

INDUSTRY AND TRADE



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INDUSTRY AND TRADE

A study of industrial technique and business organization ; and of their influences on the conditions of various classes and nations

BY

ALFRED MARSHALL

The many in the one, the one in the many

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PREFACE

THE present volume is a study of industry and trade; with special reference to the technical evolution of industry, and its influences on the conditions of man's life and work. It is designed to be followed by a companion volume, which is to be occupied with influences on those conditions exerted by the resources available for employment; by money and credit; by international trade; and by social endeavour.

Its motto is:—*The many in the one, the one in the many.* Many tendencies have gone to the making of each industry and each economic institution: therefore a thorough realistic study of any part of the economic field, calls for some reference to the interaction of many diverse tendencies, and gives occasion for some care in analysis. And, conversely, almost every important tendency is so far modified by the conditions under which it operates, that an exhaustive study of it may need to range over many fields of work. This motto supplements the motto of my *Principles* which is:—*Natura non facit saltum: i.e.* economic evolution is gradual and continuous on each of its numberless routes.

My aim has been to present as accurate a picture as I can of a part of the field of economics, and not to advocate any particular conclusions. A politician is compelled to seek his allies among those who desire the same ends as his; and therefore political influences on economic studies are not always wholesome. But a student's natural allies are those, whose aims and methods of work are akin to his own. It is of no concern to him whether a particular argument makes for or against his own ultimate conclusion: in either case he is equally grateful for any solid new suggestion that is contained in it; and equally repelled by any that seems to be based on inadequate data, or to reason

inconsequently on those data. My own experience has been, for instance, that, the more I knew of the work of Sir W. J. Ashley and the late Professor Schmoller, the warmer became my regard for them; in spite of the opposition between the main drifts of their work and of my own. Similarly, looking back on the years, in which I was much occupied in arguing that the net advantages of bimetallism are less than those of monometallism, I found that the person from whom I had learnt most on the matter, and whom I should have most welcomed as a colleague in that connection, was a leading bimetallist, Sir David Barbour.

The volume has no claim whatever to be a contribution to economic history: but an endeavour has been made to turn a few hints derived from the past to account in explaining the present: these will be found chiefly in Chapters III to VIII of the first Book, and in Appendices B to G. The table of Contents, which brings together the Section headings, indicates the general drift of the volume; and may incidentally suggest to a reader what parts of it he may with advantage shun. Analytical subtleties have been avoided as far as possible. But broad reasonings, essential for the argument, have been set out briefly; even when they have been more fully studied in my *Principles*.

For many years after the publication in 1890 of the first volume of my proposed complete *Principles of Economics*, I continued to work at its second volume: part of the type for that was set up in 1904 and is now used at last—I am told that this long waiting of type for its ultimate appearance is unique. Shortly afterwards I decided to bring out separately a more or less independent volume, devoted to Industry and Trade. Later on two volumes appeared to be necessary for the purpose: and at last it seemed best to round off the present volume in such manner that it would be an independent unit.

I may perhaps be forgiven for adding that my progress has been delayed, not only by weak health and constitutional unfitness for rapid work; but also by heavy professional duties till 1908; by preparing evidence and memoranda for various Royal Commissions on currency and other matters: and by

service on the Royal Commission on Labour, 1891—5; during which I received from working men and other witnesses, and from members of the Commission, the most valuable education of my life.

Nearly half a century has passed since I set myself to obtain some insight into industrial problems by obtaining leave to visit one or more representative works in each chief industry. I tried to get such a knowledge of mechanical technique (chemical technique was beyond my range) as would enable me to understand the resources and the mode of operation of all elementary plant in general use: I sought also to study the relations between technique and the conditions of employment for men and for women.

In pursuit of the latter aim I made it a practice to ask what pay was being earned by each class of operatives, whom I passed. Afterwards I asked to be allowed to guess in every case. If my guess was right within a shilling or two a week, I passed on. If not, I asked for explanation; and I almost always found that the reason lay in a cause, sometimes technical, sometimes relating to special conditions of the workers in question, which I did not know. The result was a conviction that inequalities of pay were less arbitrary than was often asserted, and were more directly under the influence of broad "natural" causes.

But I believed that the causes of these causes were not wholly beyond human control; and that they might probably be so modified as to bring about a nearer approach to equality of conditions, and a better use of the products of human effort for the benefit of humanity. I developed a tendency to socialism; which was fortified later on by Mill's essays in the *Fortnightly Review* in 1879. Thus for more than a decade, I remained under the conviction that the suggestions, which are associated with the word "socialism," were the most important subject of study, if not in the world, yet at all events for me. But the writings of socialists generally repelled me, almost as much as they attracted me; because they seemed far out of touch with realities: and, partly for that reason, I decided to say little on the matter, till I had thought much longer.

Now, when old age indicates that my time for thought and

speech is nearly ended, I see on all sides marvellous developments of working-class faculty: and, partly in consequence, a broader and firmer foundation for socialistic schemes than existed when Mill wrote. But no socialistic scheme, yet advanced, seems to make adequate provision for the maintenance of high enterprise, and individual strength of character; nor to promise a sufficiently rapid increase in the business plant and other material implements of production, to enable the real incomes of the manual labour classes to continue to increase as fast as they have done in the recent past, even if the total income of the country be shared equally by all. The average level of human nature in the western world has risen rapidly during the last fifty years. But it has seemed to me that those have made most real progress towards the distant goal of ideally perfect social organization, who have concentrated their energies on some particular difficulties in the way, and not spent strength on endeavouring to rush past them.

Accordingly the present volume is in the main occupied with the influences which still make for sectional and class selfishness: with the limited tendencies of self-interest to direct each individual's action on those lines, in which it will be most beneficial to others; and with the still surviving tendencies of associated action by capitalists and other business men, as well as by employecs, to regulate output, and action generally, by a desire for sectional rather than national advantage. The hopes and the fears of humanity in these matters underlie a great part of Book III, to which Books I and II are introductory: but of course the desire of the mere student for knowledge for its own sake, and without special reference to any purpose to which it can be applied, may be detected throughout.

Some matters considered in the final chapter of the volume have been affected by events and discussions, so recent that adequate place for their study could not be carved out of the text: and consequently much of Appendix P, and especially its last two sections, may be regarded as properly belonging to that chapter, to which indeed the Appendix is attached.

A little must be said about the use of terms. I have followed the practice, that prevails on the other side of the Atlantic,

of shortening "United States of America" to "America," where no confusion could be caused thereby: there is no adjective corresponding to "United States." "British" trade is commonly taken to mean that of the United Kingdom; while the substantive "Great Britain" refers only to a part of the Kingdom. I have ventured to use "Britain" as the substantive corresponding to "British" in its broader use.

Of this volume as of my *Principles*, but even more than of that, I may say that my wife has aided and advised me at every stage; and that everywhere much of whatever is good is owing to her suggestions, her care and her judgment: the index is entirely her work. Mr A. W. Flux also helped me greatly in regard to a considerable part of an early draft. Dr Clapham has kindly safeguarded my ventures on historical ground in Book I and the early Appendices; and my nephew, Mr C. W. Guillebaud, was reading my proofs, when the war called him to more important work at Whitehall.

BALLIOL CROFT,
CAMBRIDGE.

16 June, 1919.

P.S. A demand for a second issue of this volume affords opportunity for the restoration of the present pp. 657-672 to their proper place in the text: thus repairing the error, just noted, of under-estimating the space that would be required for the final chapters, which had caused those pages to be relegated to Appendix P (841-857). In consequence the numbering of the former pages 657-840 has been increased by sixteen. In addition a few small corrections have been made, chiefly on the suggestion of friends. I have been under no temptation to controversy, the sterile consumer of time and energy.

14 November, 1919.

P.P.S. The third issue (1920), and the present issue, differ from the second only in a few small details, chiefly verbal corrections. But meanwhile a study of Money; Business Credit; International Trade; and Fluctuations of Industry, Trade and Credit, has been published under the title *Money, Trade and Commerce*.

March, 1923.

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BOOK I

SOME ORIGINS OF PRESENT PROBLEMS OF INDUSTRY AND TRADE

CHAPTER I

INTRODUCTORY OBSERVATIONS

1. *The present urgency of the allied problems of industry and trade.* 1, 1, 1.

As indicated on the title page, the present work is designed to make a small contribution to the study of the progress of industrial technique, and of business organization; as well as of the distribution of the benefits thence arising among various sections of the people and various nations.

No previous age has had such large opportunities as the present for applying material resources in the elevation of human life. The forces of Nature are being turned back upon her to compel her to render ever larger returns to man's efforts in every branch of industry; any resistance that she may offer to the agriculturist and the miner being quickly reduced by the incessant development of fresh sources of rich supply, and by easy and rapid communication between distant places. New countries are quickly falling into line with old. Some of them are making greater advances in economic organization and industrial technique in a decade, than Europe as a whole has made in any century except the last: and, though this progress is continually depriving old countries of favourable markets for familiar wares; yet the very causes, to which it is due, are meanwhile opening up larger and more various

1, 1, 1. markets in the same countries, or in others. Thus material wealth has rolled in on the populations of old countries with unprecedented rapidity, and on new countries faster still.

Moreover there still hangs above all countries, old and new alike, the shadow of war. A time may indeed come when the combative instincts, implanted in man's nature by countless centuries of fierce struggle for existence, may be stilled by a *Pax Cosmopolitana*, enforced by an international police: and some small countries are even now partially protected by the desire of their more powerful neighbours to preserve a "balance of power." But so long as wars are imminent, no rate of material progress will enable the industries that prepare for war to dispense with sustained and severe labour. A single modern armoured cruiser may be more than a match for all the navies of the world fifty years ago: but no increased facilities for building an efficient warship can lessen the compulsory labour of any nation for the purposes of defence on the waters.

Improvements in the technique of rowing boats do not lighten the labour, which is required of those who desire to hold a good position in a great race¹.

But Nature's opportunities cannot long retain their present large generosity; for the world is small. Science may indeed enable a fairly vigorous life to be maintained in tropical regions, which have hitherto proved fatal to high energies: but ere very many generations have passed, the limitation of agricultural and mineral resources must press heavily on the population of the world, even though its rate of increase should receive a considerable check.

Let us turn from the cosmopolitan point of view to the national. It is true that those countries, which have abundant resources relatively to their populations, may grow in comfort, if not in luxury, for several generations: but, even if manu-

¹ The above paragraph stands as it was set up in type before the World-war was in sight. The action of Germany has increased the desire of everyone for the establishment of an agreement among nations, to intervene with force against any nation that declares war; except in accordance with a judgment of a supreme international court to which it has appealed. But the experiences of the war indicate also that the force needed to coerce a strong group of nations, who have made large secret preparations for war, may be very great: and they suggest that those, who desire peace, may not venture to neglect the sinews of war.

facturing operations could be conducted by a twentieth part of the labour now required by them, the difficulty of obtaining adequate supplies of food and raw produce would ere long weigh heavily on densely peopled countries. I, I, I.

These matters are of especially urgent concern to Britain. Before the great war she was more prosperous than ever: the real incomes of both her well-to-do and her working classes are higher than those of corresponding classes in any other densely peopled country; and the methods of her industry have advanced at an ever increasing rate. But yet she has in some respects lost leadership. Her best methods are now the common property of the Western World; and recent advances in them have been very largely due to the enterprise and inventive faculties of other countries.

The maintenance of her material well-being above that of other countries of Europe, in spite of some *relative* slackening of the industrial initiative by which she achieved her success, cannot be expected to last for ever. That it should have been maintained till now is marvellous, and calls for study. We need to know on what Britain's industrial leadership was based; and how it may be conserved, and perhaps even enlarged again.

The test of leadership is the doing things, which other countries with similar economic problems will be doing a little later, but are not ready and able to do yet. (One of the best indications of the nature and extent of a country's leadership is to be found in the character of the goods which she exports, and of those which she imports.) And, while a certain part of her foreign trade is essential to her existence; another, and much larger part, is conducive to her leadership. These are strong reasons for giving a prominent place to foreign trade in a study of the bases of her economic prosperity.

But there is another and a higher reason. (Industrial leadership counts for much among national ideals.) And if an individual, devoted merely to material ends, is but a poor creature, still more ignoble is a nation that is devoid of national ideals; that is, of ideals which recognize a national life as something more than the aggregate of individual lives. Now as the individual life is made up largely of social intercourse,

INTRODUCTORY OBSERVATIONS

I, 1, 1. so is the national. (A healthy national pride has been associated with industrial leadership) especially as indicated in the clearly written records of international trade: and the mutual knowledge which results from close trade intercourse has done something, and may do much more, towards the development of an ideal comity of nations.

Further, the notion of national trade has been bound up with the notion of solidarity between the various members of a nation. The trade of one individual with another is mainly of private concern: while the causes which enable large quantities of anything to be made for foreign sale at a profit, generally lie deep down in resources and faculties that are not wholly individual, but are in great part the collective property of a nation as a whole. A country's foreign trade is something more than a number of dealings between individuals at home and abroad; it is the outcome of the relations in which the industries that belong to her, that are a part of her life, and embody much of her character, stand to the industries of other countries.

Thus national industries and national trade act and react on one another, but the dominant force is that of industry. The main courses of trade are governed by the relations between the surrounding industries, in the same way as watercourses are governed by the contours of the hills: a map showing the contours of the leading industries of the world would show what must be the main courses of trade, except in so far as they are obstructed by costs of transport or customs duties; very much as a map which shows the contours of the hills shows also what must be the courses of the water. But the water reacts on the hills, and trade reacts on industry: the industrial history of every country would have been different if her opportunities for foreign trade had been different.

Finally in regard to sectional interests. Nearly all of them are changing their character and becoming increasingly plastic: but the chief change is the assimilation of the training, and consequently the capacity, of the working classes generally to those of the well-to-do. The spread of education is rapidly effacing those distinctions of mind and character between different social strata, which have prevailed in nearly all densely

peopled countries during several thousand years; but were in large measure the artificial results of the cumulative advantage that a small initial predominance in force gave to the more fortunate sections of each nation. 1, 1, 2.

We are indeed approaching rapidly to conditions which have no close precedent in the past, but are perhaps really more natural than those which they are supplanting:—conditions under which the relations between the various industrial strata of a civilized nation are being based on reason, rather than tradition. No doubt much force still remains in the old contention that when wealth is applied in harnessing Nature in servitude to man, by far the greater part of the aggregate benefit resulting from it, is reaped by those who have themselves accumulated little or nothing. No doubt it is as true, now as ever, that the chief work of progress is done by a relatively small number of men, whose faculty for the work can be tested only by their work: no other means of selecting them rightly has been yet devised. No doubt also those who, if of less initiative, are yet doing important work involving high mental strain, have a reasonable claim to a certain largeness in the conditions of their lives. But, for all that, it is becoming clear that this and every other western country can now afford to make increased sacrifices of material wealth for the purpose of raising the quality of life throughout their whole populations. A time may come when such matters will be treated as of cosmopolitan rather than national obligation: but that time is not in sight. For the practical purposes of the present and the coming generation, each country must, in the main, dispose of her own resources, and bear her own burdens.

2. Economic conditions are mostly the result of slow and gradual development; and, partly for that reason, they commonly show the One in the Many, the Many in the One. It is necessary to look backwards a little, in order the better to look forwards.

Economics is concerned mainly with general conditions and tendencies: and these as a rule change but slowly, and by small steps. Occasionally they may receive a strong impetus in one

1, 1, 2. direction or another from a political event, such as a revolution; or a change in a country's boundaries or alliances. A great invention, like that of the application of steam power to work that used to be done by men or horses, may enable a single generation to live through twice or thrice as much economic change as had come to its predecessors. But the printing press did not rise to nearly its full power even in a couple of centuries: and the present generation is the first that has seen the whole rise of several great inventions from nothing to dominating positions: thus the maxim that "Nature does not willingly make a jump" (*Natura abhorret saltum*) is specially applicable to economic developments.

Partly in consequence, economic conditions and tendencies show, even more than most others, the One in the Many, the Many in the One: for those, which prevail at any place and time, reflect the habits of action, thought, feeling and aspiration of the whole people, or at least some large part of them. Each reacts on the character of the population: but the roots of all are deep set in the human characteristics of the place and time: thus the One is seen in the Many. And conversely each tendency embodies in some degree almost every influence, that is prominent then and there: insomuch that a full study of it would present incidentally a nearly complete picture of the whole: thus the Many are seen in the One.

The present indeed never reproduces the past: even stagnant peoples gradually modify their habits and their industrial technique. But the past lives on for ages after it has been lost from memory: and the most progressive peoples retain much of the substance of earlier habits of associated action in industry and in trade; even when the forms of those habits have been so changed under new conditions, that they are no longer represented by their old names. Such changes increase the difficulty of so interpreting the past that it may be a guide to the present.

But probability is the only guide of general use in life. There are a few matters, in which mere reasoning avails. There are a good many more, in which the observation of current events is both necessary and sufficient: and, where sufficient, it is superior to other sources of instruction; because records of

current events can be supplemented, and witnesses may perhaps be in effect challenged and cross-examined. But observation of the present only shows what is perhaps its rate of movement: some guidance is needed also as to the rate of increase of movement. That can only be got by looking backwards. I, 1, 3.

All sorts of trustworthy records of the past may gratify a worthy curiosity: but for the purposes of economic study those only are of much service, which are sufficiently ample to suggest their own explanation. For explanation is simply prediction written backwards; and, when fully achieved, it helps towards prediction. A chief purpose of every study of human action should be to suggest the probable outcome of present tendencies; and thus to indicate, tacitly if not expressly, such modifications of those tendencies as might further the well-being of mankind.

It is true that even careful prediction is likely to overlook some influences at present latent, which will in fact greatly affect the result; while only a careless explanation can overlook any influence by which the result has been actually fashioned. But explanation shares with prediction the main difficulty, which is caused by the complex interweaving of the effects of many causes acting in the same field, and mutually influencing one another: every short explanation in economics is likely therefore to be misleading, unless indeed it be almost a truism. Moreover the progress of study opens out new problems to be considered, and thus it broadens the area of conscious ignorance even more than it increases the stock of ascertained knowledge¹.

3. *The scheme of the present work as a whole.*

As the original intention of publishing the two volumes of this work together has been abandoned, something should be said at once of the relations between them. The Table of Contents indicates the arrangement of this Volume: an introduction to Book I will follow in the next section; and similar

¹ This subject is briefly discussed in Appendix A, with special reference to the guidance which economics has derived in the last half century from the experience of the physical sciences: together with a few remarks on the relations between the economic and ethical conditions of well-being, none of which may be ever left out of sight, though the economic conditions are necessarily the more prominent in such a study as the present.

1, 1, 3. introductions to Books II and III will be found in their first chapters.

The present Volume as a whole may be regarded as concerned first with the origins of modern industrial technique and business organization; secondly with the parts played by particular nations in developing them; and thirdly with the problems rising out of that development. These problems are considered in Book II, with little or no reference to monopolistic tendencies; which are dealt with in Book III. In Books II and III there is an ever-increasing drift towards consideration of the harmonies and discords of interest among the several sections of a nation, and between each of those sections and the nation as a whole.

The sections to be most considered here are in the main of two kinds. A nation as a whole may be regarded as composed of irregularly shaped *horizontal* strata, arranged in pyramidal form, those most poorly endowed being at its base; and each successive stratum consisting of people better endowed than the last. The endowment may be measured in terms of money or of faculty: and the problem is to bring these two measurements as nearly as may be into accord; while narrowing the lower and broadening the upper strata. The issues arising out of this sectionalism are of the most far-reaching character.

But another set of issues, though of no great importance from a social point of view, is often more prominent in discussions of commercial policy: it arises out of the conflicting interests of particular industries in various matters, and especially in regard to external trade. Employers and employed in any one industry constitute, as it were, a vertical compartment, with interests in some measure peculiar to it. The problem here is to reach such an adjustment as will be most to the benefit of the nation as a whole, without pressing hardly on any compartment: and some tentative suggestions as to the relations of the Ideal to the Attainable will be ventured accordingly.

A time may come when even the aggregate interests of a nation may be willingly sacrificed in some measure to larger cosmopolitan interests. But attempts to realize that ideal now are not practicable: though some limited arrangements may be made among groups of nations, such as those that constitute

the British Empire; while a yet larger, though looser, grouping is suggested by the active alliances in support of freedom which have been developed during the World-war. In the second Volume these harmonies and discords are to be studied more closely, in connection with the harmonies and discords of interest among different nations.

Changes in the purchasing power of money, though not as important as appears at first sight, put difficulties in the way of agreements between different sections; and they confuse the statistics of international trade, though they do not materially affect its general drift. Therefore it is proposed that the second Volume shall include a short study of money and credit in relation to industry and trade.

*4. Some details as to the arrangement of Book I.
Causes of the large use of appendices and footnotes.*

The function of Book I is to indicate broadly some chief origins of the industrial technique and organization, that prevail now in the Western World. England, afterwards incorporated in Britain, was at one time a pupil of other industrial lands; though she always had certain, rather narrow, specialities. In the course of a few centuries she became, first their competitor on even terms; and afterwards their leader in many great industries.

The four or five decades, in which her leadership was chiefly developed, are sometimes described as those of the Industrial Revolution: but in fact what then happened was not a Revolution; it was merely one stage of Evolution which had proceeded almost without interruption for several hundred years. From the early Middle Ages till the present day economic evolution has presented on one side an ever increasing power of capital: and especially of capital applied in considerable quantities by professional business men; as distinguished from the resources of a great estate when applied, however ably, to its own development. On another side this evolution has diminished the strain thrown on human muscles, relatively to that handed over to the subservient energies of animals, of water, of wind, and of coal. On yet a third side

- 1, 1, 4. it has changed the general character of industrial organization in two opposite directions. Modern work is more narrowly specialized, in so far as the number and variety of the operations performed by a modern worker are on the average less than those of the elementary skilled handicraftsman: but it is less narrowly specialized, in the sense that an operative, who has mastered the accurate, delicate and prompt control of machinery of any kind in one industry, can now often pass, without great loss of efficiency, to the control of similar machinery in an industry of a wholly different kind, and perhaps working on different material.

The first of these three sides of the great evolution—that of the increased application of material resources as capital in the production of things for sale—was set on its way in various parts of Europe, while England still lagged behind. But early in the eighteenth century she ran up to the best models of the time; she passed them quickly in that production by powerful machinery, which was another stage of the great evolution; and meanwhile Mercantilism was declining largely under the influences of Dutch, French, and English writers (Chapter III and Appendices B, C, D). As the age of steam came on, she threw off nearly all remaining shackles and became the acknowledged leader of the world in massive industries. Later on she obtained a further advantage through her policy of free trade; and through the troubles which befell her chief rivals, America and Germany, in the third quarter of last century. But by that time she had become over-confident; and every class and condition of her people expected to be able to earn and to spend much more than those in similar conditions in other old countries, while yet taking their work rather easily. But a reaction set in, they learnt that they must meet strong rivals, especially in Germany and America, on equal terms: that in order to continue to lead they must learn as well as teach, and work as hard as the most strenuous of their rivals. This movement was interrupted by the World-war; but the issue of the war has been found to depend, even more than had been anticipated, on the abundance of mechanical appliances; and the movement is likely to be accelerated on the balance by the war (Chapters IV, V and Appendix E).

Englishmen, like others, have learnt and are learning much from France; especially in the fine individual perception of form and colour, which belongs to the artist as much as to the manufacturer. Germany is the chief leader in the application of organized "team work" by scientific specialists to the problems of industry. And America surpasses all in the economies derived from intense mechanical specialization, the third chief feature of modern industrial evolution: for she has turned to good account the opportunities which are offered by her large homogeneous home market, by the concentration of her forces of capital, and the ever-welling spring of energy and inventive faculty of a vast population. It includes many who are rich, but not many of those idle rich who have, at various times, damped the energies of many old seats of high industry (Chapters VI, VII, VIII). I, 1, 4

From this brief account it will appear that Book I is not in any sense a contribution to economic history: its aim is merely to indicate that the present structures of industry and trade, in so far as they are considered in the present work, are, for the greater part, direct and almost necessary consequences of conditions, which have developed almost continuously from the Middle Ages to the present time. The particular facts, to which attention is directed, have no other claim to precedence over those which are ignored, than that they seem in a special sense responsible for the good and the evil of some of the economic features of the present age.

Finally something must be said as to the reasons which have induced a rather large recourse to the use of appendices and footnotes. The writer, when reading books on subjects which do not fall wholly within his line of study, but yet have important bearings on it, often strives in vain to reach the broader issues, while avoiding the narrower. The division between broad and narrow issues must be in some measure arbitrary: for some matters of chief interest to one person are of secondary interest to another. A busy man of affairs in particular is likely to want to probe thoroughly on their practical side those issues which affect his action, and as to which he has special knowledge and responsibility: while in regard to other matters,

- 1, 1, 4. he may prefer broad statements, the grounds for which he may leave to be judged by others. Business men are those from whose guidance economic students have profited most in recent years, and may hope to profit increasingly in the future: and efforts have been made, by Section-headings and otherwise, to facilitate appropriate selection.

There is however one group of appendices which was not deliberately planned; and for the length of which apology must be made. Present policies of international trade have developed from roots in the later Middle Ages in courses sufficiently regular to offer occasion for drawing inferences from past history in relation to present conduct: and therefore considerable space was given in Book I to the rise and decay of Mercantile policy and some kindred matters. But it has been found impossible to bring out the second Volume, containing a study of international trade, at the same time as the first; and these matters have little relevance to the subjects now in hand. After some hesitation, it has been decided to retain them in proximity with the observations on concurrent changes in industrial technique and structure: but to relegate them to the end of the Volume, in spite of the great addition which they make to appendices already rather long.

CHAPTER II

SOME GENERAL RELATIONS BETWEEN INDUSTRY AND TRADE

1. *The trade of a place is likely to be increased by an advance of her stronger industries, but to be lessened by an advance of her weaker industries.*

The present chapter is in some respects more closely akin to the studies of international trade, which will come later, than to the present Book. But there will be some advantage in having a few broad results at hand immediately; for they bear in various ways on the subjects of this Book; and, though less closely, on those of Books II and III.

The only full statistics of trade are those which are collected by customs house officials at the frontiers of countries; and therefore imports and exports always suggest the notion of goods passing between different countries. But the elementary principles, with which we are concerned in this chapter, have no reference to nationality: they are almost as applicable to the trade between two neighbouring parts of the same country as they are to international trade. Therefore the illustrations will be generally taken from that particular kind of trade, the statistics of which are accessible and familiar: but the argument will be understood to apply also in a great measure to the external trade of any province or county, such as Normandy or Lancashire, or of any industrial city, such as Leeds or Chemnitz. If the local spirit of any place ran high: if those born in it would much rather stay there than migrate to another place: if most of the capital employed in the industries of the place were accumulated from those industries, and nearly all the income enjoyed in it were

1, n, 1. derived from its own resources:—if all these conditions were satisfied, then the people of such a place would be a nation within a nation in a degree sufficient to render propositions, which relate to international trade, applicable to their case from an abstract point of view; though in the absence of any statistics of the imports and exports of the place, they would to some extent still lack reality. This observation of course does not apply to a residentiary town such as Bournemouth, or Newport in Rhode Island.

Industrial leadership has generally been accompanied by a large foreign trade: and, partly for that reason, there is a widespread notion that the volume of her foreign-trade is a fairly good measure of a country's prosperity. Let us inquire broadly how much truth there is in this notion.

Much of the mystery which hangs about the trade of a nation may be dispelled by the reflection that the trade between two nations is the aggregate of the trade between their individual members, (the commercial transactions of Governments being left out of account): and that therefore it is likely to present many of the same features as theirs, though in a disguised form.

It is obvious that the trade of an individual is not a fairly good measure of his prosperity, unless he be a merchant or shopkeeper: that is, unless he have adopted trade as his industry. The volume of the trade of a merchant is no doubt a *prima facie*, though not conclusive, proof of his business efficiency and prosperity. But if a man's main business is to produce, the test is most untrustworthy: because a little energy given to some branches of production leads to a larger trade than much energy given to others.

Take, for instance, a woollen manufacturer, who has been in the habit of spinning his own yarn. Suppose him forced to give up his factory, his land being perhaps needed for a new railway. When building on a fresh site, he decides to buy his yarn, and to erect weaving sheds twice as large as his old ones. Henceforward he uses about the same capital, and buys about the same amount of coal and labour as before: but his outlay on yarn for his large weaving shed is much greater than his outlay on wool for the small one used to be; and his

output of cloth is about doubled. His trade is greatly increased. I, II, 1.
Does the change reflect increased prosperity? Is it to his credit?

We cannot say. The cause of the change of plan may have been that his weaving sheds were more successful than those of his competitors: but it may have been that his spinning mills were less successful than theirs. Mere volume of trade shows nothing. To find even an approximate answer we must go behind the facts given, and ascertain their causes. This is obviously true of private trade, and it is equally true of national trade.

✓ For a country like an individual may increase her trade as a consequence of a decrease in facilities for producing something which she imports. For instance, a bad harvest at home is likely to increase England's trade. She must import more grain, and export more manufactures to pay for it. On the other hand her trade might be lessened by the discovery of high grade iron ores, which would enable her to dispense with those that she now imports from Spain; or again by an energetic development of dairy and poultry farming, which would enable her to dispense with much of her imports from Denmark. Again improvements in her methods of building motor cars tended to lessen her trade, until her cars were as much sought for as those of France, which she at one time imported largely: and further improvements seem likely to augment her exports of them and increase her trade; at all events in directions in which the consummate mastery of their massive production, recently acquired by America, is not paramount. To speak more generally:—

✓ A country's foreign trade is likely to be increased by a rapid advance in those of her industries which are already ahead of similar industries in other countries: because such an advance increases her power of exporting at a profit. But her foreign trade is likely to be lessened, or at all events its growth is likely to be checked, by an advance in those industries in which she is relatively weak; because such an advance will tend to diminish her need of imports.

It is, however, true that a general advance of a country's methods and resources of production, affecting equally those in

I, II, 2. which she has been at a relative advantage and those in which she has been at a relative disadvantage, will put all her affairs on a larger scale: and her trade will increase with the rest of her affairs. Further, and this is perhaps more important, her exporting industries are likely to owe their success over foreign competitors in a great measure to an unusually high average of constructive ability and initiative among employers, and of sustained energy and fidelity of work amongst employees. These qualities engender and attract men of great industrial strength. And, when a country is growing in strength, a disproportionately large share of it is likely to belong to her exporting industries, and therefore to increase her trade: industrial leadership is thus reflected in foreign trade.

This rule is however not universal. It sometimes happens that a sleepy industry is invaded by a few active and enterprising men from outside, or migrates from a stagnant district to one that is progressive: its advance may then oust a large class of foreign imports from the home market; with the net result of lessening the country's foreign trade.

○ On the whole, and in the absence of all knowledge as to the causes at work, it is reasonable to suppose that an ascertained increase in a country's foreign trade reflects an increase in her general prosperity. But we may never assume that a rise or fall in that trade indicates a *proportionale* increase or diminution in her prosperity: we may not measure her prosperity by her foreign trade. We must go behind the returns, and judge each item of imports and exports by itself. On investigation, some will indicate strength in natural resources and others weakness: some will indicate industrial progress, and others will indicate industrial decadence, not perhaps positively, but relatively to other countries.

2. *The direct gain that a town, a province, or a country derives from its external trade is the excess of the real value to it of its imports over that of the things, which it could have produced for itself by the labour and capital needed for producing its exports and working the trade.*

As an ordinary rule, when anyone voluntarily exchanges one thing for another, he expects the latter to be of greater

service to him than the former; perhaps for his own use, perhaps for trading away. His gain by the exchange is the superior value to him of what he receives over what he gives up. If he made the first thing himself, and will use the second himself, this gain may be stated as the excess of the services which the second thing will yield him, over the effort which it cost him to make the first; or—which is sometimes nearly the same thing—over the services which he could have got by making for himself other things with an expenditure of effort and resources equal to that needed for making the first¹. I, II, 2.

What is true of trade between individuals is true of trade between towns, or provinces, or countries. But there are seldom any statistics showing the imports and exports of any locality, which is not either a country, or an isolated province belonging to a country; and it will be best to speak here only of countries. The *prima facie* gain, which a country derives from her foreign trade, consists in the excess of the value to her of the things which she imports, over the value to her of the things which she could have made for herself in their place; i.e. with the amounts of capital and labour devoted to producing the things, which she exported in exchange for them (the costs of working the trade being of course reckoned in).

But our statistics do not, and cannot, afford a direct means for estimating this excess. And consequently it is necessary to use them indirectly on a plan, which suggests more definite ideas: it is not strictly correct, but it serves fairly well for some purposes. On this plan, it is tacitly assumed that the country would make for herself those things which she imports, if she could not get them by trade: and accordingly her gains from her trade are taken to be the excess of the cost to which she would be put if she made her imports herself, over that to which she is put by making other things and exporting them in

¹ It will be noted that this statement differs fundamentally from one that is substituted for it in popular discussions: the statement, namely, that in a free exchange each person gives up what is of less real value to him than to the receiver. When a peasant who lives chiefly on poianta and cabbages sells his fowls to buy clothes, he receives the power of purchasing things of more value to him than the fowls. But if the purchaser of the fowls is a rich man, their possession cannot afford him as much real benefit as it might have done to the seller.

1, 11, 3. exchange for her imports. This result is of course very far from the truth in regard to such things as Britain's imports of tropical foods: for she could not produce any great quantities of these herself; and she would for the greater part go without them, if she could not import them. If her imports of French and other woollens were arrested, she would indeed make up the greater part of the deficiency by her own products, which would be pushed into uses for which imported products are now preferred; her exporting industries being of course subject to an equivalent check. But if her imports of wheat and other staple grains were arrested, she would be forced to make up the deficiency by her own production, even though that would require poor crops to be wrung by great labour from unsuitable soils, and climates.

This is however only the *prima facie* gain; her trade exerts many other influences on her well-being, some good, and some evil. It may, for instance, educate her finer industries and those which make most for leadership: or it may tend to stifle them. It may increase or diminish the steadiness of employment of her working classes; and so on. And there are other issues, to be reckoned with later on. Account will need to be taken, for instance, of exports which she sends out when lending capital to other countries, and for which she receives no corresponding imports at the time. Again allowance will need to be made for the influences of different kinds of trade in stimulating industrial energy, in ministering to the wants of the needier classes of the population and in affecting the amount and security of their employment.

3. *Countries, whose advantages are distributed in unequal proportions among different industries, may generally carry on a trade profitable to both, even though one of them is absolutely the stronger all round.*

Trade between two individuals is the result of relative differences in the ease with which they can make different things. One man may conceivably be able to do everything easier than the other: but if he has a great advantage in doing some things, and only a small advantage in doing others, then it may probably be worth his while to give all his energy to

doing those things in which he had a *relative* advantage; and to escape doing those for which he is at a relative disadvantage, though at a positive advantage. 1, 11, 3.

For instance a business man could often do the work of his assistant, or his foreman, or one of his workmen, better and more easily than it is done by the man whom he pays to do it. But he would be foolish to do it himself, if that involved, as it probably would, the neglect of other work that is peculiarly his. Again, a medical man may possess more strength and more knowledge of horticulture than the gardener whom he hires; and be able to do the gardener's work better and with less effort: and, if the gardener could not obtain it otherwise, he may well spend a day's wages on medical advice, given in a few minutes, which rescues him from many days' pain and loss of wages; though it costs little to the physician. In such cases each man does work for which he has a differential advantage, though he may be at an absolute disadvantage.

Again, the owner of cold wet land may habitually supply oats to his neighbour, whose land has a southern exposure and a deep loamy well-drained soil. To grow a quarter of oats may have cost him much more labour and other outlay than it would have cost his more fortunate neighbour: so that in raising the oats he is at a great *absolute* disadvantage. But his land though ill suited for oats is even more unsuited for wheat: and, because his absolute disadvantage in the production of wheat is greater than in the production of oats, it is to his advantage to "export" oats to his neighbour and to "import" wheat: he has a *relative* advantage in the production of oats. The existence of the trade is not to his credit or to his discredit: but it is a sign of the poverty of his resources. If by drainage, improved rotations, etc. he managed to grow a good deal of wheat without inordinate labour and outlay, he would lose this trade: and that would be to his credit¹.

Now it will be found that somewhat similar cases occur in the trade between two countries, whose peoples cling to their several native lands, whether from inertness, or for the sake of patriotic ideals. In such a case the nation that is the less well

¹ This group of illustrations is on similar lines to those of Ricardo's celebrated chapter on Foreign Trade.

1, 11, 3. endowed with natural resources, or the faculty for industrial organization, must act like one of the less fortunate individuals just described. It must turn to the best account those resources and faculties, which are less markedly inferior than others to similar resources and faculties in the possession of its neighbours. Its fortune will remain inferior to theirs: but it will not lag behind them as much as it would, if it were compelled to provide for itself those things, for the production of which its relative advantages were very low.

But the case of trade between two districts of a modern western country is different. For if the industries of one of them were so much richer than the other in natural and acquired resources and in organizing faculty, that a man of given natural ability and energy could earn nearly the full wages of the more fortunate district shortly after migrating into it; then migration would have set in long ago so strongly as to change the location of those industries which required high faculties. The backward district might continue with low wages; but that would be because its social conditions and general influences were not adapted to bring out the best energies of its inhabitants; and, possibly, because it had become a sort of sink, towards which people who could not obtain employment in the more energetic and enterprising district gravitated. After a time however it might awake from its torpor, assimilate the processes and the energy of the more advanced district and thus earn equal wages with it. Capital would follow the effective demand for it from one district to another very rapidly.

Trade between such districts shows little to correspond either to trade resulting from the faculties of the business man or the medical man, which are fixed in the individual and not capable of being transferred to his foreman or gardener; or again to properties of the rich warm land that are fixed in it. International trade on the other hand shows much to correspond with them: for the migration of labour and capital from one country to another, is still slow, though not so slow as it was formerly. No doubt lethargy and other obstacles prevent the inhabitants of some backward districts even of western countries from migrating to neighbouring districts, where they might soon learn to turn their latent strength to good account: while, on the

other hand, alert people migrate from one country to another without great difficulty, at all events where no change in languages is involved. I, n, 3.

This class of considerations will need to be pursued further in connection with the problems of international trade. But before passing away from the general principle which is indicated in this section, there may be some advantage in pointing to a few more results which flow from it, and have influenced the evolution of national industry and trade throughout the world a good deal more than might seem probable at first sight.

It is true that if a country were twice as well endowed as her neighbour with *all* natural resources, with *all* industrial aptitudes, and with capital; then there could be no trade between them. It would be twice as heavy a task to produce a quarter of wheat in the second country as in the first: but so it would be to produce a bale of cloth or a piece of machinery. All commodities would exchange for one another at the same rates in one country as in the other: and a merchant would gain nothing for his pains if he took the goods of one country to sell them in exchange for goods of the other. But in fact every industry is full of specialities, some large and some small. Britain and Germany are on nearly the same level in industrial capacity generally: and each is wont to buy from the other considerable quantities of textile, and engineering, and other products.

The greater part of such trade would indeed have been impossible without those modern facilities for transport and communication, which enable a very slight differential advantage to effect interchange, even in the face of moderate import duties. But if the richer country could produce double as much as the other could with equal effort in some industries, and only half as much again as the other in the remaining industries, then there would be so great a profit to each in exporting those things in which she was at a relative advantage and importing those in which she was at a relative disadvantage as to overbear even a heavy cost of transport.

The trade would be profitable: and that is all we are concerned with just now. But even here it is worth while

1, u, 3 to insist that the best business is not necessarily that which brings in the highest profits immediately: for other business may be doing more to strengthen the basis on which all rests. Thus the lad who carries parcels often earns higher wages than he would while learning a skilled trade: but in the long run it would have paid him better to earn less at first. Similarly, a country may rightly ask whether her foreign trade is such as to promote the education of her industries. The answer varies curiously with circumstances. For instance, when Japan first welcomed foreign traders, she sent to England fine metal work, which could have been produced there with less effort than in Japan: for some parts, though not all, could have been made by machinery. In return she imported things made wholly by machinery with a quickness and accuracy which were beyond the competition of hand work. Japan was at an absolute disadvantage in both kinds of production. But she was at a greater disadvantage where machinery could do all the work, than where it could do only a part. And some would have said—let her tax heavily imports of western manufacturers, so that her people may learn western methods. But (partly under the influence of treaty obligations) Japan on the whole welcomed foreign manufactures, meanwhile studying western methods; and she now uses machinery freely where it is appropriate. Thus both absolute and relative national disadvantages are quickly altered in this era of rapid change. And indeed each part of every country's trade is coming increasingly under the influence of causes, which affect in the first instance countries other than those with which that trade is carried on: the international element is becoming increasingly prominent in the history of all trade.

For instance, when any change in England's trade with Italy occurs, the Englishman is likely to have already in his mind the changes in English conditions which bear on it. And therefore, before forming any opinion on the change, he should make some study of recent events in Italy: he should look for changes in the relative efficiency of different Italian industries; and again for changes in Italian demand for the products of other countries, whether of such a nature as to compete directly with English products or not. And especially he

should take account of any change in the costs of transport between Italy and other countries and also in the development of Italy's internal traffic: for such changes often have a greater effect on England's trade than others, which fill a much larger place in the mind of the Englishman. I, II, 4.

In all economic history, and especially in recent economic history, and most of all in the recent history of trade, the international point of view is essential. It is easy to remember that one's own country is ever growing and changing: but it sometimes requires effort to consider how many of the changes near at hand are partly due to the expansion of life far away.

4. *A small country often has a relatively large foreign trade: for she can seldom supply nearly all her own wants as regards raw materials and other things; and her frontier is generally long relatively to her population and industry. But some causes tend in the opposite direction.*

When the foreign trades of two countries of unequal size are compared, with the purpose of finding a rough measure of their relative economic activities, it is obvious that account must be taken of their relative population: the great excess of the trade of China over that of New Zealand does not suggest any lack of energy on the part of the islanders. But if, avoiding this danger one compares the amount of trade per head of the population of two countries of very unequal size, one falls into an almost equal error in the opposite direction. This danger is more subtle than the first: and there is no simple rule which will guard against it. But it will be found that if the populations of two countries are equally vigorous and alert, and equally well supplied with capital; then the trade per head will generally be the larger in the smaller country: for, in all probability, she will have less varied resources; and, partly as a consequence, her industries will be less capable of supplying her various needs. An additional reason is that she is likely to have relatively long frontiers, adjacent to those of other countries. A comprehension of these facts is so important as an aid to reading between the lines of a sketch of the evolution of national trade and industry,

1, II, 4. that there may be an advantage in looking at a great many illustrations of the way in which it works out.

A place which produces but few things must necessarily depend largely on external markets. To take an extreme case, a village, given up to fishing, trades away nearly the whole of its produce; and the neighbouring farming villages trade away by far the greater part of theirs. But the country which contains these villages and some towns, with simple manufactures, will be more nearly self-sufficing; and its external trade will be less in proportion to population than that of the farming villages, and much less than that of the fishing village.

Again, rich mines of precious metals and stones have been found in arid districts where agriculture is difficult and the conditions of life are not attractive to an industrial population. Consequently industry in those districts has been highly specialized: they export practically the whole of what they produce, and import practically the whole of what they consume.

Again, each State of the American Union must import from elsewhere many things, which the United States as a whole can supply for herself: and therefore if statistics were kept of the aggregate external trade of each State, the total would be many times as great as the total of the foreign trade of the United States. Ireland's trade with England and Scotland has always been greater than her trade with the rest of the world; and the aggregate foreign trade of the United Kingdom was therefore less than that of Great Britain¹.

¹ This was put in evidence in 1825 when Great Britain's trade with Ireland ceased to be classed as foreign, and her foreign trade shrunk; though Ireland's trade with other countries was added to hers. In recent years approximate statistics of Ireland's external trade have been collected, and they show it to be about half as great again per head of the population as that of England and Scotland. The external trade of Greater London is probably greater than the aggregate of that of the United Kingdom.

The foreign trade per head of the Australians was lessened by more than a third when the Colonies were united into one Commonwealth. The change would probably have been much greater if Australia had offered more facilities for intercolonial trade: for the great desert in her centre sends much even of her local trade round by sea, though a good deal passes between Melbourne and the Western district of New South Wales. Further, more than a third of her population is concentrated in four sea-ports, whose cosmopolitan tendencies and opportunities prevent them from having the bias, that more restful districts have, towards local rather than foreign trade.

Again, when natural and artificial causes were combining to give the West Indies nearly a monopoly of the production of sugar, some of these islands imported not only all their clothing and other manufactures, but also nearly all their food. On the other hand India had at the time but little foreign trade, in spite of her vast population, and the high value which Europe placed upon many of her products. For she had little need of European products: she could herself supply most of the things which she desired to have; and Europeans could not then get access to more than a narrow fringe of the large and rich land. Consequently while the foreign trade of the West Indies was for a time one of the largest in the world, that of the whole Continent of India remained small. I, II, 4.

Again, so long as England's exports of cloth were made chiefly of her own wool and other home-made material, each thousand pounds' worth of them carried nearly a thousand pounds' worth of the services of her own capital and labour: but now that her cloth is largely made of imported material, that is no longer the case. Further her imports of raw wool, etc. are reckoned as part of her foreign trade: therefore the increase in her foreign trade due to her exports of cloth appears greater than it is.

Similarly the recent growth of Germany's foreign trade has been partly due to the fact that her population, which is larger than that of this country and is growing much faster, is beginning to work up imported raw material on a great scale for home consumption and for export. An additional reason is that railways have given her great new facilities for trade with the seven countries, whose frontiers march with hers. This brings us to consider the two geometrical facts, that a small country has a larger frontier in proportion to her area than a larger country of the same shape; and that the average distance of her people from the nearest foreign markets is likely to be less¹.

¹ The areas of similar figures necessarily stand to one another in the proportion of the squares of their several linear dimensions. Thus, if a country with an area of ten thousand square miles has a frontier of six hundred miles; then another country of similar shape, but a hundred times as large, will have a frontier of only six thousand miles. The smaller country will have ten times as long a frontier in proportion to its area, and therefore probably in proportion to its inhabitants and its industries, as the larger; and in so far as the frontier is a

I, II, 4. Thus Belgium has excellent access to all the world by sea, and a frontier which marches with those of France, Germany and Holland. And, though Switzerland has no access to the sea, her frontiers march with those of four great countries; and her northern, western and southern industrial districts have closer economic relations in some matters with parts of Germany, France and Italy, respectively, than they have with one another; even though they are now united by tunnels through the Alps. These conditions increase their foreign trades.

And yet a large country has her own advantages. Her large area gives greater facilities for the development of those great industrial districts in which, as we shall see presently, concentrated specialization is now carried to its highest extent: and such districts have generally a better approach to her own large markets than the industrial districts of a small country can have to foreign markets, even if their frontiers are not beset by import duties. These broad causes will be found to be among those which have tended to move industrial leadership from cities and from small to large countries; bravely as some small countries are still striving.

Again, industrial leadership—that is the power of doing now what others will presently be doing, or at all events trying to do—enables a country to cater for a great variety of wants which she feels; and which others in like conditions feel, or at least will feel when tempted by the offer of the things that fit those wants. She offers variety: she does not glut the foreign markets with things with which they are already well stocked. She sends those things which have a certain distinction, as being new in substance or in quality, or as attaining familiar ends by easier and simpler means. Whether her population is large or small, it is sure to contain a high proportion of rich people, who can afford to spend freely on imported luxuries and choice goods of all kinds. She is likely to have good means of communication, so that her exports and her imports alike can easily reach their destination. And lastly; since foreign trade

sea line, it will probably supply harbours suitable for the cheapest form of transport. In so far as it is a land line, there will probably be large openings for foreign trade with people close at hand; and with whom traffic will be easy, familiar, and cheap, unless indeed it is obstructed by high tariffs.

itself is an industry, her industrial ability is likely to show itself in conducting that trade with energy and efficiency. 1, n, 5.

5. *An increase in the distance which goods can be carried at a given cost, is likely to increase the trade in those goods in a greater ratio. Spheres of influence of different centres of trade.*

We have now seen how the unequal distribution of (differential) advantages in different places tends to cause trade to grow up between them. But of course the merchant has difficulties to overcome, risks to run, and expenses to pay: and it will not be worth his while to push the trade unless the differences in value of the things, which he buys and sells in the two places, give a sufficient margin to remunerate him for overcoming all these obstacles.

As a rule, the chief obstacle is the cost of transport; at all events if we take it broadly so as to include insurance, commission expenses and locking up of capital till the returns are brought home: and this cost increases, though irregularly, with the distance. But the area of a circle varies as the square of its radius. Therefore improvements in the mechanism or the organization of transport, which increase the distance over which trade in certain goods can be carried at a given expense, are *prima facie* likely to increase in the square of that ratio the area over which the trade can be conducted profitably. This rule may be called *Lardner's Law of Squares in transport and trade*, for convenience of reference¹.

The facilities for transport from any place in various directions frequently differ widely in character; and so do the markets to be reached. Thus the cheap sea routes at the command of a maritime port may lose much of their value if the population along the neighbouring coasts is sparse, and inland transport from the coast is difficult: and therefore the district, over which trade is profitable, is likely to be of irregular shape. Nay more, the advantage of cheap sea routes

¹ It was made prominent for the first time in Lardner's epoch-making *Railway Economy*, 1850; though its general bearing was probably recognized earlier. Its geometrical method is greatly developed in Alfred Weber's *Standort der Industrie*, Part I, 1909, especially the third chapter and the appendix.

I, II, 5. may vary from one class of goods to another; the expenses of land traffic being a greater obstacle to the movement of bulky goods of low value than of light and costly goods.

But the rule applies fairly well to a trading port in close touch with an archipelago or river delta studded with rich markets. Such a port is indeed likely to derive moral advantages, as well as commercial, from its commanding position. And, in this sense it is true, that the law of squares has had much to do with the brilliant careers of Athens, Alexandria, Byzantium, Marseilles, and Venice; of the Hanseatic League, and of Holland¹.

Causes that delayed England's rise to leadership were that her industries were neither concentrated, nor united by good communications; while she was not specially well placed for availing herself of the economies indicated in the law of squares in external trade. But afterwards transoceanic traffic became more important than that of inland seas and rivers; and the law of squares aided her more than it did any other country, especially during the early days of railways. In recent years, on the other hand, large inland countries have been helped by an ever extending net of railways to reap more benefit from that law than she has.

Of course many hindrances to communication are of a personal rather than a mechanical nature: and they are much under the influence of sentiment, and still act more strongly against international than against domestic trade. Improved education and extended travel are indeed slightly diminishing those which arise from differences of language, of business usage, of commercial law and jurisdiction, and so on. But national sentiment is not always moderated by international intercourse.

It is obvious however that even a great economy of transport will not enable a place to send its goods into the sphere of influence of an equally strong rival centre of production. For example, if a district well adapted for wheat be surrounded by a belt of pasture land, then a fall in the cost

¹ Some of the above considerations are further developed below, in connection with recent changes in the conditions of marketing in various classes of large cities. (See II, vi, 5; and Appendix J, 6.)

of sending out wheat and bringing back cattle will extend the trade: but, however low that cost, the wheat cannot be sent across the pasture land into other wheat territory. Similarly the export of coal or heavy iron goods from a great producing centre will extend rapidly under the influence of lowered transport charges, until it approaches the sphere of influence of a rival centre. Five-thousand-ton barges on the Rhine, and increased railway facilities, have sent English coal into South Germany and Switzerland: but the neighbourhood of the Westphalian mines has always been closed to it. I, II, 5.

When two centres of trade are competing for any neutral territory, an improvement which lowers equally the costs of the communication of both of them with that territory, will increase the trade of both in about equal proportions. But if the improvement benefits one more than the other, the second may lose trade by the change. Thus the Panama Canal, which facilitates trade between England and Peru, may yet lessen that trade; because it facilitates even more the trade between many parts of North America and Peru.

This points to the general observation that new economies of transport between two places exercise their *full* influence on trade between them, only in so far as they are *differential*, that is in excess of new economies in competing trades. For instance, a general fall in the costs of transport induces a country to buy many things from abroad which she would otherwise have produced for herself, or else foregone. But it is likely to diminish the advantages that her immediate neighbours have for selling to her things for the production of which they are not so well equipped as some more distant competitors. It is indeed true that the costs of handling, or—to use a railway phrase—"the terminal charges" are nearly the same for long distances and for short; and that therefore increased economies in the building and working of ships affect the total costs of long distance trade in a less proportion than those of short distance trade. But yet the total lowering of costs is much greater for very long distances than for short: and in consequence European countries now buy many things from other Continents which they used to buy not very long ago from neighbours.

- I, II, 6. 6. *Some consequences of the facts that the costs of traffic over long distances have fallen more than those over short distances; and that both have fallen unequally.*

In early times the discomforts and risks of a long journey or voyage were often very great; and were magnified by prejudice and imagination. Even to-day, if one hires an ordinary villager, with or without a cart, to carry luggage twenty miles, one must commonly pay more than twice as much as for ten miles: because if he goes twenty miles he must sleep away from home.

But, on the other hand, the international money market, the post, and latterly the telegraph have lowered those costs of trade which are not directly connected with the handling of the goods. And on the whole it is probably not far from the truth to assume that the total costs of maritime trade have been lowered about in proportion to the economies in transport, which have been effected by the discovery of the art of tacking, by improvements in the construction of ships, which give them greater carrying power for a given gross tonnage, by the substitution of steam ships for sailing ships, of steel ships for wooden ships, of high pressure boilers for low and so on. And any consequent lowering of freights (even after allowance has been made for the maintenance of *some* of the costs of handling in ports at a relatively high rate) has generally caused the water area which can be profitably covered by any kind of heavy traffic to increase in the square of the ratio in which they have been lowered. The progress of land transport has been less uniform and more spasmodic. For the art and habit of making good roads have risen and decayed more than once; and the whole conditions of transport in any district are revolutionized when a railway system appears in it.

It often happens that goods can start on an easy route, but must break away from it to the right or left in order to reach their destination: and in such a case the area which can be profitably covered by any class of trade has the shape of an elongated oval or diamond.

Suppose for instance a town were placed on a river running (very slowly) due north and south, along which heavy goods could be carried profitably about one hundred miles in either

direction; while the cost for each mile by land was ten times as great. Then, assuming the purchasers everywhere to be ready to pay the same price for the same goods, and neglecting the expenses of transshipment, we find that the town's market for those goods would have the shape of a long diamond, twenty miles from East to West, and two hundred miles from North to South; its area being about two thousand square miles. Meanwhile light perishable goods, which could not endure a slow journey by water, but could afford to be carried a hundred miles by land, would have a market of rather more than thirty thousand square miles. I, II, 6.

The case is substantially similar when traffic starts by sea, or by railroad, and has to be carried by road for a part of the journey. For that part, though short in distance, may easily be the costlier of the two. We shall see presently how much, that seems obscure in the history of the prices of wheat in England during the nineteenth century, finds its explanation in the fact that the prohibitory costs of transport for the first hundred miles from many districts ceased as soon as they had been connected by good roads or railroads with tidal water.

A simple illustration of this principle may be found in the building of Alpine chalets. When one has to be built very far from any road, logs are roughly hewn into the requisite shape by the adze and hand-saw at a very heavy cost of labour and wood. But if the chalet is to be built near a valley, which has a rough road and a simple saw-mill; then the logs are brought down the road over snow in winter, and are sawn into boards, which are carried along the road, to a point just below the chalet. The builder, however, must still apply the hand-saw, the adze and the plane to do a great deal of work which is done with a tenth or a hundredth part of the labour by large wood working mills with expensive plant, such as can pay their way only in broad valleys with ample road or railroad communications. In such a microcosm we see increased supplies of capital, and improved means of communication, gradually extending the economies of massive production to one district after another, and one class of commodities after another. The broad history of trade is little more than the continued application of similar principles to provincial, national and cosmopolitan problems.

CHAPTER III

FOUNDATIONS OF ENGLAND'S INDUSTRIAL LEADERSHIP. HER DRIFT TOWARDS MASSIVE PRODUCTION

I, III, 1.

1. *Introductory. England's forerunners in the industrial leadership of Western Europe. The spirit of economic nationality.*

The purpose of the present chapter is to sketch England's preparation for leadership in modern methods of massive production. The energies of her people showed themselves early in war and in maritime trade and adventure: and the characteristics of her later industrial qualities were foreshadowed by the uses to which she put water power in the inception of massive textile work. But "massive industry" in that full sense of the term, in which scope is offered for the complex and multifarious resources of modern technique, calls for a very much larger aggregate use of power than could be supplied by all the streams of England. This introductory chapter therefore passes quickly over the advance of England's industries through Mediaeval and Mercantile conditions to that in which considerable masses of workers were aggregated, for good and for evil, in districts that provided water power adequate for relatively large and highly organized textile manufactures.

The forerunners of modern "national trade" are not to be found in any empire of olden time, however firmly it was held together by political and military influences. But they may be found in great industrial cities in the Early, and especially in the Middle Ages: since in these, direct communication by word of mouth sufficed for nearly all the purposes of the modern printing press, post and telegraph: therefore they developed as patriotic a pride in their work as in their military strength.

And, as List says, that which is now called the spirit of economic nationality, is really the spirit of Bruges or Antwerp; of Venice, Florence or Milan, spread over a whole country. It first permeated to Holland, a land of cities intimately united by an all pervading network of waterways. There were jealousies among her cities: but they worked on the whole harmoniously for the common purposes of trade; and a national trade was created under these conditions before the time was ripe for a large national industry. But a chief advantage, which Holland ultimately obtained over her rivals in trade, was by her adoption of standardized shapes for her ships and other vessels. Each of several cities undertook the supply of a particular group of interchangeable parts; and thus the methods applied, during the World-war, by several countries to the production of munitions (and notably by Germany to that of submarines) were anticipated by Holland, long before engineers had even contemplated the delicate accuracy of work attained by modern semi-automatic machinery. Englishmen fought eagerly with Holland, and gained little thereby: but their debts as pupils to her are immense. I, III, 1.

One keynote of the contrast between the early economic history of England and Holland is incidentally struck in Petty's illustrations of his great rule that "Each country flourisheth in the manufacture of its own native commodities." He continues, "viz. England for woollen manufacture, France for paper, Luicland (Liège) for iron-ware, Portugal for confections, Italy for silks. Upon which principle it follows that Holland and Zealand must flourish most in the trade of shipping, and so become carriers and factors of the whole world of trade¹."

He was arguing that England had a better "native commodity" for shipping than appeared: but he did not venture to claim that it was very great. For the Netherlands and Venetia are lowlands watered by great streams: England is an island of which the main watercourses flow away from one another; and the seas connecting them break turbulently round long promontories. Her harbours were not specially well placed for the trade of early times, her inland waters did relatively little

¹ *Political Arithmetic*, A.D. 1676, p. 16. See Appendix B for an outline sketch of the debts of modern industry and trade to the City States and to Holland.

I, III, 1. towards concentrating her industry, and in the early Middle Ages her people cared little for the sea. But yet the sources of her strength and of her ultimate wealth lay in her geographical position, and in the climate attendant on it. Her position had attracted the boldest venturers from both sides of the North Sea and the Baltic; and Professor Schmoller, an able, if somewhat severe critic of English history, says of them:—"there arose from the intermarriage of these invaders a sportive variety of men of rare bodily vigour, strong of will, calm in deliberation, and bold in action¹."

There are indications of a tendency to regard the industrial qualities, which have been prominent in England during recent times, as accidental successors of the earlier strenuousness of Englishmen under arms:—accidental in the same way as it was a matter of accident that the Yorkshire hills, whose water power attracted woollen industries in the eighteenth century, owed their later industrial prominence to their coal, of which the earlier woollen manufacturers had taken little or no account. It is therefore worth while to insist that the energies of Englishmen have always had the same fundamental character: but the brief historical sketch which occupies the remainder of this chapter will be superfluous to many readers; and may be omitted.

¹ *Die englische Handels Politik des 17 und 18 Jahrhunderts*, published in his *Jahrbuch*, vol. XXIII. List, another critic of England, equally able and almost equally severe, while remarking that the influence of blood may be over-rated, and that there was less freedom in England under the Tudors than in the German and Italian cities, attributes much of England's wealth to "the people's innate love of liberty and of justice." *National System of Political Economy*, ch. vi. pp. 49 and 50. And elsewhere he observes that "of all the industrial pursuits, navigation most demands energy, personal courage, enterprise, and endurance; qualifications that can only flourish in an atmosphere of freedom" (*ib.* ch. x. p. 108). Roscher points out (*Handels Politik*, § 6) that vicissitudes of commercial enterprise, and the resolute independent bearing that was fostered among the people by a seafaring life, combined to weaken class distinctions in trading cities, even when their political constitution was oligarchic: and thus there was a constant spring of fresh energetic blood upwards in them. Petty argues that trade does not always flourish best under popular Governments; but he gives some curious instances of his rule that "Trade is most vigorously carried on in every State and Government by the heterodox part of the same, and such as profess opinions different from what are publicly established." (*Political Arithmetic*, p. 25.)

2. *The qualities, which gave leadership to Englishmen in industry and trade in the nineteenth century, had their roots in early times.* I, III, 2.

From 1066 down to the present time England's history has been that of the same people, never disturbed for long by any sort of grievous violence, never forcibly moulded by a series of imperious personalities, never under a dominating influence from outside. They brought with them the characteristics of firm will, self-determination, thoroughness, fidelity and love of freedom—strong qualities, which they have never lost; but also some deficiency in graciousness and delicacy of manner—pleasant qualities, which they have never completely gained. They have learnt greatly from others: but they have pursued their own course so independently and steadily, that their political and economic institutions have grown side by side in harmony; and they stand out now as the leading type of continuous development. Their methods in industry and trade were for long ages far behind the highest level that had been reached; but at last they threw their own special characteristics into business affairs with such energy, and such quickness of adaptation to the ever increasing massiveness of the economic problems of the Western World, that they became its chief pioneers of progress and trade.

In fact the qualities of body and character, which ultimately gave to Englishmen a certain leadership in industry and trade, had their origin in early times; and persisted throughout some six centuries, in which they found much scope in deeds of courage and endurance on land and sea, and in popular games: the English archer was the progenitor of the English artisan. Continuity can be traced also in England's political history. The "growing pains" of the Tudor age were in part an indication of the fusion of England, or at all events of all England except her northern counties, into an economic unity. Local restrictions and other regulations faded away: and their place was gradually taken by laws and royal ordinances, which applied generally to the kingdom as a whole: this was in part cause, and in part consequence, of the beginnings of a consciousness of economic nationality. The new order was to be based on the old: but with greater breadth of action came somewhat greater

I, III, 2. breadth of thought, and also some slight softening of temper: the new order of administration was associated with a new order of trade; and internal trade became generally more open, while external trade was still regulated, though not on mediæval lines.

England's foreign trade was for a long while in the hands of foreigners, whose conduct was mitigated by the Staple; and for some time more largely in the hands of "Regulated Companies," that is, companies which had an exclusive privilege and a small common purse, while each member traded on his own account: but afterwards privileged joint stock companies came to the front. Thus the joint stock principle was applied for some time almost exclusively to trade with distant lands, and the settlement of plantations; but it began comparatively early to attack the development of the mineral resources of the country itself. This might have been anticipated: for the land was the chief wealth and the chief source of new wealth; and the owners of land were at their ease in work connected with it. Capitalistic resources flowing from the land (either to its owner or as tribute to the sovereign) had indeed been applied directly, with very little intervention from professional commerce or industry, to most of the great constructive undertakings from the building of the pyramids down to the end of the seventeenth century. Important exceptions have to be made for the chief works constructed by the great trading Cities, but not for many others; unless the funds which Roman and other armies dug out with the sword should be entered under a separate head. The land yielded its wealth directly to the building of cathedrals, churches and monasteries: of castles, palaces and great mansions: and many of the passing glimpses which we get of the manner in which the tasks of assembling great quantities of materials from afar, and organizing the work of large numbers of artisans and labourers, were conducted in early times, are afforded by the records of cathedrals and monasteries¹.

¹ These matters are considered further in Appendix C, where something is said as to the steps by which Englishmen, starting late in the industrial race, learnt from others, and gradually rose to positions of rivalry with their teachers: and as to the slow spread of relatively free and democratic methods of life and action over a large part of the land; feudal order giving way in some measure to institutions more akin to the temper of the artisans of a great industrial city. A little is also said in the third Section of that Appendix as to

3. *The progress of England's internal and external trade during the Mercantile Age.* 1, III, 8.

The trade of the Mercantile Age impressed the imagination of those who recorded it; and some writers of our own times imply that it was large. But it was not. At the time of the Restoration England's foreign trade was less than a hundredth part of her present foreign trade in money value, and less than a two-hundredth part in volume. And though it increased fivefold during the next hundred years; yet in 1760, when the establishment of England's supremacy at sea told that the main work of the great trading companies was accomplished, it had not attained to a sixtieth part of its present bulk.

One cause of the slowness of the growth of foreign trade was that the new markets beyond the seas were really very narrow. It is true that more than half the coast lines of the new continents had been "discovered": but the countries behind those lines were still almost inaccessible. The sea-ports which were open to western traders gave them access to small islands of trade, rather than to large territories: they could not always venture very far out of hearing of the sea waves. Their goods might indeed be distributed by native merchants: but only the munitions of war, and luxuries for the rich, would generally bear carriage far into the interior. And further, in the highly civilized parts of the East they met textile and metal goods made by as subtle a skill as their own. They could sell a few trinkets in some ports in exchange for precious metals, furs, ivory, etc. given by ignorant people on terms extravagantly favourable to the European traders. But the quantities of such goods, which were on offer, were small: the aggregate volume of that particular trade was trivial when judged by a modern standard. The profits to be earned in the more solid trade for spices, tea and other vegetable products were at a constantly falling rate per cent., though in constantly increasing aggregate volume.

the influence which foreign trade exerted in developing the organized association of capitals for large purposes: for though joint stock companies, with and without monopolistic privilege, were set up early in mining and other industries, their scope was far narrower than that of companies concerned at first mainly with European affairs, and afterwards with those of Asia and America.

I, 117, 8. Later on the Plantations were growing; and there was an increasing demand by Englishmen beyond the sea for those simple, strong, serviceable goods which they were accustomed to use. But it was still only cloth and other light goods that would bear the expenses of the long journey, for ships did not yet carry very large cargoes; and, if there was any journey to be made at all at the further end, it was difficult unless it could be made by river. No doubt this exception is important; as very few centres of population were far from tidal water: and even such things as bricks could go out as ballast in tobacco ships¹.

¹ Thus Mun (about 1622), partially anticipating the notion of "invisible exports" of shipping services (which will be examined in Volume II), says:—"If we send one hundred thousand pounds into the East Indies to buy pepper there and bring it hither, and hence send it to Italy or Turkey, it must yield seven hundred thousand pounds at least in those places, in regard of the excessive charge which the merchant disburseth in those long voyages in shipping, wages, victuals, insurance, interest, custom imposts, and the like; all which notwithstanding the King and the Kingdom gets": he reckons the costs of the double trade as six times that of the original exports. He says also that the cost of carriage of wheat to Italy about doubles its value, and he takes, as probable prices of pepper, 3*d.* in the East Indies, 1*s.* 8*d.* in Amsterdam and 2*s.* in London. (See pp. 22, 12, 14 of the 1755 Reprint of *Treasure by Foreign Trade.*)

Even in 1701 the Commissioners of Customs reported that England had 3280 ships with an aggregate tonnage of but 261,000; i.e. about 80 tons on the average. They did not hold nearly as much cargo as sailing ships of the same nominal tonnage in the nineteenth century; and they travelled slowly. They could not have carried among them as much cargo on long voyages in a year as can be carried now by a single large steamship.

The estimates of the volume of trade made by earlier writers, though somewhat better founded than their estimates of national wealth and income, are widely divergent: and no trust can be given to them. It seems probable that the cautious Petty exaggerated a little, when he put the exports of England at £m.10, under which he includes shipping services of the value of £m.1.5, the greater part of the trade being of course with neighbouring countries: while he puts the exports of "the whole commercial world" at £m.45. (*Political Arithmetic*, A.D. 1676, pp. 82—4.)

The following figures are taken from Chalmers' *Estimate of the strength of the British Isles*, A.D. 1812, p. 315, which appear to have been prepared with great care. They relate to England only, the first three lines represent averages.

	Tonnage of ships cleared outwards.	Value of cargoes exported.
A.D. 1663—1669	143,000	£2,043,000
1726—8	456,000	£7,892,000
1749—51	661,000	£12,599,000
1764	742,000	£16,202,000.

To these may be added recent figures for the United Kingdom,

1913	67,820,000	£523,461,000.
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Moreover the obstacles to the transport in bad weather of heavy goods in many parts of England, including some busy hives of industry, were very great. In fact nearly all journeys had to be made on foot, on horseback, or by water. And this retarded the expansion and consolidation of the higher constructive forms of English industry more than might seem probable at first sight. For frequent long journeys involved such delays, fatigues, and exposure to bad weather, as to restrict the freedom of action of the middle-aged and elderly men; in whose hands the main control of enterprise was firmly grasped in that age of discipline. For these and other reasons, the prices charged for imported goods long remained very high. I, III, 8.

The demand for good roads came rather from the general quickening of agriculture and of urban industry, than from concentrated manufacture for export. Fairly good level roads were made for the use of heavy waggons; and a splendid system of arterial roads carried passengers and news at a rate not dreamt of before. The abundance of "stage-coaches, machines, frys, and post-chaises" was held to be a chief cause of the sudden unification of manners and of social life which startled the middle of the eighteenth century¹.

Good roads came late, and canals came later still. But when

Chalmers' table is made out to show that England's trade progressed in times of peace and generally retrograded during war: all the years selected above are years of peace. Much of what he describes as "exports" went to Ireland; and the external trade of Great Britain and Ireland was certainly less than that of England alone (see above, p. 24). On the other hand allowance must be made for the smugglers' trade, which does not appear in the records.

The difficulties of internal communication caused many London traders to be in closer touch with the neighbouring ports of the Continent than with the more distant parts of England. A detailed inventory of London's trade and its routes is given in *Atlas Maritimus et Commercialis* (1728), p. 110. London bought from abroad many things, which were to be had at a lower price in some parts of England, not very remote. Foreigners were apt to judge England by London; and hence chroniclers and writers of romance have represented the use of foreign goods as much more common in England than it really was. This anonymous book is avowedly in the main a compilation, and probably made some use of the first edition (1723) of Savary's *Dictionnaire Universel du Commerce*: it is a vast store of information.

¹ See a quotation from a pamphlet of 1761 in Locky, *Eighteenth Century*, ed. I. vol. VI. p. 169. Compare also Smiles, *Lives of Melcalfe and Telford*, and the history of roads in Walford's *Famines of the World*. The difficulties of the royal troops in meeting the invasion of the Highlanders in 1745 gave a great impetus to the making of roads.

1, m, 3. at last they were taken in hand they were pushed forward vigorously. They united the head-waters of England's chief rivers and formed a network round her manufacturing districts. Together they built up in England a larger and more active home market for commodities, that conformed to the law of Increasing Return, than had ever been known before. And the home demand, enforced by the foreign and colonial demand for similar products, acted upon industries which had now at last attained a force of unity and concentration, nearly as intensive as that of her great teacher Holland, and more extensive¹.

Defoe had said, "It is a kind of proverb attending the character of Englishmen that they are better to improve than to invent, better to advance upon the designs and plans which other people had laid down, than to form schemes and designs of their own. . . . The wool indeed was English, but the wit was all Flemish." But he went on to show in detail how we outdid our teachers; how "we have turned the scale of trade, and send our goods to be sold in those very countries, from which we derived the knowledge and art of making them²."

England's first great undertaking, that of drainage on a large scale, was carried out for her by Dutchmen; Dutch engineers superintended Dutch workmen, and paid them from funds

¹ Yarranton's *England's improvement by sea and land* (1677) is much occupied with "the advantage of making the great rivers of England navigable." His numerous charts and his arguments have the cogency of a modern pamphlet. He contends that, when once the chief rivers had been rendered navigable as far as possible, the whole country could be consolidated by a few good roads made to join their head-waters; and that they could be kept in repair easily, because they would be on "good hilly sound dry land." Nowadays transport is cheap, and transshipment—except in a few cases where mechanical aid reaches very far—is relatively expensive. But in his time transshipment was thought of lightly; and it was reasonable to hold that his plan would have brought industries, which dealt with heavy goods, nearly up to as high a level of concentrated efficiency as was already being reached by the woollen industries, whose trains of pack horses could go everywhere. This may be illustrated by a statement made in 1724 (in opposition to the claims of some exclusive traders) that the wools of Worcester, Salop and Stafford were used partly in Gloucester, Devon, Kent, and Hampshire. The case was more complex in regard to those of Lincoln, Northampton, Rutland, Leicester, Warwick, Oxon. and Bucks.: for one sort of them went to the Northern Counties; another sort to Norfolk and Devonshire. Some Norfolk wools were sent to North Wales and "there draped into cloth," and ultimately sold in London, and so on. (Unwin, *Industrial organization in the sixteenth and seventeenth centuries*, pp. 188—9.)

² *A plan of the English Commerce*, 1728, pp. 299—301.

supplied by Dutch capitalists. To make a good harbour or quay; to erect an efficient windmill, watermill, fulling-mill, or large pump, Dutch aid had been required. The first English iron cannons had been cast in Sussex by a Frenchman: and lessons from French and Italians, Dutch and Flemings, Germans and Swedes had been required to equip Englishmen as workers in cloth and silk, pottery and paper, as miners and metallurgists¹. I, III, 4.

But victory over difficulties gave courage for victory over new difficulties. Each victory tended to increase the area over which the goods could be marketed, and therefore the scale of production; and therefore in many industries at least the economy of production; and therefore again, the area over which the goods could be marketed: and so on in ever widening circles. And with each expansion there grew up increased spirit for new ventures, and increased recompense for the risk and expense of working out new inventions, and reducing them to a practical shape.

4. *England's Mercantile policy was adapted to conditions which were passing away, as the increasing mobility of industry promoted the concentration of textile industries in the neighbourhood of water power.*

The spirit of Mercantilism was consistent with a national organization of *external* trade, even before England had made much progress towards internal unity in industry. It adapted itself especially to the pioneering work done by the great monopolist Trading Companies; and to the introduction, by a far-sighted monarch, of skilled foreign artisans for the inception of new industries. But Colbert's resolute attempt to organize French industries by despotic rule in the second half of the seventeenth century obtained only a partial and transient success: and Englishmen were even at that time more capable of taking care of themselves, and more restive under regulation than the French. A century later they had become so much more mobile and masterful that they could organize themselves

¹ Tucker, who was a severe critic of his countrymen, writes in 1750, "England's manufacturers have ever been in high repute for their skill and ingenuity." But his instances come from the minor industries, and do not imply the larger inventiveness.

I, III, 4. in a widespread industrial structure; and had neither the need nor the inclination to be regimented.

In the Middle Ages the monarch and the compact ruling class were often vastly superior to the masses of the people in education, in breadth of outlook and in knowledge of the world, as well as in wealth and military strength. With some exceptions for the great commercial cities, Government alone was in a position to take the initiative in large economic affairs. Custom was the main defence of the weak against the strong; and the action of Government itself in small affairs was often most blessed, when it did little more than enforce custom. The fourteenth century saw indeed the beginning of a general assertion of the spirit of individual liberty; and that was the necessary condition for the spread among the people of habits of independent thought as to the methods of their industry and trade. From that time onward they made more rapid progress in mental capacity and moral strength than their rulers did; and, by the middle of the eighteenth century, they had moved perhaps about halfway upwards from the semi-serf-like condition of earlier centuries to that of the present day; when they are not very far inferior in shrewdness, and constructive ability to the ruling classes.

Every step of that progress increased the importance of the advantage which the common people derived from the more intimate knowledge possessed by each of his own circumstances, and the technical problems of his own work, than could be possessed by Government officials. It thus increased the probability that industry and trade would develop on the most advantageous lines, if left free to take their own courses: and it diminished in some directions, as much as it increased in others, the power of Government to control the courses of industry and trade in the public interests. The *possible* functions of Government expanded almost obtrusively in many directions: but meanwhile there was so great an increase in the complexity of the problems of industry, and so small an increase in the mental capacity of Government for dealing with them, that its *appropriate* functions in the matter did not expand in like manner, for the time at least.

There was however meanwhile a slow increase in the power of

the people to govern the Government that governed them: and this power was destined to become so large and far-reaching, that many tasks may now reasonably be intrusted to Government in the twentieth century which would have been grossly mismanaged in the first half of the nineteenth, and would have been hot-beds of corruption in the eighteenth: thus a certain new tendency to a widening of the appropriate functions of Government gradually set in. I, III, 4.

Here it is to be considered that policies, such as those of the Mercantilists, necessarily reacted on the moral character of those who administered them. It increased their temptations to use public authority for purposes of private gain. It developed the strong and the enterprising elements in human nature: but it also gave great scope to those who were selfish and cruel.

Moral developments are nearly always the complex results of many causes; and a student of any one side of human life must be on his guard against a bias to attribute them mainly to those particular causes which loom largest in his eyes. But history seems to show that wherever Mercantile policy has been active, those persons, whose private interests have been closely touched by it, have tried with some success to bend that policy for their own benefit. Occasionally a strong upright personality, like that of Colbert, might stay the evil for a time. But corruption seems generally to have increased when there has been much money to be gained by political influence. The monopolies and other special privileges granted by the Tudors and the Stuarts, were permeated by evil uses of money. And on the larger stage of the eighteenth century, a more highly organized corruption was effected by the riches which the Trading Companies and the individual "Nabobs" had drawn from the East and the West under a policy framed on Mercantile principles¹.

¹ Lecky's *England in the Eighteenth Century* has much information on these subjects. The demoralizing influence exerted by the Mercantile slave trade on the population of the great western ports of England, which were chiefly concerned in it, is well known. Silver and sugar seldom came to Europe without a stain of blood. We have been too quick to forget the horrors which caused Samuel Johnson to give his famous toast: "Here's to the next insurrection of the negroes in the West Indies" (Goldwin Smith, *The United Kingdom*, vol. II.

I, III, 4.

Corruption, thus initiated in one part of public life, must have had some tendency to spread. The particular threads of connection between immoral bargainings for commercial favours, and a low moral tone in public affairs generally, are not easy to be traced, especially in regard to distant times. But it is to be noted that the protests against Mercantilist policy, which came with increasing force during the eighteenth century, till they culminated in Adam Smith's denunciation, were based on moral as much as on economic grounds.

Accordingly it is argued in Appendix D that the interferences by Governments with the free courses of industry and trade which the Mercantile Age inherited from the Mediaeval, are not to be brought under any sweeping measure, either of eulogy on account of the patriotic motives by which they were generally induced, or of blame on account of their failure to apprehend the vast difficulties of many of the tasks which they undertook.

For indeed the further we are looking backwards the greater is generally the allowance to be made for changes in the prevalent standards of public and private morality. A statesman may have fallen below the level that is customary in England and several other countries to-day, and yet merit our respect for having risen above the ordinary level of his own age. And he may possibly have been right in constraining the industrial energies of the people to move in certain limited directions: because there was but little independent enterprise in the land; while that little could not be brought up to high intensity, unless concentrated on a narrow area. From this point of view Adam Smith's criticisms on the Mercantilists of his own age may seem harsh. But it is to be remembered that he knew the weaknesses and the corruption of those who

p. 407). The profits on the slave trade would have been enormous if any large part of the victims had survived the voyage (Craik, *History of Commerce*, vol. III. p. 113).

Forces, making for the degradation of morals, interact and mutually strengthen one another. The general laxity of Court life, corrupt practices in politics, the influence of the slave trade, and extreme drunkenness among the highest and the lowest classes, were part cause and part consequence, each of the others. In 1743 it was stated in evidence before a Committee of the House of Commons that the annual consumption of spirits was 19,000,000 gallons, of which 4,000,000 were illicit. The total population was a little over six millions.

were posing as masters of economic statecraft. His condemnation of officious meddling by such men in the affairs of industry and trade is indeed not limited to the conditions of his own time. But he had no means of anticipating the vast increase in the resources of Government, and in the honesty of public officials which began in the nineteenth century. He could look backwards only: and, though the growth of a sturdy upright middle class had given much strength to the country's political structure, experience gave little reason to anticipate that the leading statesmen of the country would cease to regard public affairs as a source of private booty. He did not suppose that private interest always leads traders and producers on those paths which are most conducive to the public weal: for indeed he continually pointed out cases in which it led them in other directions. But he did show that the *general* tendency of their conduct in pursuit of gain was to hunt out methods by which their energies might yield goods or services of increased value to the public. He did this work so thoroughly that later generations have made no great addition to it; though they have introduced many qualifications into it, and given it scientific cohesion.

They have however made a vital change in its general character, when regarded from a social point of view. For they have laid great and ever increasing stress on a point, which had not become prominent when he wrote. It is that his general argument is valid only when "value" is expressed in terms of money.

If a capable builder sets up houses all of a rental of £200 a year on a certain piece of land, his own interest will lead him to adapt them to the requirements of his future customers. But suppose he is to build two classes of houses, one of which will accommodate twenty people to the acre, while the other will accommodate two hundred to the acre; and that one part of his ground is healthy, while the other is unhealthy: then his private interest will lead him to put the denser population on the unhealthy ground. For well-to-do people will generally pay a higher percentage of increase in rental or purchasing price on account of a favourable soil than working classes will. But, from a social point of view, the health of two hundred of the

1. iii, 5. working classes is of more value than that of twenty of the well-to-do persons; unless indeed some of them happen to be of exceptional mental quality. Adam Smith's *Wealth of Nations*, interpreted by his *Theory of Moral Sentiments*, supplies a sound basis for the introduction of such considerations. And, in fact, nearly all the far reaching movements which his disciples are starting in the modern world, for increasing the constructive activity of the State in social matters, can be brought within the scope of his policy by paying adequate attention to the difference between money value and social value. This consideration is not always prominently expressed: but it will be found to underlie nearly all the most serious modern economic studies.

5. *The new structure of the textile industries, which was set on foot in the latter half of the eighteenth century, indicates the gradual transition from the methods of the Mercantile Age to those of the nineteenth century.*

The movement towards capitalistic and massive production, which has proceeded in England with ever increasing rapidity and volume during the last century and a half, has two sides; both of which became prominent in the textile industries, earlier than in any others of like importance. On the one side was the growth of free capital, as distinguished from that which was directly associated with ownership or use of land: and on the other was the diffusion of habits of thought and action among the various strata of the population in which tradition and habit counted for less than in early times: movement became larger and more general; and increasing attention was given to new opportunities and new methods of turning old opportunities to account.

Distrust of changes in the methods of work and pay died out slowly. Old traditions of the villein's duty to his lord, and his lord's reciprocal obligations lingered for good, as well as evil, long after villeinage had ceased to be formally recognized. The old solidarity of the village left odours, some sour and some sweet, in the largeness of the open commons on which lean animals lingered out a meagre life. The enclosure of commons, excellent as it was from a broad national view, was opposed with some justice, as a plunder of the very poor, for the benefit of the

well-to-do; and it increased the hardship which was inherent in rigorous, if futile, edicts against wanderers from the place of their settlement. Mobility increased: but it was often ill-directed; and the consequent rapid increase in the numbers of the most unfit became a great evil early in the nineteenth century, as we shall see presently. I, III, 5.

Large new opportunities were developed by the increasing rate of growth of England's material wealth, which was largely due to the continued freedom of her island territory from devastating wars. This freedom gave to her manufacturers and her agriculturists alike, security for reaping the rewards of effort invested in improvements that would bear fruit slowly. The choicest horses and cattle were left to breed in peace, being beyond the reach of foraging bands of soldiery: and the buildings, the machinery and the stocks of trade and industry, were undisturbed. This cause had equipped England with the sinews of industrial competition before she showed signs of industrial leadership; and during the eighteenth century it contributed much to her rise to the position of undisputed supremacy in the world's market for capital.

The abundance of capital gave scope for men with marketing ability of a constructive order. This is to be clearly distinguished from a laborious astuteness in bargaining, on which people with small capitals, and especially agriculturists, in all countries often lay stress: priding themselves on their skill in buying a thing for less than it is worth, and selling a thing for more than it is worth. That miserable ingenuity is no doubt barren: it is the one side of trade, which is amenable to the old sweeping charge against all trade: viz. that in it no one can gain save at the expense of another; and that the more energy is diverted to it, the poorer the country will become.

The constructive trader, on the other hand, aims high, and sees far: he is constantly forecasting future developments of demand, and endeavouring so to turn to account the rising force of new methods of production as to supply something which can be produced in large quantities at a low cost, and force its way into general consumption. It is to force its way, because it is sold for less than people had previously thought it to be worth; while yet it has cost him, and is in a sense worth to him, much

1, 11, 5. less than what he sells it for. For this task elasticity of mind and delight in hard work are needed: and these qualities are not often found among those who have inherited wealth: but they were found in high degree among the undertakers, most of whom had risen from the ranks.

Such an undertaker sought out "homely" producers who had the skill and aptitude for making certain classes of things economically and well; instructed them as to the precise character of the thing which he wanted; supplied generally the material and sometimes the requisite plant: and by ever widening experience learnt how better to enlarge and economize the processes of marketing. He himself needed the power of going to the centre of each practical problem as it arose; concentrating the forces of his mind on it; working out connections between it and outlying considerations; developing practical conclusions with a just sense of proportion; and pursuing resolutely the line of policy thus indicated, but with a mind always alert for new ideas, especially such as were demanded by the changing circumstances and conditions of his problem. These are faculties which have been conspicuous in the Jewish race longer than in any other: but they were also such as could be, and were, quickly and strongly developed in that sturdy English character, of which the foundation had been laid by the sea-rovers.

On the other hand, the undertaker of the work and risks of organizing supply so as to meet and stimulate demand, was drawn on continually to become increasingly in some sense the employer of the homely producers whose work he controlled. The process by which he was developed into a capitalist manufacturer was gradual and continuous; and, when it was completed, his functions as a "master of men" rose to an equal level with his functions as an organizer of production and marketing. For this he needed qualities of mind and character somewhat similar to those of a capable captain of a ship trading on long voyages far from home: and these also were natural to the English and had been developed by their work in the world. Similar combinations of faculties were to be found in all the countries of Western Europe, and were afterwards to be conspicuous in North America. But Englishmen seem to have

had a fuller and stronger supply of them than any other I, III, 5. nation.

Under the new conditions, all risks of marketing were borne by the capitalist trader, while the implements of production were supplied in some cases by the trader, and in others by the workers. When the trader supplied workshop or factory with its equipment, the industrial side of his services became more prominent, if not more difficult than the marketing side. He was therefore commonly and appropriately described as a manufacturer, rather than a merchant. This change in organization is commonly described as a transition from the "domestic" phase of industry to the "capitalistic." But a great deal of production, which is entirely under capitalistic control, is domestic; in the sense that the work is done by operatives in their own homes. The so-called "sweated" industries of the present time belong to this class; and it is well known that they give as large opportunity to the abuses of the power of capital as any others. It seems therefore best to avoid the use of the term "domestic"; and to contrast the man of means, knowledge and resources with the "homely" producer: that is, the man whose resources are so small, and *whose outlook is so narrow*, that he cannot obtain good access to general markets.

The primitive homely manufacturing producer corresponds to the peasant, who produces only for his own use and for sale to neighbours; while he can, at the same time, be fairly certain that such things as he needs will be brought within his reach by traders, without requiring him to have knowledge or contact with distant markets. He may himself be a small employer, providing for his assistants all the requisites of their work: but, as his capital is small, the capitalistic basis of his control over them is commonly ignored.

A great part of the homely industries of the country, at a later stage, were financed by capitalist traders to this extent at least that they undertook in advance to buy specified products at certain prices: that is to say the producer carried no considerable risks in regard to any particular contract, when once he had attained a fair security as to the prices he would pay for material and for such labour as he might require.

Arrangements of this kind existed early in the South of

I, III, 6. England cloth industry: and they became common elsewhere in the-eighteenth century, when changes in the fashion and texture of goods and in the technique of industry were bewildering those who loved to tread in ancient paths: and they were giving great scope for new energetic men, well supplied with capital; who were also alert and fertile of suggestions for new patterns for home consumption, and for adjusting the new English resources to the tastes of foreign consumers, especially in the Levant and in Asia. Such arrangements were very suitable to transitional conditions; and are often regarded as peculiar to them. But in fact they are common at the present time. For instance, a capitalist builder often contracts to erect a house in accordance with definite specifications, at a certain price: the purchaser may intend to occupy the house, or he may be a merchant, sometimes inappropriately called a "speculator," who buys with the intention of letting or selling.

An almost equally familiar case is that of the textile manufacturer who contracts to deliver a quantity of some fabric, of quality and design selected by a merchant, at a certain price: though he often fortifies himself by buying in advance the materials which he will need. This method enables the merchant to turn to the fullest account his powers of contriving improved models, patterns, etc., of the goods of which he has attained a special knowledge; and also of anticipating the future course of demand, with reference to coming changes of fashion and taste, and to fluctuations of general economic prosperity. The producer on the other hand (who may be a man of rather narrower outlook, if not of homely disposition) gains by freedom to escape from a task for which he is not peculiarly fitted, and to give nearly his whole energies to the administration and technical work of making¹.

¹ Prof. Unwin, in reference to Prof. Westerfield's *Middlemen in English business, particularly between 1660 and 1760*, says:—"Simultaneity of integration and differentiation is to be found in the sixteenth century, and even in the Middle Ages, in all the more developed branches of industry and commerce. The fact is that where a series of independent capitals are employed in close contact with each other, any expansion of capital in one of the allied functions tends to an overflow into the neighbouring functions, and thus to one form or other of integration. The capital of the Hanseatic, Italian, or native exporter of cloth in the fifteenth century tended constantly to flow over into the *entrepreneur* functions; whilst, on the other hand, the prosperous clothier was always striving to become an exporting merchant" (*Economic Journal*, Dec. 1915).

It is of course to be understood that the changes now discussed moved gradually and irregularly. The rising sea seldom encroaches on the sand with uniform progress, even when the wind is nearly still: and in stormy weather the retrogression of a great wave may uncover the whole ground that belongs to the rise of the mean level of the sea during an hour. The economic atmosphere is never quite still, and it is often greatly perturbed: therefore progress is seldom uninterrupted. I, III, 6.

6. *The financial structure of English agriculture and its influence on progress.*

For a long while agriculture and mining had been the only industries, except those connected with shipping, in which large capitals had been employed. In both of them nearly the whole of the capital needed had been drawn from the revenues of the territorial magnates, to whom the soil and the mineral strata below it alike belonged: and though, as has already been noted, mining took very early to joint stock finance, agriculture moved persistently on its old lines. The direct economies to be got by the aggregation of large areas of land under a single management were small and doubtful. But the ownership of a large area of land gave social prestige; and (especially in the hundred years ending with the Reform Bill of 1832) it gave political power and access to well paid posts under Government. It therefore attracted rich men, more particularly those who wished to buy their way into good society: and thus the aggregation of ownership tended to provide the land with an abundant supply of capital needed for the expensive improvements towards which agriculture was steadily making its way. "Farmer George" promoted the tendency to think that superfluous wealth might give a high return in the pleasure of owning a large property well developed, just as easily as in that of owning a castellated mansion. And though no outlay was approved by those whose opinion was most worth having, unless it aimed at a financial success, sufficient to lead other agriculturists in the same direction; yet men were willing to risk capital freely in experiments which might yield no good return, except in showing the way to others better conceived and more fruitful of gain.

I, III, 7. Some of these ventures must be tried in the first instance on "the home farm." But those which added to the value of the land and its buildings, and not merely to the current flow of stock or crop, could be safely made wholesale by the landowner for his tenants: the English system under which the tenant looks to the landlord for the provision of buildings and of capital to be sunk in the land was peculiarly appropriate to the transitional stage in which agriculture then was. Except in drainage, water supply and road making, it might be true that an additional £10,000 applied in the improvement of 1000 acres would not give better returns than £500 applied with equal skill and intelligence in the improvement of 50 acres: but, as things were, the £10,000 were more likely to be forthcoming for the large property than the £500 for the small; and on the whole they were likely to be applied with a broader intelligence, though perhaps not with as much care and knowledge as to details¹.

7. *The merging of England in Britain.*

Henceforward it will be best to speak not of England but of "Britain," as short for the "United Kingdom of England, Scotland and Ireland."

It is indeed true that the main trend of the industrial development of the eighteenth century and a considerable part of the nineteenth was the result of work done south of the Tweed. The great French war however fused England

¹ Of course this arrangement has its difficulties; as is shown by the agitations, which have recurred at intervals during more than a century on the part of tenant farmers, for increased security against the appropriation of the land: but on the whole there seems good reason to think that it will hold its own, when properly guarded, against all others, at all events on British soil.

As to the growth of the demand for large capitals on agriculture reference may be made to Mr R. E. Prothero's *English Farming*. He quotes (p. 206) from Arthur Young:—"Where is the little farmer to be found who will cover his whole farm with marl at the rate of 100 or 150 tons per acre? who will drain all his land at the expense of £2 or £3 an acre? who will pay a heavy price for the manure of towns, and convey it thirty miles by land carriage? who will float his meadows at the expense of £5 an acre? who, to improve the breed of his sheep, will give 1000 guineas for the use of a single ram for a single season? who will send across the kingdom to distant provinces for new implements, and for men to use them? who will employ and pay men for residing in provinces where practices are found which they want to introduce into their farms?"

and Scotland into a single country in sentiment and in action. I, III, 7.
The trade of Ireland was regarded in some measure as on a different footing from that of England, even after the goods sent from one to the other had ceased to be reckoned officially as "exported": but from the beginning of the nineteenth century England and Scotland had become, in fact as well as in name, a single country with one national spirit in regard to economic problems generally, and especially those which related to trade with the rest of the world. The chief agencies in this unification were roads, railroads, and common work in financial and colonial enterprise.

Late in the eighteenth century good roads began to connect the Lowlands of Scotland on the one hand with her own Highlands, and on the other with the Northern counties of England. The more potent influence of her railroads did not become effective till the middle of the nineteenth century: but meanwhile her banking had established its preeminence as a safe and efficient means for enabling a country with only a very little free capital, so to economize its use, that those, who were endowed with good business faculties, could generally obtain control of the means needed for giving them effect. The English system of banking was very inefficient in this direction; and Lancashire industries were largely financed by their own Bills of Exchange with but little aid from the banks. But the Bank of England was already the centre of stable international finance: and the Scotch system owed its combination of economy with efficiency to being able to lean on English support in international trade. This fact made for the commercial unity of the two countries more powerfully than appears on the surface: it went together with the security at home and on the seas, which both derived from the strength of the British navy and army.

But perhaps the strongest force making for unity was the leadership which the special bent of the Scotch genius, aided by a superb system of national education, achieved in pioneering the expansion of the British Empire. Scotchmen have had a much larger share, in proportion to their numbers, than Englishmen proper, in discovering what parts of the world offered the best field for western enterprise. They had com-

1, III, 7. paratively little share in the foundation of the early "Plantations": but they knew how to rise to difficulties, and how to make their way up from the ground till they stood at the top of great ventures; which, though often risky, have yielded very high returns. So they have grown rapidly in wealth: they hold high places in almost every part of "Greater Britain": and their influence in finance generally is more prominent than that of any other group of people of similar size, except the Jews of Western Europe, whose mental aptitudes are indeed in some respects similar to theirs. They are preeminently leaders in agriculture; where their widely diffused intelligence has long worked on lines similar to those on which Danish agriculture is being developed. Their manufacturing industries hold a high rank; while the ship-building on the Clyde, and that of the Scottish colony at Belfast, are unsurpassed. England and Scotland are now one.

Ireland, other than North Eastern Ulster, has suffered grievous wrongs; and has done not a little wrong herself. When England's tardy atonement for her wrong-doing has borne full fruit, Ireland may become, what she has never been yet, truly united to her: but the large economic developments, which may be hoped from that unity, lie beyond our present range. The fact, that she has already developed the economies of cooperative dairying in advance of most other countries, is one of many that are of good augury for her future.

CHAPTER IV

BRITAIN'S INDUSTRIAL LEADERSHIP: ITS LONG FREEDOM FROM CHALLENGE

1. *Characteristics of modern manufacturing processes.*

The present chapter aims at setting out the essential difference between Britain's industrial leadership and those which preceded it; and at indicating the combination of causes which enabled it to endure long without effective challenge.

Let us look backwards a little, and forwards a little. The general features of the new industries were governed partly by technical causes, partly by the special circumstances of the time, and partly by the peculiar character of Englishmen. These three diverse influences made for the same result; viz. the massive production of things so uniform in substance and in shape as to give large scope for play of the economies, which the specialization of manual tasks had been developing for several centuries with ever increasing intensity throughout Western Europe. England lagged long behind; but she came up with her rivals in the seventeenth century, and was to pass them in the eighteenth.

When a cyclist is learning to ride, each adjustment needed to save him from falling demands the whole attention of his mind: and yet practice enables him to make such an adjustment, while thinking of other things and wholly unconscious of the unevenness in the road or the puff of side-wind which has demanded it. Again, as Prof. Bücher's *Arbeit und Rhythmus* has shown, musical rhythm has been called in to the aid of elementary industrial work by almost all races: and the Englishman, even when not specially musical, has ever been prone to an exact regularity of movement, a firm coordination of eye and

J, iv, 1. hand, that have in them something of the rhythm as well as the regularity of machinery. The cross-bow was a nearer approach to a machine than the bow of an English archer: but the ceaseless flight of English arrows, each straight to its aim, was in some measure the mediæval counterpart of the quick uniform flow of bullets from a modern machine gun.

In early times an Englishman's sturdy joy in the feeling that whatever his hand found to do, he did with all his might, had been mingled with, and marred by, a proud and dull contempt for whatever his hand had not as yet taken to: and he had been a slow learner from foreign artisans. In the eighteenth century he had not freed himself wholly from a dull sense of superiority: but he was much readier to learn than before: the Revocation of the Edict of Nantes in 1685 was a chief incident in a sustained policy of Continental autocrats, which rid them of sturdy subjects. More than half a million of the ablest of them came to England, bringing with them that knowledge of technique, which was most needed by her just at that time. In particular the Huguenots taught her to make many light glass and metal wares, in which French genius excelled: and in a very short time such wares, made by the coal which was then coming to England's aid, were being sent to France and sold at a good profit. She was then well on her way to "outrun her teachers," as Defoe said: she outpaced them in energy, and she outpaced them even more conspicuously in invention.

But England's chief strength lay in heavier industries, and the eighteenth century hardly sufficed to make ready for her chief work in her most appropriate material. For even at the end of the eighteenth century, the reduction of iron to standardized primary forms, suitable for further processes of standardized production, could not be effected easily, nor on a large scale.

The particular route on which English industrial tendencies found development was determined by the fact that textile materials are delivered by nature in standardized primary forms, well suited for massive change into standardized finished products. Cotton, wool and other fibres are fine homogeneous cylinders of different shapes. Cotton is flat, wool is round; but

both lend themselves to be laid out in orderly array by machinery, and thus to be spun into yarn. Yarn is a homogeneous cylinder of uniform diameter and unlimited length, perfectly standardized: it is ready to be at once further worked up into standardized cloth by standardized machinery, which can be driven by the blind force of nature, being dependent on the guidance of intelligent fingers only in its minor details. This is the fundamental cause of the series of quick leaps, by which machine-made textiles bounded beyond the reach of the competition of more primitive forms of industry; and thus set the type of that method which spread first over nearly all England's industries, and in the course of time over those of other western countries.

The essence of the method was to watch the action of the human hand in fingering the wool and in twisting, and drawing out the yarn; or in throwing the shuttle, and making the weft lie compact; or in hammering or drilling iron; or in any other operation that needed to be performed many times in the same way. Next the work was divided into two parts, that which was absolutely monotonous, and that which had an element of variety. That which was various was left provisionally on one side to be still done by hand: that which was monotonous was further studied, broken up into parts each of which was a simple movement of the finger, or the hand. It was known that all work of that kind could be done by a wooden or steel finger or crank of some sort; the only question was whether the trouble of isolating one or more of those tasks and making a separate machine for them would be adequately remunerated.

But that was a vast undertaking, not to be fully grasped at once: its difficulties will indeed never cease. In the early nineteenth century it had not made very great way: the automatic agencies, which play a great part now in spinning mills and weaving sheds, had not been developed: there was still a great deal of purely mechanical work to be done, which demanded no strength, no discretion, and not even a very high degree of promptitude. Thus there were opened out, as the aggregate output increased, a disproportionally large number of opportunities for the work of young children; and as the new demand appeared in the first instance chiefly in places

I, iv, 1. where the settled population was scanty, this demand had very disastrous results¹.

Mechanical standardization spread from one process to another in the same industry, and from one industry to another. And gradually it was found that the machines, adjusted to standardized work, helped one another; because the uniformity of the product, when it left one machine, suited it for being operated by the next. So progress went on cumulatively. Each step forward made the next simpler; and by slow steps were evolved the root notions of those semi-automatic machines of the present day, each of which performs a great many operations one after another on the material fed into it. Thus the links which had to be filled in by hand work became constantly fewer and shorter, till in some branches of industry there was

¹ In Book II attention will be drawn to modern developments of mechanical technique, which turn on the power of a machine to use many hands instead of two, and to perform operations beyond the reach of human hands. Wool was the material to which the chief inventions were first applied. Even as late as 1783, cotton cost 16d. a pound, and yet the value of the woollens (including worsted) products of England was then nearly twenty times as great as that of her cottons. The export of her cottons surpasses that of her woollens early in the nineteenth century: but the total value of her cotton products did not pass that of her woollens. (For further facts see Ellison, *Cotton Trade of Great Britain*, ch. x.) The influence of early improvements in textile manufacture was therefore most conspicuous in regard to wool.

The history of textile inventions and their results is in brief as follows: Kay's Fly Shuttle and Paul's spinning by rollers began in 1738 a series of inventions as to spinning; which was continued by Hargreave's spinning jenny, Arkwright's improvements in detail, and Crompton's spinning mule (1779). These together gradually increased the facilities for spinning so much that yarn was superabundant; for indeed "one spinner in 1812 could produce as much in a given time as 200 could have produced before the invention of Cartwright's jenny." (Ellison, *l.c.* p. 56.) Consequently weavers' skill rose for a time to a relatively high value: and a vast number of them invested their capital in hand looms and in attaining a skilful mastery of them. But in 1785 Cartwright's power loom initiated a reversal of this process. The hand loom held its own for a long while: partly because the power loom was slow to learn how to coax the web to lie compactly on the warp: but the hand loom weavers saw their employment gradually leave them, till in 1840 few but old or obstinate men remained in the industry. The loss of employment by the hand spinners had not been very seriously felt: because they had little specialized skill, and many of them had some alternative employment: but the fate of the hand loom weavers was very tragical. Meanwhile the power loom, added to the hand loom, had been able to absorb all the vast output of yarn—except such as was exported—turned out by the steam spinning mills: and that caused a disproportionate demand for children's labour, which was to become a national calamity of the first order.

little for the human hand to do, except to act as a kind of overseer over the machines that were its servants. Traces of the method can indeed be found in nearly all mechanical work, almost from the dawn of civilization: but England applied it so systematically, with so much resource, and to tasks of such magnitude as to make it her own. I, iv, 1.

The demands of foreign armies, not excluding the French, for strong solid cloth of standardized pattern, gave a great stimulus to the massive production of her woollen factories. And the vast consumption of large and small arms, and their ammunition, added much to the value of mechanical appliances for the wholesale manufacturer of metal products, each of standardized form and fitting accurately with others¹.

Thus production became ever more massive; till at last a single business required so extensive a plant, so large an operative staff and so plentiful resources as to be beyond the range of any but a powerful capitalist (or a union of small capitalists in joint stock or "cooperation").

This last stage developed slowly. British water power came generally in such small dribblets as not to facilitate the erection of very large factories even in the textile industries. Massive production in the full sense of the word was a creation of steam power: and, as we are to see shortly, the total steam power used in manufactures (the mining and smelting industries being left out of account) did not become very important till the second quarter of the nineteenth century. By that time railways had become no mean competitors with factories in the consumption of coal: and were beginning to become the chief factor of those conveniences of marketing, without which massive production (in the full sense of the term) could not have been developed².

¹ Sombart's *Krieg und Kapitalismus* develops this and other relations between war and capitalistic concentration.

² The textile industries in 1839 used steam engines of 74,000 h.p. and water wheels, etc., of 23,000 h.p.: in 1907 they used engines mainly based on steam power, of 2,000,000 h.p., and this was but a quarter of the total h.p. in industrial uses, other than mining. The conclusion that in 1839, the textile industries were the chief users (mining again being left out) of steam machinery is suggested by the fact that even in 1851 they owned three-fourths of all the factories which employed more than 350 persons. See *Census Report for 1851*, vol. 1. pp. cclxxvi—ccclxxix.

I, IV, 2.

2. *The massive results at which English inventions were aimed, called for simplicity in method and machinery: but that could seldom be reached without working patiently through complexity. Nearly all of them were associated with uses of coal and iron in making and driving the new appliances.*

Although coal and iron were not the original causes of England's leadership, yet all that makes that leadership unique in the world's history was partly dependent on them. Without them she could at best have attained a prominence like that of Holland, and on a rather larger scale. With their mighty aid, she has pioneered so strongly, that the leading ideas of those mechanical industries which are transforming the world to-day are fundamentally hers. But iron, the material of all these industries, was largely used in England because she had large uses for it; though she had not a plentiful supply of it.

Iron is the great saver of time, and the chief engine of thorough solid work; as well as the chief material of those subtle and powerful engines and instruments, in which modern invention has found its scope. Its strength, efficiency, and perhaps its hardness, were appropriate to that sturdy resolute Norse character; which, having been revived by Puritanism, was working under the surface, even when the higher ranks of society were dissolute. So the English insisted on having iron at all cost. To make it, they burned down their own oak forests and those of Ireland, till their supply of new ships was imperilled: and then they bought it from abroad, in spite of its high price, so insistently that they consumed seven times as much per head as the rest of Europe¹.

¹ In 1740 it was fifteen pounds against two annually on the Continent. See Sir J. Guest's evidence before the Committee on Import Duties in 1840. Thanks to her Norman conquerors, English smiths had early been famous. But in the Middle Ages her lack of metallurgical skill caused iron to be nearly as costly as brass and tin; so that its use could hardly be afforded in farm implements and carts. Blast furnaces were introduced early in the fifteenth century, and England soon did a large export trade in iron cannon. Late in the seventeenth century her supply of oak for smelting ran short; and in 1740 her output of iron was but 17,000 tons. Iron was smelted by coal on a small scale by the German Sturtevant in 1612; and by the English Dudley in 1621. Darby developed it a century later. Roebuck's improved blast came in 1760; Cort's rolling mills and puddling process about 1783.

It was not till the middle of the eighteenth century that some old inventions for smelting iron by coal bore much practical fruit. But from that time onward English agriculture and manufacture have had practically unlimited supplies of the main implement needed in economizing human labour, and in applying the force of waterfalls and steam power to the heaviest and to many of the most delicate tasks of industry. I, iv, 2.

A special bent of the English genius had shown itself in the multitude of operations to which water power, often supplemented by horse power, had been turned. But the steam engine, before Watt's improvements, was too wasteful and awkward to be applied except for pumping and similar work. And so great was the leakage of steam from imperfect cylinders, that his inventions by themselves would have failed to make steam power very cheap; if Boulton had not trained up a generation of mechanics, and of master mechanics, who could make cylinders and pistons true. The work of Boulton and Watt belongs wholly to the age of iron; it would have found no place in the age of wood¹.

Wood had indeed been the chief material by which Holland had worked her way; and wood was till recently the material of the ships that bore England's commerce. But her complete emancipation from tutelage coincided with and was largely caused by her mastery of iron. Her exports of iron products have never approached in value her exports of textile goods; and yet it was in iron industries, and not in textile that the force of her character was most fully shown. And indeed the later and more complex, though not the earlier and simpler, stages of her progress in the textile industries depended on the mastery of iron, and have been thought out largely by workers in iron.

The leading characteristic of English inventions has not

¹ Arthur Young in his *Tour through the North of England*, 1770 (vol. iii. p. 14), tells us about the Crawley works at Newcastle "supposed to be the greatest manufactory of the kind in Europe," where they made anchors weighing 70 owt.: and there were to be seen "copper rollers for squeezing bars into hoops, scissars for cutting bars of iron, turning cranes for moving anchors into and out of the fire, and the beating hammer lifted by the cogs of a wheel." These were "all moved by water."

1, iv, 2. been their ingenuity. For indeed the mechanical clocks and other automata of Byzantium and of Germany and France showed an ingenuity, increasing through several centuries up to the eighteenth; which has not been surpassed, if it has been equalled, in England. But each was a separate work of a master mechanic. Even late in the eighteenth century, the resources of mechanical engineering did not reach out to the making of complex machinery on a large scale, which could be depended on to do its part without fail, quickly, and at the right time; and thus create new master-pieces with little aid from the human hand¹.

Another special bent of English genius showed itself in the resolution with which inventors sought simplicity: their ingenuity had not completed its task until it had effaced nearly all traces of itself, and left behind no detail that was not apparently simple. Such complexity as remains is chiefly in the organization of the factory itself as a whole, and in the adaptation of each part to others with which it needed to cooperate.

Massiveness of work has some drawbacks from the social point of view. But it made England powerful: it carried her through the great French war, and enabled her to subsidize nations with greater natural resources than her own. And incidentally it gave her for a long time almost a monopoly of industrial invention. She moved forwards, the rest of the world followed.

The English inventor was at an advantage in being able to make a long series of working models of each invention; and to improve and simplify them, till they were bound to conquer in competition with hand work: but the German or the Frenchman could not. The Englishman could afford to sink capital in experiments more easily than they could. For he had access to a great variety of highly skilled artisans, with a growing stock of engines capable of work more exact than the work of the

¹ Nevertheless it seems probable that as much hard thought went into the chronometer of the Englishman, John Harrison, in the middle of the eighteenth century, as into many huge toy clocks. The list of England's early debts to foreign inventors, especially in regard to mining, has been somewhat enlarged by W. H. Price's *English patents of monopoly*. An instructive account of England's economic development during this period of the mechanical inventions is given by Dr Clapham in *The Cambridge Modern History*, vol. x

human hand: thus every experiment cost him less; and it was executed more quickly, and far more truly, than it could have been anywhere else. When at last success had been fully achieved, the new contrivance could be manufactured more cheaply; and could be applied in production on a scale far greater, than in any other country. I, iv, 2.

The methods of industry changed so fast that the son of a wealthy manufacturer, who had not exceptional energy and adaptability, soon found himself undersold by rugged but powerful men; whom the banks were ever ready to furnish with the capital needed for a quick rise from the artisans' bench to a post of command.

Such men, in spite of their conspicuous limitations, were admirably qualified to deal with simple direct problems of organization, and adaptation of mechanical means to ends; and the high incomes, which they commonly earned, were but a low price for their services to production. They retained their old simple habits, sometimes even eating the plainest food out of a common bowl with their operatives; and they often added nearly the whole of their net incomes to their capital. The manufacturing industry of England was thus favoured for a long time, and on a great scale, by a large supply of high class ability, which was exactly adapted to its needs; while it was to be had for a relatively low price because it had no access to any other opening for its ambitions except mere business.

The industrial energies of Englishmen were not indeed entirely given to the organization of their own work in control of the forces of nature. They achieved a striking success in pottery under the guidance of Wedgwood, without the aid of any important new mechanical device; but rather by that delicacy of perception which had become conspicuous at various times in their wood-carving and other decorative industries, as well as in their literature.

And, with all, agriculture remained their chief industry; their gentry threw equal energy into the chace of the fox and of improved methods of farming. In agriculture, as in manufacture, they aimed at large measures, by which Nature might be induced to use her forces on a great scale in their behalf. This was shown by Bakewell and others, who realized that a relatively

1, iv, 3. small amount of labour directed to improving the fountain-heads of a great breed of stock, would yield an abundantly increasing return. And it was shown by Coke and others, who organized improved rotations; and—what was no less important—turned horse power to account in altering the character of the land, and making clay soils porous and strengthening sandy soils; and again in drawing horse hoes to clean crops that had been sown with mechanical precision. For good and evil they were apt to disdain the Continental peasant's hand work, and his patient care for petty details: the ruinous tendency of the farmer's wife to withdraw herself from the work of the dairy and other light labour had not then become prominent¹.

3. *The great war retarded Britain's economic progress: but it threw other European countries back, and so strengthened her leadership.*

Recent developments of Britain's foreign trade will be considered in the second Volume: but a little must be said here as to the external influences which were acting on her industry towards the end of the eighteenth century and in the first quarter of the nineteenth.

Her ever growing mastery of the forces of nature and of technique did not make wholly for the increase of her foreign trade. In so far as it promoted her efficiency in those industries in which she was already leading, it did indeed enable her to put more of her goods on foreign markets at a profit to herself: and thus it increased her trade. But in so far as it lessened her relative disadvantage in the production of those things which she had been accustomed to import, it checked her imports, and therefore her exports; and her trade increased less fast than it otherwise would have done².

¹ As late as 1850, 92,000 out of a total of 225,000 farmers in England and Wales (i.e. 41 per cent.) employed no hired labour: 8000 employed ten or more; while 5000 employed 20 or more. (See the *Census Report*, 1851, vol. 1 p. lxxix.)

² For instance, the application of improved pumping and lifting machinery to England's salt mines brought her salt industry from its backward place. She no longer depended on the evaporation of sea water by the sun; and her lack of the powerful sun of the Mediterranean Coast no longer gave her an import trade in salt: later on, she obtained a relative advantage and began to export it. Huguenot immigrants, having taught her to make many light textile, glass

Again the growing richness of her home markets lowered the cost of production of those of her exports which conformed to the law of Increasing Return, and therefore enabled her to sell more of them abroad. But it acted in the opposite way with regard to wheat: and her exports of that dwindled away in the later years of the eighteenth century. As soon as her population had once outgrown her small territory, and had become dependent on imported food, every further increase in its numbers increased her foreign trade in wheat; except in so far as it was counteracted either by restrictions on importation, or by improvements in her own arts of cultivation. The one raised the cost of imported wheat and impoverished her people; the other lowered the cost of home grown wheat and enriched her people: but the two affected her foreign trade in much the same way.

I, iv, 3.

By the end of the eighteenth century the process of weeding out her imports of those things, which she had learnt to produce for herself, was nearly complete. Henceforward her industrial advances were almost exclusively in industries in which she was already leading: and, therefore, except when they were checked by heavy import or export duties at home or abroad, they added more to her foreign trade than to her general prosperity: that is, they increased the percentage of her home products which she exported.

And further her growing exports of her cotton, and other goods made of imported material, increased her foreign trade much more than in proportion to the value of the work she incorporated in them: because the value of that raw material, as to which she was only middleman, entered into her trade twice, first as an import and afterwards as an export; whereas the values of her exports of wool and iron, which were wholly products of her industry, entered only once.

The period of the great French war is very instructive as regards monetary policy, but not as regards trade. For, indeed, the course of trade was governed largely by military exigencies,

and metal goods which she had previously bought from the French, her trade in some of these goods was almost suspended for a time: but later on, when she was sending these goods to France, her growing skill in small metal work increased her trade. These facts, and several which follow, illustrate general principles discussed above, I, II, 1.

1, iv, 3. and by the success with which smugglers and others could evade customs officers and Napoleon's cruisers. Partly for this reason it varied violently and irregularly: while the import and export statistics cannot be trusted, and cannot even be interpreted accurately. It seems, however, clear that England's total exports expanded more slowly during the war than before it; and that they consisted to an increasing extent of re-exports of tropical produce, in which England's command of the seas gave her almost a monopoly. The economic value of this monopoly was indeed overrated at the time, and has been overrated since, in spite of Pitt's protest¹.

✓ The war impoverished the Continent, even more than England, and therefore did not lessen the *relative* advantage, which she had obtained before the war, in those manufacturing industries which required a large stock of capital. Whatever of lasting economic effect it produced, was, perhaps mainly through its indirect influence in arresting her social and political development, and even causing some reaction.

English manufacturers had counted on finding eager foreign markets after the peace, but they were disappointed. The countries, which had been the scenes of the war, turned their energies to repairing its devastation: but, as iron was then very little used for structural purposes, England's exports were not in demand for them. There was a slightly increased demand for ordinary metal and textile goods: but that did little more than compensate for the cessation of the demand for clothing and other necessaries by armies in the field. Thus English manufacturers were really poorer than they had expected to be; and the fall in general prices, which followed the destructive war, made them seem poorer than they were. But the springs of prosperity were growing fast during those years when people were most sad, and largely because they were sad. Twice indeed they let their hopes get the better of their judgment. They

¹ He computed that in 1798 England's foreign commerce yielded to the merchants and others engaged in it a gross income of £12,000,000, and a net income of £3,000,000. (Lowe, *State of England*, ed. of 1822, pp. 24-28 and Appendix 4-8.) It may be noted that Oddy (*Analysis of European Commerce*, 1805, vii. ii) says that before the war "the French had greatly more of the West India trade than we, and could undersell us on the Continent."

boldly exported goods to the Continent in 1815, and to South America in 1824—5. But in neither case could the goods be marketed profitably. The crises of 1816 and 1826 however sobered the impetuous, and strengthened the resolute. Men worked hard, and lived sparsely: so capital grew apace¹. I, iv, 3.

Capital was needed in ever increasing quantity by the new developments of industry. For, though the stream of inventions involving fundamentally new ideas had somewhat slackened, yet improvements in detail flowed in at an ever increasing rate. And the old inventions as well as the new made incessant demands for fresh capital: partly because, as a rule, about a generation passed after the fundamental idea of a new invention had been grasped, before it was ready for general use. Very often indeed another generation elapsed before the details had been so far perfected, and the general organization of the manufacture had been so far adapted to its powers and requirements, that it could take its proper place in industry. Thus the demand for capital in manufacturing and other industries increased constantly throughout the nineteenth century; partly because the constructive ideas of one, two, or even more previous generations, were simultaneously growing more powerful, more economical, more adapted to large production and more hungry for fresh resources².

¹ The great French economist, Say, made a tour in England at the close of the war; and he was filled with wonder, almost with horror, at the intense, restless industry of all classes of Englishmen. "Everybody runs, absorbed in his own affairs. Those who allow themselves the smallest relaxation from their labours are promptly overtaken by ruin" (p. 12 of the English edition of his *Notes*). He finds the explanation of this hardness of life in his estimate that "the Government had consumed one-half of the produce of the soil, the capital, and the industry of the English people," *ibid.* p. 21.

² Thus in spinning, the fundamental idea of spinning by rollers came in 1730, but was not made efficient for nearly forty years. By 1780 the spinning mule was in operation; and the great fall in the cost of spinning a pound of yarn came some time after 1784. Deduction being made of the price of the raw cotton, this cost fell from nine shillings to one (for medium counts) between 1784 and 1812. The power loom had been invented at the beginning of this period, but was not made efficient till the end of it: and during the same interval the scarcity of raw cotton had been gradually relieved by the growth of a new source of supply in the Southern States of America. Consequently the cotton industry increased more than five-fold during the next generation; and by the middle of the century it had absorbed not much less than a hundred millions of capital.

1, IV, 4.

And gradually a change in the nature of the investment of capital showed itself. It is well known that in early times the chief forms of immovable capital were improvements in land and houses; and the chief forms of movable capital were farm stock and merchants' stores and ships. The water-driven textile and other machinery of the eighteenth century absorbed an amount of capital which went beyond previous experience, but was yet very small relatively to the demands of the nineteenth century.

In the second quarter of the nineteenth century the value of the implements of production which were chiefly made of iron, began to outrun that of the current stocks of materials to which they were applied. The value of factories and other business premises began to rival that of houses. Coal-mining took a place in the front rank of industries, and the building of railways absorbed more new capital than any other industry¹.

4. *In the second quarter of the nineteenth century the growth of railways helped to consolidate England's industries, and to expand her trade.*

In 1825, when Stephenson's locomotive had not won its great triumph on the Stockton and Darlington Railway, a Committee of the House of Commons published a Report setting forth the nature of England's industrial leadership, and its chief causes; and among these it already found a high place for railways; though they were then worked by horses, or in a few cases by stationary engines².

¹ The only definite statistics available as to the distribution of capital expenditure relate to joint stock companies: of course manufacture was almost entirely in the hands of individuals and private firms. But it is interesting to note that the new joint stock capital of the expansive years 1834—6 amounted to a hundred and thirty-five millions, of which seventy were for railways, seven for mines, eight for canals and navigation, and the rest chiefly for finance and miscellaneous. See Levi's *History*, p. 220.

² The subject of the Report is the advisability of removing the restrictions on the exportation of tools and machinery. It owns that all well-known kinds of machinery can be produced abroad without great difficulty; and that to prohibit or put difficulties in the way of their exportation is in effect to give an educative bounty to the growing manufactures of machinery of our rivals. And on the other hand the price, which such manufacturers are willing to pay for drawings or specimens of new contrivances, was so high as to much more than cover the premium which insurance companies charged for guaranteeing its safe exportation in spite of prohibition. The Report proceeds to argue, that in

But from 1825 onwards a new impetus to England's economic freedom, mobility, and energy was given by the opening of a railway on which coal and other goods were to be hauled by a locomotive; though passengers were to ride in single coaches drawn by horses. I, iv, 4.

The steps, by which Stephenson had made the engine a practical success, were characteristically English; and so were the uses to which it was put. Steam railways suited the English temper; and the configuration of England was specially suited for their early work. There was no place in the world where they could get at once so heavy and remunerative a traffic as between her various industrial districts, and from them to London. So small are the distances between the chief centres of industry that the six thousand miles of railways that were open in 1850 connected nearly all the chief towns and industrial districts of England and Scotland. They carried goods and passengers at charges which were much lower than those demanded by other means of fairly rapid transport, though they were high when measured by modern standards. They enabled perishable goods to travel far; and thus raised the price of many things to the producer, while lowering them to the consumer.

They saved time and fatigue in travel. They enabled the head of a large business, even if pressed for time and weighted by years, to keep its outlying connections firmly in hand. They

spite of the fact that it is impossible to prevent foreigners from using our best machinery, yet it can always be a little ahead of theirs; and we can hold our own. "Our minerals have a neighbourhood, whence, from the proximity of railroads, canals, and rivers, they may be conveyed with great facility to all parts of the kingdom, either for home manufacture or exportation. Almost all our great manufacturing towns, and establishments for the construction of machines, enjoy similar facilities; and thus, with the continual improvement of machinery, enable us to keep down the cost of production....The freedom, which under our government every man has, to use his capital, his labour, and his talents, in the manner most conducive to his interests, are inestimable advantages; canals are out, and railroads constructed, by the voluntary association of persons whose local knowledge enables them to place them in the most desirable situations, and these great advantages cannot exist under less free governments. These circumstances, when taken together, give such a decided superiority to our people, that no injurious rivalry either in the construction of machinery or the manufacture of commodities can reasonably be anticipated" (pp. 12, 16 of the Report).

The history of British railways and canals is considered in Book III in connection with the relations of monopolies to national advantage.

I, iv, 4 were aided by parallel developments of the banking system, the newspaper, the telegraph, and the postal service, in all of which England was ahead of her Continental rivals: and they gave her for a time a preeminence in the concentrated force of her internal trade and industry, and therefore of her external trade, to which nothing in the history of the world had been comparable except the force which Holland derived from her waterways. They strengthened her industry in just those respects in which it already had differential advantages, and thus increased her foreign trade even more than in proportion¹.

In the second quarter of the nineteenth century the Continent of Europe was no longer devastated by wars. Industry was increasingly secure and free. English manufacturing methods were introduced by English artisans, working machinery that had been bought in England, or made on English models; and in many cases, capital, managing capacity, and operatives were supplied from England. For enterprise was still timid, especially in regard to railway and other industries which were still unfamiliar. Thus at last England repaid to the Continent services which Holland had rendered to her, when her low-lying lands were drained by Dutch capital, Dutch engineers, and Dutch workmen. The Continental demand for railway material, however financed, opened out a good vent for England's (or, rather, Britain's) iron products; though by this time her iron-masters found some strong rivals in Belgium and elsewhere. These new railways facilitated her foreign trade generally, in spite of the pressure of high duties on almost every frontier.

Her trade, and therefore also her industries, were promoted also by great further improvements in the art of ship-building. But here the initiative came from America: and the history of Britain's shipping was not altogether creditable to her. The volume of her tonnage reached a maximum at the end

¹ Other causes aided. The telegraph began to be a considerable force about 1840; just when the penny postage had been forced on a reluctant Government by the energy of Rowland Hill. The first electric cable to France was laid in 1850. The newspaper stamp was reduced from 4d. to 1d. a sheet in 1836; and it remained at a penny till 1855. The advertisement duty was reduced from 3s. 6d. to 1s. 6d. in 1833, but was not abolished till 1853. The tax on paper was reduced in 1835 and 1839, but not abolished till 1861

of the great war, when she had a real monopoly of much maritime traffic: though her monopoly of trade was less complete than is often supposed, and of course a large part of her shipping was engaged in the service of the war. That level was not reached again till 1840. For indeed the Navigation Acts, which professed to foster the growth of British shipping, had been counteracted by considerable duties on Colonial timber; and by heavy duties on foreign timber, which in the absence of preference would have been much cheaper. The world's stock of shipping was indeed increasing; so that Britain's trade was promoted by low freights. But she herself built very little more tonnage annually than her Colonies did; and the shipping of the United States grew rapidly till it passed hers about 1850, just as the last vestiges of the Navigation Laws were repealed and the almost prohibitory duties on foreign timber were reduced to a moderate level¹.

5. *The growth of factories made prominent the evils inherent in crude capitalistic control, but was not largely responsible for them.*

The "Industrial Revolution" in that special use of the term, in which it is limited to the end of the eighteenth century and the first third of the nineteenth, is sometimes associated with the supersession of the merchant undertaker by the capitalist manufacturer: and the large factory is apt to be taken as the centre of that capitalistic exploitation of labour which Karl Marx denounced as characteristic of the modern age. But the ground taken by Marx himself is broader than that: for he says: "Capitalistic production only then begins, when each individual capital employs simultaneously a comparatively large number of labourers²."

¹ The Navigation Acts incidentally forbade American produce to be brought to Britain save in British ships: and, as America copied these Acts, both British and American ships had as a rule to cross the ocean one way empty. But the treaty of 1815 secured equal freedom to the ships of the two countries in each other's ports. The operation of the Acts in their later stages was complex, and raised some specially intricate questions in regard to reciprocity. At the end, as at the beginning, much thought was given to their bearing on the supply of men for the Navy. See Dr Clapham in *The English Historical Review*, 1910.

² He adds: "The labourer can sell no more than what he has—i.e. his indi-

1, iv, 5. We saw in Chapter III how the ever increasing distance of the operative producer both from the sources of supply of his material, and from the ultimate purchasers of his product, rendered him increasingly dependent on capitalist merchants for employment. The dependence was direct and obvious when he worked up his own material in his own cottage. It was less direct and obvious when he worked for a small employer, whose resources were so small and whose outlook was so narrow, that he could not afford to carry much stock and could not obtain good direct access to general markets: but it was not much less thorough; for if the merchants could not, or would not, accept the product on terms which enabled the small masters of a neighbourhood to pay the current rates of wages, the operatives would commonly be forced either to submit to a reduction, or to go short of employment.

Moreover a small master was generally in a position to know the necessities of each worker; and he was often tempted to take advantage of that knowledge. In fact the system of work for such masters, themselves under the control of capitalist merchants, is familiarly described now as the "sweating" sys-

vidual isolated labour power....The capitalist buys the labour power of 100 men, and enters into separate contracts with 100 unconnected men instead of with one....He pays them the value of 100 independent labour powers, but he does not pay for the combined labour power of the hundred" (*Capital*, vol. I. pp. 311 and 323 of Engel's English edition, 1883; pp. 285 and 297 of the sixth German edition). We must not stay now to consider all the implications of this argument. As is well known, he suggests that the capitalist employer obtains a "Surplus Value," consisting of all excess of production of 100 men working "cooperatively" with all the economy and efficiency of subtle organization, over a hundred times the production of an isolated workman. He is not troubled by the fact that in some industries the "cooperative" efficiency of the hundred is more than twenty times their efficiency when working in isolation: and that in such cases the employer would, on Marx's showing, receive in profits about twenty times as much as he pays in wages; whereas, in many such industries, the net profits are in fact not a tenth of the wages bill.

It will be argued in the second Volume that so long as there is active competition among employers, each will be forced to pay as wages the equivalent of the net value that the hundred men, working cooperatively, add to the product: *net*, that is after deducting all other expenses incurred in the production, together with profits on the whole at a rate which, on the average, diminishes slowly from generation to generation. Thus the main benefits of the efficiency of "cooperative" production accrue to the consumers: that is, to the working classes, *in so far as the industry is occupied either directly or indirectly in producing commodities or services which are consumed by them.*

tem; because it is commonly believed that a crude employer with small capital, suffering under pressure from above, will resort without remorse to measures more harsh and petty than any for which the large employer has, as a rule, either the inclination or the opportunity. Recent investigations have however proved that this common opinion goes too far: it does injustice to a class of men, many of whom work hard for low gains, and are by no means lacking in human sympathies. The employment of children at an excessively early age was common under the domestic system: and, though they were for the greater part under the protection of their parents, yet on the whole the evidence seems to show that they were often treated by their parents more cruelly than the great majority of the children in factories were. It is important to remember that workmen, who were paid (directly or indirectly) by the piece, often handled their young assistants barbarously¹.

¹ Defoe was envious of the Flemish because their manufactures had kept the people so busy that hardly a child above five years old, but could do something to earn its bread: he says that Henry VII when in exile (i.e. before 1485) had been set by this on considering the great injury that could be done to them by stinting the supply of English wool (*Plan of English Commerce*, p. 126). And in 1671 Chamberlayne reported that in Norwich children from six to ten years of age have earned £12,000 more than they spend, chiefly by knitting fine stockings. See Hull's footnote to p. 308 of his edition of Petty's *Works*.

The elder W. Cooke Taylor (*Tour in the Manufacturing Districts of Lancashire*, 1842, p. 145) reports how a very old man told him that in the days when spinning was yet done by hand, and yarn was scarce, and "the spinners were the masters of the weavers...were really the days of infant slavery," adding: "the creatures were set to work as soon as they could crawl, and their parents were the hardest of task masters." The old man with characteristic lack of reason "was indignant at the clamour which had been raised for infant protection" which led up to Lord Ashley's great Act of 1844; and contrasted his own hard life with "the light toil and positive comfort of the factory children." See also Hutchins and Harrison, *History of Factory Legislation*, ch. I. Popular history underrates the hardships of the people before the age of factories.

The chief collection of material bearing on the subject is in the great *Report on the Employment of Children in Factories*, 1832—4, by a Commission under the presidency of Tooke, the great economist. It lays bare the grievous sufferings and waste of life caused by very long hours, and the cruel discipline which was thought necessary to induce the weary children to continue on the move; and the Commissioners and Sub-Commissioners are agreed in calling for vigorous State intervention. But stress is laid on the fact that in many kinds of hand labour "manufacturers" (the word being used in its original sense) "work hard from twelve to fifteen hours a day to earn a bare subsistence; and this frequently from a very early age, and in a state of confinement which may be truly called injurious to health" (*Second Report*, p. 6). The evidence also shows

I, iv, 5.

It appears clear therefore that other causes must have cooperated with the extension of the factory system to make the fate of manufacturing workers generally, and of children in particular, as hard as it certainly was during the two generations in which the system was taking its present shape: there were in fact many causes acting powerfully in that direction. The first of these causes was a continued increase in the rate of the growth of population: it was itself partly the result of the constantly increasing separation of the labourer from the land; and it widened that separation still further. For a time harsh Settlement regulations put hindrance in the way of marriage; but they could not be maintained effectively, and the population of England nearly doubled between 1801 and 1841. The deep significance of this increase at a time when modern provisions for the comfort of large densely populated lands was unknown, is indicated by the fact that, if its rate had been maintained for four centuries, the population would have multiplied a thousand-fold in that time: and a million-fold in eight centuries.

Other causes of distress were the growing changefulness and instability of employment: these were mainly attributable to war; and to the violent fluctuation of prices, especially of wheat, which resulted from it: to the growing separation of the producer from the ultimate market for his wares: to that increase of speculative trading, often on a relatively small foundation of capital, which collapsed in an exceptionally rapid succession of disastrous commercial crises; and lastly to the increasing dependence of the cotton and other industries on sales in countries so distant that news from them was several months on its way.

This drift towards unsteadiness of employment did not affect uniformly all industries, nor even all parts of the same

that the worst cruelties were confined to a relatively small number of factories: though frequently practised by overlookers, by far the greater part of them were wrought by ordinary workmen on their assistants; e.g. by cotton spinners on piecers and scavengers (*First Report*, p. 45). Mr Tufnell states that the expensive setting up of machines for carrying off dust from the card-rooms and scutching-rooms, and ventilating by fans, and substituting a direct supply of steam for the old plan of raising the whole rooms to an unhealthy temperature by huge fires, had been effected in representative large factories, though not then prescribed by law (*Supplementary Report*, Part I. p. 227).

industry. It has already been noticed that there was a time, at which hand loom weavers were ever pressing spinners for more yarn; another, at which the spinning mills, driven by water power, could furnish more yarn than those weavers could use; and a third, at which hand-weavers were left almost without any remunerative work. And further, as Rogers observed, the transition from farm work to factory work made the employment of women more steady, without raising their wages when employed. But it made the employment of men less steady, even in those industries in which they were not largely ousted by women and children. Hired men have always been wont to spend their harvest wages unwisely; though the peasant owner has seldom thrown aside his traditionary caution. The employee of a manufacturer who works for an uncertain market, is apt to have frequent harvest-like orgies of work and high pay, followed by long intervals of low-paid work or idleness: and, if it happens that his wife and children are in relatively steady work, he is likely to squander his high wages. Thus families in the manufacturing districts, whose aggregate earnings were twice as high as those of families at work on farms, often lived in greater squalor.

This brings us to the darkest spot in the dark field of the struggle of the factory system with a crude and immature mechanical technique. The centre of the evil lay in the fact that much of the work done on the new methods was within the range of even young children. Later on the machinery became more massive, and adult males won back from both women and children many of the operations, that had taken the place of the old male artisan labour; and thus technical changes facilitated the good work of factory laws. But there is much pathos in the story of the older artisans, who lost the capital value of all the skill invested in them, and did not live long enough to see that later stage¹.

¹ The simplicity of the first machines adapted for spinning, and their small size, fitted them for being tended by children. The mills were by the side of small streams, and had but little local supply of labour: and in the early period of mill labour, apprentices from six to twelve years of age were prominent among the workers. Gradually a local population grew up, and apprentices gave place to the children of neighbouring cottages. Later on, steam power drew the factories into the broad valleys and the towns. The machines for spinning

1, iv, 5.

The technical conditions of the early textile factories; the war; the high price of bread; the rough manners of the crude, vigorous, keen-witted men, risen from the ranks, who had out-paced and superseded the older race of employers; and, last but not least, the ineptitude of the governing classes in legislation and in administration: all these causes combined to bring misery and degradation to men, women and children. The cruel enforcement of English ideas as to land tenure on the Irish population had largely peopled Lancashire with miserable immigrants, who tended to bring other workers down to their own low level. A blundering poor-law had made it possible for pauper children to be collected from the workhouses of town and country throughout the land and sent to the factory districts in waggon loads, there to be herded without care from father or mother¹.

There were indeed large and ever increasing groups of highly paid artisans; strong in self-respect and sense of duty, and rejoicing in a family life which for cleanliness, comfort and sobriety compared favourably with any that could be found in other countries, or had existed previously in England. But the incursion of the offscourings of low-paid labour, largely agricultural, from the South of England and Ireland into the best hives of high-class industry, brought with it a degradation

became more bulky, and required greater skill and exertion for producing fine counts. But children still remained in the majority: though they were not strong enough for the heavier work, which these required, till a somewhat later age. (This statement is quoted substantially from Gaskell, *Artisans and Machinery*, pp. 137—142, 1836.) An overlooker had the boldness to tell the Committee of 1832 that small children were preferable to those over the age of 14; because they had to stoop less to the low frames: and, on its being suggested that the frames might be raised, replied that even then the older children could only be paid as much as the younger (Q. 3076—9).

¹ In 1836 there were 120,000 persons, chiefly Irish, living in cellars in Manchester alone, in fearful filth, often accompanied by a pig; poor, wasteful, and dissolute (Gaskell, *l.c.* pp. 82—3). Many more details are given by him; also by "Alfred" (Samuel Kydd) in his thoughtful and well-balanced *History of the Factory Movement*, 1847; and in other histories. It was rightly argued in the debate in 1815 on the elder Sir Robert Peel's Factory Bill that there was need for stopping a system which could be so abused that a London parish stipulated with a Lancashire manufacturer that "with every twenty sound children, one idiot should be taken." Peel confessed that his own house at one time employed nearly a thousand "parish children supplied from London, Birmingham, and other populous districts."

of the quality of life, from which the chief manufacturing district of England has not wholly freed itself. There are still to be seen there relics of the old time, when parish children, brought to Lancashire mills to earn money for which they were responsible to no one, started a habit among children, even of respectable families, of "setting up on their own," as soon as their earnings were sufficient. It was not easy to exaggerate the evils of many of the new factories: but they were exaggerated; and, in return, partisan advocates exaggerated the great real difficulties which were involved in an efficient remedy¹.

The factories which were chiefly concerned in this conflict of interests, had no special favours to demand from Parliament: they worked largely for export, and had little fear of competitive imports. But it was strenuously argued on their behalf that, if the Protective duties on wheat were removed, operatives would be able to buy more food with less money: and therefore their real wages would rise; and yet the manufacturers might get their labour at a lower money cost than before. Some economists supported this suggestion, and were often supposed to be hostile to the Factory Acts; but they were friendly to the Acts².

6. Influences of war and fiscal policy on England's industry and trade in the first half of the nineteenth century.

We now pass to consider the influences which the war, and the financial policy associated with it, exerted on the life of the people; and especially of those classes, who were least able to

¹ For instance, the advocates of stringent factory regulation were apt to put forward exceptional cases of wrong-doing as representative of the general conditions of factory work: its opponents brought forward as representative the experiences of people, living in places in which there was a large low-grade population, who could honestly say that the children, employed in some neighbouring well-conducted factories, were the healthiest and most moral whom they saw. Again some expert evidence was given to the effect that England's lead in the cotton industry was so strong that, if the hours during which the machinery was at work were reduced, she could obtain for her diminished exports a remunerative price; while other expert evidence contended that even a small increase in the costliness of her cotton goods would close many foreign markets to her.

² See Appendix E, 5.

1, iv, 6: maintain themselves in the face of adverse circumstances. The dark shadow of the French Revolution had enlisted the fears of the well-to-do classes on the side of their human sympathies, in arranging a system of poor-relief, which inverted the law of nature: for it made life least uncomfortable for those of the labouring classes who were least deserving: and it caused those, who had the least nobility of character, to marry early and to leave the largest number of descendants; and they in many cases lived to become degraded helots in manufacturing districts.

Further, the capital required by war could not have been obtained entirely by taxation without extreme measures, and in fact a very large part of it was obtained by loans. The loans could not be taken up abroad, so they came from the existing stock of capital: thus making capital scarce for industrial purposes, and securing high rates of interest and profits to capitalists and employers. Meanwhile the rents of landlords were raised by the high price of wheat. Thus the incomes of the well-to-do classes were raised relatively to those of their fellow-countrymen by the war: and, when it was over, they were left with a mortgage on the revenue of the country. Under the circumstances, the revenue ought to have been raised by taxes which fell lightly upon the working classes: but in fact they were so levied as still further to raise the income of the landlords; and, if the attempt which they made in 1815 to fix the price of wheat at 80s. a quarter had been successful, it would have compelled a great number of labourers' families to live on an aggregate weekly income about equal to the price of a single bushel of wheat. According to Charles Booth's well-known estimate, at the end of the nineteenth century, those Londoners were to be accounted as "poor," (that is, "as living under a struggle to obtain the necessaries of life,") who had a "regular income of 18s. to 21s. a week for a moderate family," and 18s. to 21s. was fully the price of six bushels of wheat¹.

¹ The complaint that the system of war loans mortgaged industry to protect property is voiced by Disraeli in *Sybil*. Newmarch, in a memorable defence of Pitt's loans, suggests that loans may come from "the overflowings" of capital that would otherwise have been "wasted," and that in such a case they do not materially encroach on the resources of industry (*Statistical Journal for 1855*, p. 138). In Pitt's time capital was scarce, even in England; but, as the war lasted long, more than half its expense was paid out of taxation; though in no

These evils, grave as they were, affected England's leadership less than might have been expected. In their most intense form they affected only a small part of the population. The production per head was very much greater in England than anywhere else; and though many employers were amassing great wealth, that was because they were reaping the profits of very large concerns: there was no other country in which the working man was allowed to retain for himself anything like as large a share of the value, which he produced when aided by a given capital. This fact is sufficient by itself to raise doubts as to the correctness of a statement, which has frequently been made, that the substitution of work in large factories for work in cottages and small workshops increased greatly the power of the capitalist to exploit the people. I, iv, 6.

Nearly every sort of fiscal policy works some good and some evil. Whether the good or the evil preponderates depends much on the adaptation of policy to the conditions of industry and trade in the country affected; and on the foresight, breadth of vision and ability with which it is developed. British statesmanship was not deficient in these qualities at the beginning of last century: but many a well-navigated vessel has missed her best course in a cyclone.

The early excesses of the French Revolution had excited beyond the boundaries of calm reason, not only the despotic rulers of the Continent and the privileged classes which made common cause with them; but also many lovers of freedom, as may be seen by comparing Burke's earlier utterances with the frenzy of his later years. On the other hand the general declaration of war against France caused all Frenchmen, however deeply they abhorred those excesses, to regard war to the end without compromise as their first duty. And, while men's motives were thus mixed, the results to the world were almost exclusively evil. Britain indeed suffered in some ways less

single year was a contribution made from that source which absorbed nearly as large a share of the national income as that levied in the later years of the present World-war. Disraeli's jibe was, however, in some measure justified by an abuse of the power of the landowners after the war; for they levied taxes which increased their own incomes, and threw more than the whole burden of the war on the industrial classes, and especially the poorer classes of workers. Similar, though much milder, tendencies can be observed now.

1, iv, 6. from the war than many other countries: but her fiscal policy was set on evil courses.

Pitt, the pupil of Adam Smith, and of the French advocates of Free trade, began his career with attempts to make the British tariff more simple and less restrictive; and he pressed for a commercial treaty with France, which would have gone very far towards breaking down the tariff frontier between the two countries. But his project was thwarted: and the events which began with the French Revolution made him ultimately responsible for a tariff which was grievously complex and oppressive. He seems indeed never to have formally abandoned the hope of returning to his early projects, when the stress of the war should be over: but meanwhile he was impelled to seek revenue by paths of least resistance.

He laboured throughout under exceptional difficulties. For he found himself compelled to impose, or at all events to acquiesce in imposing, heavy charges not always well considered on all classes of the population. A great increase of local rates was partly caused by bad methods of poor-relief: but the rise of wheat to famine prices, chiefly under the influence of war and bad harvests, would in any case have demanded a large local outlay, to be defrayed by the well-to-do for the benefit of the needy. The expenses of the war called for a renewal of the income tax, which reached at one time two shillings in the pound. These causes lessened Pitt's power to withstand, and perhaps even his eagerness to withstand, the pressure put on him by landlords and manufacturers to give them some sort of compensation by the imposition of duties on products that competed with theirs, even when the taxes were such as would yield but little to the revenue. He was compelled to levy many excise duties which he knew to be very unpopular. And, far-seeing man though he was, he did not care to look very far ahead when arranging a new import duty; for the independence of England was at stake; and, if that could be rescued, his emergency measures might be repealed before they had done lasting harm.

Pitt, killed by Austerlitz, left a heavy task to successors less strong than himself; and it would have needed men of exceptional strength, either during the war or immediately on its close, to work upwards along the steep and narrow path that led

back to the ideals which he had left behind. So England was afflicted by an exceptionally ill-conceived protective tariff for many years. It was so complex that, if its origin in the crisis of the war were forgotten, it would appear to have been the work of self-confident men; and its details were generally so full of needless vexations and hindrances to industry and trade, and so ill-adapted to the ends at which they aimed, that it would have appeared to be the work of dull men. I, iv, 6.

This fact had a great influence on history. For Englishmen were averse to abstract discussions. They did not care to inquire whether a system of Protection could be devised which would be free from the meddlesomeness and the waste, the corruption and the cruelty of that system which they knew. And as soon as the public could be induced to overcome their repugnance to the idea of change, the reformers found no serried ranks of firm reasoning to oppose them. The course of the battle might have been nearly the same, but its after-effects would have been widely different, if the task to be accomplished had been one for hard thinkers rather than expert orators.

The task indeed was not quickly accomplished. For violent change was uncongenial to the English temper: and some of those statesmen, who did most for free trade, had to conquer themselves before they began their struggle with others. This was especially the case with Peel. And yet the twenty years which elapsed between his great reforms and those of Huskisson, had broken down much of the crust of traditional opinions; and, by aid of the extension of the franchise in 1832, they had so much lessened the force of vested interests, that Peel, though less venturesome than Huskisson, was able to venture far more boldly than he had done¹.

¹ Huskisson, 1823—7, abolished most prohibitions and many duties which were in operation. But many Protective duties appealed strongly to vested interests, and he did not venture to do more than lower them. Even in 1839, after his work had been carried a good deal further, there were left nine hundred separate articles on the Customs list. The taxes on many of these were in effect prohibitive. (The details are set forth in an instructive appendix to the great Report on Import Duties of 1840.) The excess of aggregate receipts over drawbacks on six hundred of them was less than £3000. Speaking in 1825, Huskisson said (*Speeches*, vol. II. p. 343) that any one who walks along the beach from Brighton to Hastings can find at almost every village "persons who will engage to deliver him, within ten days or a fortnight, any prohibited

I, iv, a.

It is doubtful whether Pitt's early movement for tariff reform would have had sufficient driving force, even if it had not been cut short by the great war. But in Peel's time motive power was supplied by the increasing strength of vocal manufacturing interests; and by the irritation resulting from the confidence with which the landlords assumed that the well-being of agriculture was the supreme interest of the country, and by the relentless import duties and prohibitions which they consequently imposed on grain. Without that driving power the subtle arguments of Ricardo and other thorough thinkers could not have been effectively rendered into the language of the market-place, even by interpreters as lucid as Cobden and as eloquent as Bright. But the wishes of the townsfolk helped them to thread their way through difficult reasonings: enthusiasm grew, and spread to the country folk; and at last it became possible to convince agricultural labourers that their real wages would be raised by the free admission of products that competed with those of the fields which they ploughed. Their money wages might conceivably fall a little; and so might even the wages of those who worked at other pursuits: but the prices of their food would fall much more; and their worst miseries would be over¹.

In Peel's time the centre of the conflict was the Sliding Scale of duties on corn. That showed Protectionist ingenuity at its worst. At the beginning of the controversy the majority of Englishmen probably believed, what they were told on authority, that it would steady the price of wheat. At the end of the controversy there was scarcely any thoughtful Englishman who was not convinced that it increased fluctuations in the

article of manufacture, which he can name, upon an advance of £30 per cent. beyond the prime cost in Paris."

¹ This broad statement must be left for the present: a study of the complex issues involved in it belongs to a later stage of our study. The general belief that money wages would fall a little does not seem to have been based on any careful or exact reasoning: but it was probably correct. For up to that time wages had seldom been governed directly by economic forces. Employers nearly always had the upper hand in bargaining. Farmers especially raised or lowered wages by agreement among themselves, at such levels that labourers' families could just live in moderate health and moderate strength, provided the whole of their income was spent for strength-giving ends: and similar influences operated in many industries, though with less force.

price of wheat; that it made the trade of farming precarious, and intensified agricultural depressions; but that meanwhile it so discouraged importation as to keep the average price high to the consumers, without conferring any proportionate benefit on the landlords, still less on the Exchequer or on the farmers. The Sliding Scale was not an essential part of the Protectionists' policy. But they defended it, and thus it served as a measure of their economic insight; and when the plain man was convinced that its claims could not be defended, he was inclined to give willing ear to criticisms of their other claims. Thus the great bulk of popular opinion swung round with irresistible force.

The defenders of the old system were, with few exceptions, ill-informed and weak in argument: they were discredited by the personal interest which most of them had in maintaining a high price in corn; as well as by the old-fashioned way in which they assumed that the welfare of the country depended on the prosperity of those who had a stake in it, and especially the owners of land; and they were worsted in almost every encounter on Royal Commissions, in Parliament, and on the platform. Their case was weakened before the Reform Bill of 1832 had transferred political power from the owners of land and decayed boroughs to the commercial and industrial classes: and after that the old Protection of agriculture could not long survive¹.

Disraeli had assailed Peel's action bitterly; but on becoming Chancellor of the Exchequer in 1852 he frankly said that a return to Protection was impossible. The subsequent vigorous reform of the British Parliament gave a free course to experiments in production and traffic; which it might not have been worth while to make if each step had needed to be defended and explained

¹ Reference may be made to Appendix E for some account of the causes of the failure of sliding scales: and for an argument that the movements of the price of wheat after 1849, though not what was expected by those who advocated the repeal of the duty, was just that which they might have anticipated if (1) they had known the peculiarly narrow conditions of the world's supply of wheat, so long as land transport was dear, and even sea transport not very cheap: (2) they could have foreseen the influx of gold beginning in 1850; also the war with the country from which England expected her chief supplies of wheat; also the disturbed conditions of the world till 1871; and lastly the building of railroads to American wheat fields, sometimes at the rate of nearly 10,000 miles a year; and so on.

1, iv, 6. to Customs and Excise officers, with the risk of being prohibited by them after some delay and when already half taken. At last every harbour on the coast line became a free port for the importation and housing of all goods except tobacco, alcoholic and stimulating drinks, and sugar; and for the exportation of all goods whatever. And the country became a free factory for the production of all goods except alcoholic liquors.

The freedom to adopt whatever trade one would, and manufacture whatever one would (*laissez faire* in its original sense), together with the freedom to send goods whithersoever one would, and to fetch them whencesoever one would (*laissez aller*), made England the *entrepôt* of the world. They gave her not only unprecedented trade, but also unprecedented advantages for developing every new idea of her own, before it reached other nations; and for learning any new foreign idea that could be adapted to her use.

But a difficult investigation always loses something from contact with the market-place. Nature is not simple, but complex. The immediate effects of any system of taxation are likely to differ from their ultimate effects: and both immediate and ultimate effects may vary much with the varying conditions of different countries. And, as the case against Protection in England (and Scotland) was far stronger than that against Protection in any other country, it was not to be expected that the reformers should confuse their English hearers by taking account of the conditions of other countries, unless they were compelled to do so: and from that they were saved by the low intellectual character of the opposition with which they had to contend. So they based sweeping general propositions on English facts and English conditions.

This gave to their argument much apparent lucidity and simplicity, which hastened their victory. And their victory was twofold. For it was followed by so great an increase of England's prosperity, that other nations began to open their ports in imitation of her; and this doubled the benefits which free trade conferred on England.

But in the long run it might have been better both for England and for Free trade, if they had been compelled to make prominent those cumbrous qualifications which they omitted.

For then other nations would have been warned beforehand that the removal of Protective duties could not be expected to confer the same unmixed benefits on their best industries as it had done on those of England. As things were, they had to learn it in the hard school of experience: and they are now further removed from a calm inquiry as to whether the benefits of Protection outweigh its evils even to them, than they might have been if the English reformers had gone to work in a more scientific way¹. I, iv, 6.

¹ The above statements are developed in Appendix E, 4.

CHAPTER V

BRITAIN'S INDUSTRIAL LEADERSHIP UNDER STRONG CHALLENGE

- I, v, 1. 1. *A rare consilience of favourable influences promoted the expansion of Britain's industry and trade after she had thrown her markets open to the world.*

The main purpose of this chapter is to indicate the new conditions of industrial leadership, which call for at least as high and sustained energy as Britain showed when she first outpaced her rivals.

The events of the second half of the nineteenth century belong to a survey of contemporary conditions. The few remarks made on them in the present chapter, are designed to do little more than indicate the way in which Englishmen have settled down to work out and develop, in cooperation with other nations, those methods of large, highly organized industry and trade in which they received but little aid from others up till about 1850. We have first to consider the causes which accelerated their advance in the third quarter of the eighteenth century, and those which led them generally to overrate that advance: secondly, the causes which brought about a well-founded, but exaggerated suspicion that all was not well with them. Thus we shall be brought to the present time, and come in touch with problems which will occupy the remainder of this work.

Looking back again, we see that a combination of causes, which is unprecedented in the history of the world, had developed England's industrial leadership from 1750 onwards. She had indeed been struck by several great misfortunes, especially her quarrel with her chief colony, her war with France, her poor laws and her corn taxes. But these evils were nothing in comparison with those which had afflicted her rivals on the Continent; while in America both capital and industrial skill

were still scarce. After 1850 England had rid herself of her corn law; and of other restrictions, which were less injurious practically, though perhaps not better conceived: and she then had an equally unprecedented combination of advantages enabling business men to make money, even when they were not throwing themselves with energy into that creative work by which industrial leadership is made and maintained. I, v. 1.

It has often been remarked that a man's energies are at their best when he is emerging from poverty and distress into the command of great opportunities. He rejoices in a little comfort; but he does not care to spend too much money or time on luxury. He is happy and proud in conquering difficulties. The fear of distress is still so fresh in his mind, that he subordinates, naturally and without effort, the allurements of the present to making secure provision for the future: he works hard without pain, and he accumulates capital greatly. That was the position even as late as 1850 of a large number, perhaps nearly half, of the older captains of industry: they had grown up in cottages, in which bread was often so scarce that the mother was forced to stay the children from eating before they had had enough. Such men sometimes indulged in bouts of gross indulgence: but they did not care for, and did not even know how to manage, those forms of elegant display, which in later years were to consume a large part of the national income¹.

England's relative strength was further heightened by the distresses of war which fell upon her neighbours. The chief of these were the slaughter and enfeeblement of bread winners, and the destruction of capital. Those who are killed, injured, or invalided in war, are mostly young men: the whole expense

¹ Newmarch remarks (*History of Prices*, vol. v. pp. 368—9) that during the five years 1846 to 1850 as many people found employment on the railway works as in the whole of the factories of the United Kingdom; and that nearly the whole of the railway calls, which supplied the means for their employment, were met either by efforts of economy or by increased exertions; and that the consequent distribution of extra wages "mitigated the disastrous effects on the working classes of the commercial and political convulsions of 1847, 1848, and 1849." In 1851 England was ready to open the great Exhibition, at which the whole world learnt suddenly how great were the numbers of those things which could be bought in London better or cheaper than elsewhere; and of those which could not be bought at all elsewhere.

I, v, 1. of their nurture has been borne by the community, and they have as yet repaid but little of it by their industrial work. This is true generally; and especially when nearly the whole nation is in arms.

England of course had her own troubles: especially those of the Crimean War 1854—6 and the Indian Mutiny 1857—8; but her finances were handled with courage; and her debt was very little increased¹. On the other hand, the American Civil War of 1860—4 destroyed more wealth and industrial energy, and closed more opportunities of producing wealth, than any other war of nearly equal duration up to that time. And from 1859 to 1871 Western Europe was the scene of a series of wars, the last of which was more destructive than any other short war except the American Civil War².

During all these wars many nations, which remained neutral, reaped high gains: but none of them reaped gains to be compared to England's. For she had a preeminence, amounting under the special circumstances of the time to a partial monopoly, in the three things that were most urgently needed by those who were preparing for war, or engaged in war, or repairing the wastes of war; viz.: the material of war, including the personal outfit of the soldiers; the services of trading ships; and the loan of capital. These gains were high in substance: and they were higher still in appearance; that is, when expressed in terms of money. For the general tendency towards a rise of prices, as a consequence of the increased supply of gold, was reinforced in regard to many things, not only by increased consumption and destruction of them in connection with the wars; but also by the temporary or permanent removal of many producers from their factories and workshops to the battlefield:—a fact which recent experiences have brought home to the whole Western World.

Further, these wars, while retarding the progress of her

¹ It was as low in 1860 as in 1850. The war did little to hinder any of England's exports: but she was largely dependent on Russia for tallow and lard products, and to a less degree for wheat. These therefore rose much in price here (though, after a while, considerable supplies found their way to North German ports and thus to England).

² France and Sardinia were at war against Austria in 1859; Prussia and Austria against Denmark in 1865; Prussia against Austria in 1866, and against France 1870—1.

rivals, increased the demand for her iron. The implements of war, which were chiefly made of it, grew in volume and in expensiveness. And as in the old times great roads had been made for military purposes; so every successive war strengthened the lessons first taught by the Crimean War, that under modern conditions an efficient railway system is a strategic necessity¹. I, v, 1.

By 1870 England had built about two-thirds of her present railways. She had joined every important centre of industry with every other; and there was little room for the making of new lines which would create important additional traffic. But she still found much to be done in providing additional tracks, in increasing the number of quick trains, and in admitting third class passengers to them, not only on a few trunk lines, but on cross lines in every direction. This practice, which was not adopted thoroughly by any other large country, turned the special configuration of England to the best account, and it bound her chief industrial centres into a more compact unity than was to be found on a scale at all comparable with hers anywhere else. Combined with the freedom of her business from the inspection of Excise and Customs officers, and with the efficiency of her banking system, it gave her exceptional facilities for the rapid and elastic adjustments of business.

But there was menace in the fact that railways had, in 1870, rendered a much larger percentage of all the services which they were capable of rendering to England than they had done to any other large country: and that from that time forward the development of railways has done more for the industrial efficiency of her chief rivals than it has done for her².

¹ Thus the Northern States built a railway across the American continent, partly because the isolation of the Pacific Slope had been felt as a peril to national unity during the stress of the Civil War. The railway building of Germany for some years before and after her great war with France was mainly directed by strategic considerations; and the German railway *personnel* is organized in peace to be ready as a department of the army in war.

² The railway mileage of the United Kingdom was 6,600 in 1850; 15,500 in 1870; and 23,400 in 1912. This mileage of 6,600 in 1850 was nearly twice as great as that of Germany, and nearly four times as great as that of France; but it was passed by that of Germany just after the Franco-German War, and by that of France about twelve years later. The railway mileage of the United States, which was about three times as great as that of the United Kingdom from 1840 to 1870, is now more than ten times as great nominally. But of course in the more thinly peopled districts the lines are very lightly equipped.

1, v, 1.

But, though her territory was so small that she was bound to see railways rendering new benefits of the first order to other countries after they had ceased to increase her advantages very greatly, it was otherwise with shipping. The contest between wood and iron as a material for shipbuilding became acute about 1850. The first place, at all events for steam-vessels, was taken by iron a little later; and by 1870 the contest was finished.

In the first half of the nineteenth century it had seemed that England's children beyond the seas would contest with her the primacy in shipping. But iron, which was ultimately to be a chief source of America's strength on the seas as well as on the land, was then needed so urgently for the land as to divert her energies from the seas. It was used chiefly for her railways; and she could invest capital in them to yield her a much higher rate of profits than that for which English capital was compelled to work, and to which therefore American capital would be limited in the general shipping trade. Up to the middle of the century she had derived a great benefit from the material for shipbuilding afforded by the forests of Maine. But wood was yielding place to iron just as the Civil War drove her shipping from the ocean. And when the war was over, her new fleet was built to trade on the great lakes and along the coasts, where native shipping had a monopoly, rather than on the great world routes. England therefore was freed from the chief rivalry with which she had been threatened; and she found in the shipping trade a profitable and ever-growing scope for her iron and for her energies¹.

Also the train traffic per mile is denser in England than in any other large country; and this in spite of the fact that a great deal of internal trade in heavy products, which in most other countries would go by land, goes by sea from one part of England to another. These points are developed in another connection in Book III.

¹ The victory of iron over wood as the material for ships, though not fast, was not so slow as that of steam power over sails; and of course, while England used to import most of the materials for the rigging of ships, she herself provided the engines and the coal for steam-ships: this tended to lessen her foreign trade.

In 1850, thirty-five years after steam propulsion had been proved a success, only about one ship in sixty was driven by steam; though there were in addition a large number of steam-boats. In 1860 about an eleventh of the British tonnage engaged in the foreign trade was driven by steam, and in 1870 about a fifth. In the decade 1860 to 1870 the British iron steamer fleet grew from 454,000 to 1,113,000 tons.

As roads running at right angles to railways fed them and increased their traffic, so railways fed ships. Steam-ships became cheaper to build, and cheaper to work; they carried increased cargoes in proportion to their displacement, and required for a given displacement fewer men and less coal to drive them at a high speed. And exactly as Holland had done before her, England found in the carrying trade a rich field in which to turn to account her large stores of movable capital. I, v, 1.

Further, her capital, her trade, and her industries had combined to give her better foreign connections than any other country had by post and telegraph, and by banking and other credit agencies; and London had become the clearing house of the world. These causes mutually strengthened one another: each new means of communication developed her foreign trade; and each extension of her foreign trade made new communications practicable and profitable.

Meanwhile Bessemer's process had much cheapened the cost of making steel of a kind which was shortly to displace iron from most of its uses. The process required ores nearly free from phosphorus: but there was a good, though small, supply of these ready at hand; and one great company, which had access to them, paid a dividend of nearly a hundred per cent. on its capital in an exceptional year.

Lastly, the Free trade policy of England had been largely followed on the Continent; and just those years, in which the industries of her chief rivals were most interrupted by the alarms and the ravages of war, were the years in which they offered not only the most eager demand for her goods, but also the freest entry for them.

These causes combined to increase her external trade rapidly. In fact its money value was twice as high from 1870 to 1874 as it had been before the gold discoveries. The importance of this fact was, however, much exaggerated by popular opinion, which pays more attention to movements of prices, than to movements of real values.

Thus rich old firms could thrive by their mere momentum, even if they had lost the springs of energy and initiative. Men whose childhood had been passed in the hard days before the repeal of the corn laws; who had come to business

1, v, 2: early in the morning, and stayed late in the afternoon; who had been full of enterprise and resource, were not infrequently succeeded by sons who had been brought up to think life easy, and were content to let the main work of the business be carried on by salaried assistants on the lines laid down in a previous generation. But yet so strongly were such men supported by the general inflation of prices, that in most cases they made good profits and were satisfied with themselves. Thus an extraordinary combination of favourable conditions, induced undue ~~self-complacency~~—the arch enemy of strength:

2. *After 1873 various signs of weakness were perceived; and later on some exaggerated alarms arose. But the national character is again showing itself in a resolute facing of difficulties.*

This over confidence was startled by the crisis, or more strictly the commercial depression, of 1873. But its immediate causes lay chiefly outside of Britain: and indeed the disturbance reached her in two sets of troubled waves, of which the centres were respectively the United States and Austria, in both of which countries the inflation of credit had been reckless. There was nothing in the depression to force on her notice the more permanent underlying dangers of her position¹: she seemed to many to combine the solidity of mature age with the energy of youth.

But the depression lasted long; and was accentuated by

¹ It may be well to quote a passage from one of the ablest, most broad minded and acute of British economists: but one who used to say that he was the last of those who had learnt from Ricardo direct without the mediation of Mill.

Bagehot, after referring to the little roughnesses, and sharp practices, which were making their appearance in England as the result of the increasingly "democratic structure of commerce," observed that such defects "are compensated by one great excellence. No country of great hereditary trade, was ever so little 'sleepy,' to use the only fit word, as England; no other was ever so prompt at once to seize new advantages. A country dependent mainly on great 'merchant princes' will never be so prompt; their commerce perpetually slips more and more into a commerce of routine....The rough and vulgar structure of English commerce is the secret of its life; for it contains 'the propensity to variation,' which, in the social as in the animal kingdom, is the principle of progress" (*Lombard Street*, 1873, pp. 10, 11). But when such matters are discussed to-day, Germany is seen to have much of the strength both of an old and a new country.

monetary troubles. For the yield of the gold mines had been diminishing; while currency changes, which really caused some new demand for gold, and appeared to cause a great new demand for it, accentuated the fall of prices that would in any case have been caused by the collapse of credit. Distress was nearly universal in the western world. France indeed had calmly set herself to solid business as soon as the second siege of Paris was finished, and she was little affected by the general collapse of credit. But Germany had been rendered over-confident by the successes of the war; the influx of the French indemnity had thrown her speculative classes off their balance, and in 1875 she was in even a worse plight than Britain. So Britons nourished for nearly another decade the comfortable notion that they could afford to take things easily and yet expect a better income than anyone else. I, v, 2.

But gradually the continued fall in prices caused people to repeat the error which they had made when over-estimating progress during the earlier time of inflated prices. The country's foreign trade was increasing very slowly; and the fall of prices made people suppose that it was shrinking. Thus they now doubly over-estimated the misfortunes of the years of shrinking prices: and many of them were made anxious by observing that in some branches of trade and industry other countries were making progress which, if not greater in amount, was yet at a greater rate than their own. This feeling of disquiet grew; and the able Commission on the Depression of Trade in 1885—6 reported that: "In neutral markets, such as our own colonies and dependencies, and especially in the East, we are beginning to feel the effects of foreign competition in quarters, where our trade formerly enjoyed a practical monopoly. The increasing severity of this competition, both in our home and in neutral markets, is especially noticeable in the case of Germany." In every quarter of the world the perseverance and enterprise of the Germans are making themselves felt. In the actual production of commodities we have now few, if any advantages over them; and in a knowledge of the markets of the world, a desire to accommodate themselves to local tastes and idiosyncrasies, a determination to obtain a footing wherever they can,

1, v, 2. and a tenacity in maintaining it, they appear to be gaining ground on us. We cannot avoid stating here the impression which has been made upon us during the course of our inquiry that in these respects there is some falling off among the trading classes of this country from the more energetic practice of former periods." The information collected by the Commission while tending to "dispel much misapprehension...and to encourage a more hopeful view...of our commercial position...will also show that if our position is to be maintained it must be by the exercise of the same energy, perseverance, self-restraint, and readiness of resource by which it was originally created¹."

Things went smoothly during the upward swing of commercial credit which culminated in 1890—1; and troubles of the United States, arising out of a doubt as to the solidity of their currency, kept back for a time the competitor from whose power of initiative there seemed most to fear. But a series of failures of British investments in South America, Australia and elsewhere had undermined confidence nearly as much as those of 1873—5. Labour disputes also became rife, and indeed those of 1892—3 were partly the cause and partly the effect of a deadening of British enterprise, which showed itself in an unparalleled prolongation of a two per cent. Bank rate of discount (the market rate being seldom above one per cent.) for three years 1894—6.

Meanwhile attention had been directed to instances in which Britain's industrial technique had been surpassed by those of Germany and America. The most important case was that of the heavy steel industry. That had received a strong impetus from Bessemer's great invention in 1856. But the small supply

¹ Final Report [C. 4893], §§ 74, 75, 76, and 106. It is noteworthy that this trouble was most conspicuous in parts of the country in which the social distinctions between employers and employed have been greatest. Thus an account of the "Decay of a famous industry" (*Times*, 19. 12. 04), mentions as one among several causes of the weakness of the West of England woollen trade the fact that, while "many mills have been worked by the same family for over a century...some of the manufacturers, who had made large fortunes and acquired large landed estates, retired to these and took a good deal of their capital with them." But in Yorkshire there was more energy; artisans were better paid; and the industry "was not content to go on making the same old cloths with the same old slow-going looms."

of Britain's ores suitable for his treatment speedily ran short. I, v, 3. Meanwhile America's greatly increased output of steel was matched by an equal increase in her own demand for its structural and other uses; but the markets, to which Britain had access, were assailed by German steel made with consummate technical skill by aid of a new process. It had been invented by an Englishman; but it was specially adapted to the ores of Alsace and Lorraine, and not to those to which Britain has good access. However alert she had been in improving and developing the technique of her heavy steel industry, it must have been outpaced by that of Germany: but the continued use of old-fashioned plant by many of her works caused her output of heavy steel to remain almost stationary while that of Germany increased fast¹.

Britain lagged even more conspicuously behind in many industries that called for high and extended scientific training: the chief of these were devoted to the manufacture of colours, and of medical and explosive products, from coal-tar bases. This was the more striking because Germany, being indifferently supplied with gaseous coal, imported much of her tar from Britain.

3. *The needs of Britain's industries gave additional momentum to a movement, that had long been on the way, for a reform of her educational system².*

English business men were slow to recognize a chief cause of decline in their industrial leadership. But about 1904 they began to see clearly that they must follow other nations in promoting industrial efficiency by improved education. The movement, thus initiated, is making way, tardily indeed for the lack

¹ The Metallurgical Committee of the British Iron and Steel Institute as late as 1917, reported with reference to the output of the British basic open-hearth furnaces, that British technique and organization generally compared unfavourably with that of Germany; and that this was the chief cause of their relatively small output. They added that, though the efficiency of the individual British workman was maintained, his short hours of working and high wages stinted the supply of capital needed to bring the plant of the industry up to its highest possible efficiency. It may be added that British production of finished steel products, including ships, remains high; and her exports of them remain very high.

² The large matters opened out in this Section and the next are considered here chiefly in relation to Britain's leadership: their broader relations will be studied in the course of Books II and III.

1, v, 8. of hearty support from those who themselves received no good education. But it does make way in school and in college; for the working classes, and for the well-to-do, and even for the relatively sluggish lower middle classes. The nation is beginning to recognize that mere accumulation of knowledge stunts rather than educates the mind; that the mind can be strengthened only by gradually increasing calls on its strength and spontaneity; and that while much general education may be advantageously given to all youth, there is also a need for specialized education adapted to the needs of agriculture, and every other industry, as well as to the learned professions. This matter is of vital importance: and must detain us a little.

There is consolation in the reflections that the poverty of England's educational system has been in large measure due to a strange freak of fortune; and that she still holds a leadership, almost unchallenged except by other English speaking countries, in that education of character which is obtained from individual activities, rather than from instruction whether verbal or in print. The playground had a notable share in the "real" education of her youth: and the paths of the ocean have been the Universities of an exceptional number of her men. During the last two centuries, at all events, they have had a more intimate acquaintance at first hand than any other people with the physical conditions and the habits of the populations of the world at large.

It is to be noted also that the intellectual alertness, which this real education developed, was well adapted to stimulate that sort of invention which was most needed in the second half of the eighteenth century and the first half of the nineteenth. But the present age calls increasingly for a new class of improvements of method, and—in a less degree—for improvements of appliances, which cannot be created by a single alert individual. Many of those, by which man's command over nature has been most enlarged during the last few decades, have been the product of sustained researches by large groups of specially qualified students extending over long periods of time.

It has already been observed¹ that Scotland developed an excellent system of education very early; and that partly in consequence, Scotchmen have taken a large share in the expansion

¹ Above, pp. 53, 54.

of the British Empire: thus the weaknesses which have prevented Britain from taking her proper place in the studies, that lie on the borderland between academic and business work in the present age, belong to England in the narrow sense of the term, more than to Scotland. But subject to this correction it must be confessed that British education has lagged behind that of Germany in some respects by more than a generation¹. I, v, 3.

The causes of this hindrance to Britain's industrial leadership seem however to be due to unfortunate accidents in political structure, more than to weakness of national purpose. Popular education, which ought to have been accepted two centuries ago as a chief duty of the State, was regarded in England till recently as an incidental duty of the clergy of the Established Church: for they almost alone were possessed of property that had been set aside for purposes higher than the immediate pursuit of material gain. But a large part of the industrial and trading classes had passed into other religious denominations: some of the country clergy shared the prejudice of neighbouring squires against educating the working classes above the mere necessities of manual work; and in new industrial districts the clergy had no funds available for education.

A new ferment appeared late in the nineteenth century: and ere long, in spite of opposition from some of those, whose larger

¹ In 1872 a British deputation visited Germany and Switzerland to study their methods of education. The following notes are abstracted from an account of some of their experiences which has recently been given by one of its chief members:—"In Saxony we found a national system of education, conducted in magnificent school buildings, attended by all, with scholarships admitting clever poor boys from elementary to secondary, and thence to technical schools, or to the Polytechnic or University. Attendance was compulsory till the age of 14. In England at that time there was no national system, no compulsion. Many children did not go to school at all: those who did, attended irregularly. The school buildings were meagre and unsuitable: there were no secondary schools for the masses; and therefore no promotions of able students from below. 'The best educated children in English elementary schools were half-timers from the factories, who attended half-time from 8 to 13. In Germany the boys, who left school at 14, were required to attend evening continuation schools; there were also such schools for girls, with apprentice workshop schools, special classes for those engaged in certain trades, and agricultural schools.' All the Universities and Colleges in England together contained less students 'taking up research and the higher branches of chemistry' than a single German University (that of Munich) which was visited" (*The Real German Rivalry*, by Sir Swire Smith, 1916).

1, v, 8. opportunities should have made them the best friends of the education of the people, the State began to take up its neglected duty. For a time nothing more was attempted than a sound, but strictly elementary education, which began rather late and ended very early. But almost every year brought new evidence that a niggardly policy of education was a mistake even from a purely commercial point of view: and now, Britain has gone a long way towards providing the children even of the poorest classes with opportunities for sound general education, and for semi-technical education in continuation schools and otherwise; together with a series of scholarships, or educational ladders, by which an able child, born even in the lowest ranks, may rise to high work. In the course of a generation the more intelligent artisans and agricultural labourers may be expected to have a better comprehension of the fundamental principles of their work than had been possessed two generations ago by many farmers and manufacturers.

The education of the well-to-do classes in England had not been as much neglected as that of the working classes. But it was held back by mediaeval shackles. For until the middle of last century nearly all the instruction at Oxford and Cambridge was given by men, whose incomes were chiefly derived from College Fellowships. They were compelled to be in Holy Orders; and as they would vacate their Fellowships by marriage, they generally looked forward to spending the second halves of their lives in country rectories, where learning would be of little use and science of no use. Celibacy remained compulsory for some time longer: not till the present century have the majority of the teachers at the chief English Universities regarded the advancement of knowledge as the main business of their lives. Oxford had indeed long ago contrived to use Plato, Aristotle and Thucydides as stalking horses, from behind which to practise demure shooting at problems of the day; and in recent years she has developed considerable scientific schools. The Cambridge school of mathematics has long been unsurpassed in the training of the reasoning faculty, in so far as that can be dissociated from experimental initiative: and her physical and biological laboratories already supply a considerable number of leaders of the world's studies in their several departments.

Meanwhile new Universities have sprung up in several great centres, modelled in some respects on that at Manchester, whose chemical laboratory had been brought into the front rank by Roscoe; and all of them give the chief place to chemistry, engineering, and other studies, which bear directly on industry. Their influence furthers the growing inclination of manufacturers and other business men to profit by German and American experience; and make large use of scientific knowledge and research in their works. A strong impulse in the same direction is now given by the establishment in 1915 of the Committee of the Privy Council for Scientific and Industrial Research; which, aided by a powerful Advisory Council, with appropriate Committees, is bringing a great part of the best scientific ability of the country to bear on the requirements of business; thereby continuing and enlarging earlier efforts, of which the foundation of the National Physical Laboratory in 1900 may be taken as representative.

The new demand for the extended study of science, with special reference to the requirements of industry, might have been in danger of laying too much stress on technical details, to the relative neglect of those fundamental discoveries, which are parents of all scientific technique. But the critical position of the country, arising out of the World-war, has caused the most eminent scientific men among others, to put their services without stint at the disposal of the Government: and it has also gained the public ear for their counsels. Under their guidance, care is being taken that even technical education shall be so used as to develop the faculties; it is not being directed mainly to loading up the minds of the students with facts, and enabling them to feel at home in the workshop.

4. *National funds are rightly given liberally to the advancement of knowledge for its own sake. Research for the attainment of particular ends is receiving some support from open associations of producers or traders, specially interested in their attainment.*

It is now generally recognized that national industry requires three distinct classes of laboratories. The first seeks the extension of knowledge at large: the second aims at knowledge in

I, v, 4. regard to special requirements of a particular branch of industry: the third checks the quality of the output of individual works.

History shows that almost every scientific discovery, which has ultimately revolutionized methods of industry, has been made in the pursuit of knowledge for its own sake, without direct aim at the attainment of any particular practical advantage: Universities are the proper places for such pursuit of "pure" science, and for the establishment of laboratories, etc., devoted to it. But though the eagerness of an academic student should increase with every prospect of establishing a new truth, independently of any practical gain which it may promise; yet his studies will lose nothing, and the world may gain much, from his keeping in touch with some of those industries, whose methods might be improved by increased knowledge of the properties of the products which he is studying. Therefore it is well that laboratories devoted to the advance of pure science should take some account of the work of a second class of laboratories, whose researches are specialized on the attainment of particular practical ends.

In some cases a single giant business which is pioneering new developments of a subtle industry may reasonably set up a great laboratory for the conception and testing of improvements on current usage: and the influences which such laboratories may exert on industrial structure will take prominent places in this and the following two Books, with special reference to German practice. But such a laboratory, if adequate for dealing with any important issue that may arise, is likely to be too costly in original outlay and maintenance for any but very exceptional businesses: and therefore the task is one of those in which the growing tendency to association among businesses in the same branch of industry is to be welcomed. It may be arranged that each member of the association has some duly qualified right to request that a particular investigation should be made in the laboratory: suitable arrangement being made for a special contribution in case its expense should be great, as well as for the ownership of patents in exceptional cases.

Such association, so long as it remains true to its avowed design, is wholly constructive: and has no kinship with "combinations" in the dyslogistic sense of the term; that is, conspiracies to monopolize a particular branch of industry or trade

in such ways as would cause the public to pay higher prices than they would if that branch were open without contest to the enterprise of any new comer. But the experience of the ages shows that associations set up for constructive purposes are in danger of being turned to destructive ends; and therefore it may perhaps be to the public interest that some limited contribution should be made from public funds to the support of such associations; partly in order to facilitate the intervention of public authority in case an association should develop anti-social tendencies. The exigencies of the World-war have enabled many men to break away from old habits, old prejudices against neighbours, old delights in the secrecy and autonomous control of their own affairs; and to work with old rivals for the common good of the country; therein lies much public gain. But on the other hand caution is needed lest arrangements should be set up, which depend for their beneficial working on altruistic sentiments, that may fade when the national emergency has passed.

Similar remarks apply to the suggestions that a locality, which is the chief seat of any branch of industry, may properly subsidize an appropriate technical laboratory; with a general understanding that its own rate-payers should have priority in all claims on its services. Public opinion seems to have received a strong and wholesome stimulus in this direction from the full recognition of the fact that many things, which Britain used to buy from Germany, were the products of more extended technical research than could easily be brought to bear by herself.

Technical research laboratories, while in touch with the chief scientific laboratories on the one hand, could on the other lend help to a third class of laboratories which have long been found necessary in the steel and many other industries, whose chief work is mechanical rather than chemical. Such a laboratory does not, as a rule, do any considerable research work: but it enables the business, to which it is attached, to make sure that each of its products from day to day, or even from hour to hour, is chemically or mechanically true to its proper standard¹.

¹ Authoritative studies of this matter by specialized experts may be found in *Science and the Nation*, by Cambridge graduates, 1917; and in *The British coal-tar industry, its origin, development and decline*, edited by Prof.

i, v, 4.

Every industrial country obtains some information bearing on industry and trade from its Ambassadors and Consuls. But, with a few brilliant exceptions British Consuls seem to have lagged far behind those of America and Germany in such matters. Great improvements in this direction are contemplated: but the Consular service is not likely to be able to meet all the wishes of producers and traders as to the requirements of each country for particular manufactures, and as to her sources of supply of special materials needed in manufacture. For large questions arise when access is opened out to materials that require treatment somewhat different from those already in use: and a firm, which makes a thorough study of such a problem, is likely to confer at least as great aggregate benefits on other firms as on itself: but, as the cost will be heavy, few will venture on it, unless those will share in the cost, who are likely to share in the reward. The Research Committee of the Privy Council finds an appropriate field in promoting such associations.

Private associations for obtaining facts as to the solvency, etc., of customers in foreign countries have long done good work. This is a delicate matter on which the best opinions seem to differ; but it is probable that, with larger experience, an extension of this plan may enable British firms to sell with advantage more extensively in countries in which purchasers require long credit on small tangible security. This class of trade is chiefly in the hands of Germans, especially in South America, and other countries in which the English language does not carry far: and there seems to be some justification for

W. M. Gardiner, 1915. These works record numerous cases in which members of the small band of British scientific men have made revolutionary discoveries in science; but yet the chief fruits of their work have been reaped by businesses in Germany and other countries, where industry and science have been in close touch with one another. Sometimes a British inventor has set up a manufacture on his own lines, with the best results; but after his death the business has fallen into the hands of men with merely administrative and commercial instincts; and it has then been left behind by foreign rivals, who have continued to work on the lines of the original inventor with patience and system, though not always with much creative genius. An excellent compressed account of the new movement has been begun in the two first *Reports* (1916 and 1917) of the Committee of the Privy Council for Scientific and Industrial research [Cd 8336, 8718]; and their continuation is likely to constitute a good history of Britain's awakening from her too easy contentment with the equipment that sufficed for the middle of last century.

the claim by Germans that their methods of financing business meet some requirements of the new age, to which the methods of "conservative" British houses are not altogether appropriate. But more of this hereafter. I, v, 4.

The maxim "know thyself" applies to nations as to individuals. Old and young are alike inclined to think more of their own strengths than of their weaknesses; and it is specially incumbent on Britain to strive against that stiffness of the joints that is almost inevitable in each old industry, and in the general relations of industries and trades in each old country. Above all is an old business in an old country in danger of underrating the advantages of that which is new. Much that passes for heavy conservatism is one of those faults of judgment, from which neither young nor old are free: but such errors are probably more injurious to an old country or industry than to one that is relatively young and therefore alert.

Britain has perhaps suffered as much from the conservatism of her working men as from that of her business men. It seems that where no restrictive traditions interfere, the British skilled artisan gives generally as much good work for a given pay as any other. But often operations, which had been difficult and therefore highly paid, are made easy by improvements in machinery or technique: and then obstacles are apt to be put by the artisans in the industry in the way of their being performed cheaply in an old country. Meanwhile they are relegated to unskilled men, women and boys in countries whose industries have not developed firm traditions: this is a matter of great importance to Britain; but it belongs to the second Volume of this work.

Again, the charge of excessive conservatism is sometimes brought against British banks. No one disputes their unrivalled efficiency in the rather narrow range of tasks which they undertake: but there is a growing feeling that, especially in regard to new ventures abroad, rather more elastic financial enterprise is required than that of the British banking system; even when the great "accepting houses" are reckoned in¹.

¹ See below, pp. 341—349. A German writer claims that Germans lead in every part of the London market, and especially in the great Accepting Houses through whose hands much of the national capital passes. But the instances

I, v, 5.

5. *Britain's industrial leadership is in process of being fulfilled and merged in that of the British Federation of Nations; the younger members of which are learning much from the present leadership of her first great Colony.*

Britain surprised the rest of the world, if not herself, by the energy which she has shown in the World-war: and the English-speaking peoples of four continents have proved themselves to be united in spirit and in truth. This chapter may therefore appropriately end with a claim that Britain's industrial leadership is to be measured by the achievements of Britons in their new homes as well as in their old: it is but carrying into larger affairs the familiar truth that parents, who have brought up a goodly array of noble and vigorous children, have done more for the world than is shown by their own achievement, somewhat narrowed as this may have been by their responsibilities.

It was observed long ago that a colony often outstripped her mother-state. For emigrants are on the average bolder, sturdier, and more fertile of initiative than those who stay at home; and their departure leaves the old country poorer in human resources than she would otherwise have been. They may take but little of her capital with them: but much of her capital follows them. Her own people are wealthier individually than they would have been without opportunities of investing their means in the development of rich natural resources in the care of their trusted relations: but she herself is poorer, and is to some extent less able to maintain her leadership, than she would have been if her territory had been large and rich enough to enable all her labour

quoted by him include, as might be expected, names of Jews, long domiciled in this country. The splendid faculties of that race for such work have brought them to the front here, and to an even greater extent in Eastern and Central Europe: and the writer believes that he has found that "though English manufacturers of textile machines supplied practically the whole world,...those who obtained orders for the manufactures of Manchester, Oldham, or Accrington, from Spain, South America, and even France, were commission firms founded by Germans. The Englishman refused to make quotations otherwise than in yards and shillings, and to sell them otherwise than for cash payment." See pp. 24, 25 of an English translation (published under the title *England's Financial supremacy*) of some recent articles in the *Frankfurter Zeitung*, under the heading, "English preponderance in finance (*Finanzvormacht*): England's mistaken calculation: Germany and the inheritance of the City."

and capital to be applied within her own limits, without forcing I, v, 5.
reluctant nature to yield large returns from a limited area of agricultural land and mineral strata. No doubt improvements in transport by land and sea enable her to obtain food and minerals from her Dominions and elsewhere at relatively low cost, so long as the paths of the ocean are relatively secure under the protection of a strong fleet. No foresight of the dangers to be developed by submarine warfare could have prevented the restraint which it threatens to the easy development of Britain's economic life, and industrial leadership. But the prosperity of her daughters beyond the seas; and the generous and wise assistance, which they have given her when under assault, are indications of rare qualities, which have been at the root of her industrial leadership.

Her daughters will probably be recognized in their turn as industrial leaders in various directions. But the time for that has not yet come: for a young country must win elementary victories over nature. Her free capital is seldom equal to the urgent demands for it, which are made by the industries of agriculture and transport: and therefore, vigorous as her people may be individually, she has little opportunity for pioneering the more complex methods of industry in advance of older countries, which have abundant capital and energy free for such work.

The British Confederation of Nations, to use a fine term suggested by General Smuts, was struck almost to the death by a crude blunder of dull, though well meaning men, out of touch with the spirits of liberty and progress, who drove away Britain's first great colony. She has become a chief leader for all the world; and the supreme leader for those peoples, who are bringing spacious territories under control. England herself has only one acre to each inhabitant, the United Kingdom has only two. But the United States even now has thirty: the Canadian Dominion has three hundred, and Australia has six hundred. Therefore it is natural and right that they should look to the past development and the present experience of their eldest sister for guidance as to their own development: by such means may the Industrial Leadership of Britain attain its broadest and fullest development¹.

¹ A little more is said on the matter below, I, VIII, 8.

I, v, 5.

To conclude, we have seen that leadership in industry and trade has been obtained in the past by cities or by nations, which have thrown energy into the use of their own "native commodities," to use Petty's phrase; and that victories in the home market have prepared the way for victories in foreign markets. We have seen that England's leadership was cast in a larger mould than any which went before it: partly because her resources were greater than those of any of her predecessors in leadership; and partly because, when her time came, the sphere of trade had been enlarged by opening up of new continents and improved means of communication: but mainly because she yoked the forces of nature in her service in production on so large a scale and by such powerful methods that her people could with relatively small efforts to themselves produce large quantities of things that were in general demand abroad. By applying the law of Increasing Return to production on a large scale she made the whole world tributary to her wants, so that the English artisan could in many respects fare as sumptuously as the well-to-do classes in some parts even of Western Europe.

As has already been suggested, France affords the chief instance of a leadership based mainly on individual skill; and Germany of a leadership based mainly on trained ability and high organization. But the dominant instance of the economies of massive production is afforded by the United States; though the lessons to be learnt from her are obscured by the fact that the richness and variety of her natural resources render her almost independent of many of those benefits of foreign trade, which are essential to Western Europe. A chief question towards which we have to work our way is this: Will the new "giant" production exercise as far-reaching an influence over the social and industrial structure of each several country and of the world as a whole, as was exercised by large production in the middle of the nineteenth century?

CHAPTER VI

THE INDUSTRIAL LEADERSHIP OF FRANCE. INDIVIDUALITY AND REFINEMENT IN PRODUCTION

✓ 1. *The physical features of France have not favoured industrial concentration.* I, vi, 1.

The economic development of France has been more continuous than that of any other great country except England: and yet it has diverged from that of England more widely than has that of any other, which bears equally high marks of constructive genius. And further, her industrial qualities are representative of those of Western Europe generally in a fuller degree than are those of any other country.

There was a time indeed, at which the ascendancy among Latin nations belonged clearly to Italy: and, though crippled during centuries of internal conflict and of oppression by external force, she is throwing out flashes of genius, so reminiscent of the two ages in which she was the centre of the world, that she may ere long be again a chief leader: but the time is not yet. Spain contested for a while the leadership of the Latin nations on at least equal terms with France: but her best industrial qualities were largely due to Saracenic blood; and the Inquisition purged her of individual originality so thoroughly, that her later economic history is almost devoid of interest. Portugal's genius for exploration was brilliant; but passed quickly. Belgium contains many cities, which have made their mark in economic history; and there was (before the World-war) no country of equal size that could compete with her output of agricultural, mineral, and manufactured products. But she has been the battlefield of Europe; and foreign rule has left its marks on her.

I, vi, 1. - France is in close touch with all these countries: she has given to them and received much from them; as well as from her eastern neighbours, Germany and Switzerland. She is thus in a sense the epitome of all Western Europe. But on the other hand, she affords the most important instance of a great industrial country, whose people are not inclined to the methods of massive production; and whose chief strength lies in the fine results, which they attain with comparatively little aid from those methods. This is a reason for making some study of her leadership before passing to those of Germany and the United States of America; for their chief industrial achievements have been the development of those methods, in various directions beyond the lines to which England herself has brought them. Among the influences, which have contributed to the special features of French industry, three groups appear to be prominent—geographical, racial and political. The geographical group has of course largely shaped the racial; and both have affected the political.

The soil of France has been the meeting place of the best energy of the North with the best culture of the South. But during the Middle Ages there was no political unity; and the various parts of what are now France were continually at war with one another. Industry made progress in some of the towns: but few of them rivalled those of Italy in population and wealth. And her industrial forces lacked concentration. The influences of Italian and Spanish culture, which were working northwards in the South of France, had a long way to go before they met those coming southwards from the Low Countries. The Seine, the Loire, the Garonne serve for internal communication on a small scale; and nearly all of the chief centres of French industry have clustered along their banks and those of the Rhone; or else at her relatively few sea-ports, or near her frontiers. The industries of the North, the South, and the East have never been intimate with one another¹.

¹ The only French port which has ever attained quite the first rank in world commerce is Marseilles: and that indeed was a considerable centre of trade for an exceptionally long time. It is a good haven, with fair access to other trading ports, and with a great river near at hand. But the mountain barrier,

France had excellent main roads very early. And long before England had any canals, the engineering genius, which distinguishes the French, had provided a splendid system of them. In the eighteenth century the good roads and the canals of England had passed those of France in number and in adaptation to the needs of business. But France set herself to bring both up to a high standard: and in consequence of England's neglect of her canals those of France soon passed far ahead. Their chief work is, however, limited to the great plain between Paris and the Northern coalfields¹.

I, vi, 1.

The geographical distribution of the industrial districts of France has retained its general character with comparatively little change to the present time. Railways have indeed spread over her whole surface. But Paris dominated France; and the railway companies trusted to Government aid more than to local initiative. So the country divided out into a number of basins, each with its apex at Paris and extending to the frontier, and each with its own railway system: so there is very little easy communication between the industrial districts, save through Paris; and in all France there is no dense industrial district nearly as large as can be found in England, Germany, or even Belgium².

b

through which the Rhone cuts its way, is so near to the sea, that its delta is too shifting, its mouth is too shallow, and its main course is too rapid for easy navigation. Had the Rhone been gentler, France might have been reckoned with the Southern rather than the Northern countries of Europe.

¹ Wood was the predecessor of coal as the chief freight on French canals. See Dupin, *Forces productives et commerciales de la France*, 1827, Livre VII. His study of English roads and canals had been translated into English in 1825 and exercised much influence in England. Foville (*La France économique*, p. 94), as evidence of the low viability of France before the days of railways, states that in 1817 wheat sold for 37 fr. the hectolitre in the Côtes du Nord, and for 80 fr. at Colmar; and even in 1847 for 29 fr. in l'Aude, and for 49 fr. in le Bas Rhin. And yet the main roads were so good that the journey from Marseilles to Paris could, Lardner tells us (*Railway Economy*, p. 28), be effected by road in sixty hours. A map, showing on an excellent plan the volume of the traffic on the various French waterways, is reproduced in Colson's *Transports et Tarifs*, and in an English Report [Cd 1836—7].

² See the maps in Levasseur, *Population Française*, vol. I; and Diercke's *Schul-Atlas für höhere Lehranstalten*, a most handy book for the student of economics. The great mining and industrial district in the North of France adjoins the still larger Belgian district. The department of Meurthe et Moselle is exceptionally prosperous; but its chief trade is with its old comrades which have been under German rule since 1870. (See Blondel, *La France et le marché*

I, *vs.*, 2.

2. *The political conditions of the seventeenth and eighteenth centuries suppressed the middle class; so that French industry was mainly given to cheap local products, on the one hand; and, on the other, to fine goods, embodying some artistic feeling and individual judgment.*

✓ The obstacles, which geographical and racial causes thus opposed to the growth of concentrated massive production, might have been overcome without much difficulty, if France had contained a strong middle class, and large well-to-do working population such as existed in England: but in this matter the course of her political evolution had been exceptionally unfortunate.

The internal wars, which had desolated France, died out slowly during the sixteenth century: and in the seventeenth the royal power was consolidated by Richelieu and Mazarin. When Louis XIV took the reins into his own hands in 1661 France was prosperous and rich. He strove to make her also glorious and orthodox: but his wars impoverished her; his taxes were fatal to the growth of capital; and, by revoking the Edict of Nantes, he presented to the rivals of France a bounteous gift of an industrial population sufficient to have created a wealthy Kingdom. In fine, the last of the able Kings of France left her partially exhausted¹.

As the eighteenth century drew on, the extravagance of the French Court, and the selfish use which the privileged classes made of their power, pressed heavily on the people. The taxes were paid chiefly by the working classes, who stinted themselves perforce with a wasteful economy. The luxury of the rich and the poverty of the poor combined to make France a bad market for substantial simple goods, which were not choice enough for

du monde, p. 99.) The geographical distribution of industries in 1789 is set out by Levasseur (*Histoire...avant 1789*, Book vii. ch. vi). The development of the vast water power of the Jura, the Alps, and the Pyrenees, may possibly create a new centrifugal force. If the mountains of central France had been rich in water power they might have ultimately linked together the scattered industries: but they are very dry.

¹ See some statistics in the account given by Levasseur of "the decadence of France during the wars of religion" (*Histoire des classes ouvrières avant 1789*, vol. II. pp. 55—56); following on a description of her vigour during the Renaissance.

the rich, nor cheap enough for the common people. But all the more did the market which she offered for high-class tasteful goods excel all others in richness and discernment. More and more did her best artisans specialize themselves on work that called for individual taste and thought as regards form, arrangement and colour: meanwhile English artisans were specializing themselves rather on work that required strength, resolution, judgment, persistence, power to obey and to command, and withal an abundant use of capital. France produced more and more delicate textile and metallic work made by individual care to catch individual choice. England (while attaining brilliant success in some decorative industries and especially in furniture) produced more and more of the implements and the solid comforts, which are needed by a strong well-to-do people, and which make them stronger and more well-to-do.

So far stress has been laid on the influences which demand exercised on supply. Rich and discriminating purchasers evoked the fine and delicate sensitiveness, and the best power of individual initiative from artisans, shopkeepers and merchants: while the absence of a strong middle class and the poverty of the working classes, except in Paris and a few other places, prevented the growth of large and profitable businesses, engaged in producing and marketing common goods by highly organized methods in specialized centres of industry.

This is, however, only one side of the case. The other, which redounds wholly to the credit of France, is that her people like most of her neighbours, but perhaps more than any others, except the Italians, from whom they learnt much, early loved every form of Art. They held artists in high esteem; gloried in architecture, the mother of the arts; and gently persuaded artistic ideas to filter down, through those industries in which a delicate taste is generally required, to those which cater for more common wants¹.

¹ This tendency has been brought into prominence by Levasseur's *historica*. He generally places "Industry" between "Arts" and "Commerce": and, a long series of chapters stretching from the Middle Ages to the Second Republic, begins by considering the predominant influences, home and foreign, which were at work in the fine arts, with architecture at their head. Through those "producers" who earned their living by sculpture, painting and engraving, he proceeds to the artistic side of high-class furniture, jewellery and enamelling;

1, vi, 2.

✓ In short, the more the people of France were oppressed by evil courses which were heading for the Revolution, the more brilliant was her success in many branches of decorative work. But a deep-set national contrast is illustrated by the fact, that in the eighteenth as well as the nineteenth century Paris was surpassed by London in designing masculine costume; which is required to subordinate itself to the free movements of its wearer, and to combine something of grace with solid strength and durability: while French products held the lead in regard to feminine costume¹.

✓ Thus France affords yet another illustration of Petty's great rule that the commodities, in the manufacture and export of which a nation has flourished, have been generally of native material². But they have also been chiefly of such a fashion as to meet a distinctive home demand; thus obtaining the advantages of organized division of skilled labour for the home market before they venture out far into foreign markets: and the fact that the home market of France was highly specialized on fine products, gave her an advantage in making them for export; much of which remained with her after an end had been put by the Revolution to that uneven distribution of wealth in which it took rise. Thus the special features of French industry seem to be attributable mainly to political, military and social causes, and perhaps to some subtle racial influences, which lie outside our present view.

Lord Lauderdale writing in 1806 dwelt on this aspect of French export trade: and held that its basis in mere division

passing thence to "industry," in which a modicum of artistic instinct supplements a large amount of common labour in its application to metal, textiles, etc. In the later periods of French history, science is found associated with art in relation to industry.

Perhaps it is not an accident that the chief centre of artistic industry in France was on the main route from the Mediterranean to Paris. Silk, its material, belongs to the climates of Italy and the South of France: it was the favourite material of Italy; and it lends itself more than any other textile to fine artistic effects.

¹ It may be noted that in 1785 a tide of fashion for English goods of various kinds swept over France: but was repressed by strong decree (although Free trade was just then in favour with the French Court) on the ground that England would not reciprocate (Macpherson's *Annals*, vol. iv. p. 82).

² See above, p. 33.

of labour was less firm than that of England, which was "derived from dexterity in supplanting and performing labour by capital": or, to use another phrase which he quotes from a French document of 1785, from "the use of machinery in every operation in which it can be employed¹." I, vi, 3

3. *The Revolution removed many obstacles to massive production. But the equal division of property made for industrial quietism; and in spite of the exceptional brilliancy of her engineers, France owes relatively little to the aid of mechanical power in manufacture.* ✓

One of Colbert's chief ambitions was to endow his favourite manufactures with the strength that may be derived from capitalistic production on a large scale. Accordingly he set up, directly or indirectly, many considerable factories, which had some sort of royal privilege, and which were called "Royal." The Gobelins and a few others belonged to the King and were managed on his account: the majority had merely a more or less extensive monopoly granted to them; supplemented often by some grant of money, or at least some exemption from taxation. But the seed was sown in uncongenial soil. Royal protection barely defended them against the hostility of the *Métiers*, or brotherhoods of the masters of crafts. A new era began with the Revolution, though it inherited very much from the old².

¹ Basing himself on the same document, he shows that the finer qualities of woollen, silk, linen, and glass-ware were better and cheaper in France than in England; while the coarser kinds were better and cheaper in England. France excelled in china, England in earthenware; France in gold and silver work, England in hardware. Similar contrasts had been made earlier. Thus *Briannia Languens*, 1680, lamenting that "the English have never attained to near so universal a manufacture as the French," is full of comparisons of the flimsy, but tasteful French goods, with the strong, serviceable English: and so are the *Dialogue between Content and Complaint*, 1677; and Fortrey's *England's Interest and Improvement*, 1673. Defoe says that "As the Englishman gives more strength of sinews to his strokes in the loom, his work is firmer and faster and carries a greater substance with it" than foreign goods do.

In Marlborough's wars the French armies dispensed with English woollens, and so they went in rags (*Atlas Maritimus*, A.D. 1728, p. 109). Napoleon therefore connived at the clothing of his soldiers in English stuffs, even while straining every nerve to exclude English goods in general from the Continent.

² These observations may be taken in conjunction with the general discussion of Colbert's economic policy in Appendix D, 6. A study of the struggles of "la grande industrie" will be found in *Levasseur's Histoire...avant 1789*, especially Book vi. ch. III. See also pp. 762—7; and 952—4.

1, vi, 8. The troublous period 1793—1815 saw France deprived of many of the bravest, strongest, and best of her sons. But those, who remained, derived a new spirit from that partial freedom which they had won; and, the Taille being removed, even the poorer peasants were no longer pressed down by extreme want. So fresh energies were given to the arts of peace. But those arts were cultivated in the main on old lines. There was still a lack of the capital required for the general adoption of English machinery; and the people were still, for good and evil, somewhat disinclined towards English conditions of work.

6 The restrictive regulations of the State and of the Métiers before the Revolution had checked the spirit of enterprise: and the universal application throughout France of the law of equal inheritance (which had been only local before) is said to have materially lessened the inclination of a manufacturer to get together an expensive plant; since it was almost sure to be broken up at his death¹.

8 Again, this law of equal inheritance increased the number of artisans whose minds were partly given to their little plots of land; and who, while willing to work at convenient times for low pay in or near their own homes, were not willing to abandon their land except for very high wages. These causes strengthened the individuality of the French work.

There is a sense in which solidarity is characteristic of the French temper. It is an integral part of French idealism. It dominates those great waves of sentiment which from time to time sweep over the nation. It gives an intense fervour to their patriotism. It promotes, and is promoted by, their tendency to lean upon the Government for aid in difficulty; and to approve an amount of regulation and authoritative interference in their affairs which would be burdensome to Englishmen. Pushed to extremes it becomes hostile to independence and self-reliance².

¹ See Poinard, *Libre-échange et protection*, pp. 479—485, 489—490, and 522—523. The gradual growth of joint stock companies for manufacture slightly diminishes the force of these considerations, since shares in a company could be divided without disturbing the business.

² Compare M. Demolins' discussion of the different conceptions of solidarity held by the Frenchman and the Anglo-saxon, *À quoi tient la supériorité des Anglo-saxons*, III. 4.

But on the other hand the great economic solidarity of the French family, especially in the country and small towns, fosters a certain aloofness, a certain disinclination to the organization of self-help, as well as to the steady and unyielding routine of the factory. M. Blondel says:—"It is because the spirit of association has remained very superficial with us, that people have been able to say with good reason that, what we want to learn is not so much how to produce, as how to combine the elements that constitute an industrial operation, and how to turn our own inventions to account and derive benefit from them¹."

I, vi, 3.

In all this time France was held back by the scarcity of her capital; by some lack of initiative among her business men, as distinguished from her professional classes; and not least by the meagre food of her working classes. For machinery had already increased greatly the volume and weight of the work, for which each operative was responsible: but had not attained to anything like its present facility in taking the main brunt of all heavy work on its own shoulders².

Here seems to lie the chief explanation of the fact that even when English methods of massive production were introduced into France, they seldom attracted the best workers. Cotton factories grew up under the shelter of Protection: but their work went heavily, and they did little credit to French energy. To the same cause it was due that England was able to export considerable quantities of plain silk stuffs to neutral markets in the face of French competition, and a little even to France herself.

¹ *La France et le marché du monde*, p. 109. The considerable success of the cooperative movement in France may be quoted on the other side. But its most brilliant example at Guise has been marked by the dominance of an individual will.

² Arthur Young (*Travels in France, 1787—9*) tells of the great state which could be kept up in France on a moderate income, partly because servants were contented with low wages and cheap food. It is well known that when Thomas Brassey was building railways in France, the native navvies could do but little work in comparison with the English standard, until he had got them on to English diet: after which they did not lag very much behind. But, as might have been expected, a similar experiment in regard to French textile operatives did not yield equally good results (*Report of Committee on Factories, 1832, Q. 6441*). Much information on wages and food in France and elsewhere is to be found in Symons' *Arts and Artisans at home and abroad, 1839*.

I, vi, 3. The finer silk manufactures called out all the best French qualities. The French climate favoured the production of raw silk and its manufacture. And, what was much more important, the French understood the importance of taste, variety and novelty in design, which the English did not. They had schools for designers; they granted copyright to new designs. In France a single manufacturer would have several designers at work on his premises, while in England a single designer would work for several manufacturers. And in the more delicate and intricate patterns, the economy of machine power counted for little: a rather proud retiring worker in his own cottage would do the best work, caring for the design and sometimes improving on it¹.

This organized team work in design anticipated organized team work in the technical applications of science. As far back as 1833 French manufacturers had anticipated the modern practice of Germany and other countries in applying chemical skill to "beautiful improvements in calico printing... There is not a printing ground there without its laboratory, or without its working chemist, whose business it is to carry on experiments with a view to improve the processes²."

The case was similar as to machinery. A few men of exceptional ability and aptitude organized excellent machine factories, the products of which were unsurpassed. But in general French machine factories were behind those of Belgium, and not in advance of those of Switzerland³.

¹ There is much evidence on this subject in the *Report on Import Duties, 1840* and Leaf (Q. 3200) gives as one reason for the superior taste of the French artisans, that "provisions being cheaper, they are not compelled to work such long hours for their maintenance, and they are able to take more pleasure, and to cultivate taste more than the workpeople do here."

The Select Committee on Arts and their connection with Manufactures 1835—6 also were much occupied with the influence of foreign importations in rousing the British manufacturer to a sense of his deficiencies in design and in technique: when the excellence is in quality, and not in cheapness, the "foreign goods are found to be French in nearly all cases." The present writer has seen a man weaving, in a cottage not far from Lyons, a fabric which was to be sold for 130 francs a metre: he scorned power looms, partly because a single spot of grease would cost more than a week's earnings.

² Evidence of a Lancashire cotton printer before the Committee on Manufactures, etc., 1833, Q. 3577—3587.

³ See the evidence of the famous Maudslay and of Galloway before the Committee on the Export of Tools and Machinery of 1825: also that of Withers,

In the latter half of the nineteenth century the increase of wealth in France became very rapid, in spite of her great military expenditure in peace and in war. For the Frenchman works well, though he is averse to being driven; and though fond of amusements, especially in the towns, he takes them in inexpensive ways. His income is generally smaller than that of the Englishman; but his wife is an economical manager, and turns inexpensive food to good account. So expenditure is generally kept down below income; and France is in the first rank of capitalist countries¹. I, vi, 3.

It is however a noteworthy, and not altogether healthy sign, that she appears to devote no very large share of her wealth to new industrial and commercial enterprises at home or abroad. The growth of her factories hardly keeps pace with that in several neighbouring countries. And her very large holdings of foreign securities are said to consist mainly of Government bonds, with a relatively small addition in the shares of industrial undertakings: in so far as this is true, its cause may perhaps be sought partly in the fact that her people do not travel much. And yet Frenchmen are specially fitted for certain large enterprises by their talent for engineering. From early times French cathedrals and fortifications, French roads and canals have borne evidence to high creative faculty. Since the Revolution the engineering profession has been held in special honour in France: there is perhaps no other country in which the ablest lads are so generally inclined towards it. The excellent technique of her railways testifies to a high level of engineering ability; and the success of the Suez Canal and other great undertakings indicates largeness of conception on the part of her leading men.

an English engineer established in Belgium, before the Corresponding Committee of 1841.

¹ It is said that, where there are only one or two children, French parents are apt to work less and to save less than where there are many children for whom portions have to be provided. In so far as this is true, we may not count as a cause of the high average wealth of the French the fact that they have spent less on rearing their families than more prolific races. But of course the aggregate wealth of France, and her importance in the world would have been much greater if they had been more prolific. On the general subject of the influence of a low birth-rate on the growth of wealth see Levasseur, *Population Française*, vol. III; and Leroy Beaulieu, *Économie Politique*, Part VII. ch. II.

I, vi, 4.

Another side of the same faculties is shown in such manufactures as those of the bicycle, motor car, submarine, and aeroplane; where French inventors have led, and a few French operative mechanics displayed a skill, a judgment and a resource which are nowhere surpassed. As these new delicate industries have reached the stage of massive production, the faculty of disciplined steadfast work becomes more important: the motor car, the submarine and the aeroplane tend to find their chief homes in other countries, as the bicycle did long ago. But there is no sign that her engineers will cease to devise, or that her small but noble army of first-class mechanics will cease to execute, new constructions in the van of progress.

4. *Individuality in production contends under ever increasing difficulties against the forces of massive organization. Illustration from industries connected with fashion.*

This same tendency is shown even more conspicuously in those industries in which the leadership of France has been long established. The individuality of her designers and her best operatives still shows itself most fully in that mastery of form and colour which calls into being an endless variety of products, each of which is individual in character and each of which is a harmonious whole. Thus new Parisian goods are sold at very high prices to the richest customers in all countries. In the next stage copies of them, made chiefly by local hand labour, are sold at rather high prices to the moderately rich. The last stage is the adoption of the new fashion for general use; and, for that purpose, people in commercial countries, endowed with a high faculty for organization, study the imported French model, catch the keynotes of its ideas: they translate these ideas as far as possible into mechanical language, and produce passable imitations for the middle and working classes¹.

To meet such competition France is driven to make a little

¹ Going further, American and other dealers in various textile fabrics of changeable fashions will get independent ideas as to some new fabric or pattern, by studying the general trend of textile products and costumes in Paris. But these ideas need to be translated into the language of highly specialized machinery before they can be commercially successful. So they have been taken to some appropriate centre, perhaps Saxony, where they are put into practical shape.

use of massive methods herself, even in industries to which they are not wholly appropriate. But the tendency of the age is to require the producer to show his goods to the purchaser. The purchaser does not, as a rule, now go to the producer unless he is in quest of goods of a very special kind: therefore, when the French goods have reached the stage of semi-mechanical imitation, the untiring push and bold energy of the travellers for German and other firms have had an advantage over their French rivals. Meanwhile, however, Paris may have made one or more new models, which can be sold at scarcity prices to those who are tired of the last model, partly because it has become somewhat vulgarized. Thus French creative faculty is the source of a constant stream of wealth: but the breadth of this stream does not increase as fast as does the number of people in the two hemispheres who follow the lead of France. I, vi, 4.

Her special faculties are of more force in the clothing than in the textile industries. But the texture and patterns of some of her woollens as well as her silks, and the patterns even of her cottons enable her to sell at prices that yield good wages to her operatives. The fine and delicate perception shown in her wines and other food products is as marked, though not as unique, as that shown in her ornamental fabrics.

To maintain her position France needs a continual supply of fresh inventive minds; and here the predominance of Paris may possibly prove a source of danger: even Lyons is said to depend increasingly on Paris designers. Every great capital city attracts the brightest and strongest minds from the whole country: but in France this attraction is more powerful than elsewhere. Comparatively little of the intellectual and artistic vigour of Paris is to be seen in provincial towns, and still less among the agricultural population. The sterling qualities of resolution, family affection, and thrift, which prevail among the peasants, give strength and stability to France in an hour of peril. But they do little towards filling the gaps in the ranks of brilliant inventors and designers, which are caused by the exhausting nervous strain of Paris, as of every huge city. Worth himself was not a Frenchman. The strong designs of Morris and some other Englishmen for wall paper, and other decorations have made way even in Paris. And such work as that of Liberty

1, vi, 4. has shown Paris how Englishmen have profited by the supreme lessons of Indian art.

England must herself look forward to a time when her natural resources will have become scanty, while the arts and resources of routine mechanical manufacture will be the common property of all the four quarters of the globe. The experience of France in the past must raise for England some hopes and some anxieties. These are likely to be heightened and deepened as the twentieth century draws on: and Englishmen will learn in the future, as in the past, some of their most instructive lessons from across the Channel.

In conclusion it may be remarked that those French industries, which have received most aid from Government by bounties, and by Protective duties against competitive imports, are not those which have flourished most. Chief among them are her shipping industries, her heavy steel industries, and her manufactures of common textile stuffs. None of these indeed are specially congenial to the temper of her people: but their progress has been sufficiently slow to give some support to the notion that Governmental aid to old industries tends to check enterprise; unless indeed those, who receive it, are exceptionally full of energy and encouraged by openings for great work. Government has given little or no special aid to those industries whose products confer distinction on France on account of their fineness and delicacy; and cause them to be preferred to all others in neutral markets, and therefore to sell at higher prices than are to be had for similar products of other countries.

CHAPTER VII

THE INDUSTRIAL LEADERSHIP OF GERMANY: SCIENCE IN THE SERVICE OF INDUSTRY¹

1. *The economic unity of Germany was achieved tardily, and in spite of many hindrances: but the movement was working under the surface for some time before it succeeded with apparent suddenness.*

At various times in her history France has disputed the leadership of the Continent of Europe with Spain and Austria. But Spain has declined; and Austria is no longer the chief leader of the German people. In fact her richest province is Bohemia, which is Slav rather than German; and less than a quarter of the population of Austria-Hungary is German. Therefore the "German Empire" of to-day stands out as the heir of the great traditions of the German race.

We have seen that England and France have passed each through alternating periods of rapid progress and relative retrogression: but that their history has been in the main one of continuous increase in unity and strength. In marked contrast has been the history of the German people. During a great part of the Middle Ages and for some time afterwards, it was full of glory. For several centuries internal discords and hostile invasions forced Germany into the background; but

¹ This chapter was written before the World-war, and the use of the present tense in it may be taken to refer generally to the years 1910—13. As little change as possible has been made in revising it during 1917: though many of those, who have owed much to Germany in the past, have felt that German character has changed, since the whole youth of the nation in their most susceptible years were brought under the influence of a militarism, whose spirit and ethics were those of Frederick II.

I, vii, 1. in the last half century she has moved rapidly and steadily forwards to a place in the first rank of the pioneers of political and economic progress. In this sense she is a new country; and we shall see presently how she shares with America and other countries, which are commonly regarded as "new," some of the advantages of youth. But her present strength is not fully to be understood without some reference to her inheritance of germs of great qualities from the distant past. Atavistic influences need to be noted in regard to races, in the same way as in regard to individual families.

History shows the German as affectionate to those near him; but as rather narrow in his sympathies, and as inclined to "particularism"; that is, to undue insistence on the separate interests of the particular social, economic or political group in which he finds himself; and yet finding pleasure in fighting in the pay of strangers. The present German inclination towards Cartels has something reminiscent of the Hanseatic and other Leagues of German cities in the Middle Ages.

The land, that is now Germany, contained in the Middle Ages more cities that could claim leadership in trade and industry than any other except Italy. They joined together in Leagues, generally of an informal character, and with ever-shifting boundaries: though with enough consistency to perform the almost national task of clearing the northern seas of piracy. This shifting of boundaries was due partly to the dominant note of German character, partly to the fact that changing conditions favoured affinities, first in one direction and then in another over the wide land.

Gradually most of the cities lost prominence and sank back into the surrounding dominion, from which indeed they had never been wholly emancipated. Then came the Provincial stage, in which German Principalities, great and small, grew and declined: they combined and recombined under the influence of the same causes as had operated before, together with the alliances and the intermarriages of princely families.

The Roman Empire, though by this time regarded increasingly as a German Empire, was not a very effective bond of union: partly because its chief seat was in remote Vienna and it looked eastwards as well as westwards and northwards.

Even the rise of Prussia seemed rather to accentuate than to I, VII, 1.
allay German discord: for Prussia was suspected of some want of consideration for the interests of others.

Misfortune followed Germany till about 1850. A few of her industries, especially in Saxony and the Rhineland, attained some success; but speaking generally she remained poor relatively to France as well as England, and backward relatively to both of them as well as to Belgium and Switzerland. But when one looks below the surface, one can see that the true German spirit was merely overlaid by incessant strife. It never died: its revival was largely due to a revolt against the slaughter of Germans by Germans under Frederick II and under Napoleon. Driven in on themselves by political failures their thoughts founded "an empire in the air," that is, an empire in philosophy, literature, and music. This empire in the air was not Prussian. It was German. And the ideal empire was the foundation of the material¹.

✓ In the first half of the nineteenth century the Universities were common meeting places of men from all parts of Germany. Passing from one to another, teachers and students alike propagated a German, as distinct from a Provincial, movement in philosophy and learning, in literature and music. This intellectual unity had made great progress before much attention was paid to economic problems. But gradually the inconveniences of the commercial subdivision (*Zersplitterung*) of Germany became prominent: so that some, who cared but little for mere material considerations, took advantage of the irritation caused by these inconveniences; and pressed for commercial unity, partly for its own sake, and partly as a means to larger ends. The movement took the form of the Zollverein, or Fiscal-league. ✓ In 1852 the League encircled practically the whole of Germany by a single customs frontier, within which goods moved freely:

¹ When Frederick II died, the following incomparable groups were alive: Haydn, Mozart and Beethoven; Kant, Fichte and Hegel; Lessing, Goethe and Schiller. But Macpherson, *Annals of Commerce*, under date 1762, quotes, as proof that Prussia would not become industrial, a proclamation by a Prussian Governor of Saxon Freiburg, who was less liberal than his master:—"It is an indecency not to be suffered for burghers to presume to talk of state affairs, in which such pitiful creatures can do neither good nor harm."

I, vii, 1, the taxes collected at the frontier being paid into a common purse¹.

✓ The League finally removed those hindrances to internal commerce, which in List's words "lame internal traffic, and have much the same effect as if every limb of the human body were bound by tight ligatures, so that the blood could not flow from one to another." Its benefits were unalloyed by any considerable drawback from the point of view either of the enlightened Free-trader Nebenius or the enlightened Protectionist List. This was mainly because it introduced a free circulation into a territory which nature had made compact, and which man's quarrels and jealousies alone had separated. Of course the success of the Zollverein affords no good argument in favour of a commercial union, imposed on countries to which nature has assigned separate frontiers, widely removed from one another. For that would introduce much friction: and, if it involved the imposition of complex differential duties on things which now pass British frontiers freely, it would perhaps reproduce on a larger scale many of the evils from which Prussia suffered, when her territory consisted of some seventy fragments scattered over Germany. The success which has followed the founding of the German Zollverein, so far from affording a strong argument in favour of such a union, tends rather to suggest that it should not be undertaken lightly², though a closer union in spirit of the various members of the British Confederation of States would be worth more than much economic gain.

¹ The need for it is best comprehended by a glance at maps, showing the tariff frontiers which it removed. In this connection see the map in the *Encyclopaedia Britannica*, s.v. Germany; also map 107 in the *Atlas of the Cambridge Modern History*. The present subdivision of Thuringia corresponds rather closely to those which were common throughout Germany not long ago: but import duties are not levied at the frontiers of the several Principalities now. The human element in the formation of industrial Germany is well shown in Dawson's masterly study of the *Evolution of Modern Germany*, especially chs. III, v, VI.

² We must return to these subjects at a much later stage; meanwhile reference may be made to the further account given of the Zollverein in Appendix F. Sombart, *Die Deutsche Volkswirtschaft*, I. II. lays stress on the hindrances which the minute subdivision of her territory put in the way of specialized production for sale at a distance. They are partly responsible for the fact that simple homely "domestic" work held as prominent a position in many parts of Germany a hundred years ago, as it did in England some two hundred years ago.

2. *The facilities for traffic, begun by the Zollverein, were developed by railways, and have helped to build up much the largest industrial district in Europe.* I, vii, 2.

The Rhine, deepened at critical points, now bears a large number of barges of 5000 tons each, which carry coal and other heavy products at relatively low freights, nearly up to the Swiss frontier. Other rivers have been improved in like manner though to a less extent: while an admirable system of canals connecting the chief river basins of Germany is already doing much, and is expected ere long to do a great deal more, for the general cheapening of heavy traffic throughout the northern half of the country¹.

Her first railways came chiefly to those districts, which were already best supplied with water communications; and were the richest, partly for that reason. Even in 1850 Westphalia, Rhineland and neighbouring parts of Germany formed an "extensive basin of population, commerce and industry, subordinate and tributary to which the other systems of railways of the Germanic states may be considered²." In this, as in other cases, strength has been the source of strength.

Railways have made the lower Rhineland and Westphalia into much the strongest compact economic unit which exists, or which seems to be in progress of growth, anywhere on the Continent of Europe. And it is connected by close networks of railways on the south with the iron-mines of Luxemburg and Alsace, and the industrial districts of the upper Rhine; while on the east a similar band stretches out through Saxony to

¹ By aid of canals goods can be sent from the Rhine into Switzerland and the South of France; and Berlin, in a level district, has been connected without difficulty with Hamburg, Stettin and Breslau; and so on. Much of the inland water traffic is indeed liable to be suspended in winter by ice; and summer drought often obstructs traffic in the higher reaches of most rivers. But in spite of this compulsory idleness of the plant during a considerable part of the year, the inland freights by water are generally about a third of those by rail; though they themselves are low in comparison with the English rates. More is said on these matters below, III.

² Lardner, *Railway Economy*, p. 460. Railways came late to Germany: in 1840 she had only 400 miles of them; and she had imported from England and Belgium most of their plant. Now she has a larger mileage of them than any other country in Europe: their density of traffic is much less than that of English railways, but it grows rapidly.

1, vii, 2. Silesia. These two broad bands produce about half of the iron and steel products of the Continent of Europe¹.

To the advantages of a central position, and the absence of any considerable range of mountains, except in Southern Bavaria, Germany adds those of a very large expanse of land, nearly the whole of which repays diligent and wise cultivation. Her soil is not indeed as rich, nor her climate as favourable, as that of France; nor has she much land that is as good as (say) the best fourth part of that of Britain. But she has no hopeless waste lands to compare in the aggregate with the cold rain-sodden moors and low mountains of Scotland, Ireland, Wales and England: and her hot summers are better suited for wheat, sugar-beet and some other crops, than those of Britain are. On the whole she could probably supply food to a larger population in proportion to her area than Britain could, though less than France could, with an equal application of labour and mechanical appliances per acre. But in fact her population is less dense than that of Britain and much denser than that of France².

Further she has half of the known coal deposits of Europe; and her potash deposits are without any rival. But her supplies

¹ There are rather thin places in these two bands, especially near the Middle Rhine and in the stretch between Westphalia and Saxony. The extension of the band running eastwards beyond Saxony is narrow. But the two bands together are quite beyond the rivalry of the two national districts on the Continent next in industrial importance, which cluster round the old seats of mediaeval industry in Italy and the Low Countries. A general map of Europe shows an area of dense population made up of most of Belgium, together with the neighbouring parts of France; and this is so compact as to be comparable with Rhineland plus Westphalia, to which it is next in rank.

² The percentages of the occupied population, male and female, in the three great divisions (1) agriculture, forestry, and fishing; (2) manufacture and mining; (3) trade and transport respectively, are: in the United Kingdom, 13.0; 45.8; 16.3; in Germany, 35.2; 40.0; 12.4; in France, 41.8; 35.5; 9.5. (The figures for Germany relate to 1907; the rest to 1901.) Forty-five per cent. of those Germans whose occupation is mainly in agriculture, etc., are women: but this fact is partly accounted for by the considerations that, (1) many men whose main occupation is different, work in the fields a good deal; and (2) agriculturists in military service are not reckoned in these figures; nor are Poles and others who work in Eastern Germany in the summer and return home for the winter. The families connected with the first group in Germany number in all only 17.7 million, while the corresponding figure for the second group is 26.4 million: though the numbers of those employed are not very different.

of iron ore, came chiefly from Alsace and France before the World-war. I, vii, 2.

It is a notable, though not altogether accidental, fact that the richest, or nearly richest, provinces of all the seven countries by which Germany is surrounded, are contiguous to her frontiers; and find traffic for her railways. Part of this is transit or "through" traffic. But much greater importance attaches to trade which is conducted in through trucks between every part of Germany and the countries by which she is surrounded.

British exports and imports must generally be moved at some expense, and often with some extra risk, from truck to ship and from ship to truck. But, in suitable cases, truck loads can be sent straight from the producer into the warehouse of the consumer alike in Germany's import and in her export trade. She does not send as much as three per cent. of her exports to any country whose frontiers do not march with hers, except only the United States and the United Kingdom.

The markets of Europe are at present richer in the aggregate than those of any other quarter of the world. Germany is in the heart of them, and railways have made Europe like a steppe which a caravan can traverse in any direction; while the cost of carriage by the modern caravan is but a very small fraction of that by the old. Were it not for the heavy tariffs which she and her neighbours levy at their frontiers, it is probable that the economy of transport which railways within and beyond her territory are providing, would have widened the European markets accessible to her manufacturers nearly in proportion to the square of that increase in economy: and, even as it is, they have widened the markets very greatly¹.

Thus the geographical features which have always adapted her for unity, have been turned to full account. During the long years of her subdivision, she had singularly little opportunity for massive production: suddenly she obtained exceptional advantages for it. She has developed these advantages on lines peculiarly her own. On one side they represent the

¹ As to the Law of Squares in transport and trade, see above, p. 27. As to the advantages which Germany derives from her configuration and position, see Gruber, *Wirtschaftsgeographie*, Division I.

1, vii, 2. strict discipline which men of iron (Frederick II, Bismarck and others) have developed for good and evil in Prussia, and in a less degree in the rest of Germany. On the other side they represent that zeal for education, which was associated with the rise of the national spirit. These two motive forces, acting on Germany's great geographical advantages, have naturally, if not necessarily, made her the leader in the applications of science to massive production.

✓ In fine, from the geographical and material points of view France and Germany are in some respects similar to one another, but from the human point of view the contrasts are more marked than the resemblances. For two hundred years, during which France was united by a strong national feeling, Germans were largely occupied in fighting one another: and yet individualism is a French rather than a German characteristic.

✓ Thus the products of the workshops of France make their way through their excellence and in spite of their high price: and, when they yield ground to products of her factories, the cause is often that her high grade individual work can no longer hold its own in competition with cheaper machine-made productions: for these are ever approaching nearer to the delicacy and variety of that work, in which the sensitive hand does more, and the machine does less, than in the large factory. But in Germany the case is the reverse. Where artistic sensibility is required, the best handiwork of Germany is seldom either as individual or as fine as that of France; and it does not always reach the highest standard of England in products, that demand absolute exactness and delicacy of finish. As a rule the products of her workshop and domestic industries rank rather below than above the products of her factories, and make their way by a cheapness which reflects long hours of labour and low earnings. A displacement of such exports by factory-made goods generally indicates a diminished use of ineffective methods of production, and an increased use of methods in which her faculty for organization, her habits of order and her methodical training are turned to good account¹.

¹ The growth of large businesses in some parts of Germany has been very rapid; but not in all. The last industrial census, that of 1907, showed as many persons employed in small businesses (1—5 employees) as in large concerns

3. *Germany's zeal for solid education lays the foundation of her industrial progress.* I, VII, 3.

Germany holds a leading place in scientific studies; and she is without a rival in the organized applications of science to practical problems. In 1828 Liebig set up a chemical laboratory at the University of Giessen; and a great part of the subsequent rapid advance in the chemical technique of production is due to his pupils, and to others taught by them in Germany and elsewhere. France indeed, the true mother of chemistry, has continued to work mainly on her own lines. But America's scientific studies came early under German influence; and Britain followed gradually.

A chief strength of German education lies in its order and system. Discipline is indeed a foe to spontaneity; while spontaneity is the chief creator of original work, and especially of that which makes epochs in thought. This danger has not been overlooked: and organized efforts for the increase of spontaneity have a place in Germany's educational as well as in her military system: but after all spontaneity is the only effective inspirer of spontaneity, and its only trusty guide. The disciplined life of the German schoolboy is indeed a good preparation for subordinate work in factory or counting-house. But it attains only a partial success in the education of self-reliance; of the ability to forbear as well as to bear; and of quick intuitive sympathy. The education which boys receive from boys is the chief source of that political faculty, which in spite of some blemishes, has held together the British Federation of Nations in bonds of sympathy and affection; and history seems to show that the German people are somewhat deficient in it.

Not the least of the benefits which railways have conferred on the industries of Germany, lies in their quickening of the intercourse of her Universities. Though German Schools have a severer discipline than the English, yet in German Universities both students and teachers have great freedom; while the constant migration of teachers as well as students from one Uni-

(51 or more). Medium concerns (6—50 employees) showed only two-thirds as many as each of the other groups. An excellent compressed account of *Industrial Germany* by Mr W. H. Dawson throws much light on the subjects of this and of some later chapters

I, vii, 3. versity to another brings a national opinion to bear on each one: and thus, in spite of the freedom, which is generally allowed to each Professor to choose his subject and his method of dealing with it, German Universities combine order and efficiency in a remarkable degree.

Thus all the world has had much to learn from German methods of education. But the lesson must be itself criticized, and made the starting point for further progress. In particular it seems doubtful whether the discipline of German school life is a good preparation for making use of the unlimited opportunities for spontaneity which are offered at the University. Moreover a wayward teacher sometimes turns his liberty to bad account by directing his pupils' attention to secondary issues before they have mastered leading principles. In the result it appears that though German original work is of prodigious volume, it often is somewhat lacking in penetrative power. The matter is one on which an Englishman will speak with diffidence. But there are some reasons for doubting whether the average student at a German University is as well taught, or takes his studies as seriously as the average student at English Universities, in spite of the undue predominance of games in them. But most of the vast number of German University students (some 65,000) get so far in touch with scientific studies, that in after life they are inclined to take seriously any scientific issue that impinges on their business; and they then find some five thousand trained chemists ready to respond to invitations to earn their livelihood by special skill¹.

Again, the military drill, which is imposed on all citizens of full physical strength, gives some firmness to very weak characters, and helps to prevent the growth of a class of professional paupers. But perhaps it does some injury to many fine and sensitive characters, and even checks the development of the subtler forms of manual skill; as well as of the highest genius that might find vent in literature, art, and science.

These qualifications are important, but it remains true that the amount of intellectual activity in Germany is greater than

¹ Some trenchant opinions on these matters, supported by statistics of which none has been made in the text, will be found in *Modern Germany* by J. Ellis Barker, 1912, cha. xx and xxv.

in any other country; and that the broad enlightenment, which most high officials and heads of large businesses have acquired at the Universities, enables Germany to apply science to industry with a breadth and system which establish a claim to industrial leadership of a special kind¹. I, VII, 3.

Availing herself of the economies of massive production in education, Germany can afford to offer it at charges which are within the reach of the lower middle class, and even of artisans; and therefore the supply of scientific routine-services rises faster than the demand for them does: though that grows very fast, as a consequence of the rapid increase in Germany's exports of goods in the production of which those services can be turned to account. Consequently the great benefits of a large system of education are accompanied by some evil, which is sometimes described as the growth of a "scientific proletariat." The clerk who can merely write and do simple arithmetic has found at last his proper place and the routine experimenter must find his only a little higher up: but, when that has been done, he will become a source of strength to his country from the social point of view, as he is already in an eminent degree from the economic point of view. He contributes increasingly to the success in foreign markets of many of those industries from which Germany derives a chief claim to leadership².

In Germany—and the same may perhaps be said of Scandinavia and Switzerland—education gives sobriety and strength to the conduct of the citizen in every-day life: it develops civic virtues; and it inclines the German of to-day to adhere to the habits of low living and high thinking which he has inherited from a generation of forced economy. He is better

¹ The trade schools, which Saxony started in the eighteenth century, were doubtless a chief cause of her early success in manufacture: and German trade schools of all kinds, but especially her "continuation schools," have raised and partly solved questions of ever increasing importance. It is noticeable that some of the most suggestive experiments in this direction have been made in parts of Germany which are not inclined to the extreme stringency of Prussian discipline.

² Similarly, the thoroughness and universality of the musical training of her people have given her piano-manufacturers a large choice of designers, and workers apt to judge tones with a true and fine instinct: several of the English, French, and American firms, which have attained the highest success in the industry, were founded by Germans.

I, vii, 4. fed than his father was: the care for his health is directed by more knowledge, and his food, though still simple and not always cooked with French skill, serves its purpose well; because it is chosen and prepared in accordance with the popularized results of chemical and physiological research.

Sixty years ago, perhaps even forty years ago, the German on the average did no more in three hours than the Englishman in two. But while the Englishman has possibly been a little spoiled by prosperity, the German in most trades works harder than he used to do. He does not very much less work in an hour than the Englishman, and he works for longer hours: now, where double shifts are not in vogue, a man who will keep expensive plant working two hours longer than another, may be the cheaper to the employer even at higher wages in proportion to an output per hour, which is only slightly less. Again, the German woman, though well educated, is in no way emancipated from the old ideals of patient devotion to family cares. And the intense interest, which parents take in the schoolwork of their children, is in the first rank among the sources of German progress.

✓ 4. *Germany's leadership is mainly in industries, in which academic training and laboratory work can be turned to good account; and these are growing in relative importance.*

In the early stages of modern manufacture scientific training was of relatively small importance. The Germans accordingly, recognizing their own weakness in practical instinct and organizing faculty, took the part of pupils, whose purpose it was to outrun their teachers. They began by the direct copying of English machinery and methods; and they next set themselves to get employment in English firms; and to offer steady, intelligent services in return for a low pay in money, and a silent instruction in the inner workings of the business¹.

The practical knowledge and faculty thus obtained served as

¹ The Committees on Import Duties and on the Exportation of Machinery of 1840, 1841, already referred to, were told that in Prussia "every man is intelligent, and every man thinks." In spite of the prohibition of exportation, every new English machine was bought at Government expense and sent to the Gewerbe Institut at Berlin. It was there tried; and, if successful, a working model was made of it for preservation in the Museum; while the machine itself was given to some progressive manufacturer.

the basis on which to build a large superstructure of business efficiency. This ran out into all branches of industry and trade; but especially into those, in which the systematic training of school and university and technical institute could be of most avail. And all the while Germany has been quick to grasp the practical significance of any master discovery that is made in other countries, and to turn it to account. I, VII, 4.

Her hopes of an enlarged industrial leadership would however be less than they are, if progress were likely to depend in the future mainly on that mechanical adaptation of means to ends, in which a ready wit and sound judgment are more important than elaborate mental training. But science has had a considerable share in the brilliant mechanical advances made by the present generation; and the greater part of the increased command over nature which man is obtaining, may be traced to the aid of chemical, electrical and biological sciences. Here there is a vast field which has as yet been little cultivated, and for which the resources of the twentieth century are beyond all comparison greater than those of the age of the early mechanical inventions—a field therefore which may, for many generations to come, yield Increasing Returns to effort. In this field mother-wit counts for much, but only on condition that it is equipped with thorough training and with high-class laboratories; just as in a naval battle mother-wit and courage are needed for victory to-day as much as ever, but yet are of little avail unless aided by modern equipments.

It is moreover a matter of common knowledge that applications of chemistry and other sciences dominate nearly all the chief recent advances of agriculture: of the industries connected with all but the simplest forms of food, solid and liquid; with new textile materials and dyes; with subtle forms of glass; with compounds of steel and other metals, which render possible far more intense applications of pressure, explosive power, heat, and other forms of physical force, than seemed attainable even a short time ago. In all this Germany has played a conspicuous part. Two or three countries are perhaps fully on a level with her in scientific conceptions of that rare kind, characteristic of the highest genius, which makes epochs in thought and lays the foundations of epochs in industrial practice in the same

I, vii, 5. or a later generation. But none can compare as yet with her in the organized work of detail, by which the epoch-making thought is brought to bear on practice in such a way as to make an epoch in industry.

It has already been noticed that France led the way in the employment of chemists as officials of particular factories. The Germans have led the way in dividing up a scientific problem—whether mainly of the academic sort, or concerned with the attainment of a particular result of commercial value—between a group, or class, or “team” of workers of inferior rank, and generally rather young. The main responsibility for the work lies with a chief, who sets to each man his task: very often the whole group is put to the same, or nearly the same, experiment and other investigation, applied to various products. The German temperament is specially adapted for this work; and the practical applications of science, in which Germany leads, give very large scope for it. (Other countries, and especially England and America, seem inclined to move, for good and for evil, on the same lines of massive production of knowledge by methods that are partially mechanical. But Germany holds an unquestioned lead in those fine chemical (including glass) industries which offer large scope for the application of science to practical work.) She has larger and more numerous laboratories than any other country both of the first and the second order—that is both such as are devoted to the advancement of science as an end in itself, and those which pursue various technical ends¹.)

5. *Germany's industry and trade have some advantages which attach to youth; their strength and its limitations.*

✓ It is noteworthy that in the steel and some other industries, a greater proportion of German works than of English are on that large scale which recent experience has proved to be the most economical: they are equipped with the best semi-automatic plant, and turn their waste heat and gas and other by-products to the fullest account. This by itself proves nothing,

¹ As to relations between the various orders of laboratories see above, pp. 101—2. More is said below (pp. 203—5) as to the need of supplementing the creative work of men of genius by teams of well-disciplined association.

for the English works are older on the average than the German; and it is asserted that a comparison between new English works and new German works is not to the disadvantage of English: but it must be admitted that a large share of the improved scientific methods has come from Germany¹. I, vii, 5.

A couple of generations ago the inexperienced firm was everywhere grievously handicapped by its lack of trained instinct and experience, and perhaps by its ignorance of important trade secrets. But now the application of scientific principles is constantly ousting established practice; and the new firm can generally buy from a pioneer maker a more efficient and economical plant than the average of that of his older rivals, even if they are quick to throw away all that is obsolete. Again, so fast do the methods of industry change, that employees frequently lose, rather than gain, in efficiency as they approach middle age: and thus what used to be one of the chief advantages of an old-established firm, is now of little service; and indeed it sometimes becomes a hindrance. In this and other ways German industries have advantages over British in being free from the trammels of traditional organization.

She can bring to bear the powers of large concentrated capital and labour on great tasks, in which she can profit by the experience of others, assimilating and improving on their best methods, machinery and organization. Her employers and her workmen in the growing industry are generally younger, have more elasticity and are more free from the fetters of trade custom and usage than they would have been; had not the new age broken suddenly with the traditions of the old, especially in regard to those branches of industry, trade, and transport, in which massive operations have the fullest scope.

Again, a German, when wanting to get a foothold in a market in which English or French traders are established, will take a small order to meet some special or local need; though it requires him to make new patterns or other plant, and to take trouble, for which the order gives no adequate return. But an

¹ Reference has already been made (p. 95) to the curious fortune which aided Germany's steel industries in rising to the first rank by means of an invention, made by an Englishman, but exclusively applicable to phosphoric ores of which Germany could procure large supplies from Luxemburg and Lorraine.

1, VII, 5. old-established firm may be as wise in refusing *some* of these orders as the new firm is in taking them¹.

The Germans excel in the sedulous adaptation of their manufactures to local needs, high and low. They are quick to take account of differences in climate, of taste and custom, and even superstition. They make cheap things for people of impulsive temperament; who prefer a brilliant gala dress, to one made of solid durable material. And with equal patience they get to know enough of the business affairs of individual traders to be able to sell with relatively small risk on long credit, where Englishmen sometimes demand prompt payment: in all this they are much aided by their industry in acquiring the languages of Eastern Europe, Asia and South America. Even in markets in which English is spoken they push their way by taking trouble in small things to which the Englishman will not always bend himself.

On the other hand Germany is in a weak position, in so far as a considerable part of her exports to Eastern Europe, and elsewhere, still consists of simple textile and other goods for sale to homely consumers with limited means, to whom low prices are especially attractive. For countries that started a little behind her in the industrial race are already learning to make such things for themselves; and the causes which have tended to exclude the commoner and cheaper forms of English and French goods from Germany's markets may possibly affect her export trade in the future somewhat prejudicially. Moreover some of those parts of Europe, which are economically within her sphere of influence, are already adopting her own methods of fostering by Protective duties those simpler forms of massive production, in which almost unskilled labour can get fairly satisfactory results by working new machinery bought from western countries or made on western models. She may therefore be forced to turn her export industries, as France and

¹ British manufacturers and merchants complain that some disparagements of their methods, in official reports and elsewhere, ignore considerations such as this. That may be granted: but when all just deductions have been made, the reports of travellers and Consuls leave no room for doubting that Britain has something to learn from Germany in these matters. A similar conflict of opinion exists as to the aid given by German banks to old and new German businesses in foreign countries.

England have done, towards making those finer goods, which I, vii, 5. half-developed countries cannot make for themselves at all; but which the wealthier consumers in all parts of the world may be willing to buy almost without regard to their price. There are already signs that she is setting herself to this task, with her wonted resolution and energy.

She is also setting herself with much originality and resource to emulate the individual taste and fancy of French goods. And she is bringing her great organizing faculty to bear on work belonging to the border between mechanical and manual production, which is partly industrial and partly artistic. As has already been indicated, France is moving almost against her will somewhat in this direction; and many other countries and especially the United States are moving in it not unwillingly¹.

Again Germany obtains supplies of strong physical workers for her iron industries, for building and for agriculture, from nearly the same Slav and Latin races from which America draws similar supplies. Their standards of life are not high: they are often willing to labour hard for low wages; and they are serviceable not only for unskilled manual work, but also for the management of semi-automatic machines. In this respect Germany and America have an advantage over England, similar to that which, more than a century ago, the new centres of textile industry in England had over its old homes: for in the new centres everyone was willing to do work that was new to him by new methods; while the spirit, if not the formal regulations, of the old guilds offered a more or less open opposition to the introduction of new methods, that tended to lower the value of the knowledge and skill obtained by long training. This advantage will diminish in time. But for the present American manufacturers, who have travelled in England and in Germany, appear to be unanimous in their opinion that a modern American machine is less likely to be worked grudgingly and to less than its full capacity in Germany than in England¹.

¹ Germany will soon become old in some respects, relatively to her Eastern neighbours. In 1891, when the present writer visited some large engineering works in Bohemia, the manager said: "Look at that lad. A few months ago he was working in the country for 5s. a week. I now pay him 12s., and he is

I, VII, 5. There is another side to the progress which the German makes in foreign markets by his alertness, his readiness to take trouble about small details, his familiarity with foreign languages and so on: but that side may be best presented in the words of a German. "In those industries where cartels and syndicates have not yet been formed, too great a rôle is played by dubious practices of many kinds, by infringement of payment stipulations, by unjustifiable deductions, etc.: while on the other hand the cartels are often too ruthless in their action. In this field we have much to learn from the English business man. Long commercial tradition and international business experiences have taught him long ago that broad-mindedness is the best business principle. . . . Tolerance, another quality, which the German lacks, has been of great practical advantage to the Englishman¹."

There are several matters, closely connected with those just discussed, on which it might have been proper to say something here; but, as they will need to be studied on broad lines later on, it seems best to pass them by. Such are the growth of cartels and other forms of associated action in production and trade, with or without monopolistic tendency: the parts played by German banks in promoting and controlling industrial enterprises; and recent developments of Germany's fiscal policy.

It is obvious that an industry which offers large scope for the economies of massive production stands to gain much from Protective duties, if they can be so arranged as to insure it the almost undisturbed possession of the home market, while keeping open for it opportunities for large sales abroad: its sales at home, and its sales abroad, alike increase its command over economies that help it to undersell rivals in neutral markets. German and American thought has been much occupied with looking after three semi-automatic machines. In your country, none but skilled engineers are allowed to work those machines, though no skill is needed for it: and each engineer is compelled to confine his attention to one machine." Shortly afterwards more liberal methods were adopted in England, partly as the result of the great lock-out of 1893: and in this matter England is now at a less disadvantage than she was relatively to her young competitors.

¹ From the chapter on "Germany and the inheritance of the City" [of London], in *England's Financial Supremacy*, from which the opposite side of the case was quoted above (p. 104 fn.).

this class of considerations; and has made out a strong *primâ facie* case for the conclusion, that national policies in regard to international trade need to rest on a basis somewhat different from that which was appropriate to them before the modern economies of massive production had come into view. We shall, however, find reason for thinking that the *primâ facie* suggestions thus made are inadequate. To begin with, they do not take account of the fact that the economies of massive production are of many different kinds: some are cosmopolitan property, some are national, some are local, and some belong to individual firms: each of these different kinds has its own method of affecting both the national and social issues in question. Further, the new point of view will be found to give reason for attaching not less, but greater, cogency to the old argument that many of the advantages which a single industry derives from a Protective duty in its favour, involve loss and hindrance to other industries; and that, even if it be thought fit to select the whole class of massive production industries for special favour, the ultimate result may be of little service to that class; and may perhaps injure the nation at large. Problems of this kind have not the highest claim on the attention of the economist: but they are closely associated with those which have that claim, as will gradually be made clear. Meanwhile reference may be made to some short remarks on the varying trends of German tariff policy since the complete setting up of the Zollverein, which will be found in Appendix H.

✓ It may be added that erroneous conclusions are sometimes suggested, especially in partisan writings, by comparisons of Germany's industry and trade with those of Britain, without taking account of differences in their industrial ages, their populations or their areas. German industry and trade being younger than British, naturally grew faster: a young boy grows very fast. And since Germany's population is more than a third greater than Britain's, and her area more than a half-greater, her industry and trade will not have attained equal distinction, till they exceed those of Britain by at least a third.

I, VII, 5.

CHAPTER VIII

THE INDUSTRIAL LEADERSHIP OF THE UNITED STATES: MULTIFORM STANDARDIZATION

I, VIII, 1.

1. *Introductory.*

Germany's contributions to industrial leadership belong to the modern age; and they will doubtless spread widely and be developed in coming generations: but the range of industries which have been much affected by them up to the present time is not very large, and there seems to be no immediate prospect of its being very greatly extended. On the other hand those tendencies to industrial evolution, in which the United States of America is the chief leader, are likely to influence in various degrees a very large part of the field of manufacture. They are not indeed new: some of them may be traced back to primitive forms of the loom, or to an early printing press; and they have long dominated nearly all textile manufactures, together with a large part of the lighter metal industries. Thus the provinces of French and American methods are on the opposite sides of the broad field of industry. French instincts enable the hand and eye to make subtle discriminations, and ceaseless variations in form and colour; and thus to gratify the fancy and the artistic taste, at prices which are generally beyond the reach of the masses of the people. American methods on the other hand make for the production of business plant and of products for immediate consumption in an almost infinite variety of standardized forms. They analyse the ultimate product into simple parts; and provide a sufficient number of semi-automatic machines with the adjustments necessary for fashioning each part; and, if possible, for finishing it. In some cases a single model

of the product will meet fairly well the wants of all purchasers. But, if not, careful study is given to the question how much increase of sales will result from any proposed increase in the number of models made, and how much extra custom it will yield. If the answer is favourable the number of varieties is increased; and the standardization becomes "multiform." I, VIII, 2.

Standardization is of several different kinds, corresponding to differences of the materials used, and the purposes for which the product is needed. It varies also with the structure of the individual businesses which make use of it, and with the marketing and general organization of the industry to which they belong. But such matters must stand over for Book II, where they will occupy a considerable space: our present concern is only with its general characteristics and with the striking consilience of causes, which have given to America the leadership in it. The causes will be considered under the following heads:—her maintenance of the spirit of youth, when already strong among the strongest: the homogeneity of the methods of living of her vast population, in spite of racial differences: her large supplies on the one hand of strong immigrant labour, devoid of special skill, but able to work semi-automatic machines; and on the other hand of keen, resolute, native Americans ready to plan and control: the inevitable preference given by great railways to large consignments travelling long distances, by which a giant business, even if far off, is at an advantage in competition with a smaller business near at hand: and, lastly, the tendencies, partly caused by these conditions, for large masses of capital to be accumulated in the hands of a few strong men, who retain its control in their own masterful hands.

2. *The United States has remained young very long, partly because the geographical distribution of her resources has been such as to tempt men of strong character to move to new scenes, in which their enterprise has been further stimulated.*

✓ A "new country" is commonly taken to be one which has newly come under effective control of an advanced western people: so that, though her aboriginal population may still linger on, it no longer exerts any great influence on the destiny of the

I, VIII, 2. land; and the new inhabitants develop her resources in their own way. In some countries, on the other hand, the new inhabitants are in a small minority; and, even while they direct the work of the older population, they are compelled to acquiesce to a great extent in the survival of primitive forms of industry. It is, however, obvious that these two classes of countries range into one another: there is no broad, clearly marked, dividing line between them.

○ ✓ Again, a country, which has been regarded as old, may become in fact new almost suddenly: for the great body of its people may awake to the attractions of modern industrial methods; and apply them energetically to rich natural resources, which have hitherto lain almost dormant. Japan has become new in this sense during the present generation: India, China, Siberia and even Brazil, with much larger natural resources, may become new ere the present century has passed. All such countries have much to learn from the United States of America, which more than any other, has pioneered the path of new countries; though only those of them, whose resources are comparable with hers in volume and variety, can profit fully by all her experiences. With these facts in view, it seems advisable to enlarge the triangle, of which the three corners are in England, France, and Germany, into a quadrilateral, of which the fourth corner is in the United States. That quadrilateral reaches very far: for deep set physical conditions have combined with various incidents in her history to cause the United States to retain her youth long after she had become a leader in industry.

✓ Colonies established by strong European races in a temperate and stimulating climate, such as that of North America, almost always flourish, in spite of the hardships which they must endure at first. Meat and wood and dairy produce are sure to abound; rude houses are easily built; and a little grain is won from select patches of favourable soil: so the people and their children are well fed, and sturdy. As Adam Smith said, the most important wealth which they bring from their old homes is a "knowledge of the arts of agriculture, . . . the habit of subordination and some notion of regular government¹." They

¹ *Wealth of Nations*, Book IV. ch. VII. Part II.

bring also habits of forethought and the willingness to incur present exertion in the expectation of a remote benefit. The splendid material resources of America slumbered until a capital stock of "moral wealth," which is the heir of the ages, arrived from Europe.

The immigrants developed the physical riches of America: and, in return, the new hope, freedom, and changefulness of their lives developed in them germs of high spirit and initiative: these are indeed latent in most people and especially in those who seek new lands, even though they have been driven forth by oppression, rather than allured by the promise of larger opportunities.

The stability and quiet of settled life affect character for evil as well as for good. Few men are prophets in their own land: neighbours and relations are generally the last to pardon the faults, and to recognize the merits, of men who differ from themselves by being less docile and more enterprising. It is doubtless chiefly for this reason that in almost every part of England a disproportionately large share of the best energy and enterprise is to be found among those who were born elsewhere; while, by converse with others who come from different places and have different customs, travellers learn to put on its trial many a habit of thought and action, which otherwise they would have always acquiesced in as though it were a law of nature. The fact that colonists generally have keener and more elastic minds than the majority of those whom they left at home, is a special instance of the rule that change of environment is likely to be caused by activity of mind, and to stimulate that activity. But this assumes that the conditions of the environment are favourable: and that has not always been the case throughout the early years of a new country.

In fact life in secluded villages of a new country, before the age of railways and telegraphs, often became more rigidly set than even in the villages of the mother country. Thus, even Anglo-saxon colonies, when isolated, have aged rapidly: the colonies of Holland are older than Holland, and parts of the province of Quebec are older than France. Some English in North America were touched by this somnolence: but the opening up of the Mississippi Valley shook them out of it: and in some

I, VIII, 2. respects the United States is younger now than at the beginning of last century. For, indeed, the people of the United States differ from other European colonists of the New World in that their nervous energies have been stimulated not only by one great migration across the ocean, but by an exceptional persistence of migration within their own large country. This habit rose rather slowly; but has been in full strength for the last sixty years, and it has been supplemented recently by new strains of immigrants of excitable temperament.

The chief causes of these internal migrations have lain in the facts that the richest parts of the Continent were not accessible to the earlier immigrants: and that the qualities of the best land in the centre of North America made it specially attractive to those new immigrants, and to those descendants of the earlier settlers, who had the greatest vigour, and enterprise. The focus of the economic strength of the United States has therefore not remained by the Atlantic, but has moved into the heart of the Continent. This fact is obviously of primary importance from the political point of view: those, whose sturdy determination prevented the disruption of the nation half a century ago, came in great part from the "Middle West": but its significance is equally vital, though not equally conspicuous, from the economic point of view. Let us look into this.

The soil of the Atlantic Coast, especially in the north, was relatively poor. The best soil of the great Mississippi Valley was so tender that "a walking stick could be pushed into it up to the handle": and the greater part of it was so stored with plant food that it would yield many successive stocks of grain without being manured. In its Northern half, soil and climate specially favour wheat; while further South, maize is the standard crop. The power of dispensing with manure for several years attracted strong men whose resources did not suffice for setting up the appliances of a "mixed" farm, and stocking it with cattle; and this advantage, combined with the general richness of the land, caused "the West," as the Mississippi Valley was long called, to attract those whose sturdy, independent characters fitted them to become the backbone of a great nation¹.

¹ More is said on these matters in Appendix G, 1.

The westward movement in the South, especially before the Civil War,

* The selection of the stronger agriculturists for the work of the far west was reinforced by a similar selection of the most alert, though not the most technically skilled artisans. "As a people," said Horace Greeley, in 1870, "we may be viewed as on the march from the East to the West; the active, aspiring mechanic, who was born in Maine or New Hampshire, migrates to New York or some other Middle State soon after attaining his majority, reaches Illinois or Missouri two or three years later; and will often be found traversing Montana or California before he is thirty¹."

I, VIII, 2.

The movements of the miner are governed by natural causes even more absolutely than those of the farmer: and the two have much in common. Both make heavy freight for railways: and the two largely control the course of railway building: while the geographical distribution of other industries follows rather than directs that course. Water power may indeed attract manufactures to itself in some countries. But it happens that the main cause of the infertility of the mountainous band, which extends from about the hundredth to the hundred and twentieth parallel of longitude, is its want of water: and any railway net, which may spread over it and unite the Pacific Coast to the Mississippi Valley, must depend for local custom largely upon mining centres, together with some basins of land that are naturally rich; and some mountain

was of a different character from that in the North. The cultivation of cotton had been adopted for slaves, because it did not require or even offer much opportunity for the use of expensive appliances; and because it gave nearly continuous occupation throughout the year and therefore required no versatility. Food for workers was grown on the spot: but in the main cotton was a sole crop, and therefore an exhausting crop, and cotton moved westwards because, as Jefferson said, one could "buy an acre of new land cheaper than one could manure an old one."

¹ Greeley was one of the ablest of American journalists, and very great influence was exercised by the articles which he ultimately compressed into "*Essays designed to elucidate the science of Political Economy, while serving to explain and defend the policy of Protection to Home Industry, as a system of National Cooperation for the elevation of labour.*" The passage quoted (p. 286) is part of a characteristic argument that the American working-man "is unlikely to trouble himself with aught to which stability is so essential as it is to co-operators" on the Rochdale model: its "petty and paltry problems" are worthy of "the assembled wisdom of the humble weavers of Toad Lane." His life is cast in a larger mould: nothing less than "National cooperation" is worthy of his efforts.

1, viii, 3. slopes that offer facilities for irrigation. The richest coal beds at present known are on the western slopes of the Alleghanies, and the richest iron mines are near Lake Superior. The materials needed by the ironmaster can be assembled at nearly equal cost over a great part of the States which lie between the Alleghanies and the Rockies; and these States are among the strongest alike in agriculture, in the production of steel and in general manufacture.

In fact as soon as the slight obstacles which the Alleghanies offered to intercourse between the Atlantic Coast and the Mississippi Valley had been overcome, the United States possessed an unbroken continuity of large and various resources, to which no rival has yet been developed; and to which no rival seems probable in the near future.

3. *The various races of which the population is composed are homogeneous in matters of consumption; but they are diverse and mutually supplementary in industrial aptitudes. The homogeneity of demand creates an unrivalled market for standardized products: while the diversity of aptitude leads some to invent and others contentedly to use semi-automatic machinery for making them.*

"The American has a constantly expanding home demand, urging him to extensions and justifying costly improvements and the adoption of new processes. He has also a Continent under one Government....The best places are selected for assembling materials, raw, or partially prepared, for their final forms. In short, it is free, unrestricted trade in everything under the same conditions, same laws, same flag, and free markets everywhere¹." This perfect fluidity has made many branches of American production marvellously efficient. But, at the same time, it has tended to separate the producer widely from the consumer, and to suppress those methods of production which depend for their strength largely upon the adaptation of products to the special requirements or tastes of the purchaser.

An even stronger force in the same direction is being exerted by the homogeneity of the American demand for

¹ Carnegie, *Rectorial Address at St Andrew's*, 1902, pp. 31—2.

manufactured goods. Even those race differences, which have become almost a dominant factor in American life, lessen this homogeneity but very little. Widely as the Scandinavians are separated from the Italians, and the native Americans from the Poles, in sentiment, in modes of life, and even in occupations, they are yet purchasers of nearly the same goods. Allowance being of course made for differences of climate, they buy similar clothes, furniture, and implements. Some negroes and a few others may cling to old habits and methods, and prefer implements to which they are accustomed to those which are the most effective and economical. But speaking generally all the various races in the country, widely as they differ from one another in character and aptitude, are yet alike in yielding to the dominant spirit of the strong mixed race among whom they have settled. Only in a few cases, chiefly in large cities, are the new comers in sufficient numbers to make a market for goods of kinds peculiar to their old homes. Lastly, they are more quick than any but the most alert inhabitants of the Old World in taking to every improved implement or material which comes to their notice. I, VIII, 3.

Even the farmer is quick in this matter. Much of his clothing and furniture comes to him ready made; and a good deal of his food is prepared for him and put into tins a thousand or more miles away. His implements must be of almost the newest pattern: they can seldom be made in a neighbouring town, and he often buys them direct from a distant factory. In case of accident to any part of a machine, he writes or telegraphs for a numbered facsimile of the broken part. And, when once it is clear that goods must be ordered by post and sent by rail, the extra cost and loss of time involved in sending them a hundred miles instead of twenty is often very small; so that producers and store-keepers in large centres, who can offer a great variety of shape and pattern with low prices, are driving others out of the field.

Next it is to be considered that the population, while homogeneous in demand, supply a unique combination of the faculties and aptitudes needed, on the one hand for inventing the machinery suitable for standardized production; and on the

I, VIII, 3. other for working that machinery with adequate intelligence in return for relatively low wages. Those English, Scotch, and German immigrants, who did not become farmers, generally did somewhat skilled work in the towns or in the mines. From their ranks have come the greater part of the foremen in most trades that require a long training: the full-blooded American, when found in factories at all, is apt to be either in the higher ranks of management; or else engaged in tending machines which called for exceptional alertness rather than slowly acquired manual skill.

In spite of the ever increasing fineness and delicacy of American manufacture, the demand for high manual skill, and especially for men who have served long apprenticeships to a craft, has increased but slowly. It has even diminished in some trades, while in others it has been partially met by men born of European parents in America; and on the whole the inducements offered to the European artisan with a narrow range of high manual skill to emigrate to America are less than formerly. For these and other reasons emigration from England, Scotland, and Germany to America has very much slackened. And that from Ireland, though still considerable, has slackened also; partly indeed because her population is no longer too large for her resources, and her land system is more generous than it was.

Meanwhile the newly awakened though still very poor populations of Italy and of the central east of Europe have learnt to look for a refuge in America; and the facilities for emigration offered to them have been greatly increased. The same economic progress which is keeping English and Germans at home is sending ever increasing numbers of relatively poor and backward peoples across the ocean. Some of them are of high quality: for instance, the rapid progress of California in the art of growing fine fruit is largely due to the inherited skill of Italian immigrants. But more of them take to hard manual work in building, in railway construction, in mining, in heavy steelworks, etc. Some of these indeed rise: for instance, particular departments of some steelworks are so fully manned by Slavs, that they are beginning efficiently to take the places of Irish and others who have hitherto acted as foremen: while very large numbers of them

are to be found in relatively light, but monotonous work in large cities. They may lack the resolute will and self-control which put many British, German, and Scandinavian immigrants on terms of equality with native Americans. But they are quick withal, versatile; and, as a rule, easily moulded; they take readily to the use of machinery; and they have no traditions that could prevent them from doing their best in using semi-automatic machines, which are simple of handling, while doing complex work. Thus America has suddenly obtained a plentiful supply of people who are able and willing to do the routine work of a large factory for relatively low wages, and whose aptitudes supplement those of the stronger races that constitute the great bulk of the white population¹. I, viii, 3.

Even in the Old World progressive industrial districts gain much from the immigration of workers to whom all methods of manufacture are new; and who readily betake themselves to the ~~newest processes~~, and work these to the best of their power. But none rivals, none but Germany approaches near to the power which America derives from this advantage, in combination with an almost unlimited supply of alert workers in the higher grades: for it affords her an unprecedented scope for Babbage's great principle of economical production, according to which every worker is set to the most difficult and important tasks of which he is capable, and only to those.

The position is indeed not without its difficulties and dangers, some of which are pertinent to our present subject. To begin with, all migration tends to foster isolated action and individualistic aims: separated from old associates, each one is

¹ In the years between 1900 and 1910 America received 8.5 million immigrants. Of these, 6.1 million came from southern and eastern Europe, and only 1.8 from north-western; whereas three-fourths of all the immigrants in the years between 1830 and 1870 came from the United Kingdom and Germany. Statistics of immigration into America appear to be vitiated, though less than those of emigration from Europe, by evasions of the laws prescribing universal military service. There is therefore some interest attaching to the following figures showing the percentages of the total foreign born population, in 1860 and 1910 respectively, which were recorded as born in the following countries: England, 10.4 (for 1860); 6.5 (for 1910); Ireland, 38.5; 15.6; Scotland, 2.6; 1.0; Germany, 30.5; 18.5; Italy, 0.3; 9.9; Austria, 0.6; 8.7; Russia, 0.1; 6.2. See *Abstract of Thirteenth Census*, pp. 190—1. The occupations of immigrants from different countries are analysed in vol. xi of the *Twelfth Census Report*. See also *Report of the Industrial Commission*, vol. xv.

I, VIII, 4. apt to care mainly for his own interests, and those of any friends and relatives who may be with him. And this tendency has been increased by the variety of races and languages among the recent immigrants. It fosters the eager, absorbing pursuit of material success, partly for its own sake; but perhaps even more as an indication of power and as a trophy of satisfied ambition. It contributes to that alertness, that restless energy, that impatience of any occupation which does not enable a man to take out his whole day's income of strength in his day's work, which are characteristic of the United States now. In these respects, again, American conditions resemble those of the industrial districts of England a century ago; when they were crowded with immigrants from agricultural districts, to whom the new methods of manufacture offered wages far above those which their fathers had earned¹.

✓ 4. *The drift of America's industries towards massive multiform standardization is further associated, both as cause and as effect, with their widespread geographical distribution, and also with the special features of her great railway service.*

It is a general rule that specialized branches of production are apt to rise in places which offer suitable raw material (including in some cases pure water, and in others water power or coal); which have a favourable climate and access to good markets for the sale of the products. But these conditions being satisfied, the development of a specialized industry in any place was until recently nearly always a gradual process. Sometimes it was fostered by a far-seeing ruler, but it was incapable of sudden creation even by him.

In America the growth of localized industries has always been / rather rapid, partly because many of her artisans have been immigrants: a smaller inducement is generally needed to incline a man, who is already on the move, towards a rising centre of industry, than is needed to attract him there from his home; and therefore immigrants with specialized skill drift easily to places where that skill will be highly valued. } This cause of

¹ The subject of this Section is studied more closely in the chapters on "Some technical influences on the size of the business unit," below, II, III and IV.

localization was indeed much weakened as soon as automatic machines and other expensive plant, together with high organizing faculty, became a more important factor than manual skill in production. But the advantages offered by large towns with good and cheap railway connections have acted as a continual inducement to the capitalist undertaker and to the working-man to keep to the towns and the thickly peopled districts of the Eastern and Middle States¹. I, VIII, 4.

Nearly all large cities have competitive railway services: and this is, even now, more likely to result in favourable terms for their traffic in America than elsewhere. They offer to the immigrant, who does not speak English, a good chance of finding work under foremen and with comrades who speak his own language, and of being able to follow the religious worship of his fathers. These advantages, together with those which large centres of industry always offer to manufactures, have until recently tended to collect immigrants increasingly in very large cities. But in the last two decades the lower charges, at which dwellings and sites for factories can be obtained in cities of a middle size, have turned the drift towards them in America, as in England: and some factories, sufficiently powerful to be able to buy and sell in large quantities on favourable terms, and to make special arrangements with the railways, have gone into the country and practically founded cities of their own. All these cities offer nearly as high attractions to most classes of immigrants as the giant cities do: and the medium sized cities can market a larger part of their products at moderate distances than a giant city can. Consequently, although the increases of population of very large cities are due in great measure to extensions of boundaries, as they are in England; yet the rate of increase of those with more than half a million inhabitants is less than that of all urban districts, and considerably less than that of medium cities having between fifty thousand and a quarter of a million².

¹ In a masterly study of the causes of localization given in vol. VII of the *Twelfth Census Report* it is pointed out (p. cexiii), that six of the fifteen industries which were mostly highly localized in 1900, had made scarcely any use of machinery till after 1870.

² And yet New York city has a greater net manufacturing output than any State except its own and Pennsylvania, and there are twenty other cities each

I, VIII, 4.

The Rocky Mountains, the Pacific Coast and some smaller districts are not very densely peopled. But, subject to this exception, it may be said that the population of more than a hundred million has been distributed by constant migrations of industries fairly evenly over her total area of about three million square miles. The transport of agricultural produce to the Atlantic and the Mexican Gulf on the way to Europe accounted for much of the railway traffic in past times: but now by far the greater part even of the large consignments, that are carried long distances, consists of internal commerce.

This vast goods traffic is in some measure a cause, and in some measure a result, of the direction which has been taken by America's industrial leadership. Because her railways were chiefly concerned with carrying large consignments long distances, therefore they developed that traffic with special energy: because their charges for long distance large consignments were very low relatively to their charges for traffic of the kind that (except in regard to coal) predominates in Britain; therefore giant businesses, which sent large consignments to distant middlemen, obtained nearly the full advantage of their special economies of massive standardized production in many varieties.

We are not concerned at present to inquire how far the multiplication of semi-automatic machines, in the control of which a man is not required to use any high faculty, is a real benefit to the world. It undoubtedly increases material comforts; and any harm, that it may tend to do to man's nature, is not conspicuous in America in her present phase, because those who are chiefly affected by it came mostly from narrow

of which has a greater net manufacturing output than any of the sixteen States which stand lowest on the list. (Net output is reckoned after deduction of outlay for material, etc., but not for depreciation, etc.)

In 1910 the largest percentage of urban population was found in New England: but the largest percentage of population in cities with more than 100,000 inhabitants was found in the "Middle Atlantic States" (i.e. New York and Pennsylvania): and next in the Pacific States, where population flocks to the great harbour cities, as it does in Australia. Urban districts account for nearly 80 per cent. of the total foreign born population; but for less than 40 per cent. of that in the States between the Mississippi and the Pacific watershed. (The data for the above statements are to be found in Tables 19—27 of Ch. 1, Table 12 of Ch. 5, and Tables 5—7 of Ch. 15 of the *Abstract of the Thirteenth Census.*)

surroundings: their outlook is larger than it would have been, I, viii, 5. if they had stayed at home¹.

5. *America's movable capital has grown very fast in recent years. Its ownership is widely distributed; but natural selection of singular efficiency has brought to the front a relatively small number of men with high business genius, and has given them control of a great part of it.*

✓ That massive organization of manufacture, in which a few alert minds direct, while the greater part of the work is done by semi-automatic machinery, requires not only large armies of workers with mutually supplementary aptitudes; but also a concentration of a large volume of movable capital in the hands of powerful and enterprising owners.

The material resources of the United States increased rapidly from the time when railways began to bring the Mississippi Valley into close union with the Atlantic border and with the markets of the Old World. But the making of railways, roads, etc. in the new region, the building of farm-houses and development of the farms, absorbed most of her surplus of income over expenditure, large as that was. Even in 1860, the value of farms and farm property was nearly half the whole wealth of the country; and the railways accounted for a good deal more, though it is true that they were largely built with capital borrowed from Europe. There was a vast destruction of capital in the war: rapidly increasing opportunities for investment in land and railways followed it; and these conditions, combined with the supersession of wood as the material of ships, tended to make her withdraw her resources from work in which she would have to compete on equal terms with rich countries, whose opportunities for the investment of capital at home were narrower than hers. But about 1875 a new era set in. The preceding inflation of credit and prices had been checked by a collapse of credit: work was resumed with energy; and the excess of income over expenditure commenced to grow rapidly².

¹ Some further results of these conditions are noted below, II, vii, 5.

² The money value of farm property kept about even pace with the growth of population between 1860 and 1900; but it has increased much faster since that time; mainly because many people here suddenly awakened to the fact

I, viii, 5.

Most of the new wealth has been distributed among a large part of the population, as holders of real property, or of shares or bonds of those railway and other companies which have long had a solid position. But investments in risky undertakings—such as those connected with the development of petroleum, copper, and other mineral properties—often yield nearly as much loss as gain to the ordinary investor: and yet they may be handled by people with large capital, and exceptional means of information and organizing faculty, so as to yield them large gains. This cause is one among many, which, as will be seen more clearly at a later stage, are increasing the wealth of those who are already rich: it acts in America even more strongly than in other countries. Another cause is that such businesses as mechanical engineering, grain dealing and milling, cattle that the scarcity-element, which has long been present in the value of land in old countries, is beginning to appear in America. Probably the statistics of farm values in the following table are not liable to the very large errors that are to be feared in those relating to total wealth and to capital in manufactures. It is to be remembered that the figures for 1870 are reckoned in paper currency, which was worth about four-fifths of its gold value; while gold prices were then exceptionally high in world markets. The Census Returns show:—

Census Year	Population	Millions of dollars		
		Total wealth	Value of farm property	Capital in manufactures
1850	23,191,000	7,136	3,967	533
1860	31,443,000	16,160	7,980	1,009
1870	38,558,000	30,068	8,945	2,118
1880	50,155,000	42,642	12,180	2,790
1890	62,622,000	65,037	16,082	6,525
1900	77,256,000	94,300	20,440	9,874
1910	93,401,000		40,991	18,490

The revised figures for total wealth, given in the *Statistical Abstract* 1917, are (in millions of dollars) 107,104 for 1904; and 187,739 for 1912. A part of this enormous increase in recent years is due to a rise in the value of agricultural land caused by the absorption of unoccupied land, and an increase in the home-consumption of agricultural produce so great as to obviate the necessity of selling it at very low prices for exportation.

For some purposes it is better to study rates of growth of wealth per head, than those of aggregate wealth. But the growth of wealth per head would give a very inadequate measure of the economic progress of a country whose population is growing at an exceptional rate. For the additions to the population, whether native born or immigrant, do not bring their share of wealth with them.

The increase in the size of businesses is considered below, III, vii and viii, and Appendix N.

dealing and meat canning, and even retail dealing, have offered larger scope than anywhere else. Thus strong and persistent men accumulate into their own hands the profits of agglomerated business, which not long ago were distributed among many smaller undertakings. And all such causes work upon the basis of an exceptionally large aggregate of new income in the hands of the commercial classes. I, VIII, 5.

For profits in ordinary business are very high in America, because the growth of capital, rapid as it has been, has not sufficed to fill up nearly all the openings which Nature is still lavishly offering to those who have the faculty to read her hints and to act on them: and therefore a man who obtains profits at a rate that is normal in America, on a very large business over many years, will accumulate a vast fortune. Both the opportunities and the special energies, by which they are turned to account, are as unrivalled as were those of England, when she brought a large use of coal and iron into her service a generation ahead of the rest of the world.

The American problems of the present age are on a vastly larger scale than were the British problems of the earlier age: but the means available for handling them have developed in at least equal proportion. For, while such things as the telegraph and telephone, and facilities for rapid travel under restful conditions, are accessible to all; powerful capitalists are able to set select staffs of shrewd and skilled assistants at high salaries, on the detailed study of one problem after another in constructive business, in speculation, or in the two combined.

✓ Education has always been taken seriously in America; but it has never been regarded as reaching far, by itself, towards making men efficient in business. It has never given the same prestige as can be obtained by the evidence of keen mother wit, which is afforded by a new contrivance, or a new scheme of organization which is effective for its purpose. Thus it has come about that the American genius for inventing, organizing, and arranging is the finest in the world. To concede this is not to attribute to Americans more than their fair share of natural ability. It is but to note that the able young American is almost as sure to become an inventor or an organizer or both, as the able barbarian was to become a leader in battle, or as

I, VIII, 5. the able Florentine in the Middle ages was to seek distinction in art or politics. For young ambition naturally flows to whatever vocation offers the most prominent difficulties to be overcome and the highest distinction for overcoming them. A powerful process of natural selection has thus called out the leaders of American industry from the many millions of lads who were born to the last generation from alert parents of many races; and who entered on life with the resolve that they would prove themselves to be abler and greater than their fellows by becoming rich: and of this effectiveness the money test is on the whole a safer test than any other which the common man can apply¹.

There are in America a great number of men who have become very rich while still in the prime of life and full of enterprise. Some of them have little inclination towards social amusements or culture: they are conscious of being but second-rate powers in the lighter affairs of life; and are happiest when at their places of business, engaged in yet enlarging the fortunes, which they value chiefly as evidence of their organizing genius. As arts and sciences flourish best where their followers work for the approval of brethren of the craft, and not for the sake of money: so business flourishes most where the aim of the business man is not to shine in elegant society, but to be held in respect by those who are the best judges of his special form of strength. This exclusive devotion to one pursuit involves some loss to the life of the individual; but the constructive economic force which it gives to America at this phase of her development is unique.

Meanwhile the thoroughness and alert sense of proportion, which have been developed in business, run over into congenial studies. American work in applied economics has already taken

¹ See a representative discussion in Carnegie's *Empire of Business*, pp. 106—113. He gives a list of many of the "best known industrial establishments in each department.... Every one of these works was founded by mechanics.... If we were to include those which were founded by men who entered life as office boys or clerks we should embrace almost every famous manufacturing concern in the country": Wansmaker, Claflin, Jordan, Lord, Field, Barr, Phelps, Dodge; the Stanfords, Rockefellers, Goulds, Sages, Fields, Dillons, Seligmans, Wilsons, Huntingtons; and most of the chief bankers have been clerks, or have come from a still lower grade in the ranks. More is said on this matter below, pp. 358—9.

the first place in the world: and in such studies as those which relate to the respective provinces of competition, cooperation and monopoly, and to the functions of the State in regard to them, American studies appear to be the most real, thorough and penetrating; as will be suggested in Book III of this work. I, VIII, 5

Looking back on these exceptional conditions of the present industrial leadership of the United States we see that many of them are in a transitional stage.

Her agriculture is rapidly leaving the extensive methods, which are distinctive of the New World; and passing to intensive methods, in which an ever increasing element of Old World practice is embodied. But they will never be simply Old World methods: they will always be in part descended from the typical American agriculture, in which nothing was done by heavy manual labour, if ingenuity could contrive either to do it by machinery, or to evade doing it altogether.

The changes in the character of America's manufactures, combined with the exhaustion of her supply of land stocked by Nature with food for ten or twenty years successive crops, have given to her policy in regard to international trade a character very different from, and in some respects the opposite to, that which prevailed when Protection to nascent manufactures first came under discussion. The keynote then was that she suffered from a lack of the inherited industrial skill of the Old World: a little later the keynote was that the large capitals, which European and especially British manufacturers commanded, enabled them to make use of appliances beyond the reach of the poorer American; and also to ruin him by selling goods at less than cost price (in modern phrase "dumping" them), when he was already in financial straits. But now those American industries, which can exercise the greatest influence on the Legislature and are in general most favoured by it, are among those in which the power of aggregated American capital is greater than that of any other country. This change gives much room for thought: but the questions raised by it are beyond our reach at present¹.

¹ Something is said as to the relations between early phases of American industry and fiscal policy in Appendix G.

I, VIII, 5.

(The time is not yet in sight when any other country is likely to outstrip her in opportunities and incitements to large enterprises; and therefore her share in industrial leadership is likely long to remain of an exceptionally large mould. In fact no leadership quite like hers is to be expected from any country, which cannot rival both the largeness of her national resources, and the alertness of her vast population.)

(The world contains undeveloped resources many times as large as hers: and, though her success owes less to her resources than to the exceptional force of character of the people who have come to her shores, and to the stimulus which those energies derived from exceptional opportunities for bold and rich enterprise; yet it is to be noted that the best strains of her population are not growing in numbers very fast. On the other hand the practical applications of social science to the betterment of human life are being developed by her with great ability and zeal. The new strains of her population may probably have not yet shown their strongest sides: and they may contribute important elements which, on the whole, will raise rather than lower the wealth of character that was brought to her shores in earlier years by the forcible but perhaps somewhat too individualistic immigrants from Northern Europe.

To conclude:—the life of North America was for several centuries in the main a continuation of the lives of several countries of Western Europe. But Holland, Spain and France gradually yielded place to England: and from 1760 to about 1850 the life of North America was dominantly British. After that, immigrants from Germany and Scandinavia became prominent; to be followed later on by Italy and by countries of Eastern Europe. Now, nearly the whole of Europe lives again in North America, Britain holding the lead.

And Britain leads elsewhere. Australia and New Zealand are British colonies in the fullest sense of the word; South Africa is predominantly British, but largely also Dutch and partly cosmopolitan. This cosmopolitan element in South Africa seems to foreshadow, more distinctly even than the cosmopolitan element in the United States, the beginning of a new era; in which the influences exerted by relatively old countries on those whose resources are not yet developed, will depend less

on consanguinity and racial inheritance, than on similarities of opportunity and of need: or, to use a more general term, "of circumstance." In so far as this view holds ground, it may be expected that the United States will be in some sense the parent of all others of whatever races they may be peopled, which begin to develop large physical resources with new born energy and alertness. I, VIII, 8

6. *Some slight speculations as to future homes of industrial leadership.*

Those ideas which make for industrial progress have not been the exclusive property of powerful industrial countries. Many of them have come from the smaller countries of Europe: Italy and Scandinavia have been important contributors. But, so long as the main conditions of economic development remain nearly as they are now, the chief initiative seems likely to lie with countries whose great size, rich natural resources, and accumulated capital enable them to concentrate large and highly organized mental and material appliances on the translation into practice of the architectonic ideas of the scientific student and the inventor. The difficulty of forecasting the future in this matter is increased by the growth of these ideas, more than it is diminished by the accumulation of exact knowledge as to the resources of the world, and as to the people who inhabit it.

For instance, the growth of mechanical technique, especially on the American model, increases generally the advantage which a large, but unified and compact, country has in massive production. But Australia and Canada, though well-endowed with natural riches and inhabited by alert populations, suffer from lack of compactness; and their prospects of leadership may be materially affected by inventions that lessen the hindrance arising from this defect. Not long ago communications through the air by telegraphic instrument, telephone and aircraft were not in sight; but even the last is now regarded as a possible aid to ordinary intercourse. If each decade of the next two hundred years should be merely as prolific of inventions as each of the last two decades has been—and that is a low estimate—the conditions which now in some measure limit the scope of industrial leadership to compact countries may have passed away. But though

I, VIII, 6. \ we cannot look forward far, we may look a little way, and venture on guesses, which may at all events suggest some reflections as to the present: though their value as prediction is of the slightest.

Canada is to some extent a partner with the States in leadership. There is a constant interchange of methods between the two: "American" discussions relating to railways, monopolistic combinations and similar matters, cross the frontier into Canada with little sense of change of atmosphere, such as is palpable when they range to any other country. Her main route from Montreal to her Far-west lay not long ago to the south of the Lakes, through Chicago: but railways are at last penetrating the poor land to the north of the Lakes; and the unification of her East with her West is likely to move the faster, the further it goes. This is indeed partly because the stock of free good land in the States has been exhausted: and it has been found that the rigours of the long winter in the Canadian North-West are less hostile to wheat farming and even to mixed farming than had been supposed. Thus the tide has turned back, and Canada is receiving again her own with increase: for the farmers, who throng into her new wheat lands from the States are men of many races, but are alike in having trained faculties and aptitudes for their work, and in being already supplied with adequate capital. The severity of her climate, which hindered her progress at first, is now selecting for her benefit those individuals who are most able and willing to encounter physical difficulties and hardships; and a vigorous future seems to lie before her.

South Africa has shown great energy under difficulties. Her gold and diamond mines bring wealth, though they do not greatly develop industrial leadership of a western type: but the solid strength of the British and Dutch population, now happily united, may pioneer new and more successful methods of intimate cooperation between white and black races. Her distances are great, and her means of communication still slender: but her resources are vast: *Ex Africâ semper aliquid novi*.

Australia is leading the way bravely in the great endeavour to bring the labouring population as a whole up to a high level of culture and physical enjoyment. It appears indeed that her

procedure involves certain forms of restriction which might prove fatal to a country whose natural resources are on less generous a scale than hers; and the rate of increase of her population is somewhat slow. This retardation, partly due to the predominance of urban conditions, has been caused in great measure by her geographical peculiarities. I, VIII, 6.

For there is a large almost vacant space in her centre: some of the land in it seems indeed to be of good quality: but its rainfall is small and uncertain, and it has not attracted a solid agricultural population. In the neighbourhood of the sea, much of the land was allowed to fall into the hands of large capitalist sheep-farmers and bore but a slender population. This evil is being remedied: but the preferential advantages possessed by Melbourne, Sydney, and other great harbours have attracted to them the greater part of the strength of the people. Most of her communications have been by sea: but a considerable network of railways is growing up in the neighbourhoods of Sydney and Melbourne: and the splendid energies of her people may be trusted to develop the natural resources of their great country in spite of difficulties. New Zealand is on a smaller scale: but her racial and physical conditions are highly favourable for the evolution of the best British tendencies.

Passing away from European races, we find in Japan a bold claimant for leadership of the East on lines that are mainly Western. Her insular position, contiguous to a great Continent, is almost as well adapted for the development of industry and trade as that of Britain. She has learnt so much during the last thirty years, that she can hardly fail to become a teacher ere long. It seems indeed that stronger food than they now have will be required to enable her people to sustain continuous, severe, physical strain: but the singular power of self-abnegation, which they combine with high enterprise, may enable them to attain great ends by shorter and simpler routes than those, which are pursued where many superfluous comforts and luxuries have long been regarded as conventionally necessary. Their quick rise to power supports the suggestion, made by the history of past times, that some touch of idealism, religious, patriotic, or artistic, can generally be detected at the root of any great outburst of practical energy.

I, VIII, 6.

India, though less agile, is developing renewed vigour and independence in industry as in thought. She is the home of some of the greatest thoughts that have ever come to the world; and the originator of many of the subtlest and most artistic manual industries. She has suffered in the past from lack of unity, and a scarcity of power for manufactures and transport. But she may yet be found to have considerable stores of coal: and some of her regions may be enriched by electrical energy derived from water power. The rapid recent rise of her larger industries is a source of just pride to her, and of gladness to Britain.

Great futures may also await Russia and China. Each is large, continuous and self-contained: each has enormous resources, which could not be developed so long as good access to ocean highways was a necessary condition for great achievement. Their populations differ in temperament; the persistence of the Chinese being complementary to the quick sensibility of the Russian: each has inherited great powers of endurance from many generations of ancestors who have suffered much. But recent events obscure the outlook.

Up to the present time a tropical climate has been fatal to the best energies of races, however vigorous. It has not indeed extinguished either the subtlety of their thinkers or the physical strength which their workers can exert for short periods; but it has been hostile to the power of undergoing severe continuous strain of mind and body. The tropics contain however much rich land and mineral resources. These are indeed of little avail except where a good supply of water can be obtained. It is needed, not only for domestic uses, but also (in default of any other means) to enable the energy contained in the sun's heat to be converted by aid of various cooling processes into mechanical power. This is another direction in which the progress of technique may possibly alter the conditions of industrial leadership. But for the present it may be concluded that there is no sure ground for thinking that industrial leadership will remain always with the same races, or in the same climates, as in recent times; nor even that its general character will remain unaltered.

CHAPTER IX

TRANSITION TO PRESENT PROBLEMS OF INDUSTRY AND TRADE

1. *The foundations of modern business in general confidence and credit.* I, ix, 1.

The present chapter is designed to afford a link between Book I and Book II by applying some indications, furnished by observation of past phases of industry and trade, as part of the basis for a study of business under present conditions.

✓ A chief feature of economic evolution has been the gradual emergence of the notion of a "business point of view" in regard to the affairs of life. That phrase could not have been understood in a primitive society; and there is a sense in which it may be argued that business operations are merely one drift of a tendency to adapt means to ends, which is universal throughout all forms of life. Biology is indeed discovering numerous ways in which inheritance and natural selection—supplemented by the imitation of the successful actions of parents and other older individuals, and by other post-natal influences—have enabled even low grade animals so to adjust their structure and their operations to their environment, that they may be able to utilize it for their own benefit with ever increasing ease, efficiency and certainty¹.

¹ This remark does not assume that acquired faculties are inherited from parents by children at their birth: it is sufficient for the argument that children automatically imitate the actions of those by whom they are surrounded, and are especially sensitive to suggestions from the examples of mother and father: while acquired skill and faculty in small matters, as well as in large, pass from parents to children by definite instruction. But a protest may be permissible against the pretensions of some exponents of Mendelian doctrine that arithmetical averages of observation of inheritance by mice and vegetables afford

I, ix, 1.

Most of these adjustments are in regard to the functions of individual members of a species separately: but one large part of them has to do with the military organization of the various members of a group, and another and yet larger part with their business organization. It is probable that anthills and beehives have been highly organized business concerns during very many more centuries, than those which have seen human business organizations of equal complexity and efficiency: but, so far as we know, the organization of ants and bees has been automatic and unconscious, without direction by foresight and deliberate contrivance. On the other hand there has been some element of conscious adaptation of means to ends in nearly every organization of human business. And, though the automatic elements preponderated greatly over the conscious and deliberate elements in early phases of economic growth, yet changing conditions were gradually met by quiet adjustments. Elementary, partial division of labour grew up between individual members of the same family, between families, and between neighbouring villages, or clans. Here were the origins of business trust and confidence, which were indeed enforced within each group by the social penalty of ostracism: an offender against his neighbours became an outcast, often without refuge.

As small communities merged and increased in size, an offender could more easily move from the scene of his transgression. The extension of neighbourliness lowered its intensity; and in consequence the trust between neighbours became less habitual and instinctive. In other words life became in some degree "business-like"; and ere long the transactions between neighbours began to be governed by arithmetical comparisons

conclusive proof that the characters which children bring into the world with them, are incapable of being affected by the past mode of life of their parents. Mendelians do not claim to know what causes originate differences between elementary germs: it seems to be certain that changes in the mental and moral habits of a human being are reflected in his face: and Mendelian arithmetic has little direct bearing on the question whether the nutrition supplied to germs in the body of a person excessively addicted to drink or other sensual indulgences may not result in the birth of a child with less firm character than it would have had, if the parent had lived soberly and chastely. Some Mendelians concede that it does: and the gradual development of trustworthy statistics of inherited mental and moral characters may ultimately lead to further admissions in the same direction.

between the value of that which was given, and that which was received in exchange. I, ix, 1.

The traders who bought goods in one locality and sold them in another were distinctively business men. But the greater number even of them seldom needed to look long ahead or very far afield: partly because they were in personal touch with those from whom they bought, and to whom they sold; and were thus directly cognisant of nearly all changes (except those arising out of war, famine and plague) which were likely to upset their calculations in the short time over which each such transaction generally ran. On the other hand a broad confidence in the steadfastness and efficiency of large and various markets is a necessary condition of the highly complex modern division of labour among producers, and between producers and middlemen: for indeed almost every considerable operation of business involves some speculation based on well-informed confidence. The whole mechanism of society rests on confidence: it permeates all life, like the air we breathe: and its services are apt to be taken for granted and ignored, like those of fresh air, until attention is forcibly attracted by their failure. When confidence is shaken by a rumour of war or of civil commotion, or of disturbing financial legislation, or of extensive frauds or rash trading by important firms, then business life is stifled; and men yearn for the wholesome atmosphere that is associated with the general re-establishment of confidence¹.

This trust contains a personal element: but it contains much more. For most of those on whose actions anyone relies are personally unknown to him. It is sometimes called "commercial credit." But that term seems not to cover the whole of it: we may call it "*social credit*." It is analogous to personal credit. But it is also, and for the larger part, trust in

¹ The methods of business in the remoter districts of New England a century ago throw much light on those of Mediaeval England: the light is all the brighter, because high intelligence and cultured thought were being brought to bear on crude material conditions. Professor Sherwood (*Quarterly Journal of Economics*, VIII. p. 157) tells how his grandfather used to dress flax for the ropes and grain bags needed on his farm, and to make his own shoes; but slowly gave up the habit, as the growth of markets around him gave him a double confidence that he could advantageously dispose of his grain to one set of people, and obtain his ropes and shoes from another.

I, ix, ¹the character of society; in the stability of public order, in freedom from disturbance at home and from foreign attack; in the gradual and harmonious development of economic conditions; in the probity and reasonableness of people generally, and especially business men and legislators; and—to lay special stress on one important detail—in the solidity and good working of that currency which acts as a medium of exchange and a standard measure for gauging economic obligations and transactions of all kinds. The breadth, persistency, and fluidity of modern markets enable the producer to make things on the “speculative” chance of selling them, with a reasonable confidence that he knows beforehand approximately the price at which he will be able to sell them; whether they be finished or half-finished commodities, or raw materials, or implements that have no value except to people engaged in other industries—people whom he has perhaps never seen, but with whom the wide ramifications of business keep him in constant, if unconscious contact.

The modern producer throws all his energies into one particular group of operations, trusting that the same market organization, which secures for him in advance approximately known prices for his sales, will enable him to buy at approximately known prices such things as he may want; whether they be small supplies of personal necessities and luxuries drawn from distant regions of the earth, or relatively large supplies of just those highly specialized kinds of raw material and implements which are used in his work.

The merchant, the broker, and the financier are those who are most directly concerned with the machinery of modern marketing, and with the stability of the social credit; just as fire insurance companies are most directly concerned in provision against fire. But a general reduction in the risks of fire, which would be an unmixed gain to the general public, would bring loss as well as profit to the insurance companies: and those who have profited most in the aggregate by the growing efficiency and stability of social credit, and market organization are the producing class rather than the trading class; and the general public has gained most of all.

2. *A preliminary review of changes, which sometimes render a very large manufacturing or mining business in a measure independent of other industries in its neighbourhood. A note on the meaning of the word "productive."* I, ix, 2.

Economic progress has at last undermined some of the foundations of Petty's great rule that "Each country flourisheth in the manufacture of its own native commodities." But yet most of them remain, though changed in form; and they are now, as formerly, intermingled with, and sometimes confused with, the advantages which an industry derives from a large home market. In Petty's time, and very much later, people worked of course much for themselves in their own houses on whatever materials Nature supplied liberally to their hands; and, when a specialized industry began to take the work over, it found a large home demand ready to encourage its development. Abundant raw material, and a large market for the finished products, developed ever more highly specialized skill in the main industry, and ever stronger subsidiary industries to supply its incidental requirements, and to work up its waste products. Each single business was on a small scale; and though it had access to many of the economies of production on a large scale, these were *external* to it, and common to the whole district.

For long ages industrial leadership depended mainly on the number and extent of centres of specialized skill in which these external economies abounded: a relatively small importance attached to those *internal* economies which any single business could attain by the elaboration of its own plant, and to the subtle division of labour between its own employees. But with the growth of capital, the development of machinery, and the improvement of the means of communication, the importance of internal economies has increased steadily and fast; while some of the old external economies have declined in importance; and many of those which have risen in their place are national, or even cosmopolitan, rather than local.

Associated with this change there has been some shifting in the relative importance of different orders of industrial capacity relatively to one another and to capital. The supply of skilled labour has increased: but, partly under American

- 1, ix, 2. influence, machinery has covered so large a range of work that a comparatively short training enables a youth, who is naturally alert, to control a manufacturing process that not long ago would have required the work of a great number of artisans.

Skilled labour is indeed better remunerated than ever before. But while the earlier stages of machine production tended to raise the wages of skilled labour even faster than those of unskilled; the later stages have tended to diminish, relatively at least, the volume of the demand for that sort of highly developed manual skill, which requires special training from boyhood upwards. There are a few industries in which a considerable supply of skill of this kind is as imperatively necessary as ever: and an attempt to start such an industry in a new home has great difficulties and risks. But the chief need of the large majority of modern industries is for alert intelligence, good judgment, promptness and trustworthiness in conduct on the part of the more responsible employees. Where this need has been met, resolute and capable men and women can generally be found who will quickly acquire adequate familiarity with the materials, the plant, and the operations of the industry. Such an industry can be started by a powerful firm; if it imports a considerable staff of leading men into a district, the population of which is energetic and has a fair share of alert intelligence. Modern facilities of communication by railway, and motor traffic; by post, telegraph and telephone facilitate this independence of local aid: and a powerful firm can sometimes set up a railway siding of its own.

Another disruptive influence, which helps a strong business in able hands to be independent of its surroundings, is the certainty with which business success attracts capital. It is often more difficult for a small business to borrow a thousand pounds than for one, which is ten times as large, to borrow fifty thousand: and there is practically no limit to the amount of capital that the public is ready to place at the command of a joint-stock company, which has already done great things, and is believed to be in strong hands. For indeed the stock of capital has grown so much faster even than the scope for its use in

industry, that capital is always at the command of those who have I, ix, 2. both the mental faculty and the moral character needed for turning it to good account.

The keynote of this change was struck by the American Francis Walker, who said as early as 1876 that the man who has the faculties required "to shape and direct production, and to organize and control the industrial machinery... rises to be master of the situation. It is no longer true that a man becomes an employer because he is a capitalist. Men command capital because they have the qualifications to profitably employ labour. To these captains of industry... capital and labour resort for opportunity to perform their several functions¹."

The drift of capital and labour to the control of the best business faculty within a country is gaining force, and is being accompanied by a similar drift from one country to another. The great business energy of Germany attracts to her industrial districts labour from countries in Europe equally well endowed by Nature. The great business energy of the United States has caused her population to increase very rapidly, even after her best natural resources have passed into private ownership, and the new comer might be able to obtain elsewhere better opportunities of becoming the owner of rich land with but little outlay. It is true that these countries have not recently borrowed very much external capital for public and private investment to match the increase of this population; but the reason is that indigenous capital has been growing very fast in Germany, and at a stupendous rate in the United States.

And again a new keynote is struck:—"A few managing Britons or Americans can now readily be obtained to establish manufactures in any part of the world, and educate nations to become satisfactory workers... The seat of manufacturing is now, and will continue to be more and more, simply a question where the requisite materials are found under suitable conditions. Capital and labour have lost the power they once had to attract raw materials; these now attract labour and capital²." This keynote may perhaps have been struck a little too sharply. But it is certainly true that manufactures on a large scale can

¹ *The Wages Question*, ch. xiv.

² Carnegie, *Rectorial Address at St Andrew's*, 1902, pp 7, 8.

- 1, ix, 2. be created, wherever the resources of nature are favourable, much more quickly than was possible before the recent developments of mechanical processes of production. It is no longer necessary that several generations of workers should successively be trained to a gradually higher pitch of specialized skill. And, what is in many cases almost as important, a new industry is not as dependent as formerly on the parallel development of subsidiary industries in its neighbourhood, which may supply its minor wants and turn its by-products to account. Machinery and other implements can now be brought from almost any distance in standardized shapes; and the other services, many of which used to be rendered by subsidiary industries, can now be performed in subsidiary workshops, erected for the purpose by a single vast factory.

The great business, which is set up far from cognate industries, has to trust very much to its own resources not only on its "productive" side, but also in regard to marketing; that is in regard to buying what it needs and selling what it produces. This points to the facts, which will receive much attention later on, that an increasing part of the activity of a manufacturing firm is now given to marketing; and that indeed the line of division between production and marketing is increasingly blurred.

According to popular usage agriculture, fishing, mining and manufacture are productive, because they produce new goods *into the field of business*: while transport and commerce merely change the positions and the ownership of goods which are already in that field. But man does not make coal, he merely transports it from its bed to the surface; and thus makes it potentially useful; its usefulness is nearly complete when delivered by carrier and merchant into a private cellar; and is quite complete when delivered by a domestic servant to the fireplace. Thus the common distinction between "productive" industries and others rests on no scientific basis. But it corresponds to a division, which plays a considerable part in economic studies; the objections to coining a new term to take its place are very great; and for the present at least we must be content to use it¹.

¹ The student of science whose discoveries promote the advance of manu-

3. *General causes which have given to the leaders of productive industry much of the prominence and responsibility, that formerly belonged almost exclusively to great merchants.* I, ix, 3.

The chief beginnings of bold capitalistic speculation were in the long distance trade, and especially in that between different countries. As has already been noted, it was relatively small in volume, being confined mainly to a few fine and costly manufactures; and to things, which could be obtained only by special favour of Nature in particular places: but, slight as it was, this trade was the chief training ground for those faculties which distinguish the master minds in business at the present day. In it alone was there large scope for economic initiative and far-reaching foresight; for the power of controlling great numbers of subordinates of all ranks, from the unskilled porter to the highly responsible officer who was often at once captain of a ship and chief administrator of a large moving storehouse of valuable goods. During long ages the land and the authority of Government were indeed the chief sources of great accumulations of wealth: but gradually even powerful rulers began to lean for financial support on the shoulders of those who had reaped the harvests of large mercantile business¹.

facture has as good a right in the abstract to be called productive, as the commanding officer has to be called a soldier, though he may not handle any weapon.

¹ Of course every great empire of early as well as of recent times has afforded a training ground for the faculties of organization and administration in regard to the affairs of Government in peace and war; and, in the hands of a man possessing business genius and aptitude, the work sometimes reached a high standard of technical excellence. But the proceedings were based on force rather than on free bargaining: arbitrary decisions governed incomings and outgoings alike; and those who amassed large fortunes from handling the public revenues, from selling privileges, and even from the ownership of large tracts of land, were not always endowed with high constructive faculty. The resemblance of the fortunes of Richelieu, Mazarin and Fouquet to those of predatory Roman Proconsuls has been made familiar by Dumas. The large share of the fortunes of eminent merchants, which was derived from the necessities of King and State on the Continent generally, is indicated by Ehrenberg, *Das Zeitalter der Fugger*. M. d'Avenel (in *Les riches depuis sept cent ans*); and his suggestive chapter "De quoi se composaient les anciennes fortunes," of his *Decouvertes d'histoire sociale* discusses the importance of ransoms as a source of wealth; and observes (p. 260) that a prisoner served as a sort of negotiable bill of exchange, according to his ransom, with which a debt might be paid.

I, ix, 3. ✓ Merchants were the "Venturers" or "Adventurers" from whom modern enterprise descended. They had a large part in the coordination and the finance of localized manufacture, as soon as it began to outgrow the capacity of the small master working with two or three assistants. The clothiers and other merchants, who let out wool to be spun and woven to their orders on the Yorkshire streams at the end of the eighteenth century, were men of a larger scope than the "manufacturers": and Liverpool Merchants looked down upon the Manchester cotton spinners, even after a hundred years of mechanical inventions had raised the capitalist manufacturer up to the level of leading merchants in regard to the magnitude of his operations, and had entrusted to him a greater responsibility than theirs as a leader of men. It may possibly be true that no industrial leader of recent times has excelled Watt and Stephenson in creative faculty, or Boulton in administrative: for they were forced to rely mainly on their own strength; whereas only a small percentage of those ideas, which are turned to account in any existing business, were created in that business. But yet the work of some great manufacturing and other productive businesses in the present age has demanded a combination of faculties almost as rare as those of Watt and Boulton; together with other acquirements and resources which were not in demand, and were not forthcoming, in the earlier age.

✓ This development is the result of many causes: most of which are connected with the magnitude and complexity of modern industrial operations, and their intricate relations to and dependence on one another. The stage has been passed at which a great idea is almost self-sufficing: it has to be elaborated in connection with others already in possession of the same or neighbouring parts of the industrial field; and its application is therefore not an act, but a long process, ✓ needing patience and large resources of mind and perhaps of capital. For instance, when a new mechanical idea has been created, its translation into a smoothly-working business machine generally involves a long series of experimental stages: the constant increase in the size and complexity of the machine-unit often causes such an experimental stage to need the consideration of many more side issues than formerly; and

perhaps to cost hundreds or thousands of pounds, where tens or hundreds would have sufficed for the simpler and smaller appliances of a few generations ago. There is therefore a large class of improvements, of which prominent examples may be found in the heavy steel industry and again in the manufacture of monster printing presses or other machines, which are beyond the range of anyone who does not unite the command of a great business concern, with the possession of high faculty for appreciating new inventions, if not for creating them. Again, most of the so-called "chemical" industries, together with others in some of those connected with metals, glass, oil, explosives and other things, which are not commonly regarded as chemical, offer exceptional opportunities for those great business men in Germany and elsewhere, whose genius is partly scientific, and who have founded laboratories within their own works. So far as these considerations are concerned, the growth of large industrial capitals tends to promote technical progress: the inclination of the great manufacturer to take a direct interest in engineering chemical and other studies works wholly for good in raising the prestige of industry.

Again, a progressive business must sometimes rouse an interest in its improved and new-fashioned products: and if they are very expensive, as for instance electrical power plants are, the marketing side of the business must be very strong and enterprising and courageous: he who can discharge these functions adequately must include among his qualities and aptitudes those of a great merchant.

Lastly the administrative head of a giant business must hold together several thousands of employees of various grades in an order which, while harmonious and disciplined, yet elicits their individual and spontaneous enterprise: and for this he must have some of the chief qualities that are required of the commander of an army. He is not a "captain" of industry; he is a "general" in control of several regiments.

Thus it appears that the term a "large business" has become ambiguous. Not very long ago a business was almost always concentrated in one place: it might have agencies and branch offices elsewhere; but they were under the control of the central bureau. Now, however, a single company frequently owns

1, ix, 4. several large establishments engaged in the same or allied branches of a great industry; each of them being self-contained as regards plant, material and executive, though all are under the same supreme financial control. So far as technical efficiency is concerned, each of these establishments is a separate business. But the central control can bring the experience of each part to bear in guiding the whole: and can defray the costs of large experiments, the benefit of which will be available to the whole. Again, each may have some advantage in being secure either of a good market for its products, or of a good supply of its own requirements in half-finished products, from some of its sister establishments acting under orders from the directors of the one financial business that includes them all. Further the technique of each establishment may be indirectly strengthened by the opportunity afforded to it of keeping expensive specialized plant in nearly continuous activity on a relatively small range of work; while other parts of orders, coming to the central bureau, are told off to different establishments, which also work intensively within a narrow range. In so far as this can be done the technical efficiency of the business as a whole appears to correspond rather to its aggregate capital than to that which is invested in any one of its establishments.

In fact, however, the question is much more complex than this. "No one is so wise as all the world"; and no single business is as powerful as the whole industry to which it belongs. A large open market effects an automatic distribution of tasks to those establishments which are severally best fitted for them. The domination of a few large businesses may impair the efficiency of the open market; and the aggregate technical efficiency of the country may be less than if each large establishment had been less independent¹.

4. *Some observations on the assumption that social and economic tendencies, which are general and seem natural, are to be accepted as inevitable and beneficial.*

Increasingly throughout our coming study we shall be concerned to inquire how far industrial progress is dependent on

¹ The subjects of this Section are considered more fully in Book II; and reference is made to some of them in the last chapter of the volume.

individual and how far on collective action: how far it depends on ceaseless initiative; and how far on broad ideas and knowledge, which when once acquired pass speedily into common ownership; and become part of the collective wealth, in the first instance of the countries to which the industries specially affected belong, and ultimately of the whole world. We must consider how the embodiment of a new knowledge or a new idea in a new or improved industrial implement or method is likely to require the control of a large capital. We must examine the limitation which this condition imposes on the utilization of the world's stores of creative faculty in the development of the material sources of well-being. We must inquire how far the gains, which accrue to a giant business as the apparent results of its fine initiative and its prudent courage in taking financial risks, are really its own; how far such gains are increasing the dominance of large capitals; and lastly how far the tendencies thus resulting are desirable, and how far they are inevitable. I, ix, 4

Even thoughtful men are still often in some measure under the dominion of the old notions that those changes, which are general, are probably irresistible; and that to resist them is flying in the face of nature. But subordination to natural tendencies, when pushed to its extreme logical issue, is blind fatalism. It is true that capitalistic aggregations, approximating to the mechanical routine of a socialistic bureaucracy, have so far been most prominent where economic progress has been most rapid; but so also have the pallid faces caused by a scarcity of fresh air and sunlight. Sources of individual or social decay are sometimes most dangerous, when they are associated with great achievements, and rich benefits.

Darwin's "law of the survival of the fittest" is often misunderstood; Nature being supposed to secure, through competition, that those shall survive who are fittest to benefit the world. But the law really is that those races are most likely to survive, who are best fitted to thrive in their environment: that is, to turn to their own account those opportunities which the world offers to them. A race of wolves that has well organized plans for hunting in packs is likely to survive and spread; because those plans enable it to catch its prey, not because they confer a benefit on the world.

I, ix, 4. The common opinion is, however, not as wholly false in substance as it is in form. For almost every increase in power, which any race of men has acquired, can be traced to some social qualities which have enabled that race to overcome the difficulties that lie in the way of obtaining the necessaries and comforts of life; or to overcome its human enemies, or both. Success in war may indeed be partly due to ferocity of character. But, though it could perhaps not have been predicted *à priori*, the social qualities, habits and institutions of a conquering race have in the past generally been of a stronger fibre than those of the conquered. The temper which enables wolves to maintain the discipline of the pack, has in it something that is noble; and the world has in fact gained a good deal from those qualities which have enabled the dog, a domesticated wolf, to take a high rank among living creatures. But man is not bound to follow the slow steps by which the race of wolves has passed through disciplined ferocity to higher things.

Again, by aid of "natural selection" certain insects, and flowers from which they gather honey, mutually modify one another, till the insects ensure themselves an abundance of food by the untiring efficiency with which they fertilize the flowers. And in like manner, while it is true that those institutions tend to survive which have the greatest faculty for utilizing the environment in developing their own strength; it is also true that, in so far as they in return benefit the environment, they strengthen the foundations of their own strength, and thereby increase their chance of surviving and prospering. On this account then we may admit that the mere existence of broad tendencies towards the dominance of the joint-stock form of administration and towards combinations of semi-monopolistic scope, affords some reason for thinking that these tendencies make for the public good. But it is only a *prima facie* reason, and not a very strong one.

The earlier socialists, neglecting the teachings of history, constructed ideal societies, which probably would have been unstable even in a world consisting solely of people, whose unselfish love of humanity was as eager and unalloyed as their own. Marx and his followers resolved to be practical, and argued that history showed a steadily hastening growth of large businesses

and of mechanical administration by vast joint-stock companies: and they deduced the fatalistic conclusion that this tendency is irresistible; and must fulfil its destiny by making the whole State into one large joint-stock company, in which everyone would be a shareholder. But no one would have much scope for independent initiative, and a glib tongue would be likely to give a man more prominence and influence than could often be attained by originality and energy: while those, who just escaped discipline as sluggards, might often have an unduly easy existence. I, ix, 4.

BOOK II

DOMINANT TENDENCIES OF BUSINESS ORGANIZATION

CHAPTER I

THE ADJUSTMENT OF PRODUCTION TO DEMAND IN AN OPEN MARKET

II, I, I. 1. *Some introductory observations.*

The general relations of Books II and III to Book I have already been indicated: the growth of massive production, and the ever increasing size of the representative business unit in almost every branch of industry and trade, which have moved with ever increasing speed during recent centuries, are now to be studied in their present forms, and with some regard to their probable future tendencies. It remains to add a few words here as to the relations between the methods of business in open markets, with which alone Book II is concerned; and those in markets in some degree under monopolistic control, which are the subject of Book III.

The line of division between the two classes is indeed indistinct: they shade into one another by imperceptible degrees. And, further, "competition" and "monopoly" do not cover the whole field of industry and trade. Some good work is done and more might with great advantage be done by associations which aim at the joint performance of special tasks. Some of this "cooperative work," in the original use of the term, has long been done by several Institutes of Engineers and others,

whose interests are partly of a professional and partly of a business character. II, r. 1.

In this respect British business men may profit by a study of the constructive part of the work of German cartels: for that can be separated from their control of marketing, and in some cases of production, in the pursuance of monopolistic ends. Such associated efforts need not encroach on the freedom of each business to manage its own affairs in its own way: they are entirely in accordance with the frank and generous character of the British race; and they have been developed rapidly in several directions, with the patriotic purpose of facilitating the provision of munitions and other requirements of the country during the World-war.

No doubt such cooperation is not in harmony with that of aggressive competition, which was frequently to be observed among the crude, though energetic men, who mastered English industry in the first half of last century. They were, no doubt, often inclined to regard business as a species of warfare, in which every man's hand must be against his neighbour: and they sometimes found more pleasure in the empty defeat of competitors than in an increase of solid prosperity, which was shared by all. And some prominent writers have disparaged the spirit of economic freedom by the assumption that it involves that old bitter contentiousness. But in fact there is no necessary connection between the two. The representative British business man of the present century has a broader mind and a more generous character than such an argument assumes: his progress in mind and character towards higher things during recent generations is one of the most notable changes on record.

It is however true that the complacency, which was generated by too easy success in the third quarter of last century, has not yet wholly disappeared from all branches of British industry¹. Many opportunities and occasions for cooperative effort, especially in relation to the scientific problems of industry, have been neglected; and the World-war found so much to be desired in this respect, that the active intervention of Government became more urgent than might otherwise have been the case. But so hearty has been the response in nearly every industry to the

¹ See I, v, 1, 2.

11, 1, 2. 2. *Ambiguities of the terms Market, and Cost of production.*

The term *market* is used in many different connections; and in scarcely any two has it exactly the same significance. This difficulty has its origin in the ordinary discourse of life; where the context, or a special explanation, indicates the particular use of the term intended: and economists are compelled to conform, in this as in many similar cases, to general usage. But a short account of the chief groups of these various uses will be proper to our present purpose¹.

(In all its various significations, a "market" refers to a group or groups of people, some of whom desire to obtain certain things, and some of whom are in a position to supply what the others want. A market may consist of all the inhabitants of a town, or of the whole country: or it may consist in effect only of those of them who have a special interest in something, as for instance zinc or leather. In some cases, dealings over the whole Western World may be worked out in such constant unison as to justify the phrase "world-market." Everyone buys, and nearly every producer sells, to some extent in a "*general*" market, in which he is on about the same footing with others around him. But nearly everyone has also some "*particular*" markets; that is, some people or groups of people with whom he is in somewhat close touch: mutual knowledge and trust lead him to approach them, and them to approach him, in preference to strangers.) A producer, a wholesale dealer, or a shopkeeper, who has built up a strong connection among purchasers of his goods, has a valuable property. He does not generally expect to get better prices from his clients than from others. But he expects to sell easily to them because they know and trust him; and he does not sell at low prices in order to call attention to his business, as he often does in a market where he is little known.

(The demand and the supply of a modern market are not definite stocks on hand at any time, but streams flowing at various rates during a year or some other appropriate period. There are a few exceptions. For instance, in a market for fish

¹ See the concluding remarks of Appendix A

on a hot day, with no access to cool storage, the supply is merely the stock in hand; and the demand is a short sharp movement on the part of a compact group of people. (But as a rule supply is a gradual process, liable to be influenced at every stage by varying facilities for production, and varying expectations of the terms on which the product can be marketed.) II, 1, 3.

The term *cost of production* is commonly used in two very different senses. (Where the affairs of a particular business are under discussion, it always means *money cost*;) that is, the aggregate of the outlays in money, that are incurred directly or indirectly in the production of a certain thing. Among these are commonly included a reasonable rate of profit, together with insurance against risks: remuneration of the work of the owner of the business does not appear as a separate item in the accounts; but goes with interest on capital under the head of profits.

(But in the discussion of social problems, it is often necessary to inquire whether certain businesses, which may or may not be adequately remunerative to the persons concerned, are worth what they cost to the country or the world: and in this connection the term cost of production refers to real cost. The *real cost of production* of a thing is the aggregate of efforts and sacrifices which are incurred in its production.) Thus the work of very young children in factories, even though paid for in money at the full market rate, is seldom worth its real cost: the satisfactions, which are derived from its contributions to production, are not worth the social cost of child life spent in grievous and depressing toil, and without an adequate education to prepare for the duties of after life¹.

A little care in wording will avoid all confusion between real and money costs of production. (But there is another difficulty about the term "*cost of production for a market*" which is apt to be overlooked, and calls for careful attention. The manufacturer, or other producer, adjusts his production to his market so as to obtain for himself the greatest net excess of receipts over

¹ The degree of correspondence between the price paid for any particular industrial work and its real cost, though a matter of vital importance from the social point of view, is not very closely connected with the subject of this Book. The relations of risks to costs are considered in II, vi.

11, 1, 2. his "expenses" or "money cost" of production; with due allowance for his own trouble and risk, and for the use of his capital.

Until goods are marketed their production is seldom of much avail in the modern world: and there is no uniformity of practice on the part of manufacturers and other producers as to the extent to which they themselves incur labour and expense on behalf of the marketing of their goods. A manufacturer may sell to wholesale dealers who, after inspecting his goods on his premises, take their own measures for bringing them, together with other goods, to the notice of retailers: but even he must incur trouble and expense in attracting the attention of the merchants: and remuneration for this has to be included in the price received by him; for otherwise he would not earn profits adequate to his outlay. Heavier costs for marketing are incurred by a manufacturer, if he sends round incessant streams of expensively equipped travellers to dealers of various sorts: and much heavier still, if he also advertises largely in order that the general public may demand goods bearing his name or trade-mark from the dealers.

Considerations of this kind will be found to underlie the general reasonings of economists as to the relations between demand, supply, and value; but perhaps they have not been made sufficiently prominent. The rule is simple. When considering the operations of demand and supply in governing price in any general market, we must aggregate the expenses up to one and the same point in regard to every transaction; and take the demand price at that point. The customs of each particular branch of industry and trade indicate the most convenient point for this purpose: it is generally the point of delivery to a wholesale dealer, and less frequently to the retailer. In a few cases, such as that of bread, it is commonly the point of delivery to the ultimate consumer, either at his own house or when fetched by him—a difference in detail of some practical importance¹.

¹ A manufacturer sometimes sells in his own shops to the ultimate consumer goods such as are generally sold to a middleman; and then his point of delivery may be reduced back close to the customary (manufacturer's) point by deducting the expenses, direct and indirect, of his shops together with allowance for his own trouble and risk in regard to them, from the total expenses of his business; and at the same time deducting the *gross* profits of the middle-

3. *Increased supply, demand being constant, lowers price both immediately and ultimately; though in various degrees for different things. Increased demand for a manufactured product generally sets up forces tending to lower cost, and therefore price, except when increased supplies of raw material can be obtained only at greater cost: but its immediate effect is always to raise price.* II, 1, 3.

So far little account has been taken of the time required for the development of the full results of changed conditions, whether on the side of demand or supply. Economic doctrines, when expressed in short and handy form, generally neglect this element of time: they imply that certain results will follow on certain causes, leaving the common sense of the reader to supply the qualification—"provided no great change, working in a different direction, set in before the effects of these causes have time for full development." This qualification being ignored, the doctrines are taken to be unconditional; and thus trouble arises: for, though the causes perhaps begin to produce the effects assigned to them, they have not gone far before their influence is modified or even overborne by other causes with different tendencies. This shows that economic doctrines cannot be stated correctly in a few words.

(The growth of demand is in fact gradual. People take some time to learn the uses of a thing which they had regarded as beyond their means. When the price comes within their reach, the more alert may begin to use it, and others in their own class may gradually follow.) But there may be hindrances in the way: the thing itself may be of little service without subsidiary appliances that are not yet provided for general use. Thus a fall in the price of gas cannot produce its full effects on consumption till people have had time to experiment with gas-engines

men, through whose hands similar goods generally pass, from the price which he receives. The results thus reached will correspond to those suggested by an observation of the relations between wholesale demand, supply, and price. They may be faulty in particular instances: but if the profits of manufacturers who retail their own goods were habitually much greater than is indicated on this plan, the practice of the market would change: middlemen would be eliminated; and the point of delivery at which expenses and price would alike be reckoned, would be the ultimate consumer. All this, however, must be taken broadly; and subject to the reflection which will shortly be developed that the production of goods and the marketing of goods are not acts, but processes.

11, 1, 3. and gas-cooking stoves for unaccustomed uses; and perhaps not even till a gradually increasing demand has improved and standardized, and thus cheapened the gas-engines and stoves: and this growing familiarity may of course be checked by a further development of, say, electrical appliances. Again, a fall in the fares charged on a tram line or suburban railway will not have exhausted its effect on increasing the traffic, till new houses have been built near one end to accommodate people whose work lies near the other end.

In this connection it will be well to introduce an academic term, that will be much needed later on. (If a given fall in the price at which a thing is offered causes a great increase in the amount demanded, the *elasticity* or *responsiveness of demand* is said to be great; and, if it causes only a small increase, the elasticity is said to be small¹.)

(It is a general rule that a lowering of the price, at which a thing is offered, increases demand. (The increase will be great or small according as the demand is elastic or inelastic: and either a long or short time may be required for developing the extended uses of the commodity, which are rendered possible by the fall in price.) But (at all events if exceptional cases, in which a thing is driven out of fashion by a fall in its price, be neglected) the influence of price on demand is similar in character for all commodities. And, further, those demands which show high elasticity in the long run, generally show a high elasticity almost at once: so that it is reasonable to speak of the demand for a commodity as being of high or low elasticity without specifying how far we are looking ahead.

(But while the response of demand to increased supply acts on price always in one direction, though with varying degrees of intensity; the response of supply to increased demand acts on costs, and therefore on price, in different directions according to circumstances.) Its immediate tendency is to raise price: its later effect, in the case of manufactured and some other goods, is gradually to lower costs and therefore price.)

It is, of course, true that an increase in the scale of produc-

¹ If the increase in amount for each small fall of price is proportionately equal to the fall, the elasticity is said to be one; if twice as great, it is said to be two; if only three-quarters as great, it is said to be three-quarters; and so on.

tion of each manufacturing (or other "Increasing Return") industry opens out to it almost invariably opportunities for a gradual increase of the internal economies to be derived from fit coordination of more extensive varieties of specialized ability, skill and plant; as well as for the standardization of products, and for dealing in the most favourable markets. Again an increase in the scale of production of the industry as a whole, or even in that of the industries which supply its needs, tends to open to each business in the industry, whether large or small, access to improved plant, improved methods, and a variety of other "external" economies. But all these tendencies are *gradual*: some move fast; others require several years, and others again several decades for their full development.

(Even stronger cases can be found of the importance of the element of time in regard to the economies of manufacture on a large scale.) A large, standing, order for rifles or cartridges of a particular pattern can be filled more cheaply than a small one; because the large order will enable the cost of adapting plant specially to that pattern to be spread very thin over a large surface. In fact, this position is somewhat similar to that of the printing trade, which will take an order for fifty thousand copies of a book at a much lower rate than for five thousand, and at a very much lower rate than for five hundred; because the same expense of setting up type has to be incurred in all three cases. And yet a sudden and unexpected order for a million rifles, *to be delivered promptly*, could not be filled at as low a rate as one for a hundred thousand. For the larger order would require more plant: and much labour skilled and unskilled, not specially adapted to the work, might need to be forced into it. (Thus, the tendency to a rise of the price at which increased quantities of anything can be obtained (or their "supply-price") dominates as a rule all industries in regard to short periods.) It is therefore even more necessary to make explicit reference to the period of time which is allowed for the adjustment of supply-price to changed conditions of demand, than it is to make reference to the period required for the adjustment of demand-price (that is the price at which any given amount will find purchasers) to changed conditions of supply¹.

¹ With regard to short periods, and especially to the transactions of a

II, 1, 3. It is to be further observed that the effects of a steady increase in demand for a commodity on the economies at the command of the industry, which makes it, cannot be properly studied without some reference to the conditions of industries, which supply it with plant and other things. If its increased demand for their products enables it to fill its requirements at lower costs than before, then an increase in the demand for its products will enable it to lower their price more than would have been possible otherwise: and therefore yet further to increase its sales, and therefore to obtain yet further economies of production on a large scale and so on. That is to say, the economies of production on a large scale can seldom be allocated exactly to any one industry: they are in great measure attached to groups, often large groups, of correlated industries.

It is not necessary to pursue this matter further here, because so long as competition works freely throughout the industries concerned, the share which each industry in such a group obtains of the aggregate economies and gains resulting from the increased demand, is governed by broad causes; a comparatively small place being left for commercial strategy. But if any of the industries in the group are under some degree of monopolistic control, the matter becomes important, as will be seen in Book III.

So far no account has been taken of the dependence of manufacture on supplies of raw material coming from the two "extractive" industries, agriculture and mining. They are commonly classed as "Diminishing Return industries," because in them Nature's resistance to a greatly increased demand generally overbears in the long run the force derived from those resources which man provides: but in fact the constraints which she exerts in the two cases differ fundamentally.

dealer's market there is an "elasticity of supply" which corresponds closely to elasticity of demand: that is, a given rise in price will cause a great or a small increase in the offers which sellers accept, according as they have large or small reserves in the background, and as they have formed low or high estimates of the level of prices at the next market. But in the more fundamental problems of supply our primary concern is with the costs at which a given amount of the commodity can be produced on good notice; and therefore amount cannot here conveniently be regarded as a function of price.

Good cultivation will enable a field to yield the same amount of produce decade after decade in return for the same amount of labour as before: but, no improvement in the arts of cultivation being assumed, it will not, as a rule, enable an increased produce to be raised without the application of labour and capital increased more than in proportion. In other words, what is called "Diminishing Return" in regard to agriculture relates to the difficulty of increasing the *annual* flow of produce, not of maintaining that flow. But what is often called by the same name in regard to mining relates to the difficulty of getting more produce out of a mine, when its accessible and rich supplies of ore have been lessened by a given *aggregate* amount, with but little reference to the period of time over which the operations have extended. II, 1, 3.

In agriculture improved knowledge and methods are always contending against Nature's resistance to the demands made on her by an increasing population. And no guess can be made as to whether the ratio, which the agriculturist's produce bears to his efforts, direct or indirect, will increase or diminish; until it is known whether the rate of improvement of his methods and appliances is greater or less than the rate of increase of the demands which he makes on his land¹.

(Of course this tendency to Diminishing Return in agriculture is of little practical importance in a sparsely peopled country; but it may press heavily on a country, which has a dense and rapidly growing population, unless large supplies of agricultural produce can be obtained on favourable terms from abroad.) The pressure may be relieved a little, but only a little, by better adjustments, as for instance better forms of land tenure, or better education of the farmer².

¹ In regard to the action of an individual farmer, this tendency may be expressed in terms of money: but in regard to broad problems it must be expressed in terms of amounts of appliances and of products, in spite of the inconvenience caused by varieties of labour, of farming plant, and of crops. For the price of staple foods tends to rise more than in proportion to any increase of demand relatively to supply: so that the necessity for a greatly increased production from the land is likely to increase the aggregate money receipts of cultivators more than their aggregate outlays. This difficulty is often overlooked.

² It is therefore on a wholly different footing from those tendencies to diminishing return which arise when any producer distributes his resources inappropriately; as when a farmer takes either more land or less land than is appropriate to his capital: or when the number of plowing machines in a

- II, 1, 4. 4. *The cost of production which controls value relates to whole processes of production rather than to any particular parcel of products.*

(The cost of any one thing—a bale of cloth, a lawn-mower, or an engraving—cannot be definitely isolated from that of similar things made in the same process with it; that is, of things made by the aid, in whole or part, of the same business ability and organization, the same labour, and the same machinery and other plant.) In other words, the cost of production, which exercises a dominant influence on value, is the cost of a whole process. This elementary but important principle (or chief head) of the doctrine of value has already been to some extent implied in the statement that the immediate influence exerted on cost, and therefore on price, by a great increase in the demand for a manufactured product is generally in the opposite direction to its ultimate effect.

We must go far from the facts of life to get a case, in which the cost of production of a single thing can be exactly deduced from the total cost of the business in which it is made: we must imagine a steady demand without fluctuations for the products of a business, all of which are of the same kind and made under the same conditions. If a hundred things are made by it annually, locomotive factory is either so large that several of them are habitually idle, or so small that work is frequently held up to wait for the planing machine. Such troubles are not very frequent: they are transitional: they do not enter as a primary factor into the conditions of human progress: and some little confusion seems to have been caused by speaking of the permanent tendency to Diminishing Return as though it were merely a particular instance of numerous passing incidents. For they do not, as it does, materially affect the rise and decline of nations; or threaten to offer, ere many centuries have passed, a stern opposition to a further considerable increase of the population of the world.

This is not of great importance in relation to the structure of business; which is the chief matter now in hand. For indeed the reasonings, by which a farmer decides whether his capital will reach out to the profitable cultivation of an additional piece of land that happens to be available for hire, are of the same character as those by which he decides whether it will be better to buy his own steam cultivator, or to hire one on occasion. And again the reasons by which a manufacturer decides whether to put an additional floor on one of his buildings or to take a new piece of land and put a low building on it are similar to those by which he decides whether to instal an electric supply of his own or not. But, from the social point of view, land in an old country is in a class by itself: for however it changes hands from one owner to another, the country's stock of it is fixed: and this is a matter of the first importance in regard to the incidence of taxation and other large issues.

then the cost of each is a hundredth part of the total annual cost of the business: or, in other words, it is the special cost of that thing together with a hundredth part of the general costs of the business for a year. This imaginary case is commonly taken as the starting-point in discussions of value. But it is not representative; and its suggestions are misleading. (It is true that the *prime cost* of a particular thing can frequently be isolated: but its full cost cannot.) We must here go a little into detail as to this familiar distinction. (Its *prime cost*, in the narrow use of the term that is common in many industries, consists of those direct expenses for wages, coal, material, wear and tear of plant, etc., which are incurred by making it, and which would have been avoided if the process of production had stopped short of making it. But its full cost includes an appropriate share of the *general charges* of the business.)

Thus the taking of an additional order is likely to involve an increase of the wages bill to nearly the full amount of the wages paid to the artisans and labourers who work on it: but foremen and other trusted artisans are seldom dismissed even in slack times; and therefore parts at least of their wages are not prime costs in the strictest use of the term. Again, it is customary not to include any part of the office charges in prime costs; because the salaries paid at any time are but little affected by the amount of work that happens to be in hand at the time. But there are exceptions to this general rule also; for, when work is slack a vacancy in the office may be left unfilled for the time; or occasion may be taken to dismiss someone whose services are no longer desired.

(The general charges include interest on capital employed; depreciation of buildings, machinery, etc., otherwise than by actual wear and tear; salaries of officials and others who cannot conveniently be discharged at short notice; and the whole cost of building up the organization of the business both internally and in relation to its customers.) And, over all, allowance must be made for the earnings (i.e. excess of profits over interest on capital, and insurance) of the heads of the business.

The distinction between special (or prime) and general costs has always the same character: but it differs in detail according to circumstances. In particular a great part of those costs

II, 1, 5 which are properly regarded as "general" when a passing transaction is in view, must be regarded as "special" when reference is made to one which extends over a long period. This consideration is very important in connection with the division of costs between two classes of things, in the production or marketing of which some use is made of the same plant, or the same business organization. If the period in view is short, it will often be impossible to assign approximately to each its proper share of the costs which are common to both; though such an assignment can be made fairly well with reference to a long period of time. The full significance of this contrast between short and long period results is apt to be overlooked: and it will appear to hold the key to many difficulties which we shall encounter later on; especially in connection with problems of marketing in the present Book, and the next. See also Appendix J.

5. *The distribution of the general costs of a business between the various products, to which its resources are devoted: whether they are "joint" in the sense of being practically inseparable, or are produced "in common" for any other reason.*

This class of consideration is reinforced if we look at cases of a group of "*joint products*" in that narrow sense of the term in which it is not practicable, or at all events not convenient, to produce any one member of the group without at the same time producing the others. Instances of such groups are the meat, skin, and wool of a sheep; or again wheat and its straw. If the relative proportions of each of these were fixed absolutely by Nature, the cost of each group would need to be set as a single thing against the aggregate of the prices which could be got in the market for the several members of the groups. (Cost of production would have no part in determining their relative prices: that would lie wholly in the hands of demand.)

In practice, however, there are few, if any, cases of joint products the cost of production of both of which together is exactly the same as that of them alone. So long as any product of a business has a market value, it is almost sure to have devoted to it some special care and expense. If straw were

valueless, farmers would exert themselves more than they do to make the ear bear as large a proportion as possible to the stalk. Again, the importation of foreign wool has caused English sheep to be adapted by judicious crossing and selection so as to develop heavy weights of good meat at an early age, even at the expense of some deterioration of their wool. (It is only when one of two things produced by the same process is valueless, unsaleable, and yet does not involve any expense for its removal, that there is no inducement to attempt to alter its amount.) And it is only in these exceptional cases that we have no means of assigning the separate supply price of each of the joint products. When it is possible to modify the proportions of these products, we can ascertain what part of the whole expense of the process of production would be saved, by so modifying these proportions as slightly to diminish the amount of one of them, without affecting the amounts of the others: and the expense of production of that part of this particular product which would not have been produced, if there had been a lower expectation of demand for it, may in some sense be taken as indicating its cost of production. At all events, it may be said that there is some tendency so to adjust the proportions of the several members of a group even of "joint products" in the narrow use of the term, that the excess of receipts over outlay on the whole group shall be greater than it would have been if Nature had been left to adjust those proportions in her own way. To that limited extent there is some correlation between cost and value even in regard to such products.

When two things, say locomotives and stationary engines, are made in the same works, and in a great measure by the same labour and plant, it is often said that their costs are "joint"; but, this term has a special historical association with groups of things, such as wheat and straw, which cannot be produced separately; and it seems better to speak of such groups as having "common" or "allied" costs.

In cases of such common or allied production, each thing is charged with a share of those expenses which are incurred on account of the general work of the business; it is next charged with a considerably larger share of those expenses for plant, for superintendence, for advertising, etc., which more specially

II, 1, 6. belonged to the particular department by which it is made, in addition to the prime costs incurred directly and specially for it. Simple arithmetic in this case needs to be supplemented by careful analysis and thoughtful study of each problem as a whole: and, as we shall see later on, much systematic and organized effort has been given by accountants and others to the task.

Let us push this a little further. Suppose a manufacturer to be doubting whether to set up some expensive plant, or some addition to the office staff, or some new selling agency, which could not pay its way by the work it did for any one class of his products, but would save a little on each of three classes. If he decided that the aggregate of these savings would make the proposed outlay remunerative, he would adopt it, and regard its cost as part of the costs of those three classes. There would be no direct means of dividing out the cost among them: but he might divide it out roughly in proportion to the savings he made on them. This distribution would have no strict logical basis. But it would be nearly that which competition would have compelled; if each of the three classes had had to meet similar products made by manufacturers, who specialized on them, and found full employment for a machine, or other appliance similar to that which he was contemplating.

6. *General conclusions as to limitations of the tendency towards such an adjustment of supply to demand, as would cause market price to cover expenses of production with normal profits.*

This account of the adjustment of supply to demand has aimed only at indicating broad tendencies, which conduce towards the attainment of an equilibrium position; though incessant changes in the conditions, which must be satisfied by a position of equilibrium, prevent them from reaching it. To revert to a familiar illustration, the gravitation, which effects a smooth surface on a pond when the air is still, is making always for an equally restful result on the surface of the ocean: but there the winds build up mighty waves; while tides alternately raise and lower the general surface by amounts, which vary with the positions of the moon and sun: and the

explanation of these movements, and their partial prediction are based on a study of elementary physical laws. In like manner business enterprise tends to increase the supply of anything, when the price at which it can be marketed will return its expenses of production with fairly good profits: and this tendency is working at any moment towards an imaginary position of equilibrium, which would be promptly reached if the general conditions then prevailing were rigidly fixed. But in fact it is not reached; any more than is that imaginary position of equilibrium of the sea, which would be reached if the relative positions of the earth, sun and moon were fixed, and the winds were stilled. II, 1, a.

Almost every one of the expenses of maintaining any process of production is liable to incessant change. At one time additional machines may have to be bought when the market for them is exceptionally favourable to the seller: while another set may be bought at a time when machine makers were willing to accept a price, which did not go very far beyond covering the mere prime cost of production. The same shop under one manager will turn out more and better work at the same expense than under another. The same manufacturer, using his best energies without stint, will at one time put out a commodity which the market absorbs quickly at a price much beyond its full expenses of production; but at another he will have missed his aim, and be compelled to force his product on the market at a heavy loss. In these and innumerable other ways the return to a whole process of production may be kept for a considerable time a good deal above, or below, the level which might return its whole expenses with normal profits. But yet the tendency to keep expenses and price in close relation to one another is strong and persistent in an open market in regard to whole processes of production; the deviations from normal equilibrium, though ceaseless, are seldom very wide. Thus far-reaching are the various uncertainties of demand on the one side and of supply on the other.

But indeed a perfect adjustment is inconceivable. Perhaps even it is undesirable. For after all man is the end of production; and perfectly stable business would be likely to produce men who were little better than machines.

II, 1, 6.

The general position is, then:—Every manufacturer, or other business man, has a plant, an organization, and a business connection, which put him in a position of advantage for his special work. He has no sort of permanent monopoly, because others can easily equip themselves in like manner. But for the time being he and other owners of factories of his class are in possession of a partial monopoly. The prices of the stock, which they put on the market, will be governed by the demand of that market relatively to that stock, nearly in the same way as if they had a true monopoly. Nearly in the same, but not quite: for in the case of a permanent monopoly consumers will seldom gain much by waiting for lower prices; whereas, if prices rise above cost of production in an open trade, those consumers, who can do so conveniently, will wait for the effect of competition in bringing down prices. Combinations for regulating prices aim at consolidating provisionally this partial monopoly, and at putting it in good working order: and this fact goes far towards explaining their gradual, and in some cases almost unconscious, drift towards monopoly in the full sense of the term. So important indeed are these considerations, that the greater part of Book III will be occupied with the complex issues which are raised, on the one hand by monopolistic tendencies in markets, that are in the main open; and on the other by competitive influences on monopolistic policy.

CHAPTER II

DEBTS OF INDUSTRIAL TECHNIQUE TO SYSTEMATIC RECORD AND TO STANDARDIZATION

1. *In early times the cumulative progress of industrial technique was in the main dependent on the informal records of customary usage: and this primitive method was until quite recently the chief resource of agriculture in sparsely peopled districts.* 11, 11, 1.

If custom had been absolutely rigid, it would have been an almost unmixed evil. But the resistance which it offered to the bold reformer resembled that presented by a glacier to anyone who might try to change its shape: custom and the glacier are plastic, but both refuse to be hurried in their adjustments. Custom has discouraged any attempt at improvement which involved a sudden breach with tradition: but, except in some ceremonial matters, it has been tolerant of modifications in substance, form and method which did not obtrude themselves. On the one hand, stagnant social conditions do not crush out of everyone the desire to humour his own fancy, or his love of novelty, or his inclination to save trouble by a rather better adjustment of implements to the work done: and, on the other hand, the solidity of custom has rendered the supreme service of perpetuating any such change as found general approval.

Had each put his individual fancies into practice without restraint, few would have followed his erratic movements: there would have been no *corpus*, or body of general thought, in which they could have been merged; and, in the absence of written record, they might probably have perished without leaving direct successors. But custom supplied a permanent body of general design, on which each fresh mind might try to make some variation for the sake of economy of effort, of in-

II, II, I. creased utility, or more pleasing effect. And custom under favourable conditions was able to make utility, economy and artistic delicacy work harmoniously together in improving the *standard* commodity of common life.

(Modern conditions have given some solid foundation for the common statement that utility and beauty are hostile to one another.) For when a thing is marked out for description as useful, it is almost sure to be a device for attaining some utility, old or new, by a new method; that is to say, it has not had time to be gently moulded by innumerable light touches of successive makers, who have tried to bring it more into harmony with their sense of fitness. But in the ages of patient custom time was abundant. Perhaps not one in twenty of the tentative mouldings was well conceived: but those which were bad, passed away; while those which the people approved, were almost unconsciously incorporated in hallowed usage; and they became material for further moulding by the delicate breathings of the spirit of the race. Thus it comes that the carpet, the axe, and above all the sword, have been gradually standardized in different places, and often on quite different lines; but always so gently as to combine grace with efficiency in high degrees. So far as we can tell, men had then generally less quick, subtle, and fine instincts than now; and if each generation had moulded its own implements with little guidance from the past, the effects might probably have been crude; but, working on the plastic standard received from the past, each made its own step towards the Ideal¹.

¹ In like manner melodies and ballads, which have been standardized by unwritten tradition, have offered opportunity and incentive to every bard in each successive generation, to make slight variations in his recital. Some would not please even himself; and few would meet with enduring favour. But whenever a man of genius arose, he would leave ballads or melodies a little altered for the good: and thus the finest ballads, especially those which have come down to us with the name of Homer, and the most delicate traditional music have some charms that are beyond the reach of individual poets or musicians.

It is not indeed to be denied that a few ceremonial costumes which have come down from early times are ugly as well as inconvenient; and indeed some of them seem to have been developed as a means of proclaiming a superiority to manual work. The surviving vestiges of ancient costumes in the Alps include some, which are not admirable from any point of view; but they are cherished as indications of hereditary rank and of loyalty to the village or valley.

Even in a primitive civilization, changes in appliances, in methods, and in the purposes for which they are to be used, are mutually dependent on one another: and this cause alone would greatly limit the practical influence of isolated new ideas. Here however the institution of slavery sometimes came to the aid of progress, by forcibly breaking down prescriptions of custom: for it enabled a new idea, which had taken hold of a few strong men, to be realized in practice more quickly than if the manual workers had been free, but comatose and unintelligent. It has often been observed that progress has owed much to the subordination of the masses of the population to the will of a dominant race, whose minds have not been occupied with petty cares. But mankind will not have achieved their destiny till the masses can pioneer for themselves.

II, II, 1.

(Even where custom opposes no great resistance to change, progress cannot be very fast unless a man's best thoughts are recorded in some way, so that others may profit by them.) For large inventions and other advancements are seldom completed by a single man; and not always by a single generation. In fact, they are often named after those who have planted the flags of conquest on the crests of the battlements; while those who led the way, but did not live to partake in the ultimate victory, are forgotten. For the highest constructive instincts are apt to die with him who has developed them: their offspring may live in those, whom he has influenced personally; but otherwise they bear little fruit except in so far as he has embodied them in a form which is generally accessible.

During the greater part of the life of the world most of the people have spent nearly the whole of their time in the fields: compact centres of life and thought were rare: and, before the days of printing, a scattered population had little opportunity for the stimulus and suggestion, which one man can derive from the thoughts and experiences of another. Tradition ruled; and particular experiences seldom developed into successive steps of cumulative progress. These facts go far to account for the

whose flag they in effect are: and this loyalty may have tended to some accentuation of local peculiarities. It seems that with comparatively few exceptions those parts of the local costume, which are worn in every-day life, are convenient and in good taste.

II, II, 1. slow progress of technique till recent times. It may be true that the native brain power of the individual has not greatly increased with the ages; and it is certainly true that emergency and opportunity have frequently proved agricultural populations to be strong in resource as well as in resolution. But yet the conditions of agricultural life have not been such as to bring to the front those men, who had the faculty requisite for making great occasions for themselves: one reason for this being that the ownership of land has come by inheritance in a somewhat greater degree than the ownership of considerable industrial resources. Further, every agricultural problem has peculiarities of its own: and some sides of it can be mastered by shrewd, experienced, alert, instinctive judgment, better than by systematic reasoning based on ordered knowledge. (Therefore the agriculturist has never been apt to search for the general in the particular, and the particular in the general. His instinct and insight have for the greater part died with him. The progress of his art remained for the greater part empirical, until men trained in industry, or commerce, or in scientific schools came to his aid¹.)

¹ Even now we read that in Britain, though many of the big farms are excellently managed, "all depends on man's instinct and memory." It is true that agricultural methods are being improved in some places by agriculturists themselves; but this progress is for the greater part confined to districts in which agriculturists have learnt the importance of a good education, by which is meant "not so much further knowledge of a technical sort, as the more flexible habit of mind that comes with reading, the susceptibility of ideas, that is acquired from acquaintance with a different atmosphere than the one in which a man ordinarily lives." The work of a tenant farmer on a holding of 150 to 500 acres is often of high quality, both technically and in regard to business methods. But men mostly "learn by example, by looking over the hedge"; and the bad farming one sees so often in England alongside the best, is not due to any lack of knowledge, but to the low mental calibre of many of the men occupying the land. (The above statements are reproduced from the concluding article of a notable record of "A Pilgrimage of British Farming," *The Times*, 6 Jan. 1913.)

Mr R. E. Prothero (*English Farming, Past and Present*) shows that the work of agricultural pioneering did not begin to combine "science with practice," and proceed steadily by one firm stepping-stone of recorded advance to another, till about 1812. The great work of Townshend, Bakewell, Coke and other early guides was mainly based by empirical methods on practical experience. Attention has already been called to the use which some monasteries made, even before the "Revival of Learning," of Latin literature on behalf of the agricultural arts.

2. *Various uses of the term Standard. Influences on technique exerted by clear and exact registration of the results of progressive experiments, such that each can be used as a stepping-stone to later endeavour.* II, II, 3.

Custom standardizes unconsciously and crudely processes and products alike. The modern science of industrial technique deliberately standardizes some products and many processes; and deliberately leaves many products and some processes open to varying tastes and humours, to fluctuating needs, and to the caprices of fashion. But deliberate standardization is used as a means to the attainment of some definite aim: and it is in turn deliberately modified, or even set aside, as soon as that aim either loses importance, or is found to be accessible by a better route which requires different standards. (A standard may be *Particular* to an individual producer, or it may be *General* to the greater part of an industry or even the whole western world¹.)

General standardization for industrial purposes is sometimes set up at a stroke by authority of Government, or of a convention of leaders in the industries most directly concerned. Thus, for instance, the present electrical standards, Watt, Ohm, Ampère, etc. were fixed by an international convention: and every Government appoints, and changes from time to time, the exact measurements and other specifications of rifle cartridges, whether made in its own or in private workshops. No one would assert that the general adoption of standards, differing by a little from any of these, would be much less useful: but there is a vast advantage in the existence of definite standards, adherence to which within less than a thousandth part may be required in certain cases. This kind of standardization, as well as the Particular standardization of the individual parts of a typewriter, or a reaping and binding machine, etc. by an individual maker, will be considered shortly. But just now we are concerned rather with that General standardization which is evolved gradually and embodies the progressive evolution of improved technique.

¹ Mediaeval regulations as to standardization provided a somewhat futile occupation to the Aulnager; and they flourished in a form, partly mediaeval and partly modern, under Colbert.

II, II, 2. (For instance, every decade has seen the standard shape and proportions of racing yachts moulded by the thought and experience of numerous capable experts in several countries.) Each designer is ever striking out some more or less important deviation from ordinary practice: if his venture seems to him good, he embodies it in his own practice, and it becomes part of his Particular standardization. If it meets with approval by others, it is soon embodied (with perhaps some modification) in the General standard shape as has been the case with racing yachts. But the best shape for a racing yacht depends a good deal on the conditions under which it is to be sailed, and a little also on the personality of its captain; and similar personal considerations affect, in various degrees, the choice of business methods. When the athlete strikes out a particularly successful way of taking hurdles, his Particular standardization is not at all sure to become General, until experience has shown to what extent his success with it is due to his idiosyncrasy.

A similar cause retards even more the general adoption of a modification in the method of conducting a certain class of business operations which has proved successful in a particular case. But technique is less dependent on personal peculiarities; and an experiment bearing on the technique of an industry may be trusted, as a rule, to give the same results in the hands of any two competent investigators. Specialized students generally have access to exact printed records of the course of every set of experiments; which form the basis of the prevailing standard method of attaining any end in which they are interested; and a comparatively short description of anyone's work generally enables others to know what he has tried, where he has failed, and where he has succeeded. If therefore the suggestions embodied in his work are accepted, and become the basis of the General standard method, others are able to start for further investigations from the point which he has reached, and with nearly the same advantage as if they had made the original experiments themselves. Let us then pass to consider the methods of work of the modern inventor, who turns to account the best results of scientific research that bear on his purpose; and adds to them.

3. *Distribution of the studies, that make for progress, among men of various kinds and degrees of ability.* II, II, 3.

We now revert to subjects touched in Book I: they will occupy us a good deal¹.

An improvement in business method is generally initiated by a man of affairs, who sets himself to attain a particular practical end by the best route. The same is generally true of advances in industrial technique, in so far as they are made in the course of business (but the greater part of the work, which lies at the bases of those advances, is made by other men with different motives and different methods. (It is made by mere students: that is, by men who labour, not with reference to the attainment of any particular practical end, but in search of knowledge for its own sake.) They group together for investigation phenomena which are fundamentally akin, so that the study of many particular relations between them may set thought on the track of general rules or "laws" of causation, tendency, or coexistence: imagination creates movement; caution checks reason by working out parallel but independent trains of thought: and, wherever possible, each general rule is tested by application to particular instances, in which it may be confirmed or discredited by experiments or observations of specific facts. Some of these architectonic workers, but not many, have the power and the will to embody their ideas in specific practical inventions of commercial value: and occasionally a man will be found, who combines the faculties and aptitudes required for high scientific research with those of a great business administrator².

(The pursuit of knowledge by the pure student for its own sake is generally a richer source of new knowledge, than is the

¹ See especially pp. 99—103; and 132—134.

² This interdependence of the work of the professional student and the man of practical ways and means is being worked out in several ways. Thus the electric incandescent lamp must not contain more air than would fill a millionth part of its volume at ordinary pressure: and the way for this perfection "was prepared by an army of men, whose main object was the advancement of knowledge; and who could scarcely have imagined that the processes, which they had elaborated, would soon be in use on a commercial scale, and entrusted to the hands of ordinary workmen....The requirements of practice react in the most healthy way upon scientific electricity" (Lord Rayleigh, quoted in *Iles, Inventors at Work*, ch. XIX.)

II, II, 3. pursuit by the business man of that particular knowledge which bears directly on a specified practical aim: for an idea, which generates new ideas, will be pursued to its consequences by the student; while the practical man will be inclined to drop even the most fertile idea as soon as he has extracted from it the help, if any, which it can give him in attaining his practical purpose.) But nevertheless the methods of the two, if both are able investigators, will have much in common. Each of them concentrates his attention for a time on some particular subject, learns nearly all that is already known about it; analyses it; selects for his main study, or at least his first study, some part of it; extends his observation in regard to that part; exerts his constructive imagination; devises developments which offer some promise of leading to new knowledge or to improvements in technique; makes systematic experiment in regard to those developments; makes provisional record of their results, and studies those results. Perhaps he makes further observations, further analyses, further imaginations, and further experiments; until at last he has attained a result which he believes to be of value. He will estimate its value with reference chiefly to the services it may render to the world, or to the prestige or the reward which he will reap from it, according to the bent of his character and mind.

Whether he communicates his results to a learned society, and leaves others to earn money by them, or applies them in practice himself (with or without the protection of a patent), they become in effect the property of the world almost at once. Even if he uses them in a "secret process," enough information about them often leaks out to set others soon on a track near to his own.

Sometimes an investigator is dealing with irregular phenomena, the causes of which are not likely even to be conjectured till much further progress has been made in the high borderland of molecular physics and chemistry; and then his only plan is to make vast numbers of experiments on material chosen almost at random, with a watchful eye for any that tend in the desired direction. He must examine the more palpable qualities of the materials that please him, and seek out others that have any of these qualities in a higher degree; thus reaching his end by

sedulous, disciplined imagination, even though he has no access to fundamental laws of causation. Investigations of this kind often need more time than is at the command of any one: they must be done by a "team" of workers under the direction of a master mind. But, when he has before him a particular mechanical aim (as for instance in connection with the phonograph, the telephone, the cinematograph, etc.), his imagination can work straight on along definite processes of reasoning in subordination to general fundamental principles. In both cases he makes use of methods and reasoning, which had been brought up to high standards by the collective efforts of innumerable workers at various times and in various lands: and in return almost every stage of his original methods, in so far as published, contributes to the world's wealth of knowledge¹. II, II, 3.

Team work, if somewhat mechanical and lacking in romantic interest, is of very great power in chemistry and some other sciences, as well as in business technique. Its steady expansion is partly cause and partly result of growing tendencies on the part of scientific students and leaders of industry to develop common interests, and work together as allies for the invasion of the borderland between science and technique. In numerous directions the chief leaders of industry are making assiduous use of organized and provisionally standardized general principles: and, aided in very various degrees by the Governments of different countries, they are working for extensions of knowledge which shall be at once technical and general; at once serviceable in their own particular operations, and fertile sources of larger and more exact science in time to come².

¹ See Dyer and Martin, *The life of Edison*, ch. xxiv. Edison's laborious research for rare earths that might serve as material for incandescent lamps has lost some of its interest in consequence of the new methods by which wire, a thousandth of an inch in diameter, can be drawn from tungsten and other suitable metals.

² Some of the work is done by young men, of rather narrow mental vision. Each of them is contented to plod under instructions at a minute part of a small question; he studies whatever has been printed about it in various scientific memoirs; and works on that material till he has made some advance that can be combined by a stronger mind, with other results obtained by similar plodding. Thus overlapping work is cut down: students of varying aptitudes and abilities are occupied, each with work that is just within his range. The strength even of weak men is turned to account for high work; and that of strong men is given almost wholly to work that is worthy of it: while every step gained

- II, II, 4. 4. *Influences on industrial technique exerted by the cumulative power of carefully made machines to create others, that are capable of work even more exactly standardized than their own.*

(So far we have considered the influence of recorded and standardized knowledge in regard to method and powers; each new knowledge being the offspring of others that went before, and the parent of many that follow.) A simple form of such knowledge, which has contributed greatly to the progress of technique, is embodied in improved constructions of material objects—house, furniture, clothing, implements, etc. (But early in last century some ideas, which had been for some time in the make, developed into the great architectonic principle that a well driven machine tool could become the parent of new machine work more exact than itself, which could become in its turn the parent of yet more exact machines; and so on.) This idea has so developed, that at last each successive generation, and even each successive decade, has seen results accomplished, which appeared almost impossible till lately. The work has been done chiefly by engineers, who have often loved their workshops, as academic students have loved their laboratories. Chemistry is becoming the mistress of a rapidly increasing number of workers: but engineering has special claims to be regarded as the leading representative of modern industries, at all events from the point of view of an inquiry into the general course of economic progress. For all other large industries are dependent on it for most of their appliances; which are growing rapidly in exactness and efficiency, while falling rapidly in cost. The technique of some of the textile and other industrial groups owes as much to the invention and initiative of mechanical engineers as to their own: and the economist is under exceptional obligations to the semi-technical literature of engineering¹.

is registered, under discriminating judgment, for the benefit of the world. This method seems likely to dominate many branches of study; but of course it can seldom lead directly to epoch-making discovery.

¹ A prominent place must here be given to the Engineering Supplement of the *Times* and to articles in the *Manchester Guardian* and other newspapers, as well as to the *Engineering Magazine* and similar periodicals.

The attention of the progressive engineer is concentrated on some branch of production, which has been neglected, or of which the methods appear to be needlessly cumbrous. It is analysed into its component parts. Each part is again analysed, with the aim of subdividing it into elementary tasks; each of which can be effected by a single procedure, mechanical, chemical or other. Apparatus is devised or adapted for each elementary task. It is tried and amended and tried again. By successive steps larger and more delicate work is thrown upon the apparatus: and it is required, firstly, to adapt itself to ever subtler varieties and nuances of human requirements; secondly, to perform one process after another, that is needed for the ultimate end, with little or no assistance from the hand of man. Thus at last it becomes an "automatic" machine; and it has this much of right to be called a thinking machine, that it changes its mode of action at the right time, acting on hints given from within, which would require the thoughtful care of an attendant, if given from without. Thus complexity of result is attained. But the means need to be simplified: and indeed the subtlest conceptions of the inventor are often given to laboriously simplifying his apparatus, till only the expert can detect the subtlety of his labour.

II, II, 4.

When all is in order, the machine is nearly self-sufficing. It needs only an alert watcher to attend to any complaint it may utter: but, because it is simple, it seldom complains; and its complaints can sometimes be made to take the form of standing still, till the watcher can attend to it.

The lead in this direction came from the simple strong Boulton. Watt found that much of his steam ran to waste, because Boulton's cylinders and pistons were not true; though they were the best that had been made so far. For indeed the manufacture of machines had not up to that time reached an exactness much more advanced than that to which the Dutch had brought their wooden ship-building many centuries before. So Boulton set himself seriously to improve the common appliances for making machines: and thus struck out the first cardinal idea¹.

¹ His plan, he said, was to "engage and instruct some excellent workmen who (with more excellent tools than it would be worth any man's while to

II, II, 4. Later on attention was more given to the fact that the lathe, "the mother of exact work," was unable to turn her latent power to full use, so long as the movements of its cutting tool had to be governed by the untrustworthy hand of man. Many worked at the difficulty: and at last it was overcome by a simple great man, a fit successor of Boulton and Watt. Maudslay found that every bolt and nut was "a speciality in itself. . . all bolts and their corresponding nuts had to be specially marked as belonging to one another"; which was specially troublesome "when parts of complex machines had to be taken to pieces for repairs." Accordingly he devised a simple "generating machine," which made fairly accurate screws: and he set one of these to act as Guide screw for the cutting tool; which no longer was moved along according to the judgment of the machine, but automatically moved at a steady rate duly proportioned to the rate of rotation of the material. His "self-acting lathe," governed by fine screws, enabled him to make a machine that would measure easily up to a thousandth part of an inch. He put his best work into appliances with which he made still better work: and thus he went far towards the modern age; in which the most accurate standardization is applied to the master machines, that are responsible for making the most important of those machines, that are responsible for the every-day work of an ordinary engineering shop. But the finest modern engineering work requires gauges true to a ten-thousandth of an inch, which must be read on occasion by a micrometer reading up to a hundred-thousandth part; i.e. to a two-hundredth part of the diameter of the human hair. (For some scientific work even greater accuracy is needed; but that is effected by optical instruments making use of diffraction fringes¹.)

procure for one single engine) could execute the invention...with as great a difference of accuracy as there is between the blacksmith and the mathematical instrument maker."

¹ Maudslay devised a measuring machine, "the Lord Chancellor," in which he used his best screws, and also two planes made by an improved method; and originated the saying "Measure up to hundredths of an inch and feel up to thousandths"; that is, press the planes together till their friction offers some resistance to an attempt to shift the bar between them; and then read with a micrometer divisions as finely as you can.

Meanwhile Whitworth, following in Maudslay's steps, had studied the question of the best shapes for screws for various purposes. His Particular standardization of them was approved: and made the basis of an organized General standardization for Britain. In such matters progress is ever eating up her own best results: perhaps it is best that several systems should be tried in various countries; but the movement towards a plastic international standardization, though temporarily checked, may ultimately prevail. II, II, 4.

The lathe has pioneered not only in exact work, but in complex automatic work. In one of its chief forms sets of tools are placed in "turrets" etc., and these are made to do their work much as did the figures in the great cathedral clocks. The lathe feeds itself; each tool is brought into play in its proper order, and with an appropriate traversing motion. It can make the hub of a cycle wheel, for instance, straight from the bar of steel and without any human interference; and one competent man can be responsible for twelve lathes. Here is a strong case of the rule that ("the tendency of all specialized machines is to take the responsibility off the operator and put it on the foreman and his staff of tool makers.") This tendency of course diminishes the demand for the skilled artisan, whose eye and hand are in thorough coordination, in those particular works in which such machines are used. But, by their productiveness, they make new openings for him elsewhere: and Sir Benjamin Browne, referring to this social danger, said "many of us remember the great economy which came in when we took to stamping all sorts of small smith work under the steam hammer. Some people thought the days of blacksmiths were numbered; but they have not become fewer, nor are their wages lowered." And yet it seems possible that the continued expansion of the dominion of automatic machines may at last diminish the area of old work in which manual skill is of high account, faster than it opens up new ground in which the hand is again supreme¹.

¹ Exact standardization of particular parts by aid of standardized machinery has enabled cheap watches to be made which will keep good time; and watch screws weighing nine thousand to the ounce, which are seen to be perfect under a microscope, are turned out at a vast rate. Again, in the service of the textile industries, standardization has enabled large sheets of cotton cloth for

II, n, 4. It has already been noted that America is now extending their dominion at a rate far exceeding what seemed probable a few years ago. And the experiences of Britain and other countries during the world-war in manufacturing munitions of war by many millions have made strongly in the same direction.

The changes, of which these instances are representative, have come so gradually that their vast dimensions have only recently been recognized. They all rest in part on the fact that, while the easiest motions of the hand are backwards and forwards, the easiest motions of a machine are rotary. The rate of movement of the hand is limited; and therefore if it is to do much work, it must exert a considerable part of its small strength at each stroke. But, by the aid of gearing and other devices, a machine tool can be made to rotate at any speed, however great, provided it does not generate too much jar or too much heat. These two limitations retarded progress for a long while: but they have now been for the greater part overcome by mechanical and chemical invention; and large turbines now maintain easily 140 revolutions a second, the outside of the wheels running about 900 miles an hour.

Invention enables numerous clear photographs for the cinematograph to be taken in a second; and a single machine to make a quarter of a million matches in an hour. It enables six hours to suffice for casting separately and arranging in line spaced out automatically by wedges the type for 24 large newspaper pages; and for taking a number of stereotypes from them; from each of which long rolls of very wide paper are printed off without hitch at the rate of 20 miles an hour¹.

the envelopes of airships to be made of thickness uniform to within a two hundred and fiftieth part of an inch: and it has so far attracted the interest of working artisans that makers of micrometers reading to a ten-thousandth part of an inch, find it worth while to advertise them largely in the *Journal of the Amalgamated Society of Engineers*. Some other aspects of Particular standardization will be considered later on, see pp. 221—3.

¹ Again, a new steel alloy, which will stand a temperature up to 700° C. without hurt, is able to cut ordinary steel as quickly as ordinary steel can cut wood; but perhaps its most interesting applications are in the substitution of quick movements, each of which treats the material tenderly, for slower movements that must be comparatively rough and harsh. Thus slotting machines are being displaced by drills, which will penetrate a thick steel plate by rapid but comparatively gentle pressure, which leaves no harsh edges. Milling

Thus great are the debts which industrial exactitude owes to machine-made machines, made almost regardless of cost, to be the parents of yet more exact machines; and destined to dominate the massive production of every sort of implement, from the firing apparatus of a monster gun to the motor of an aeroplane. But lest the marvels of such work should get even more gratitude than their due, it may be well to take another instance of fine work in which massive production has no part:— the chemist's balance.

The first accurate standardizations of quality were made by the alchemists: each of them worked chiefly for himself; and his standardization was Particular to his own secret pursuits of gold or subtle poisons. Now the standardization of elementary drugs in regard to quality has been authoritatively made General; so that a prescription written out by any physician can be made up accurately by any qualified apothecary. He buys wholesale elementary drugs already standardized, and he compounds them by aid of the chemist's balance, an instrument which remained long without a rival for extreme delicacy and certainty of work. From it have been evolved precision balances which will detect an error of one part in 250,000,000 of a 500 gramme weight. Of course the heat of an observer's body if he were near at hand would disturb the equilibrium: so he stays at a little distance, moves very small weights from one scale to another by mechanical appliance, and watches the balance with a telescope.

Almost as fascinating is the recent suggestion that the elasticity and tenderness of the hand can be rivalled by methods quite different from those of human muscles, which almost alone had been previously imitated. The transmission of pressure by rope and rod, and even by water and electricity, is too uncompromising for much subtle work: but its transmission by air has no such limitations; and it can be arranged cheaply even on a small scale. It is handy and flexible; and

machines are greatly increasing their speed and turning out clean work that needs scarcely any hand finishing. And lastly even fine tools are giving place for delicate work to rapidly rotating emery grinding wheels. For "from being a non-precision method, grinding has become the most perfect device for producing accurate results, measured precisely within thousandths of an inch." (*Encyclopædia Britannica*, s.v. Tool.)

II, n, 5. it has great advantages for work in mines, for signalling on railways, for riveting in ship-building and in cramped corners in all branches of engineering. The familiar operations of player-pianos by air represent a simple extension of the action of the pneumatic hammer; and a yet higher stage is reached in the marvellous mechanism of the monotype printing machine¹.

5. *The good and evil of machines that supplant fine skilled handiwork.*

Let us return to that increasing tendency of machinery to supplant the skilled hand; which is greatly increasing man's power over nature, and his material wealth, though it is not an unmixed benefit from the social point of view. In fact, if all the world were a single people, with one purpose and that the highest, it might be well to put some check on this rapid supersession of human skill; even at the expense of delaying the increase of material comforts and luxuries. (But Britain can exist only by obtaining her necessary supplies of food and raw products in return for the exportation of manufactures: and her hold on external markets can be maintained only by her use of the most effective processes known.)

Some mead of sympathy is indeed to be extended to the owners of manufacturing plant, which has been superseded by

¹ But perhaps the subtlest application of the power of air pressure is that which enables it to reproduce the infinitely delicate variations in the pressure exerted by the highly trained hand of the skilled artisan. A shutter is placed over the orifice, through which the compressed air comes to its work, with a slit cut in it of varying width. The shutter moves under the control of the main machine in such a manner that a broad part of the slot is opposite the orifice when the work is at a stage at which much force is wanted; and, when less force is desired, the force is lowered by the opposition of a narrower part of the slot. Such a machine seems perhaps to think for itself more distinctly than almost any other: but its method owes nothing to suggestions by the human hand.

It is interesting to look back from these marvellous achievements to the beginnings of modern machinery, where success in copying the elasticity of the hand was a goal to which inventors aspired, and which the sceptical thought they would never attain. Such was for instance the tardy triumph of machine combing, which originated in Heilmann's observation of his daughter's method of combing out her long hair; and again the success of the power-loom, achieved by making it imitate the small pushes by which the hand-loom weaver packed his work tightly together. Perhaps the first great break with the notion that the movements of the hands should be copied was that of the inventors of the sewing machine; when it occurred to them that a machine can work two needles and threads, though the hands cannot.

recent inventions: but their business ability remains with them; and, if united to brave enterprise, it will enable them soon to be doing well with improved plant, which their good credit will generally enable them to obtain. II, II, 5.

(The case is more difficult, when the specialized manual dexterity of a skilled artisan is struck by a machine that outdoes it: for if he is no longer young, he can seldom hope to earn high wages by any other kind of purely manual work.) His chief defence comes from the facts that improved machinery is likely to increase greatly the volume of the production, for which it is designed: and that his general experience, judgment, and high character may enable him to obtain a position, in which he may direct the unskilled workers who handle the machines that "almost think." This trouble is not easily seen from a distance: but it looms large before the eyes of many skilled workers: and a fair judgment must take account of it, when attention is directed to the cold welcome, which they sometimes give to such machines.

Nevertheless, the stern fact must be boldly faced that the spirit, which induced many hand-loom weavers a century ago to pine in poverty rather than touch the hated power-loom, has not entirely passed away. In so far as it operates it is a grievous handicap to an old industry, when faced by the competition of young industries far away; and during the last few decades it has been a considerable, though an ever diminishing, hindrance to the maintenance of industrial leadership by Britain¹.

¹ Obstacles to the introduction of machinery may be more complex than is here suggested; as can be seen in the following instance. Scissors and blades of knives, forged by hand, have long been among Britain's best products. But latterly German products made of steel shapes, pressed into moulds by powerful machines, have yielded almost as satisfactory results as her hand-forged products; and of course their cost has been low. Sheffield was unwilling to adopt the new method: but having once been fully convinced of its efficiency, is adopting it; and she is striving vigorously to regain the ground lost by her delay. The moulds and machinery for making the pressed blades are too expensive for the independent artisan cutler; and, though he may buy the moulded blocks and finish them himself, his chief vantage ground is lost: thus the industry is passing into the hands of large businesses. They are of course in a better position for developing, and even for imitating, improved technical methods, than the small makers were: but complaints are still heard that, in such matters as the tardy adoption of stainless steel for household cutlery, there is seen something of the preference of old age for things long familiar.

CHAPTER III

SOME TECHNICAL INFLUENCES ON THE SIZE OF THE REPRESENTATIVE BUSINESS UNIT

- II, III, 1. 1. *Some introductory observations. Different methods of the expansion of the business unit.*

It has already been indicated that many various causes are tending to increase the size of the representative business unit. Our attention will shortly be directed to developments of marketing, of finance, and of the methods of business administration: but this chapter and the next are concerned exclusively with causes, that are closely connected with the progress of industrial technique. Reference will be made only to such industries as are much under the influence of that progress: they show some technical developments, which make towards an expansion of the business-unit in all the industries affected by them; together with others, which tend under some circumstances to aid the large business in overpowering the small; and under yet others to strengthen the small business at least as much as, and sometimes even more than the large.

Unfortunately the use of terms connected with business is not always consistent. A limited store of words is compelled to accommodate itself to the ever-changing needs of the market-place: the context, or verbal explanation supplies the clue to the precise meaning in view at the moment: and, as has been repeatedly observed, the economist must accommodate himself to the practice of the market-place.

Two contiguous factories of the like kind and in the same ownership, but with separate balance sheets, are sometimes classed as separate businesses: while for other purposes dis-

similar factories in distant places, with separate management and balance sheets, are classed as a single business, merely because they are in the same ownership. This divergence presents almost insuperable difficulties to officials engaged in a census of manufactures: but it does not greatly incommode the present study, which is concerned with general tendencies rather than specific figures. II, III, I.

On the other hand it is necessary for our purposes to make a clear distinction between two chief forms of business expansion; the vertical and the horizontal. The manufacture of any commodity starts from the basis of the provision of its raw material. This is regarded as a sort of ground floor. The first stage of operations on it constitute, as it were, a "higher" first floor: that is followed by a second, still higher; and that perhaps by a third, and so on; until the finished product is reached.

The product still needs to be marketed: and the producer, unless he is working to order, must be responsible for starting it on its way to "consumers"; that is, those who buy it for use whether in business or in the household. The producing firm may sell at once to wholesale dealers or other middlemen; or it may include the "higher" stages of marketing, and deal direct with consumers: the line of division between making and marketing is, as has already been observed, vague and varying.

(Whenever a business expands into a stage higher or lower than that with which it was originally occupied, its expansion is vertical.) Instances are, when a printing business acquires mills to make its own paper; or, moving in the opposite direction, sets up a binding and a publishing department to enable it to dispose of its products in the finished state: or again, when rolling mills set up blast furnaces, and open iron or coal mines; or, moving in the opposite direction, undertake the manufacture of steel bridges or steel frames for buildings. (Works which undertake many different stages are sometimes called mixed.) ✓

(The upper stages of mixed works have little anxiety about their supply of material, for it consists mainly of half-finished products from the lower stages of the same works: and the

ii, iii, 1. lower stages are generally secure of a vent for their products in the upper stages. But a firm with limited capital can seldom undertake considerable vertical expansions with success; for such expansions are not easily made by gradual steps.)

(On the other hand, a business may proceed gradually and tentatively when extending its operations *horizontally* in the same stage;) as for instance when a book printer increases the size of his plant, without altering its character. Again a manufacturer of locomotives may increase his output, by producing more locomotives of the same type with more intensively specialized plant; or by producing locomotives suitable for greater varieties of traffic at home or abroad; or by adding branches for the production of stationary steam and gas engines.

(Almost every kind of horizontal extension tends to increase the (internal) economies of production on a large scale which are at his command;) but, as a rule, an increase in the variety of his output lessens his gain in this direction; while increasing his facilities for meeting the various wants of customers and for marketing generally. All these general statements will however be found liable to some exceptions.

A large business aggregation may result from the growth of a single unit under exceptionally able and fortunate management; existing departments are enlarged and new departments are added till vast Krupp or Carnegie Steel Works, or (Wanamaker stores have grown up from a single root. Or it may result from the "fusion" (or as is sometimes said the "amalgamation") of several businesses in one. The fusion may be vertical; that is it may unite a number of businesses in successive stages of the same large process. Or it may be horizontal; that is it may unite a number of similar businesses.)

(Horizontal fusions often pass through an intermediate stage of Regulative Federation or Association, or Cartel; the functions of which are to control the prices, the amounts produced, and the methods of marketing of its various members; and in some cases to conduct their marketing for them.)

(Economies in administration and in production are not easily obtained by a mere federation; they need unified ownership and administration. A halfway house was indeed found

in American "Trusts" in the original sense of the word; when a number of businesses in the same industry agreed to assign the control of their general policy to the same body of trustees, who administered the whole in *trust* for all concerned. But, chiefly on account of legal difficulties, this form of organization has disappeared from America; though some European cartels seem to be drifting towards it. II, III, 1.

(The name Trust is now given commonly to a manufacturing or trading company if its capital and power are sufficient to give it a dominating influence, extending over some branch of industry or trade throughout the whole or a large part of the country to which it belongs¹) This dominating influence is frequently believed to be monopolistic in character: to involve some menace to public interests; and to call for inquiry, whether the Trust should be subjected to public regulations, in some respects more stringent than those which apply to an ordinary joint-stock company; just as that is subject to some rules which do not apply to a private business.

(A trust may be a joint-stock company which owns the whole of the businesses controlled by it. But in many cases it leaves some or all of the businesses, which it controls, nominally in the hands of independent companies with their own directors; and merely secures a majority of the shares of these subordinate companies. Thus it can elect their directors; and, though it must leave them legal freedom to act as they choose during the coming year, yet they well understand that their reelection will depend upon their conforming to the general policy marked out for them: so that there is thorough unity of administration. Local freedom of initiative is indeed commonly encouraged; but it does not go very much further than that which, as already observed, a huge company sometimes concedes to the managers of its branches.)

One of the most impressive achievements of modern

¹ Some would confine the name "Trusts" to those large companies which have obtained their dominating position by the fusion of several independent businesses; and not by the expansion of single businesses. The two classes differ in some important respects. But in relation to the most fundamental problems, the practice of the market-place in drawing no distinction between them seems to be right.

II, III, 2. technique is its power to handle masses too great for any force which was at man's command until recently. But, as often happens, that which is most wonderful, is not that which has exercised the greatest influence on the course of evolution. Those industries which need to handle very large single masses must necessarily be concentrated in the hands of a relatively small number of large businesses; but they are not numerous. And a greater influence on the structure of business in general is being exercised by the economies of continuous production, especially in regard to things which can conveniently be made in vast quantities, though they are not handled in large single masses.

Some account of those industries in which the work of transporting materials, or transmitting force plays the chief rôle; and require large continuous rights of way, whether in public or private ownership, is transferred to Appendix H; because, though very important, they are governed by exceptional conditions, and are not representative of the general trends of industrial development. Better illustrations for our present purposes are found in the steel and the textile industries. The steel industries dominate many others; and changes in their organization have exercised widespread influences on the organization of industry in general in America and Germany. The textile industries on the other hand offer the best instances of the coexistence of numerous establishments, repeating one another; because the full technical economies of large scale production, though not always of marketing, can be obtained by an establishment of moderate size. The two groups cover nearly the whole ground of industrial organization fairly well: but they do not touch the adaptation of mechanical processes to the varying requirements of particular individuals: and therefore a little is added as to the boot and shoe industry.

2. *Many causes make for the expansion of the business unit in the steel industry, especially in its heavy branches.*

The central task of the heavy steel industries is the handling of great volumes of homogeneous fluid steel, ready to be worked up into an infinite variety of products large and small. There is no other group of industries, in which the forces making for

the increase of the business unit are promoted in like degree by the magnitude of the aggregate volume of the homogeneous fluid material which has to be produced, and by the magnitude of the individual masses to be handled. II, III, 2.

(Further, there is no other group of industries in which the higher and lower stages work for one another so steadily and on so large a scale; and therefore there is no other group in which large lateral extensions and amalgamations are so likely to be accompanied by large vertical extensions and amalgamations. Iron and coal mines at the "lowest" stage are large users of the rails and the machinery which come from the higher stages: the smelting furnaces receive from the mines at the lowest stage; and pass on their products to the heavy mills: which like all the rest are large consumers of high-class machinery. There is nothing at all analogous to this in any other group of industries: the steel industries are in a class by themselves, just as are railways and water-supply equipments, though for entirely different reasons. Let us consider the operations of the furnaces and the heavy mills.

(The size of the most economical furnace is rapidly increasing: and Open-hearth furnace baths already have a capacity of several thousand tons.) But a furnace is not amenable to discipline. It will not work economically except at nearly full pressure: it must be laid by for repairs occasionally; and, therefore, complete efficiency is to be obtained only by the presence in a single establishment of a good many blast furnaces that are individually of the modern pattern, in order that a business may be able to adjust total output to varying activities of demand.

In furnaces and in rolling mills alike the individual masses to be handled have mostly become so bulky that every operation must be performed by mechanical force: (and thus a new economy arises from increase of size. For it requires no more effort and not much more discretion, to turn a handle that will set in motion a big electric or hydraulic crane than a small one.) Supplemented by internal railways, these travelling cranes enable a massive piece of metal to be removed easily, safely and quickly from one department to another of large works, spread over many acres: at each department it finds just those

II, III, 2. appliances and just that specialized skill which are needed for the particular work to be done.

An economy, characteristic of the present age, is inducing owners of blast furnaces to set up rolling mills; and owners of rolling mills to set up blast furnaces, or to amalgamate with existing furnaces. It is that of the heat often to be gained, by passing the molten iron straight from the blast furnace to the converter, and carrying off the blooms from the converter straight to the mills that are to roll them into rails or plates or structural shapes. Again "mixed works" that own mines, furnaces, mills and engine shops can keep each of the four branches at work during many slack times by enlarging and repairing the rails, hoists, machinery, etc. which all the four need in various degrees. Again the waste gases of the furnaces, after heating and pumping air for their own use, have a large surplus energy: this can be turned to account, either directly or through the medium of electricity, in working other branches; and it thus becomes a powerful aid to "mixed" steel businesses in competition with "pure" blast furnaces and with "pure" rolling mills. The influence thus exerted on the structure of the German steel industry will occupy our attention in Book III¹.

No doubt several of these economies have already exercised nearly their full influence on the size of the business unit: because their economic force is now so great that no concern that lacks them can hold its own against well-equipped competitors with equal access to its markets. The United States Steel Corporation has already several sets of mixed works, each of which is possessed of practically every technical economy which size can give. But the cooperation of these various sets of works under a single control is said to give it certain advan-

¹ It should however be added that the importance of this advantage will be diminished if the production of electricity is organized, on a vast scale, as now seems probable. In that case the economy of by-products at the central electrical works will be so great, that a small business may be able to buy its power at less cost than that at which it is obtained now by very large businesses, excepting only those which smelt iron-ores. They will doubtless continue to use the energy contained in their waste gases; though perhaps they will apply a larger part of it in its original form of heat to various uses. As to the services of electricity to the small business generally see Appendix H, 2.

tages in marketing, in obtaining progressive expert guidance, and in economy of transport. It can send each order to be filled up by that set of its works which can handle it best, account being taken of its geographical position; of the quantity of work that it already has on hand; and of any special fitness of its plant for that particular task. Thus, for instance, it can be arranged that each group of works shall keep its sets of rolls almost constantly in operation without being changed; whereas an isolated rolling mill must frequently change its rolls. But this economy can in great measure be obtained by other means: as we are about to see.

3. *Tendencies of Particular standardization to become General.*

(The influences exerted by the progress of technique on the structure of business, which have been so far noticed, tend almost without exception to increase the size of the business unit. But the influences exerted by good standardization are not entirely in that direction: and, for this and other reasons, they call for rather close attention.)

It was from the first obvious that each railway must have a uniform gauge for the main traffic. But for a long while even the main lines of railways in an advanced country were of various breadths, so that the wagons of one could not run on the lines of another. The inconveniences thus caused compelled General standardization of gauge for all main lines throughout each country; and, with a few exceptions, throughout each Continent.

Meanwhile considerations of its own convenience had caused each railway to seek for Particular standard patterns of rails suitable for the chief varieties of frequent heavy traffic; and after a while it became clear that, if General standards could be agreed on, rolling mills would be able to produce much more freely for stock; and therefore to give more continuous employment to their plant and their staff; and therefore to produce more cheaply.) This course, which has been largely adopted, presented no great difficulty: and it was followed by the more difficult and interesting development of standardized shapes for structural steel. The use of iron as the mainstay of building is

II, III, 3. due to the initiative of many men, among whom a chief place must be assigned to Sir Joseph Paxton; steel at a moderate price was not to be had when he planned the exhibition of 1851, and he had to be content with iron. But the subsequent use of structural steel is largely due to a characteristic burst of American initiative.

Mr Carnegie observed that the wooden tressel bridges which were in general use on American railroads, had no longer a *raison d'être*. The English practice of using iron for bridges had been little followed; because iron had been relatively dear, and wood had been cheap. But wood was becoming scarce, and steel was becoming cheap: and the rapidly increasing traffic was worried by wood's constant need of repairs. So he pictured the future in his mind and set himself to prepare for it on American lines. He gradually trained a staff of engineers to plan steel bridges, test them, improve them, and at last reduce them provisionally to standard patterns. Meanwhile he adapted his plant to producing their component parts on a large scale; and prepared to put through a complete bridge much more quickly and cheaply than anyone else. Next, he applied the same notion to steel frames for high buildings, which were just coming into vogue, and which are indeed little more in principle than vast congeries of small bridges.

But there was a difficulty. Though bridges of similar dimensions and designed for similar traffic could well be made of similar pattern, almost every building required individual treatment: and architects, accustomed to other materials, were not always able and willing to make their plans fit in with the technical idiosyncrasies of the manufacture of steel. So the Carnegie Company developed a specialized staff of engineer-architects: and they undertook to design and erect a building which should meet nearly all requirements; and yet be made almost exclusively of units that were already standardized; and therefore far cheaper, than if they had been made to order. The power which the Carnegie Company obtained, partly by this means, enabled it to set the tone of the whole American industry, so far as structural steel was concerned. But the very victory of its method destroyed much of the semi-monopolistic power which it had obtained. And though the average size of the

business unit in the heavy steel industry has increased, and is likely to increase; yet, the further standardization goes, and the more care that is given by architects to the choice of standard shapes in their specification, the better will be the outlook of rolling mills of moderate size in regard to structural steel. II, III, 4.

The General standardization of rails enables a man to buy a certain quantity of rails of a given kind for delivery at a future time. If an organized market price for such rails is established from time to time, he may make such a purchase without any intention of accepting delivery; and may expect to receive the excess (or to pay the deficiency) of the market price at the time as compared with his contract price: that is, the way is open for general speculation. This development is indeed exceptional. It probably works for good on the whole: but a considerable share of the total price paid by railroads for their rails is intercepted by speculative dealers. The general tendency of their operations is to render prices more steady; and in so far as they do this, their gains are well earned: but there have been occasions on which it has appeared that they have artificially stimulated fluctuations; and in such cases their action has been harmful to consumers and producers, whether they themselves have gained or lost on the balance.

4. *A partial specialization of particular establishments in certain branches of the steel industry has long been in progress, partly under the influence of mutual understandings: and it has received a great impetus from the experiences of the industry under State control during the world-war.*

A spirit of order has long been spreading over British steel rolling mills. Soon it will be true that "the producer can cheapen the cost of production, because he can roll considerable quantities of any given section at one time, and place in stock any surplus with a reasonable prospect of its being required. The buyer can feel sure of obtaining the section that he requires from one firm or another with the least amount of delay and at the least cost!"

From Mr Hawkins' Presidential Address to the British Institute of Civil

II, m, 4.

Such specialization is not quite as easy in all branches of the steel industry as in that of rolling. But it is even more urgently needed in some branches; and it was making considerable progress, even before the exigencies of the world-war had called for an output of certain classes of munitions in greater volume, and at higher speed than had been reached in any similar case before. The Minister of Munitions became in effect autocratic controller of every business that could take part in the work; and many large establishments were set up for the occasion, chiefly in places where there was abundance both of room, and of the unskilled labour of men, women and children who could perform elementary tasks hour after hour under expert supervision. The method is properly regarded as American, because America has developed it in numerous industries further than any other country has done: and from another point of view it might properly be called British; because it is based on Babbage's famous observation (A.D. 1832) that in a large factory "the manufacturer by dividing the work to be executed into different processes, each requiring different degrees of skill and force, can purchase exactly that precise quantity of both that is necessary for each process." But it has been carried out so thoroughly in the war-munitions industries as to arrest public attention, and give a powerful impetus to a movement which had already made much progress. It will greatly affect the further advance of technique, and the extended organization of business; we may therefore stay a little to consider its peculiarities.

The influence of patriotic sentiment has enabled the employer—in this case ultimately the nation—to carry Babbage's Engineers, 1901. He continued:—"Our trade and interests being more far-reaching and world-wide than those of any other country, makes the question of standardization more important, but at the same time more difficult for us." The American Society of Civil Engineers had led the way, Germany had followed, and later the four British Societies chiefly concerned agreed to appoint joint committees to take evidence and recommend standard sections for (1) Bridges and general construction, (2) Railway rolling stock underframes, (3) Rails, (4) Ships. He noted that Germany had 67 standard sections and America had 49, whereas Britain used no fewer than 170 different sections. But in the early years of this century great progress had been made in this and similar directions by efforts of the industries themselves; and by those of the National Physical Laboratory, somewhat on the lines of the *Physikalisch-technische-Reichsanstalt* at Charlottenburg; and by other institutions.

hint further than it has ever been carried before; especially in an old country, where (as was observed at the end of the last chapter) those who have acquired special manual skill are inevitably somewhat jealous of technical improvements that tend to narrow the sphere of their special usefulness. There are in fact very few occupations, in which every operation performed by skilled workers makes demands on their special skill. Sometimes indeed the skilled artisan has an assistant, who learns to move things into their proper places and do like small tasks, without distracting the attention of his chief. But such arrangements are profitable, only when the total aid given by the assistant saves a considerable part of the artisan's time: Babbage's principle is not operative in other cases. When however highly finished and accurate products are required in vast quantities, it may be practicable to pass a great number of them over to an unskilled worker who gives his or her whole time to performing some single operation on each. Under the emergency of war, skilled artisans have concurred in such arrangements, even though contrary to custom.

II, III, 4.

For instance, the manufacture of shells during the world-war has required millions of wedges to be made, so finely tapered that the wider end of each is only about a thousandth part of an inch broader than the narrower end. But an accurate ring having been made such that the narrower end of a properly made wedge can enter it, while the broader end cannot pass through, the task of testing the wedges, instead of being one of supreme difficulty, is brought within the competence of a careful child. A child might be careless: but the task is well executed by unskilled adults; and similar arrangements for the economy of skilled labour might be extended, wherever the aggregate volume of each such simple task to be performed in any one establishment is sufficient to justify the setting up of special provision for it. That may be effected in the future much more largely than in the past, as a result of the allied tendencies to exact, though plastic, standardization; and to the specialization of considerable establishments on particular tasks in a single large process. Thus a steady demand for vast numbers of similar products has moulded the work of the human hand, somewhat in the same manner as it has that of machines. It

II, III, 4. enables numerous machines, each relatively simple, though semi-automatic, to be set up each adapted to one special task, and each working steadily with but little need for supervision¹.

The centralized control of the munitions' industries has been aided by so much unselfish energy, that it seems to have been but little affected by that comatose slackness which frequently hinders Governmental industries from reaping the full fruits of their advantages of position. And it has focussed increased attention on the economies that may be attained by such co-operative understandings among businesses in the same branch of industry, as would enable each of them to adjust its plant and its arrangements to a single task; or, at least, to a single small group of tasks.

For instance, though ships of any particular character are not needed even by the thousand, the British Government has found it worth while to indicate a few classes of standardized ships, which are suitable to present conditions. This measure is specially adapted to the urgent need for large output in time

¹ The following observations are taken from *The Times Engineering Supplement*, April, 1917: "No shop manager, though possessed of an original and inventive genius, backed up by experience, could have anticipated the profound changes which the demand for munitions has brought about in the designs of machine tools. Less than three years ago nearly all the machine tools in use required experienced men in charge. Yet they were ill-suited for many of the new duties imposed upon them, comprising as they did elements fitting them for purposes of general utility without providing for highly repetitive production... Some manufacturers have been able to supply very simple single-purpose machines in batches of several hundreds for a single shop. In consequence not only have new works been built, but old firms hitherto engaged in other industries scarcely related to this class of work, in the metal trades, for example, have taken over some sectional portions of munitions from the controlled shops until such time as they could obtain the tools necessary to enable them to carry out more extended tasks. In some instances these firms, by availing themselves of instructions supplied by the builders of the machine tools, were thus enabled to get together a staff of girls or lads, with a few skilled supervisors, soon capable of producing an enormous output of accurately gauged parts. Machinists never realized before how many ways there are of attaining identical results."

For instance, "Machines for producing 18-pounder high explosive shells exclusively have been evolved from the multi-spindle design of automatics. One design deals with the exterior work only, the other with the interior. A pair of machines, each requiring only one attendant, turns out a shell complete in six minutes. The one which deals with the internal operations has eight spindles for holding shells, and a sufficient number of tool spindles in opposition for performing 19 separate functions, comprising drilling, facing, reaming, and threading. The machine which deals with the exterior work has six spindles."

of war: and there is now some general agreement that even in time of peace each shipyard might advantageously concentrate its energies on a limited number of classes of ships; each of which should be standardized as far as was possible, consistently with quick readjustments to meet changes in technique and in the conditions of maritime traffic. II, III, 4

But in fact the standardization of component parts is at once more productive of economy and less hostile to progress than that of complex structures. The same standard girders are used with advantage in thousands of different sorts of buildings, and appliances for use on land and sea: while the same standard screws are used for hundreds of thousands of different purposes: and this contrast is of special significance in regard to the contest between giant businesses and those of moderate size. For even the largest business has but a small output as compared with that of an industrial country: and therefore the small producers can often buy particular components, that have been made for open market by aid of larger economies of massive production than are at the command of any single business¹.

(Standardization is likely to attain the highest perfection in the case of a product which has been long in use; and of which both the component parts and the general design have been subjected to long and varied trial: for in such a case the experience of the multitude overtops the finest imagination of constructive genius.) But, on rare occasions, there may be an imperative need for sudden massive production, which allows no time for protracted experience. An instructive instance of this kind occurred when America had unexpected occasion to provide a large supply of aeroplanes, on models, which the experiences of the war had brought to the front. ✓

Several eminent American engineers "pooled" their faculties in order to devise a general plan for the economical and rapid construction of aeroplane engines by methods specially appropriate to the American genius. They proposed to build the

¹ The North-East Coast Institution of Engineers and Shipbuilders have agreed on a scheme for the standardization of reciprocating triple expansion engines, the principles of which may probably be extended to other types of engines and to many auxiliaries employed on shipboard. It is intended that the specification shall be subject to a revision each year by an expert committee. (*Times Engineering Supplement*, February, 1917.)

- II, III, 5. engines in various models, each using the same standard cylinders, pistons, valves, cam shafts, and so on. Thus the parts of wrecked eight-cylinder or twelve-cylinder engines are to be interchangeable, and a new engine could be assembled from the parts of wrecked machines¹.

5. Recent developments of the means of communication have facilitated the escape of a large business in a heavy industry from the constraint imposed by lack of space for expansion.

We now pass to a side issue, which has recently become of some importance. It turns on the difference between businesses which, by building high, can employ a large number of operatives on a site of moderate dimensions, and those which cannot expand so as to avail themselves of the full resources of modern technique without access to large space.

The lighter sort of manufactures can generally accommodate a great number of operatives, together with machinery, in high buildings on a relatively small area: and in case of need, sufficient

¹ European aerial engineers assisted in forming the plan: but it was decided not to adopt any European model: because British and French machines, as a rule, are not adapted to American manufacturing methods. They are highly specialized machines, requiring much hand work from mechanics, who are almost artists. Such men are relatively scarce in America: and therefore exact mechanical standardization was applied in American fashion to do as much of the fine work as was possible. But it was found that some finishing work had to be done by the hand at the last in almost every case.

Since however cylinders, pistons, and every other part of the motor had been standardized, they could be produced rapidly and economically by a great many factories operating under Government contracts. They could be as rapidly assembled, either by these plants or at a central assembly plant.

Rapid procedure was indeed rendered possible by previous studies in Britain, France and Italy, as well as in America: for the war-demand for aircraft has been too sudden and intense to be left to private enterprise. For instance, a group of the ablest British experts have served as "The Advisory Committee for Aeronautics," under the presidency of Lord Rayleigh, to study, by aid of experiments at the National Physical Laboratory and the Royal Aircraft Factory, matters relating to aerodynamics, to engines, to materials, to strength of construction and design, etc. Their Report of 1917 speaks of experiments with powerful appliances as to longitudinal and lateral stability in flight; as to various types of magnetic compasses and other instruments; as to the durability of fabrics under various conditions; as to aluminium alloys; as to the location of distant thunderstorms and their progress, etc.

space for extensions can generally be acquired close at hand at a price which is not prohibitive. But heavy industries must do nearly all their work on the ground: their machines are bulky, and most of their movements are effected by small railways, together with overhead gear. Therefore, even when a considerable space for expansions has been provided at starting, a successful heavy business is likely ere long to need more space than is to be had on reasonable terms in a crowded district. II, III, 6.

But some classes of operatives used to spend high wages somewhat crudely; and they were not easily attracted into the country: for this and other reasons even heavy industries were slow to move away from densely peopled districts, until pressed by the recent expansion of the business unit, and aided by the telephone and other modern means of communication among businesses at a distance. Meanwhile the working classes have become better educated, less addicted to the coarser enjoyments, and more appreciative of the quiet of a many-roomed house with a garden: also the advantages of working only on a single floor, have extended from the first stages of heavy industries to others for which a firm basis on the earth is not absolutely necessary. It has become increasingly convenient to cover the whole area of work with overhead gear capable of moving along and at right angles to the main line of each building; so that it can take up materials from any part and set them down in any other¹.

✓ 6. *Illustrations, drawn from textile and boot industries, of diverse influences which partial standardization and specialization exert on the size of the business unit.*

We have seen how the application of water power to spinning collected that branch of the industry into factories,

¹ A few details may be added. In some cases each building of the works is in addition surrounded by railway lines of normal gauge, and perhaps permeated by narrow gauge lines for special uses: each department of work can have its own province; often so located as to be in contact on one side with that from which it is to receive material, and on the other with that to which it is to deliver. Ample space can be taken for the works at starting; and almost unlimited expansions can be arranged by enlarging the original simple building either longitudinally or laterally or both. Walls are needed only at the outside of a building, which may cover an acre; for the roof, as well as overhead and other gear, can be supported on steel pillars.

II, III, 6. while hand-weaving remained in the cottages: but the power-loom needed factories. At first it was a rough and untrustworthy instrument, likely to deal harshly with the yarn; and the only people who had the technical knowledge and other facilities for the management of textile factories were master spinners. So the growth of machinery seemed at once to crush out the small man, and to bring under one roof the successive processes of a great industry.

But all the while machinery was preparing the way for undoing this vertical consolidation: for improvements in spinning gradually enabled yarn to be made with such absolute certainty and precision to any standard requirement, that the weaver could buy it in open market, or even contract for it in advance, with confidence that he could get what he needed; and the loom became both more powerful and gentler. These improvements have continued by innumerable small stages down to the present day, and now the element of routine preponderates in cotton spinning mills, and in weaving sheds for staple cloths. The size of such factories is not much influenced, at all events directly, by the progress of technique: for that is not increasing materially the expensiveness of the plant required for the best work. But the growing efficiency of the plant is increasing the floor space, the engine power, and the quantity of machinery required to give employment to a given number of workers: and there are larger calls for organizing faculty, and for some ready initiative in throwing out machinery which has been left behind by recent improvements. These branches of the cotton industry are excellently managed by strong, but simple men; and again by joint-stock companies, some of which are largely in the hands of working-men and have something of the character of cooperative societies.

On the other hand, the manufacturer of finished cotton goods of other than the standard patterns must ever be watchful, supple, and quick: for variations in demand for different classes of things in his trade would prevent the work of each one of his departments from being fitted in exactly with that of the others, however steady his aggregate output might be. And, even more than organizing strength, he needs the faculty of reading coming events in a relatively narrow thoroughfare

of the world's business, and turning to the best account the flying opportunities which are offered by his changeful relations to men and things¹. II, III, 6.

The woollen and worsted industries deal with materials which are very variable in character: and nearly all their products, except such things as blankets, are made for consumers who are under the influence of western fluctuations of fashion. Merinos and other short fibred wools, which are used in "woollen" stuffs in the narrower sense of the term, are often mixed up with shoddy and even wound around cotton yarns: and no manufacturer (i.e. maker of stuffs) can be sure of getting exactly the description of such yarn as he wants, except by making it himself. As a rule all the various stages of woollen cloth making (exclusive of dyeing and finishing), are carried on together in rather small factories: for they yield no very great economies of production on a large scale, and individual care and judgment as to details are incessantly required.

The worsted industries, which deal with long staple wools, are organized generally on similar principles to the "woollen" (in the narrower use of the term), except in one important matter. The unravelling and smoothing out of long yarns require an elaborate process; which is, as a rule, that of "combing": the short fibres mingled with the long are taken out and the long are combed out into "tops," for worsted making. This process requires expensive machinery, which was for the greater part invented in England. It is worked by very powerful firms, and the tops are marketed at home and abroad; England thus returning some of the obligations, which she has

¹ There is much of interest on this subject in Chapman's *The Lancashire Cotton Industry*. He observes that the complete command which Lancashire offers to the manufacturer of any sort of yarn that he may need gives scope to even very small men in manufacturing specialities. They "rent buildings and 'turning,' and produce successfully in a small way. Sometimes several firms may be found in one building" (p. 163). Schulze-Gävernitz, *Cotton trade in England and on the Continent*, presented a vivid picture of the advantage which the high organization of his markets gave to the English textile manufacturer over his Continental rivals in 1895: but the organization of their markets has made progress since then; see Landauer, *Handel und Produktion in der Baumwollindustrie*, 1912. *Bulletin 74* of the Bureau of the Census of the United States 1905 speaks of the hindrances to trade, which arise from the lack of adequate specialization in the American cotton industry.

II, m, 6. incurred, as a consequence of her own inertia, and of Germany's systematic application of chemical science to industry¹.

The arts of dyeing and finishing all kinds of textile materials began to make rapid progress about the time when the power-loom was coming into general use; and, indeed, partly in consequence of the great increase in the volume of the textile industries that resulted from it. It soon became clear that the resources of a cloth factory could not offer nearly as great a variety of refined finish, as could be got by large firms, each of which gave its whole energies to a particular form of finishing. Every such firm, or rather company, is equipped with vast and various special apparatus, and with high technical skill. It can thus bring the appropriate part of extensive technical forces to bear on each task, which it undertakes: the same highly specialized task often needs to be performed at about the same time on a great variety of goods, coming from many customers and designed for many purposes; and thus it is able to obtain many of the advantages of continuous process, even in regard to small transactions².

Modern textile industries are in the main the products of British thought and method: the new boot and shoe industries are distinctively American. They have developed with marvelous thoroughness the notion that standardization, adapted to the many various wants of consumers, is an economic force corresponding within its own sphere to the standardization of parts of machinery to meet the varying requirements of particular machines. Not many years ago every well fitting boot or shoe was adjusted in each detail by individual care to the shape of a single foot: but now the call for individual judgment in the industry is almost confined to the economical arrangement of shapes for various portions of boots or shoes of different sorts

¹ The tops are to some extent standardized; but the needs of some manufacturers cannot be met by any judgment less subtle and careful than that of expert buyers in their own employment, who handle and test before accepting. A little more is said on these subjects in Appendix I, 2.

² Clapham's *Woollen and worsted industries* is a model study. See also Weld, "Specialization in the woollen and worsted industry," in the *Harvard Journal of Economics*, Nov. 1912. Landauer l.c. is specially instructive as to the German finishing industry.

and sizes. So a multitude of steel plates, each corresponding to some part of a boot or shoe of some one of the many sizes and shapes in vogue, are laid on a hide or skin; and adjusted to its irregular shape in such a manner that they cover nearly the whole of it; and the hide or skin is cut up along the boundaries of the plates. Then machines enter the field, and require from their human associates little more than careful feeding. II, III, 6.

A passenger in the *Mayflower* founded a boot and shoe industry at Lynn, which spread over Eastern Massachusetts¹. In 1845 the industry was highly organized, with much standardization and division of labour, but mainly on primitive lines. Then came a long series of brilliant mechanical inventions, which reduced the direct labour cost of a boot to less than a tenth of what it had been; and hand labour practically ceased from the industry. But people's feet vary much, and in order to enable a machine-made boot or shoe to compete with one made to order by hand, the standardization needed to go on the opposite route to that, which it may best follow in making agricultural implements or watches, or other things in which human needs have little variety. In America, though not elsewhere, each factory makes, as a rule, only a single class of boot or shoe,—it may be a high-class boot for girls, or a stout boot for working women—: but, whatever the class is, it makes each quality and pattern in "sizes" and half sizes, and in six or a dozen different widths. The result is that while the work of each operative is very simple, the total output is so subtly organized that the needs and taste of each individual consumer are, save in a few exceptional cases, met almost as delicately and thoroughly as they could be by the careful thought of a skilled artisan.

The machines required for each stage of the manufacture are very numerous and expensive. Many of them are patented, and either sold at very high prices, or hired out at charges apportioned to the number of times they have been used, as indicated by automatic registers. Its high capital charge would prohibit the use by a small manufacturer of a machine, which performs only one short operation, but can do it for a great

¹ See a suggestive study of the boot and shoe industry in *Report of Twelfth Census of the U.S.A., 1900*, vol. VII. p. 754.

ii, iii, & number of boots: the practice of paying in proportion to the work done, puts him on a level in this respect with a more powerful rival. Thus the technical efficiency of the boot machinery organization is of the highest order: but the power, thus obtained, has been turned to harsh uses, by "tying clauses." As we shall see presently, these resemble Deferred Shipping Rebates, in binding a customer who makes any use of the aid of a particular business, to abstain from obtaining aid from any rival business: such action tends to create a harsh monopoly.

The number of businesses that manufacture on a small scale, or devote themselves to subsidiary *processes*, is diminishing generally. But the purchase of ready cut soles, and of some completely manufactured *parts* is on the increase: by this arrangement, manufacturers "get the grade and weight they want, save one operation, and do not have on their hands sole leather that they do not want¹."

A large manufacturer has however considerable advantage in retailing. He can open many shops in the same city, in each of which a customer's taste and fit can be ascertained; and if he selects a style in which exactly the right fit is not on hand, it can be ordered by telephone and sent to him from a common store in the course of an hour. Thus he procures custom more easily, and at less cost for marketing, than if he kept a full supply of everything likely to be needed in each of two or three giant shops. It is however true that this full standardization enables any retailer, with a considerable stock and near to a large wholesale stock, to market efficiently and cheaply on similar lines².

¹ *Report of U.S.A. Census of 1905*, Bulletin 72, p. 12.

² Similar remarks apply to other kinds of goods; see Appendix J, 2 and 4. The general trend of this Section is continued in chapters vi and vii of this Book.

CHAPTER IV

FURTHER TECHNICAL INFLUENCES ON THE SIZE OF THE BUSINESS UNIT

1. *The expansion of the business unit in industries which handle continuous streams of homogeneous materials is being promoted by new economies appertaining to uniform and continuous process.* 11, 17, 1.

We now pass to a group of industries which handle no large single mass: they have little kinship to the higher stages of the steel industries, but they closely resemble the lower. They turn their material promptly into powder or liquid form, and keep it on the flow through many consecutive processes. During all this time there is very little for the hand to do, except to turn certain handles, etc., at the right time; and not very much for the head to do, except in the organic planning and masterly management of the whole.

Thus paper-mills and flour-mills deal with raw materials already in shapes easily handled. They turn the logs of wood, or the grain, into a homogeneous fluid or powder, by a series of processes, which are automatic; and require little more effort of thought, and not much more effort of hand, to make them available for a vast output than for a small one. A small paper-mill may thrive in such a place as the Black Forest, where a stream of water grinds down logs from the adjacent woods into pulp; mixes it with gluten, etc.; spreads it over rollers; and at last delivers it as made paper, without being touched by a human hand. There is here no waste of labour: but the same wood could have been turned into a better paper, with little further outlay, in a highly organized mill. And the growth of large mills at the expense of small is steady and rapid.

II, IV, 1. Similarly with regard to flour-mills. The farmers in the wheat districts of America, send grain for local consumption to be ground into coarse flour in old-fashioned mills, each of which is commonly worked by its owner unaided. But all over the western world the economy of the large mill in grinding for the market is irresistible.

Modern flour milling is Hungarian in its origin; its later development was characteristic of American resource. But some mills in British sea-ports have overtaken American practice; while they have an advantage in mixing their grains and make the virtues of the various kinds supplement one another. A big ship holding many thousand tons is floated against the walls of a mill; the wheat is made to flow in an endless stream from the ship to the upper floor of the mill. No hand touches it. But after a time all its various impurities, each taken out by a separate process, are delivered to their proper compartments; and flour from any desired mixture of wheats, by a selection of any desired parts of each grain, is delivered at the end after having gone through a score of separate processes¹.

As a uniform powder or liquid can be passed from one

¹ Many other household commodities, such as cocoa, mustard, and soap, are similarly made in vast homogeneous quantities: but the influences which the technique of their production exerts on the size of the business unit is supplemented by, and perhaps even subordinate to, economies of advertising on a large scale.

Cement belongs in part to the same class. But local firms often have special advantages in supplying particular markets with so bulky a product. Moreover its raw materials vary locally: the demand for it is even more irregular than for most other building materials; and the sustained series of perplexing episodes of its history in England, America, and above all in Germany, obstruct any attempt to use it as a basis of generalization.

Another class of difficulties hinders deductions from the histories of the two great groups of chemical industries based on salt and on tar; of the marvellous new developments of the glass industry; and again of the industries connected with high explosives: for they are all to be regarded in some respects as branches of advanced chemical research rather than of mere business. Again geographical causes affect the structure of the industries based on salt. A factory of high explosives requires a certain seclusion, which may be inconvenient to a firm too small to rely mainly on its own resources: an effective guarantee as to the purity and correct admixture of the materials used cannot easily be given except by a large firm; and many diverse advantages are united in such an undertaking as that which Sir Andrew Nobel spread over a large area of waste sandy land in Scotland.

automatic apparatus to another without the aid of the human hand, and emerge at the end of a long course transformed and adapted and transformed again in a score of different operations; so also pieces of steel, set into an automatic complex of machinery, can emerge automatically transformed into a cycle wheel hub, or other complex thing. Here might seem to lie the limit of consecutive automatic machine work. II, iv, 1.

But the economy of consecutive highly specialized operations can be carried much further, if a series of operations is substituted for a series of machines, and the product to be worked upon passes automatically from one to another in a continuous series. This idea was embodied in the organization of the Chicago meat-packing firms. No two animals are exactly alike: but yet when an ox or a hog, suspended from a rail, passes from one operator to another, each performs one definite operation on the same part of the carcass, with a quickness, a certainty and an efficiency which rivals that of the automatic machine. A minute element of judgment is demanded from the operator; but in the main he is, in his working hours, a most excellent and economical machine, and not much more. This idea has passed over into other industries.

A step, which may prove ultimately to exert a profound influence on the structure of business in some engineering and other industries, was taken when this method of the meat packer was adapted to the needs of setting up the component parts of an intricate mechanism. A striking instance of this is that of the Ford motor works. A standard form and size of chassis having been adopted, all its component parts are made to standard shape by automatic machinery. These appendages, etc. are stored, each in a separate compartment, connected by a slide running down to an appropriate place in a central room. Here is an endless conveyer, which completes a round in about an hour. A frame is put on this: as it reaches each slide, the appropriate part is fixed on it, by men who act as automatically, promptly and easily, as those in meat-packing works: at the end of its round the frame is a complete chassis. ✓

It is claimed that this method enables high-class products to be made at low costs by very highly paid, though not exceptionally skilled workers, moving steadily without strain or

II, IV, 2. hurry: should the claim stand the test of time, the method is likely to put a large part of the industries that are most characteristic of the modern age, almost exclusively under the control of giant businesses. It is however relevant to note that Mr Ford himself began business on a small scale.

Finally, note may be made of a matter of secondary importance. A business which deals with a large homogeneous product is likely to buy large quantities of some things, which are subsidiary to its processes of manufacture or of marketing; and it often sees its way to making them more cheaply or more conveniently than it can buy them. For instance many food and other products can most conveniently be packed for retail sale in small wooden boxes. Some time ago automatic machines were invented for nailing these boxes together: but their full influence on the price charged by box makers was not exerted quickly: and in consequence some very large users of boxes, did a good stroke of business by setting up subsidiary departments equipped with the new machinery, and making boxes for themselves. But this tendency is of doubtful public advantage: for such departments are not, except by accident, under the control of men specially adapted for the work; and they are much less likely to contribute further inventions and improvements to that work than might be expected from independent producers giving their whole faculties to it.

2. The handling of large masses of homogeneous material is often associated with the utilization of by-products, which further strengthens the tendency to any increase in the size of the business unit.

There is an intimate connection between the massive manufacture of homogeneous products and the utilization of by-products. For the processes of standardization of the main products tend to segregate by-products: and if any particular element of the original material is cast out by a special process—and this often happens—then a long step has already been made towards the standardization of any by-product, of which that element is the basis. By-product industries are however liable to great vicissitudes. Something which was apparently almost valueless is suddenly made the foundation of an im-

portant product, either through a new technical discovery or through the rise of a new demand. For instance, the confident expectations, current not long ago, that electric light would speedily displace gas, took insufficient account of the great rise in the price of coke, which would follow any check to the output of gas: nor did they anticipate the vast field for the consumption of tar, which seems likely to be opened out by its new applications to road surface making. II, iv, 2.

The advantage of continuity of process is one of several causes that incline large producers to work up their by-products. In old times, when the head of a business was also the master workman, economy and efficiency alike required that the subtle treatment of each by-product should be in the hands of a master of that work; and consequently by-products were generally handed over to subsidiary industries. But in modern times, a great organizer, with abundant capital, can employ experts to travel for him and study the best methods of treatment known at home or abroad, and can set them to put up a large and expensive plant. He has a double set of gains to expect from experiments that tend both to increase the demand for his by-product, and to improve the quality of the goods made out of it: so he will risk larger outlay and be less discouraged by some initial loss than almost anyone else¹.

Some of the by-products of petroleum are subtle and costly chemical compounds, for pharmaceutical and other uses; and they demand the thought and care of highly trained professional analysts. The same is true in regard to several by-products of the "heavy" chemical industries, in which Britain holds a leading place: for she is favoured by her own supplies of coal and salt, and by easy access to sulphur and other necessary materials. In all such industries, new products are frequently

¹ The utilization of horns, as by-products of the slaughter-house, is vividly described by Babbage (*Economy of Manufactures*, A.D. 1832, § 270). So when the Chicago meat-packing firms found a sudden opening for a vast industry with high profits they throw all their force into their main work; and subsidiary industries grew up around them to handle their by-products. But later on some of them applied their overflowing capital and energy to setting this work on a higher plane: and, partly by aid of European methods, they got so much profit from it as to be able to sell their main products at a low price relatively to the cost of the animals. See *Report of the Commission of Corporations on the Beef Industry*, Washington, 1905.

11, 14, 2. coming to the front; and a business, which has abundant capital and is controlled by men with scientific interests and large faculty for high enterprise, may constantly introduce into the world not only new methods, but also new things.

But yet the main occupation of these industries is with familiar bulky products: and a great firm may long hold a prominent place in them, if it is managed with discretion and energy, and has an alert apprehension of any improvements in method or product that are on their way. Such industries give scope for bold and wise faculty, ready to sink large capital in organizing scientific studies and experiments: for, though they must in great part be barren of result, they yield splendid rewards on the relatively few routes which lead to success. They may be compared and contrasted with the light chemical industries, which have already been noted as specially characteristic of the German aptitude for organized team work in scientific exploration under capable guidance.

The main basis of those industries is coal tar, which Germany at first procured largely from British gasworks, but afterwards from the coke ovens of steel works, themselves a characteristic product of scientific method. Persistent study has shown that dyes, capable of resisting the effects of strong light, and offering a large variety of pleasant colour effects, can be made, by working on this basis on innumerable routes. Many of the products evolved on the way to the discovery of a new dye, are found to be useful in other combinations for other purposes. Nothing is hastily dropped; every intermediate product and every by-product is tried in various combinations, with the hope of getting some new result of value in some industrial process, or of getting at an old result by a shorter or more economical method. Such work as this can be effectively done only by a business that can afford to work long and patiently at each of a vast number of problems: and anyone who, without adequate scientific apparatus, specialized on the manufacture of a few of the products in most repute, might possibly find himself left stranded, the tide of discovery having swept by him. In fact the complex interactions of new products and by-products show signs of exerting on the light chemical industries an influence different in its nature, but similar in its results, to

that which has been exerted on massive mechanical and chemical industries by the ever increasing variety and expensiveness of the plant required by them. An army of high-class experts, such as won the success of the chemical works at Ludwigshafen, or those at Elberfeld, is as much beyond the reach of a man of moderate means as is the plant needed for making armour plates¹. II, iv, 2.

This case gives much matter for thought: but no general inference can safely be drawn from it. It shows that when an industry is in process of incessant transformation by the creation of new things as well as by the invention of new methods, there is little chance that a general supply of a particular class of by-products will be available, on which a man of moderate means can specialize. But nothing quite similar has ever occurred before: and it is perhaps probable that, when the products, which have been evolved by the colour industries, have been further developed, they will again be handled in some cases

¹ An "economic appreciation of the colour industry," by Dr Kapff, which is at once technical and instructive to the lay reader, will be found in the *Handbuch der Wirtschaftskunde Deutschlands*, 1904, vol. III. ch. 24. He stated that the Ludwigshafen works employed 148 chemists, besides 75 technical, and 305 commercial officials: but that they paid less than four marks a day for their 6300 workpeople, all adults, on the average. See also below, p. 570.

The industry affords an excellent illustration of the intercommunication of various processes:—"A, B, and C, which are intermediate products for making dyes, are also intermediate products for making photographic chemicals. Further treatment of A leads to the production of D, which is a finished photographic chemical and also a very important intermediate body in the manufacture of an important group of dyes. The same treatment of A which produces D also produces E, which is another important halfway house to fresh dyes. The chemical reaction between a and b, which produces A, also produces B, from which very important photographic chemicals are produced, during the manufacture of which residues are left from which the valuable drug K can be made. It is obvious to anyone that it will only be possible to make A and B economically from a plus b, if there is an outlet both for the intermediate dye products and for the photographic chemicals...The German manufacturers do not publish manufacturing details of any value in their innumerable textbooks. When a process is described with working details one can rest assured that it is because much better processes have rendered it obsolete. Reactions which at the commencement gave yields of 20 to 25 per cent. have been coaxed to give 80 and 90 per cent.: but the achievement of this end has taken, in many cases, years of research in the laboratory and in the works; and the German manufacturer is sufficiently awake to arrange matters so that very few of his staff indeed have a sufficiently intimate knowledge of a wide range of products to be able to give away much that would be valuable to the outsider." (*Manchester Guardian*, 4 Jan. 1915.)

- II, IV, 3. most effectively by businesses each of which devotes to one class of work a considerable capital and high ability specialized wholly on it.

3. *The increased dependence of those, who pioneer progress in broad fields of industrial technique, on the aid of large capital.*

The considerations submitted in this and the two preceding chapters seem to point to two conclusions. (The first is that future advances of technique on broad lines are likely to need the aid of capital on an ever increasing scale. The second is that much may still be done with moderate means by a resolute man, who is content to concentrate his strength on a narrow field of work so long as his means are but scanty.)

The area of science has indeed no boundaries: there is no reason for fearing that new discoveries in it will dwindle into relative insignificance; as those of the explorers of the earth's surface have gradually done, since two new worlds were opened up by the voyages of Columbus and Vasco da Gama. On the contrary, it seems probable that, the further man goes into the unexplored regions of science, the larger will be the scope for new discoveries, which will effect revolutions in the practical arts of industry as in the meditations of the speculative student.

And yet it may be feared that the rapid increase in the power and scope of the arts of production is perhaps preparing the way for a partial retrogression of the social dignity and weight of the productive industries in some directions. The very strength which they derive from science may be a source of lassitude. For, though the creation of new knowledge evokes the highest intellectual energy, yet men's faculties may be somewhat burdened by carrying a great bulk of merely useful scientific knowledge, and turning it to account in business routine. The fact that Aristotle, Newton and Guvier would have much to learn, if they should meet a mediocre student of modern science on his arrival in Hades, does not tell entirely on the side of the present age. For creative faculties are developed by exercise; and many who might have been fascinated by opportunities of relatively easy creation fifty years

ago, now find that very little of the original work, which remains to be done, and yet has the fascination that belongs to bright new ideas, is within the scope of their limited power. This depressing influence, which is already felt in some realms of science, may possibly spread in the realm of business. (For the widening range of standardized methods tends generally to increase the dependence of the creative mind on large capitalistic aid in obtaining scope for its activities.)

Further, almost every extension of this grasp increases the opportunities and thus raises the prestige of any capitalist; who, though without high creative faculty, is yet shrewd and steadfast, and can organize and adapt to his particular uses the best plant and methods that so far have been devised. The advantage held by the pioneer of improved methods is of course most prominent in new industries; and in those which, though old, are in transitional stages: but it dwindles rapidly when pioneers have overcome the chief difficulties, and their methods are open to all. For instance, when bicycles first came into vogue, every year brought some striking change in their construction and their methods of manufacture: and the products of a firm, which had no initiative, were obsolete almost as soon as they were made. But now a cycle firm with adequate capital, administrative capacity and assiduity, can manufacture at a comparatively low cost for general consumption an ordinary cycle, that is immeasurably superior to those made by the first leaders of the industry; and is but very little inferior to the best that can be made to-day. Thus improvement in the methods and products of a partially standardized industry goes together with a certain decline in the place held in that industry by the high faculties of initiative: they are apt to be overshadowed by the more commonplace faculties of orderly administration and commercial skill; combined with large resources held perhaps in joint-stock ownership.

Again, the aid, thus given to a new industry, increases both the social importance and the monetary value of an invention, which overcomes any difficulty that may be met in regard to the secondary requirements of the industry: for instance the excellence of the aviator-motor engine increases the premium which is offered for textile materials that are, other things

II, IV, 4. being equal, lighter or stronger or more enduring or even cheaper than those yet known. It is indeed true that when a sound new idea is explained to his brother experts by a man, whose only wealth lies in his brains, it will receive due recognition; the rumours of which will in exceptional cases reach the public ear: in this opportunity will be found a chief mitigation of the injury which the increasing dominion of joint-stock companies inflicts upon the spirit of initiative and enterprise; and such matters will occupy us a good deal later on. But yet every expansion in the general scale of an industry is likely to increase in some directions the advantage which an inventor, who is also a capitalist, has over one whose means are narrow¹.

4. *Opportunities of a strong man with moderate means, who concentrates his energies on a speciality.*

(It is not to be denied that the increasing economies of specialized machinery and skill are on the side of the powerful capitalist in competition with a weaker rival so long as the tasks on which they are engaged are similar in scope: for large works are at an advantage over small in being able to assign to almost every task a specialized machine, which is perhaps more efficient and certainly cheaper in proportion to its efficiency

¹ Experiments on a laboratory scale or with small mechanical models have as a rule but little commercial value, until they have been fortified by practical proof of their efficiency on a working scale. The sums, needed to be expended on large scale experiments before final success is achieved, sometimes amount to hundreds of thousands of pounds: and there are many industries in which a thousand pounds go no further in this direction than a hundred pounds did a few decades ago. An invention, which cannot be patented, is seldom of much value to anyone who does not already own a considerable business in which it can be used.

It is true that, when an invention is complete, and a patent has been obtained for it, it may be sold, or taken up on some sharing plan, by a capitalist. But he is generally in a position to get the best of such a bargain; for a commercial critic of an invention is seldom inclined to regard its possibilities as very high, relatively to the chance that continued working will bring out latent defects; or perhaps suggest to someone else a superior plan, that is not technically covered by the existing patent. It is to be remembered also that large sums of money are often expended by wealthy inventors on developing and patenting plans that run parallel to their chief plan, in order to delay the advent of rivals on those parallel lines: and, though this practice has been somewhat checked by recent legislation tending to weaken patents which are lying dormant, yet it still tells on the side of the strong capitalist in competition with men of smaller means.

than the general or "omnibus" machines applicable to many uses, on which small works of the old type largely rely¹) II, iv, 4.

And even if there is little scope for highly specialized plant, the large business will subdivide the work among so many men; and specialize each of them so closely to a particular task, that by constant practice he will be able to perform it better and very much quicker than a skilled artisan, of much higher faculty, who is equally expert at many other tasks. This matter is indeed of somewhat less importance in Britain than in America: as has already been noted, new strains of immigrants have generally but little industrial training, and yet congregate in the towns. This gives an impetus to the desire of the small manufacturer to confine his production to a class of goods so limited that he may be able to specialize his employees as well as his machinery almost as thoroughly and minutely as can be done even in the largest works. A man with moderate means who knows how to turn the economies of partial standardization and complete specialization to his account is not in a bad position.

The task of pioneering the general standardization of structural shapes was indeed heroic in its dimensions; and tasks on a like scale cannot be frequently achieved by a single effort. But smaller and more gradual movements in similar directions are becoming increasingly frequent, and are doing much to bring particular parts of large processes of massive production within the range of a strong man with comparatively small capital.

Such a man may indeed find that the markets in which he looks to buy his material or to sell his products, are controlled to his prejudice by a monopolistic combination in stages of production below his, or above his, as we shall see. But, if the markets are free, standardization relieves him of many troubles of marketing which might weigh him down, and it enables him to give his energies to that work which is specially his.

¹ For some parts of such a machine are almost sure to be idle in each of the many tasks to which it is applied, and their presence is always a source of extra cost, and often of extra work to the machine. Again, each part of it must be made heavy and strong enough to bear the maximum strain imposed in any of its uses; whereas in a specialized machine, every part is kept light except those which will be subject to heavy strain in the constant repetition of its single task.

II, IV, 4. He looks to selling his standardized product without inordinate expenses on advertising, or in building up business connections with individual firms.) And, what is often more important, he can enter into any process in which the standardized products are used, with a fair certainty that he will be able to buy them, as he needs them, at a low cost.

This is noticeable in production, the earlier stages of which give large scope for machinery, and require much capital, but not much labour or individual treatment; while the later stages need mainly to be done by hand, and call for the kind of care that is best given by an artisan working on his own account or by a small employer. Thus large steel firms have always supplied small cutlers with their material. Machine-made standardized component parts are built up into good bicycles in many a small workshop. The small milliner, dressmaker, and shoemaker buy many more materials already partly worked up by machinery than is commonly supposed. And the small builder and picture frame maker buy ready made doors, and window frames, or picture frame material from large producers with elaborate plant; while they themselves give their main attention to local needs, to the tastes of particular customers, and to superintending hand work aided by but very little plant. (Thus the large business, itself increasingly given to semi-automatic work on standardized products, is often indirectly aiding businesses in which routine has but a secondary place; and in some directions it promotes new openings through which a man of small means but large energy may work his way up to become a leader in industry.)

In every industrial country there is a sufficient market for specialities, which can be advantageously produced by a man of moderate means; and he can often turn alert and energetic faculty to the best account by concentrating all his strength on making some one thing, perhaps only of a single size. For then he can afford to provide a machine for every subdivision of his work: and, as it need never be set to more than one task, it can be simple and therefore firm and yet cheap.

The thing at which he works may be a piece of electric apparatus, a portable power-driven hammer or riveter, a new pump or windmill: it may be a complex registering machine,

which needs to be revolutionized and again revolutionized; and at last made largely by aid of machines invented for the purpose, before it is ready to take its place as an almost human participant in the clerical work of many kinds of business. In any case he will resolve to have the best plant and the best methods existing for that particular task which he has taken in hand; and he collects around him a staff of men ideally fit for his purpose. They must be alert, and must have every faculty that he needs. But he will not pay for faculties for which he has no great use; and he will not allow skilled men to spend much time on tasks, for which cheaper labour would suffice. When his works are so well equipped, and so highly organized that there seems no great room for further improvement in them, he may probably turn his newly acquired strength to larger fields. Then he will have joined the ranks of the large producers: and is likely to be unconsciously opening avenues through which new small men may work their way up¹. II, iv, 4.

Thus it comes that, though the small producer is constantly threatened with extinction; though he has in fact been driven from some branches of many industries, and is in process of being driven from others; yet he survives. He is saved by the fact that although machinery may have been applied to what used to be the greater part of a process of production; yet the remainder

¹ A hero of See's characteristically American, and profoundly suggestive, *Chordal's Letters* (1880), illustrates a drift of character which did more than anything else to promote England's leadership, and which is still a chief source of her strength. Saokett, a rising engineer, tells (p. 41) how he looked out a likely, intrusive, troublesome boy. "I set him at work on a three years' apprenticeship. I first set him to chipping castings, and told him he could drop such work forever the moment he could do it well. He seemed to understand my plan and passed through the ordeal quickly. Then I put him on a bolt cutter with the same understanding. He soon graduated, took a rough lathe, then a better lathe, then a vice, then a floor. *He always did the most valuable work of which he was capable.* This was my regular plan in the shop, and secured for every man his proper sphere of action." And this boy later on became a foreman; went to help another employer out of his difficulties; found men spiritless because they had not just the work fit for them; put them to work that brought out what was good in them; and soon his employer "was paying higher wages and getting cheaper work than any one else in his line."

The success of small Jewish masters in the East End of London seems to be partly due to the care with which they select for each man work suited to his latent aptitudes. See "The Jewish Immigrant," by J. A. Dyche, in the *Contemporary Review*, vol. LXXV.

II, IV, 4. is still done in the old way. The money-value of the part done by machinery is likely to shrivel up, and the aggregate demand for labour in it is likely to diminish, though the vent of the product may have been much increased by the fall of its price. But meanwhile the demand for labour in those parts of the work, that still require individual attention, will have grown with the increased output: and the scope for the elasticity, for the initiative, and for the watchful care about details, in which the small producer excels, may have been enlarged in one direction as much as it has contracted in another¹.

Moreover improved mechanical processes are taking over many tasks which each household used to perform for itself. Such industries as dressmaking, baking and washing, once largely domestic, are ever adding to the ranks of small businesses, and creating new steps by which enterprise and initiative can begin their climb upwards.

No doubt some of the forces that are working against the small producer are growing cumulatively. We must presently consider how the very inertness of joint-stock companies tempts them to apply some of their large capital in branches of manufacture for which they have no special aptitude, but in which they can turn to account their facilities for borrowing capital at low interest. Meanwhile it may be said, with reference to the present century, that though machinery has ever been extending its domain; yet each conquest has increased the relative importance, from the point of view of the operative, of that ground which it has left open to hand work. It has opened up new ground for general markets: and, there is no cause for wonder at the fact that the number of small businesses is constantly growing; since their products are ever finding new vents in these markets, as well as in the supply of special materials and machines to large businesses.

¹ For instance, if machinery takes over what used to be regarded as three-fourths of a process of manufacture, and after a time performs it at a tenth of the original cost; then, though the real importance of that part remains as great as ever to the consumer, its importance in the statistics of both industry and trade will fall to less than a third of that which used to be three times as important as it. Perhaps the fall in price will have increased the sale of the product five-fold, and, in that case, the employment of labour afforded by what used to be but a fourth of the industry will now give more employment than used to be given by the whole industry.

(Thus, so far as the "productive" side of business is concerned, it may be concluded that—though the volume of output required for maximum efficiency in proportion to capital is increasing in almost every industry—yet, at any given time and in any given condition of industrial technique, there is likely to be a point, beyond which any further increase in size gives little further increase in economy and efficiency.) And this is well; for small businesses are on the whole the best educators of the initiative and versatility, which are the chief sources of industrial progress. II, IV, 4.

(But this conclusion does not extend to the "marketing" side of business: for we shall find that, on that side, the advantages of large capitals in competition with capitals of smaller size are constantly increasing almost everywhere.)

CHAPTER V

CONSTRUCTIVE SPECULATION. ORGANIZED PRODUCE MARKETS

II, v. 1. 1. *Introductory observations.*

A good deal has already been said incidentally as to the ever increasing complexity of marketing, and as to the aids which its operations derive from modern facilities for transport and for the transmission of intelligence. The purpose of the group of three chapters, of which this is the first, is to consider the influences, which these changes are exerting on the costs and methods of marketing in various classes of industries, and on the structure of business in them.

(It will appear that the influences, exerted by developments of the means of communication, operate much as do those exerted by changes in the technique of production: on the whole they strengthen the strong producer and dealer relatively to his weaker competitor; but in some directions their aid is of greater service to the weak than to the strong.)

(Good marketing has always provided or helped in providing; (a) a supply, both steady and elastic, of everything for which there is a considerable demand (measured in terms of purchasing power) in any place; and (b) a fairly steady supply of employment for the labour, skill, plant and managing faculty required for turning them to effective account.) Most of these tasks have been comparatively simple where people have been satisfied with a few products, mostly of local origin; and where, as has often happened, the handicraftsman has been also an agriculturalist, and divided his time between his two occupations so as to meet fairly well the more pressing demands of nature and man: but many of them have gradually become very complex.

The advance of knowledge and wealth has brought so great and ever-changing a variety of goods into ordinary consumption, that if the resources, on which the local dealer could draw, had remained without great change, the stocks needed to meet the impatient demand of the modern western consumer would have been larger in proportion to population than the whole movable wealth of, say, the sixteenth century. And, on the same supposition, the employment found in any place for the highly specialized skill and plant of modern industry would have been so fitful and irregular, that modern knowledge and wealth would scarcely have sufficed to make modern industry commercially possible. But the same causes, that have brought new difficulties, have brought also new methods of overcoming them. II, v, 1.

Nearly all western markets are now united by so many various connections, that a need for any common product almost anywhere can be filled in a couple of days, if not in a few hours, from a large reservoir; which can be replenished quickly from still larger reservoirs near or far. In return for these services, which central reservoirs render to local consumption, linked-up local demand provides a fairly steady market in time of peace for nearly all commodities, however highly specialized, the consumption of which is not greatly varied by such widespread influences as changes in the season or in fashion¹.

Thus technical improvements in transport and marketing are ever overcoming old difficulties; but they are also ever stimulating further developments, which open out new difficulties. One of the most prominent of these, the increase in the distances over which food and other goods travel before arriving at their final resting place, has perhaps nearly reached its full force already. For, as backward countries and districts gain on those which had an earlier start in the industrial race, the average distance travelled by ordinary manufactures will diminish. Long distance transport will be increasingly concerned with fine indus-

¹ On this side of its work good marketing may be compared to a fly-wheel, rather than to a reservoir. The engine which drives a single machine, liable to short sudden increase of strain, must have a fairly massive fly-wheel. If it drives a score of such machines it needs a mass perhaps only six times as great: and if it drives five hundred of them, the wheel may be perhaps less than a thirtieth part as massive in proportion to the work done, as if it drove only one.

II, v, 2. trial specialities; and with such crude agricultural and mineral products, as Nature yields in greater relative abundance, or on easier terms, in some parts of the world than in others.

2. *Modern organization tends so to distribute the risks inherent in making and marketing that they fall increasingly on the shoulders best fitted to bear them.*

The intensest risks of early times and of some backward countries even now, have been "consumers' risks" connected with harvest failures. But cheap and speedy transport by land and sea, aided by the telegraph and the specialized activities of dealers in harvest products, have very greatly diminished such risks in the Western World: and there is some tendency to think of "speculation" as a thing, with which no one need be concerned who does not set out to seek it. But in fact the great risks of business have much in common with the many small risks which must be faced by every responsible citizen.

For when a traveller is in doubt which of two roads to take, he speculates. He must ultimately take one risk or the other: he has no choice but to speculate as to their relative advantages and act according to his speculative judgment: and, in the more weighty affairs of ordinary life, everyone is frequently at a crossing of roads. If a man is in a hired house which he much likes, but is not sure how long he will stay in the neighbourhood, he takes a risk, whether he accepts or refuses a long lease of it: and similarly when a man decides for what occupation to prepare his son, and to what school to send him, he must take some of many risks. But the *looking into the future*, which such risks involve, is seldom recognized as speculation: and even business transactions which follow the ordinary routine are not commonly regarded as "speculative": that term being almost confined to dealings in things the future prices of which are eminently uncertain.)

(The speculative taking of high risks has many varieties. Some are in effect mere reckless gambling. Others are shrewd business ventures, aimed at gains, that must be balanced by losses to traders who are concerned in the same affairs. Others tend to improve the general application of efforts to the attainment of desirable ends: these last alone are entitled to be called "constructive" in the full sense of the term.)

Aristotle's doctrine, that neither party to trade can gain II, v, 2. except at the expense of the other, is true only of that particular form of trade which is classed as gambling, a class to which many varieties of trade speculation belong. But genuine trade commonly benefits both parties to it: because, though each receives only what the other gives up, what he receives is more desired by him than that which he gives up. In gambling, when conducted fairly and on equal terms, every transaction is an exchange of equal risks¹.

(When a man, having superior knowledge as to horses, lays a wager about them on advantageous terms to himself, he effects an immediate increase of his property; but without advantage to the world. On the other hand, when a man has superior knowledge that the supply of anything is likely to run short in any particular country or in the world generally; and buys it either outright or for future delivery; then, on the assumption that his judgment is right, his action is to be regarded as constructive speculation. Such work adds to the world's wealth, just as diverting a stream to work a watermill does, for it tends to increase the supply of things where and when they are likely to be most wanted, and to check the supply of things where and when they are likely to be in less urgent demand.) This is its most conspicuous service.

But it also renders another service; which, though less conspicuous, is not much less important; for it often enables a man whose whole energies are needed for the internal work of his business, to insure himself against the risk that the materials which he will need in his business will not need to be purchased at an enhanced price. The risk is governed by broad causes over which he has scarcely any control, and the study of which requires knowledge and faculties other than his own.)

¹ This statement is not inconsistent with the fact that if a man stakes half of his fortune of £10,000 on an equal risk, his prospects of material well-being are forfeited. For the increase of well-being derived from an addition of say £10 to property or income, is in accordance with fundamental laws of human nature, generally the less, the greater the amount already possessed: and therefore his welfare stands to be diminished by his exchanging a certainty of £10,000 for two equal chances of £15,000 and £5,000. But almost every general rule has its exceptions: and if he could with £15,000 get something that would make him permanently happy, while a loss of half his £10,000 would do him no special injury, the bargain might be wise.

11, v, 2.

As a rule the manufacturer who has not contracted to deliver, but works for the general market, desires to be insured against a fall and not against a rise in the price of his material: he stands to lose by such a fall; since purchasers, unless specially pressed for time, will decline to buy his finished product at a price much above that which corresponds to the current price of the material. There is no simple means of insuring against this risk, which corresponds to a contract for delivery of material at a fixed price; but the two sets of risks are in opposite directions, and it is obvious that much economy might be effected by setting these to neutralize one another. In spite of the abuses connected with them, organized markets for dealing in standardized produce, render many services to business men and to the world at large; and perhaps the chief, though not the most prominent of these is their indirect effect in so concentrating risks, that those of them which, like those just considered, are in opposite directions, will tend to extinguish each other.

But, before entering on this matter, it is worth while to note that insurance against a risk may be so important a benefit to anyone whose capital is not large relatively to the risk, that it may be worth his while to pay far more than the actuarial value of it. For instance, suppose that the chance that a building of a certain class worth £10,000 will be destroyed by fire in the course of a year, is one in ten thousand: then the actuarial value of that risk will be £1. And yet, if the destruction of the building would ruin its owner, and the chance that he would be ruined in that way would materially increase the difficulty of his borrowing additional capital, it may be worth his while to pay £10 (or even more if it were not to be had at a lower rate), for a secure insurance against that risk. But an insurance company, with an income from insurance premiums of £1,000,000, would scarcely feel such a loss; and it is therefore able to reckon the risk at its actuarial value. Of course allowance must be made for the company's heavy expenses of administration, for risks of fraud, etc.: but even so it might make good profits by charging only £2 against the risk¹.

¹ The actuarial calculations are of the same kind, but much more intricate in practice: for partial losses by fire, which are very much more frequent than total losses, are commonly included. In consequence much higher rates than

This illustration shows how a bank or any other powerful business might benefit capitalists of smaller means, if a method could be devised by which it could bear their risks, supposed to run all in the same direction: for it would be to their advantage to insure at more than the actuarial value of their risks. But a characteristic of those risks of a business which are governed by causes external to it, is that they turn on price movements which throw about equal risks in the opposite direction on other businesses. If an insurance company could contrive that the risks which it undertook in regard to a particular price movement in the two directions up and down were equal and opposite, the aggregate burden of its risk would be nothing at all: it would need compensation only for its expenses of administration. II, v, 2.

A balance of this kind is seldom attempted under the name of insurance. But miscellaneous risks are shared out in various ways, some of which are commonly described as insurance; while many others, not so described, amount in effect to indirect insurance. For instance, bad weather on the day set for a Coronation procession is a risk against which an insurance rate is definitely quoted at Lloyds; and it is of great benefit to caterers for public entertainment whose risks are exceptionally large. Insurance against the danger of fine weather is not of frequent occurrence: but it is notorious that fine weather on a Bank holiday causes indoor entertainments to be deserted for outdoor entertainments and excursions. Now, if it were possible to insure simultaneously indoor entertainments against fine weather and outdoor entertainments (together with railways, etc.) against bad weather, for the same day and to equivalent amounts, the insurers might take many grievous risks off the shoulders of others: they might reap a goodly profit for themselves, and yet bear little net risk themselves: for opposite risks would have partly extinguished one another. We are now to see how a chief function of organized markets is to accomplish what is in effect a double insurance of this kind, though its manner is rather that of wagering than of insurance.

that suggested above are charged: but the general principle by which they are governed is not affected by this.

II, v, 3.

3. *Characteristics of organized markets.*

(“An organized market” is one the proceedings of which are formally regulated.) As a rule those who deal on it are in effect a corporation: they elect new members and also the executive of their body and appoint the committee by which their own regulations are enforced. In some countries their status is fixed and their actions are superintended by Government. Their regulations generally provide, implicitly or explicitly, for the completion of a contract to buy or sell a quantity of a definite commodity at a certain price, by the utterance of a few words on the one side, and by a brief response, sometimes a mere nod, on the other. They generally prescribe a rather large unit as that to which the contract refers, at all events in the absence of any specific statement to the contrary.

The most highly organized exchanges are the Stock Exchanges of the chief industrial countries. But they can profitably be considered only in connection with the Money Markets to which they belong; and their special problems have but little direct connection with those of the present group of chapters. They may therefore be left on one side for the present.

(The chief conditions needed for rendering any class of products suitable to be handled in an organized market are, (1) that it be not quickly perishable; (2) that the quantity of each thing can be expressed by number, weight or measure; (3) that its quality can be determined by tests that yield almost identical results when applied by different officials, assumed to be expert and honest; and (4) that the class is important enough to occupy large bodies of buyers and sellers.)

These conditions are sufficient to render organized marketing practicable. But a fifth condition is required to make it attractive: (it is that the class of things dealt in should be generally liable to considerable fluctuations in price.) For otherwise the dealings would be confined almost exclusively to producers, consumers, and merchants: there would be little scope for those professional dealers who make a living by speculative purchases and sales; and who, as we shall presently see, in some cases render great public services by carrying risks that would otherwise need to be borne by people whose special aptitudes lie in

other directions. It is true that this beneficent work is often marred, and sometimes over-borne, by evil practices which intensify fluctuations and mislead honest dealers: but, for the present at least, that evil has to be taken with the good. (An organized market generally gives scope for purchases and sales for immediate delivery; and for dealings in "futures," that is in goods to be delivered at specified future times¹.)

This fifth condition implies that the things in question are not of such a nature, that their supply can be varied by rapid and extensive changes in the rate of production; so that their price is prevented from fluctuating rapidly, and remains always close to normal cost of production. There are few material things which satisfy all these conditions in very high degree: the chief among them are various grains, especially wheat; and raw cotton. The authorities of each organized produce market define the standard, or standards, in which dealings may be made; and all produce, which comes for delivery in these dealings, is inspected and certified as being truly up to the standard which it claims.

(Comparatively few transactions in futures lead to the actual delivery of the produce.) In most cases the buyer pays to the seller any amount, by which the official price of the quantity sold may have fallen below that at which the sale was made; or receives from him any amount, by which it may have risen. Either side may insist on completion: but that is generally effected through the organization of the exchange, by bringing together those who wish actually to deliver with those who wish actually to receive; the rest being "rung out." The practical effect of this is that anyone can as a rule buy a future, without being called upon to pay its price either at the time of making the contract, or afterwards. Each party is required to put in "margin," which will cover a small movement of the price

¹ A contract in relation to a future often takes the form of an "Option" by which the payment of a certain sum secures the right to demand certain things (or to sell them) within a given period at a specified price: these two options may be combined, an option to buy at a stated price being coupled with one to sell at a stated higher price. There are a few cases in which dealings in options are part of legitimate trade. But there appears to be more force in the arguments for prohibiting them by law, than for prohibiting a simple buying or selling of futures; for they are relatively more serviceable to the gambler and the manipulator than to the straightforward dealer.

11, v, 4. against him: and, as soon as the price moves considerably against him, he is likely to be required to make a corresponding addition to his margin.

Thus by far the greater part of the transactions are in substance merely wagers to the effect that the price of produce will rise or fall. Of these wagers some are, as we have seen, careful, deliberate business operations, sometimes classed as "legitimate" speculation: others are the almost random guesses of foolish gamblers; and others again are parts of large manipulative policy, which is in the main evil economically and morally.

4. *The services rendered by constructive speculation on a Wheat Exchange, illustrated by its efficacy in lightening the burden of risks borne by grain merchants and millers.*

In early times the population bore economic risks, arising out of the uncertainties of the harvests, incomparably more grievous than any that fall on any large class of persons in the present age: and the machinery of modern grain markets cannot be adequately judged without some recognition of the evils from which mankind has been delivered by the gradual development of organized trading in grain: a little is therefore said about them in Appendix I, 1. Milling is now a subtle industry, requiring a highly technical knowledge of machinery and of the many variations of grain. Flour is not now made of any grain that comes first to hand: it is worked to definite standards, for particular districts and classes of consumers, by appropriate blendings of different sorts of wheat; and the miller therefore has more work to do outside of speculation than before. On the other hand, prices in his local market are now so closely bound to those of the world markets, that to form a good opinion about them requires the undivided energy of an able man. The miller is therefore often glad to insure himself against those risks of his business, which arise, not out of the local conditions of which he has special knowledge, but out of world movements.

A produce exchange can best undertake such risks as these, because many minds of first rate ability and many large capitals are occupied there in dealing with just these risks: and

because many of the risks are in opposite directions and cancel one another. The broad shoulders of an exchange can carry without effort the intense risk, relatively to his financial strength, which the chance of a rise in price has imposed on one man; and can generally neutralize it by carrying the equal risk, which the chance of a fall in price has imposed on another. II, v, 4.

It is of course impossible to recognize officially contracts in every sort of wheat. But a standard sort and quality is set for official dealing: and when actual delivery is being arranged, sorts differing in some specified small degrees are allowed to be substituted for the standard grade, under special adjustments as to price, which are ordered by the officials after inspection¹.

A British miller may bring shiploads of wheat of various descriptions alongside his own elevator, and mix them by automatic flow in various proportions to make different sorts of flour. He often buys direct from far-off farmers or local elevators, through agents on the spot, who know his requirements exactly: but he can, if need be, send special instructions in return to telegraphic reports; basing himself on the last records that have been received in Liverpool, or other centre of the wheat trade, of the prices of standard grades in all the chief markets.

Having ordered the purchase of a certain quantity of what he needs, he "hedges," by selling at once in a central market an equal quantity of standard wheat for delivery at about the time at which he expects that the wheat, which he has just bought,

¹ Grading by American elevator companies, of grain sent to them by farmers, is not always without reproach: though in the main it seems to be fairly correct. Official grading is generally careful though it varies a little from one place to another. A long rod, with a row of small boxes along its whole length, is pushed to the bottom of the truck or other receptacle in which the grain is. The boxes are then opened and filled by a single movement; and old fraudulent methods of making the grain appear better than it is, by concentrating good qualities in those parts of the receptacle from which a sample was most likely to be drawn, are stopped by grading the whole as of the lowest quality shown in any box, where there is any difference. The grading is based chiefly on weight per bushel, colour, condition and cleanliness: the last three elements being decided by individual judgment, which appears to be liable to perceptible though small variations: and it takes little or no direct account of strength in gluten, starch or other matters which are important to the miller. See the *Report of the Industrial Commission*, vol. IV. p. 432. That Commission, appointed in 1898, issued its nineteenth volume in 1902; and is the authority for many statements as to American conditions made in the present work.

11, v, 4. will be in his elevator ready to be made quickly into flour. If wheat falls in the interval, his flour has to compete with that made from cheaper wheat; but, what he loses through that fall, is returned to him almost exactly by his gain on the "future" which he has sold. Conversely, if wheat rises in the interval, he has to pay on the sale of his "future" about as much as he gains from the corresponding upward movement of his flour. (By buying a future he does *not* speculate; he throws on the shoulders of the general market the risks and the chances of gain that would otherwise have come to him through general movements external to his own business.) The elements of risk, that stay with him, are only the chances of some divergence between the price movement of the standard grade which he has undertaken to sell, and that of flour of the sort which he is preparing to make: and experience shows that that divergence is seldom large. He does not speculate: he insures¹.

Meanwhile many millers have made contracts to deliver flour to bakers and others in specified quantities and at specified times and places: and prefer to buy their grain as they need it. These millers run opposite risks to those of the set just considered: for a rise in the price of wheat might cause them heavy losses. So they insure themselves by buying futures on the Exchange. In so far as the sales of futures by the first set, and the purchases by the second, are for equal amounts and like times, the resulting risks cancel one another: whatever excess of risk there is on the one side or the other remains to be borne by the dealers on the Exchange: and their shoulders are very strong for the work. (Of course the miller who buys a future, can demand delivery only in a standard grade: and if he is producing fine qualities he sells his right to that grade, and buys direct those sorts which he wants².

¹ Exception must indeed be made for the improbable case in which his sale of a certain grade for future delivery comes at a time, when the price of that grade is being forced up by a campaign on the Exchange to "corner" those who have sold futures.

² The general position is set out clearly by Prof. Emery in his work on *Stock and Produce Exchanges*, 1896, and in his paper read to the American Economic Association in 1899. It may be noted that the miller who contracts in advance to deliver flour of a specially fine quality is put in a better position by buying a future on the Exchange than he would probably be by contracting with individual dealers for the delivery to him of the sorts that he expects to

All great wheat Exchanges are in close touch with one another; their movements are now reported at short intervals to the local markets of the districts which they severally dominate; and though passing fluctuations are ignored, a great change from one month to another tends to influence the breadth of sowing and the assiduity of weeding, etc., of any who may be thoughtfully inclined. It is to be remembered that there is no month in the year in which there are not many cultivators in some part of the Northern or Southern Hemisphere, who are making preparation for, or actually sowing, winter or spring wheat. II, v, 4

Long ago English farmers complained that corn-factors arranged to keep down the price of wheat just after harvest when the farmers "had their payments to make," and were compelled to sell; and to raise the price against the public later on¹. The modern version of that complaint in America is that futures are sold down on the Exchanges immediately after harvest, in order to lower the prices of wheat for immediate delivery; and that the prices are raised afterwards so that the consumer does not gain what the producer loses. And, while farmers' organizations complain that speculation in futures lowers prices, millers' organizations complain that they have the opposite effect: but analysis and statistics seem to show conclusively that neither contention can be sustained².

need. Such a contract would be difficult to make, and it would be liable to uncertainty and friction in the execution. While buying a future on the Exchange he puts himself in command of funds apportioned to the prices of the time at which he needs them; he then buys after inspection, and possibly readjusts his combinations of various sorts according to their several conditions and current prices. The British miller, especially on the Mersey, the Clyde, or other chief waterway, has a choice of wheat from a great number of soils and climates in all parts of the world, and has generally at command several alternative combinations of diverse qualities by which he can reach any desired result.

¹ See e.g., evidence of a Sussex farmer before H. of L. Committee on Agriculture, 1836, Q. 34, 25, 6.

² The Industrial Commission after a full hearing of the arguments of farmers and others in the opposite direction, concluded (*Report*, vol. VI. p. 223) that "prices prevailing at the time when producers dispose of the greater part of their products are greater in comparison to the rest of the year than they were before the advent of modern speculation."

In regard to German experience, see a chart leading to a similar conclusion in Conrad's *Grundriss der Pol. Oek.* i. p. 220. And Table VII, in Mr Hooker's paper on "the suspension of the Berlin Produce Exchange," *Statistical Journal*, 1900, indicates that the German prices fell below the American exceptionally just after harvest, as a result of the suspension.

II, v, 5.

On the whole it seems safe to conclude that, since those, who buy because their investigations lead them to think that the supply is likely to run short, or sell because they are convinced it has been underrated, will gain if they are right and lose if they are wrong; therefore they are in their own interest contributing to the public the best judgment of minds that are generally alert, well-informed and capable. Their influence certainly tends to lessen the amplitude of price variations from place to place and from year to year. But let us turn to look at the evil side of such speculations.

5. Dealings in organized markets are liable to abuse by unscrupulous men, aided as they often are by the folly of ill-informed speculators: but the power of selling the future command of a thing not yet in possession has important uses.

Manipulative speculation has many forms and many degrees. (Its chief method is to create false opinions as to the general conditions of demand and supply.) A clique will lead the market generally to believe that they are working for a fall, when really they are buying quietly and by indirect means much more largely than they are selling; and conversely they will buy openly, when they are really speculating for a fall. To publish definite false news is an extreme measure, bringing so prompt a punishment, that it is generally avoided by shrewd manipulators. But ~~false suggestion is a chief weapon~~: and it has so many shades, some of which seem trivial, that men of fairly upright character are apt to be drawn on insensibly to condoning and even practising it¹.

When a large command over wheat (or other produce) has been quietly obtained, a clique will sometimes go on buying, till all that can be made available before the time of settlement

¹ A rise in price at (say) Chicago, is often started by ordering the purchase of some millions of bushels in Liverpool on a certain morning; so as to suggest to the Chicago market, when it opens a few hours later, that information in possession of the English wheat trade points to some scarcity in supply relatively to demand. Again, when a powerful speculator wishes to buy, he often makes large sales openly in his own market; and a little later causes to be bought by agents, acting secretly on his account, much larger amounts, partly in distant markets, to which the news of his sales has of course been telegraphed.

is already sold; and then go on buying, till the price has been forced up to an exorbitant level. This process is of course facilitated by the practice, that prevails on American Exchanges, of buying and selling in a sort of auction open to the whole market. The clique, if successful, finally let out every one who has over-sold, at prices varying with his means: for it is against their interest to make people bankrupt. Some of the corners thus made have a considerable place in history. But the very forces of the modern Money-market and modern means of communication, which strengthen the attack, strengthen also and in a greater degree the defence offered by the community. The clique may plot in secret: but their dealings, however disguised, are soon interpreted by operators about as shrewd as themselves. And the larger the plot, the more surely will energy and ability be directed to the inquiry, whether the movement which is on foot is really justified by the general relations of demand and supply in world markets. If that appears not to be the case, a hostile clique well financed will enter the field: and it will be secure of victory, if its calculations are right. For if two teams of nearly equal strength are pulling in opposite directions, that one which is pulling with the slope of the hill must surely prevail¹.

In all such cases a powerful clique reckons on obtaining great, though unwilling assistance, at all events in the earlier stages of its campaign, from the folly of amateur speculators. For such men do not understand that the affairs of a great

¹ Thus Mr Partridge in 1891—2 sold vast quantities of wheat at Chicago, in the belief that the market's estimates of the crop were too low and that the current high price was too high. He was right, so he was able to buy back the wheat at a lower price than he paid for it. The market is not often thus wrong, but it was wrong again in 1897 when Mr Leiter thought that the current estimates of the crop were too high, and the price too low. Having large funds at his back, and aided by others, he bought great quantities, adopting subtle devices for preventing wheat that was not under his control from reaching Chicago; and was thus able to make many of those, who had sold to him, pay very high prices for default of delivery when the time for settlement came. But having won one battle, he attempted another: and, partly because he had ranged strong enmities against him, he failed grievously. His second venture indeed illustrated the general rule that sensational success in great speculation tends to strengthen the nervous, confident temper in which it originated. It engenders rashness in venturing, and an even more dangerous inability to recognise defeat. In fact a great speculator has scarcely ever reaped on his victory: he has nearly always persisted till overtaken by disaster.

II, v, c. speculation require thorough equipment with knowledge that is beyond the reach of the general public: they do not speculate altogether at random; but they act more mischievously and disastrously to themselves than if they did. For when a man decides, without any bias whatever, on which side of an uncertain event he will wager, he will of course lose any charges that may be levied on his wagering, and these will accrue to the members of the Exchange: but he will, as a rule, not lose any more; for, if he acts absolutely at random, he is about as likely to go in the right direction as in the wrong. The fees which he pays help to finance constructive speculation and trade, and contribute a little also towards the expenses of malign strategy.

But ill-informed speculators generally suppose themselves to be basing their action on the most recent news. Now, the latest information accessible to outsiders has nearly always been acted on by well-informed persons, and has exerted the full influence, belonging to it, before it reaches the public. They are therefore likely to buy, when a fall is more probable than a rise, and *vice versa*; and in the long run they would make losses by which better informed dealers would profit, even if all the news, which comes in their way, were designed to lead them aright. But in fact many of the statements and suggestions, by which they are guided, have been specially prepared with the purpose either of inducing the unwary to buy, because an unscrupulous speculator or clique wishes to unload; or of inducing them to sell for the opposite reason. In other words ✓ they are, to their own great loss, a powerful force on the side of evil manipulations of the market¹.

(Thus the power of selling the future command of a thing, not yet in possession, is liable to abuse. But, when used by able and honest men, it is beneficial: as is shown by the havoc, caused by epidemics of unorganized speculation in the value of land, such as are not infrequent in new countries. Speculation for a rise in the value of land is always easy: anyone, who has considerable means and believes that the land is being sold

¹ A full explanation of the folly of such men, written many years ago by Crump, *The Theory of Stock Exchange Speculation*, is in the main applicable to present conditions.

under its true value, or turned to uses below those of which it is capable, can move its price upwards by buying, and using his purchases as security for loans with which he buys again. But no one can speculate for a fall in the value of land, except to the extent of selling any that he happens to hold. Those who have knowledge, but no land to sell, are unable to turn it to effect in checking an excessive rise, in the same way as they could if it referred to a thing for which there is an organized market. Of course in all such matters opinion is under influence from a public press, in which wise and honest counsels have the upper hand in ordinary times: but this influence is apt to fail at critical times. II, v, 5.

For instance, the land boom of 1887—1890 in Melbourne began in a shrewd anticipation by able men that the business of the city would require a great extension of the areas used for wholesale trade, domestic and foreign; and for general purposes. They bought, and were able to sell at higher prices; for their success hastened a general appreciation of the great possibilities of Melbourne: and they were joined by others, not all of whom were capable business men like themselves. A little later, a large part of the population had bought land to the full extent of their own capital, if not beyond. No effective note was sounded, or could well be sounded, to warn them that the rise in price had far outrun all reasonable expectations; and that when the bubble was pricked, business would be so crippled that the value of land would fall fast and far. Consequently Melbourne passed through a period of grievous distress¹.

¹ While the boom was yet far from its climax, a Melbourne business man told me the price of land in a part which was indeed well suited for commerce and industry, but was adjoined by much neglected land with almost equal natural advantages. The price was in fact higher than in any part of London, except two or three acres near the Royal Exchange. He said that prudent men knew that a terrible catastrophe was near: but having already sold all the land which they controlled, they had no direct means of influencing prices; and their opinions were unheeded. If a great quantity of futures could have been sold by such men, as soon as prices had gone a little beyond their reasonable level, the sellers would have enriched themselves, and conferred on Melbourne as a whole a benefit many times as large as their own gains.

A little is said in Appendix I, 2, about cotton exchanges and trade in some partially standardized crude products.

II, v, 6.

6. *Some marketing risks relating to "ordinary" products can be transferred by forward contracts: but the majority can be delegated only as incidents of the delegation of corresponding functions.*

The methods of transferring risk from the shoulders of one set of men to those of others, more fitted to bear it, which have now been considered, are not applicable to *ordinary* products, that is those for which no highly organized market is available. But something can be done in that direction by other methods; and the increasing complexity of business often inclines the producer to delegate all such responsibilities as he safely can.

When two men are in partnership on equal terms, it is frequently arranged that one gives nearly his whole energies to making, and the other to marketing. Again a very large business, whether in joint stock or not, commonly entrusts to each of several heads of departments responsibility for a group of details, some of which are considerable, relating to the whole affairs of a small business: each of them discharges a share of the functions of the business; but, as a rule, he bears little or no share of its risks. Function can indeed be delegated easily without associated risks: but the class of risks which can be delegated without any corresponding function is narrow. The risks, which can be transferred without function, relate almost exclusively to definite particular transactions; and the chief instance of these has just been considered. The associated functions and risks with which the next chapter is chiefly concerned are incidental to some stage in the journey of various products on the way from manufacturers, or other producers, to ultimate consumers.

We have seen how an organized market enables a producer to secure in advance an adequate supply of certain materials: and how it also enables him to insure against a loss, that might result to him indirectly from a fall in the market value of his material while he is working it up. So far as future supplies of material go, the same security can be had in many classes of work by a contract for future delivery: though it cannot be undone or modified to suit altered circumstances by a compensatory sale, as easily as it could if an organized market

offered facilities for a sale of futures. For instance, shipbuilders and other users of half-finished steel products commonly buy their materials in advance as far as possible, when building under contract; in which course they are aided indirectly at least by partially organized markets for some products. Coal, a chief material for many industries, is too various in character to be handled in a highly organized market: otherwise the dealings in such a market might at times surpass all others in volume and excitement¹.

II, v, 6.

Thus by private contract or otherwise it is sometimes practicable to insure a business against loss by definite changes in recognized prices, as thoroughly as against losses by fire or other specific accident. But it is not possible, it is scarcely even conceivable, that insurance should be effected against the results of slackness in action or errors of judgment. Such risks must remain with those who control the business and appoint its officers. They may delegate some of their functions, and yet bear these risks either in whole or in part: but it is generally impracticable to transfer such risks without transferring the functions to which they are related. A producer can indeed transfer to middlemen some of the risks of marketing, which he must otherwise bear himself: but he can do so only because that transference is incidental to a transference of some functions to them².

To this fact and another which is closely allied to it may be traced many of the chief characteristics of modern marketing.

¹ There are many local coal markets in Britain, each having trade terms and usages peculiar to itself: and, though the broad dealings of the London Coal Exchange in almost every variety have introduced some uniformity in the movements of prices, no approach to a satisfactory reduction of all varieties to their equivalents in several standard sorts is yet in sight. Comparatively few consumers make their contracts in advance with mineowners: but the middlemen's dealings in such contracts are so vast as to bear some comparison with those of an organized market. They even occasionally bear the market, in order to obtain favourable terms from coalowners for large contracts for the coming season: but for this purpose they do not sell futures: they merely withhold their customary purchases for a time. (See the account of "the marketing of coal" by Prof. H. Stanley Jevons and Mr David Evans in *Practical Coal Mining*.)

² Some "profit and loss sharing" schemes may seem to point in another direction: but the general trend of such schemes does not. The ordinary shareholders of a large joint-stock company bear its chief risks, but delegate nearly the whole of the control.

- II, v, 6. The second fact is that though each bargain on an open market, whether an organized cotton market, a cattle market, or a fish market, stands very much by itself; the dealings of a mercantile house with its customers cannot generally be isolated, either as regards their costs or as regards their rewards, as to which more will be said in the next chapter.

CHAPTER VI

SOME BROAD PROBLEMS OF GENERAL MARKETING

1. *The costs and risks of marketing attach to whole processes rather than to particular transactions: many of them are common to a great part, and some even to the whole, of the affairs of a business.* II, vi, 1.

(Let us revert to the notion that "the cost of production, which controls value, relates to whole processes of production, rather than to any particular parcel of products¹.") Let us follow it out on the commercial side of the business of a builder who works only on contract under precise specifications, and contracts in advance for his chief supplies at fixed prices. He has indeed insured himself against all the most prominent risks of marketing; but more risks remain behind than appears at first sight.

Suppose that he has insured against a rise in the standard rate of wages of each chief class of his employees. That will go but a little way, if he does not get hold of at least a fair proportion of able, alert and loyal men, and manage them with tact and firmness: nor is his success likely to be permanent, if he fails to detect and attach to his business those who will in the course of time be fit for promotion to leading places. He cannot insure against the results of errors of judgment in such matters unless by sub-letting contracts; that is, by handing over to middlemen certain functions, with the risks attached to them. Again, as his business increases, he must decide whether an extension of his plant is likely to be turned to sufficient account in future undertakings to be remunerative. He may be doubting whether to enlarge his carpenters' shed, or

¹ See above, p. 190.

II, vi, I. to buy a steam mortar-grinding machine; or, if he is in a large way of trade, a great derrick gantry. Whichever way he decides any one of these questions, he must run a risk of having cause to regret his decision. Constructive speculation, as was argued at the beginning of the last chapter, is inherent in nearly every business decision: there is generally a choice of risks, but seldom any choice as to whether to take a risk inherent to a function, save by transferring function and risk together.

Now it may appear that, though the productive side of a business involves large decisions as to investments in plant, etc., which will bear fruit slowly and only by means of their services in many various undertakings; yet there is no similar obstacle to the assignment of its particular costs and rewards to each several marketing transaction. But that is not the case. On the contrary there are many marketing problems in which the most advantageous course may be found to lie in making a loss on particular transactions. A great American trader gave instructions that, when a customer, who did not know her own mind, brought back a recent purchase somewhat the worse for its journey, it was to be taken back, and the full money returned, unless there was reason to suppose that she had not acted in good faith: he reckoned that where he thus lost half a dollar in money, he would gain a dollar's worth of good will. The success of his method points to the fundamental principle that the marketing side of the work of a business is an integral process, and not a series of independent transactions.

(The marketing reputation and connection of a business may be a larger property (or "capital") in proportion to its earnings, than is the fixed plant of a manufacturer in some industries.) Reputation for fairness and generosity in dealing, is a property seldom acquired without special effort and sacrifice, and is a powerful factor of success in all the undertakings of a business. (The reputation acquired by large general advertising is easy of attainment, though expensive.) It is indeed seldom of much value, unless accompanied by capable and honourable dealing: but, when attained, it extends in varying degrees to all products made or handled by the business: a name or a trade mark which has gained good fame in regard to one product is a great aid to the marketing of others. Again the expenses of

advertising by means of a firm's commercial travellers, and the resulting sales, are common to a great part of its business. A single prominent position in a great thoroughfare promotes the sale of many various things: the knowledge that a trader obtains of the character and solvency of his customers, and the opinion, which they form of the soundness of his advice as to the qualities of different sorts of his goods, extend from one part of his business to another.

Some of these considerations will be developed later on. But enough has perhaps been said to support the conclusion that, with a few exceptions, the costs and risks of marketing any one commodity cannot be separated from those of others, which are handled in the same businesses. Each of the trades of the fishmonger, the greengrocer, the grocer, the milliner, etc., has a more or less clearly defined set of costs and risks. But there is seldom a clear line of division between those which belong to particular branches of the same trade. When several trades are combined in the hands of the same Universal Provider, the costs and risks of any one department cannot be stated separately, and only a vague guess can be made as to the part which it has played in making or marring the success of others.

2. The organization of trade is in the long run as vital to consumers as to producers and traders: but the ever increasing energy, with which sellers push their goods on the notice of buyers, is an inevitable result of modern developments.

(In all this it has been assumed that the necessary arrangements for marketing are, as a rule, the business of the seller; while the buyer remains relatively inactive.) Before going further it will be well to consider the causes which make this assumption reasonable and even necessary in the modern world; though it would not always have been reasonable.

(Under a system of barter, neither party to a bargain could be called a seller. But as soon as money came into general use, it became obvious that a person who had money and a free range of the market in which to spend it, was in a stronger position than one, who had a stock of goods which he could not

II, vi, 2. turn to account easily except by first exchanging them for money.) This superior strength in the position of the buyer was felt strongly in foreign trade; and it contributed much to the Mediaeval and Mercantile preferences against the exportation of the precious metals, and in favour of their importation. As time went on, the cruder arguments in support of these preferences fell into disrepute among thoughtful people (but the fundamental notion that the buyer confers a greater benefit on the seller than he receives in return, governs the policy of many countries at the present time.)

Of course the peasant in a backward country, whose supply of food has run short, often has access to only one man from whom he can buy grain, or borrow the means of purchasing: if there are several grain dealers and lenders (for the two functions are commonly combined), they are likely to be acting in combination. The harsh exactions therefore of monopolistic sellers take a much larger place in Mediaeval history, and in the modern history of such countries as India and Russia, than do those of monopolistic buyers. And as we shall presently see, special circumstances in America, and still more in Germany, have put great power into the hands of monopolistic sellers or combinations of sellers. (But buyers in England seldom suffer more than a trifling inconvenience from the refusal of a seller to supply them at a fair cost price: for the sources of supply are generally numerous, and they are very rarely combined under one control.)

(The opinion that buyers have the upper hand has indeed been promoted by the common habit of looking at immediate and transitory rather than ultimate and enduring results; insufficient attention being paid to the distinction between the gain which a seller makes on a particular sale, when the existence of his plant and his business organization is taken for granted; and that which he makes on his sales as a whole, when the cost of setting them up has to be reckoned in.)

The advantage of obtaining a broad market is often much exaggerated. It is argued that if a manufacturer is ready to supply a thousand bales of cloth or a thousand mowing machines a week, he may be losing money on an output of five hundred weekly, though they are sold at a price that would give

him fair profits on an output of seven hundred, and high profits on an output of a thousand: and it may be suggested that these figures indicate the economies to be gained by production on a large scale. But they do nothing of the sort. They indicate the economy to be gained by adjusting plant and business organization to the demands that will be made on them in normal times, and by preventing as far as may be fluctuations from one season to another. If two cloth manufacturers sell on even terms in the same markets, and have the same percentages of unemployed plant at various times of the year, the fact that one of them can produce ten thousand, and the other only one thousand bales a week, will occasion no great difference in their rates of profit. For the technical economies open to the two will be very nearly the same, and each will have some advantage over the other in administration. And, if the smaller producer has a steadier market, or is in better touch with it, so that he can keep ninety per cent. of his plant at work on the average, while the larger can keep only eighty per cent., then the smaller will make the higher rate of profits.

(Thus the statement that the buyer confers a great benefit on the seller assumes that, for some reason or other, the seller's market has fallen short of his power of production, and that the buyer helps to bring it up to that power.) A sudden increase in the number of buyers will of course move prices strongly in favour of sellers. But if it lasts only long enough to cause a great deal of new plant to be erected, then it will be a great injury to sellers. For the high profits which they make during the short time of boom, will be much less than the losses of the probably much longer time, that elapses before normal demand has risen so high as to enable them to keep this larger stock of plant running as steadily as before, without selling a large part of the produce at forced prices. This then is the second point to be made clear in interpreting the statement that the buyer stands to gain less from a particular transaction than the seller does: the first point made was that the statement assumes the buyer to have good access to sources of supply other than the seller in question.)

(To conclude:—in many cases, the buyers would suffer from being *permanently* deprived of part of their needed supply, much

II vi, 3. more than the producers would by being driven to another occupation for their capital and enterprise; and, in the long run, consumers generally stand to lose more from a deficiency of the plant needed to supply their wants, than producers do from a fall of prices which disinclines them to make additions to their plant, and to keep the old plant in a state of thorough efficiency.)

But we must get to quite a different point of view to observe *the short run*. For a buyer in the modern world can nearly always get what he wants from other sellers and on about the same terms, if his negotiations with a particular seller fall through. The seller on the other hand looks to a sale, as not only covering the direct, or "prime" costs incurred in producing the thing; but also as contributing something to his remuneration for outlay on plant and other "general" costs of his business: when he has sold a thing on normal terms, he is more than remunerated for the direct or prime costs involved in handling that thing. He has less certainty of selling at current prices whenever he wants to do so, than the buyer has of buying at those prices¹.

3. *The distribution of the general costs of marketing, and especially those connected with the holding of stocks for sale.*

It has already been noticed that producers nearly always bear some considerable costs on account of the marketing of their goods. Those, which the customs and general conditions of any place and time habitually assign to producers, are commonly classed among "costs of production." But if a producer undertakes burdens and tasks which are generally transferred to traders, then it is convenient to regard his costs of production without reference to them: he bears costs of production and some part of the costs of marketing².

Formerly most people were content to be supplied with

¹ When a privileged visitor passes through the main door, which separates the buying department of a great linen drapery business from the retailing, he will leave an atmosphere, in which able travellers for manufacturers and wholesale merchants show an assiduous and persuasive courtesy to the employees of the business; and he may enter one, in which employees of similar rank are carefully polite to working women, bent on making their small purchases.

² See above, p. 184.

such things as could be conveniently produced near at hand; and, in regard to seasonal products, at such times as Nature afforded them of her own free will. Even the well-to-do were forced to eat but sparingly of fresh meat in winter; and, until quite recently, fresh sea fish was not to be had far from salt water. Fruit seldom travelled far: as a rule every place had to shift with those kinds for which it was suited; and, if the blossoms of one of them were struck by a sharp local frost, the people went almost without it during the coming year. Even the fairly well-to-do had no great variety of clothes or domestic utensils: the great majority of the people had scarcely any imperious demand save for the common necessities of life, and perhaps a few spices and other slight things. II, vi, 3.

But all this is changed. In the modern world the necessities of life absorb an ever diminishing share of the family income. The great body of the people are in a position to pay for a regular and unconditional daily supply of many various kinds of food, all the year round; and the village grocer's and draper's shops contain many scores of different goods made of material brought from all parts of the world. Again, whereas local supplies of wood used to suffice for nearly all purposes; now the most appropriate wood for each purpose of domestic economy is generally supplied, even though it be a product of distant lands.

This imperiousness of demand varies from one kind of goods to another; and, in regard to the same class of goods, from one stratum of society to another. Its effects on marketing costs, and therefore on prices, are most marked in things, which Nature supplies only at particular seasons; and those for which the demand is most uncertain and irregular. If the purchasers of a thing are rich; if its direct cost of production is small; and if several causes combine to increase the difficulty of adjusting supply to demand; then the costs of marketing often double or treble the price received by the producers, before the thing reaches the consumers.

We pass to corresponding changes in the characters and quantities of the stocks needed to be held by producer and trader. The aggregate stocks of grain and other annual products

II, vi, 3. have always borne nearly the same fixed relation to the annual consumption of the people.

The amount, that stands over at harvest time from earlier years, has of course varied with the weather. In spite of the growth of wealth and providence, it has been diminished by the security which cheap and quick transport affords against merely local failures of the crops; and by the arrival of grain from the Southern Hemisphere to eke out Northern stocks, when they dwindle before the next harvest. It is however still true that farmer (or other cultivator), trader, and consumer have to hold among them nearly a whole year's consumption just after harvest, and nearly half a year's consumption on the average. The cheapest housing of the grain has generally been on the land, where it was grown: but, when most of the grain had to be moved to great mills and thence to the consumer, large elevators and other stores grew up; and the trader, who had long "financed" the poorer cultivators by buying their grain shortly after harvest, became responsible for housing it also. Taking the history of the world as a whole, there are no producers' or traders' stocks to compare in importance with those of grain: and the course of their distribution has been followed in great measure by the stocks of other things.

We saw above (I, III, 5) how "homely" producers of woollen and other goods at first used their own wool, or that of their neighbours: how later on they became increasingly dependent on traders for the supply of wool from a distance; and in various degrees were financed and even controlled by them: and how, in the earlier phases of English manufacture by "power" (whether that of falling water or steam), the new men, who rose to the occasion, were dependent for finances on capital which had been accumulated by merchants and others, and was made accessible by banks that then grew up. During that phase the manufacturer kept as little stock as possible; his goods were housed and "carried" financially by merchants and middlemen till they reached the consumer. But gradually many manufacturing firms, and especially manufacturing companies, have come into control of large capital: which has been in some cases mainly inherited from several generations of suc-

cessful work; in others obtained mainly from the general public through the Stock Exchange. II, vi, 3.

A powerful modern manufacturing business frequently carries a considerable part of its stocks itself, at all events as far as the retailer. But the extent to which this new tendency reaches, varies greatly from one industry to another. It goes furthest, other things being equal, in industries, the ultimate consumer of whose products is a business firm which has an intimate technical acquaintance with their characters, and each of whose purchases is likely to be of sufficient amount to be considered carefully. Some engineering firms, for instance, generally keep most of their own stocks, and bear most of the responsibility for meeting an effective demand.

But meanwhile there are very many manufacturers, whose capital does not reach much beyond what is required for maintaining and enlarging their plant, and for other purposes of their work. It is therefore still true that traders benefit productive industries and the country generally by taking a considerable part in the carrying of stocks. Such a distribution of burden is all the more reasonable because they can turn over most of their stocks more quickly than formerly. Their turnover increases relatively to the capital needed for it: while, on the other hand, the manufacturer's plant increases in costliness relatively to his net output—that is, to the excess value of his product over that of his material.

Thus in a broad view it may be concluded that, so great has been the increase in the variety of the goods demanded by the people at large, that the aggregate of stocks held by producer and trader would have increased much faster than population, and faster even than aggregate wealth, if very powerful causes had not been acting in the opposite direction. (The disadvantages of keeping large stocks are increased, in the case of some kinds of engineering and other plant, by the likelihood that they will be speedily depreciated by new inventions and by changes in technique; while a large stock of goods for consumption may be depreciated even more quickly by changes in fashion and custom. On the other side the advantages to be gained by keeping a large stock are lessened by the rapidity, with which modern methods of production enable a manu-

II, vi, 4. facturer to replenish quickly his stock of anything, for which he has appropriate plant: while the post, the telegraph, the telephone, and the almost omnipresent quick railway service of a compact western country, supplemented by motor traffic, enable every dealer, whether wholesale or retail, to get almost anything that he wants within twenty-four hours, or even less; the way for his easy purchases having been already prepared by trade circulars, catalogues, etc.)

For these reasons the stocks held by producers and traders in the western world are an ever diminishing percentage of their turnovers: and thus, although the variety of production and the imperiousness of demand are multiplying rapidly the number of products for which each industry and trade is responsible, there is a general (not universal) fall in that percentage of the retail prices of commodities, which is attributable to the costs of keeping stocks of them.

4. *Functions of middlemen as links between producer and consumer.*

(The chief functions of middlemen generally are however those of studying the wants of consumers, and the resources of producers; and bringing the two into connection: these functions are important even in regard to the minor requisites of business.) But they are almost indispensable in regard to household goods, clothing, etc. For such things must commonly be seen before purchase: and they must be delivered in small quantities to innumerable consumers, often on credit.

The ultimate consumer must be reached through a retailer, save in some relatively rare cases. But the retailers in such a country as England are almost as numerous as the whole people of a very small country: and to reach them is a task not lightly to be undertaken by producers, whose main energies must be given to other work. That task falls generally to wholesale dealers, who lay themselves out to study the retail trade. They keep a sufficient variety of goods, coming from many sources, to be able to fill up nearly every order from a retailer promptly from their own stocks. Some of these wholesale traders get their supplies chiefly from a higher stratum of traders; each of whom specializes on a narrow range of goods, but keeps in stock

a large variety within that range. In a few cases there is yet a third stratum with still more highly specialized skill and stocks. II, vi, 4.

(A large, strongly capitalized business is often but little dependent on merchants for aid in establishing contact with retailers; for it can organize an effective commercial department of its own.) But on the other hand its marketing may extend over a large area; and in that case its commercial department may have enough to do in dealing with merchants and other wholesale traders. Meanwhile the manufacturer of but moderate means often finds his need of aid from wholesale dealers increased by the growing breadth and complexity of trade, about as much as it is lessened by his increased facilities for obtaining direct information from far and near, and for getting into direct touch with consumers. And it remains true generally that the several strata of trade make more thorough studies of the requirements of consumers and of the varieties and qualities of producers' goods than could be effected by any means other than extensive subdivision of labour and specialization of knowledge and skill¹.

It should be added that many goods are commonly supplied on credit by producers to wholesale traders; and by both to

¹ Traders not infrequently aid producers by direct hints as to customers' needs, and even by suggestions as to methods of meeting them: and various arrangements are sometimes made for the division of any gains that may thence arise. Of this more will be said hereafter: but some illustrations may be given at once.

A manufacturer of textile goods designs a number of patterns for the season; and arranges a loom, or other plant for each. He works off samples in various colours; and occasionally in various materials. The merchant, or his agent, inspects the samples; or perhaps visits the factory, where some of them at least are to be seen in the piece. Some of the combinations of colours shown in a pattern may meet with no approval, and never be worked in the piece. The retailer, on the initiative of commercial travellers, receives pattern-books or samples; from which he chooses at once some things for stock, and orders others as occasion arises to meet the selections of particular customers. In other cases a merchant devises a pattern and contracts with a manufacturer to make a cloth or other product to it. Sometimes again a dealer makes suggestions for improvements in details of patterns submitted to him; and this leads to some curious results. Thus a large retail dealer recently boasted that his agents after inspecting patterns of shoes from many makers, select ideas contained in several of them; and he then gives out an order for a considerable make of a pattern in which these ideas are combined. In such a case it is difficult to say to whom the product is properly to be attributed.

II, VI, 4. retailers: and, in so far as this is done, the real taking of risks does not move downwards as fast as it appears to do. This tendency undoubtedly often makes for an undue extension of the number of traders, and especially of retailers: and there is probably some ground for suggestions that there are more traders in many countries than are needed for their work. Such suggestions are strengthened by the observation that advantages of situation or connection sometimes enable a trader, though without any special faculty of artistic or other discrimination, to make very high profits on small sales. And complaints are perhaps made that a particular group of traders secures by combination, prices unreasonably in excess of the producers' prices. Such combinations are, as a rule, distinctly antisocial: but they have existed at all times: and they have often been most mischievous when they have been based on mere implicit understandings, without any explicit and formal agreement.

Thus the relations of traders' policies to public interests are not wholly above question. But yet, in a survey by broad and by long, it appears that traders as a class do not earn much more than adequate remuneration for their work, their capital and their risks. With few exceptions, the field is open; and there is nothing to prevent the influx of new energies where good profits are to be had with abnormal ease.

It is however true that producers often see the prices, which they receive for their goods, increased beyond reason in the charges made to the consumer; and form associations for influencing, and even completely undertaking, the marketing of their goods, at all events as far as the retailer. This task has been done by many German cartels in regard to many standardized goods, especially half-finished products, which serve as materials for further production: we shall see presently that though the direct effects of such action have generally been beneficial to those who take it; its indirect effects on other branches of industry, and on the public at large, are often evil¹.

¹ These matters occupy a considerable space in Book III. The beneficial effects of movements by producers and dealers making for the standardization of fruit and other agricultural produce are noted in Appendix J, 4.

5. *Costs of marketing may be increased by difficulties of meeting demands for a constant supply of goods of uniform quality, and for supplies varying greatly from one season to another.* II, vi, 5.

(The chief place among goods that can be marketed easily and at little expense, belongs to staple products which are not perishable nor dependent on seasons.) A steady demand for a thing of uniform pattern and quality enables expensive plant to be set up for its making; to be kept constantly running on an even routine; and to require little contrivance, when once its technical details have been brought nearly to perfection.

Under similar conditions we find relatively low expenses for holding and housing stocks, with little waste through depreciation, and without any great tax on forethought or contrivance. (Marketing costs are rather low, in regard to things, for which the demand is large and uniform, even though it is concentrated on particular seasons of the year; such as very heavy or very light curtains or underclothing, suitable for winter or summer respectively: the same staff, shop front, and store room will generally serve for both sets.)

Manufactured goods of textile materials, leather, metals, wood, etc., not being perishable, can often be maintained in constant supply at no very great cost; especially if they are not bulky; are not in uncertain demand, through changes of fashion or otherwise; and are so far standardized, at all events relatively to the needs of the locality, that the demand for them is not greatly affected by varieties of individual need or taste. Under this head come the common sorts of food and apparel, staple household utensils, the tools of the artisan, the gardener and the farmer; and many other things, which are judged by most purchasers from nearly the same point of view. One will elect the cheaper and another the dearer: but there is a tolerably general, though not a close, agreement as to which would be the more eligible at equal prices. Nevertheless a considerable variety of each of such things must be held by the wholesale dealer, and even by the retail dealer. The retailer's choice is narrowed by local conditions; and the wholesaler follows his lead. For instance, a wholesale dealer's traveller visiting a working class district, will put forward samples or illustrated catalogues.

SOME BROAD PROBLEMS OF MARKETING

II, vi, 5. representing things likely to suit the technical work and domestic habits of the place: and the shopkeeper, or his assistant, will know in advance or will quickly divine, the particular sub-class of goods which are likely to attract a particular customer. ~~On the other hand~~ the highest trade in fine specialities remains, and may long remain, in the hands of men and women who are in a sense artists, and ~~as objects~~ ^{of interest} to connoisseurs, and the. Those who supply rare vases and ~~prizes~~ ^{pieces} of fashion, must spend most expensive dresses to the leaders ~~of~~ ^{of} fashion, must spend much thought over each of their sales; and ~~and~~ ^{and} they seldom care to engage in branches of trade which offer scope for ~~large~~ ^{large} semi-mechanical organization. A subtler and more delicate, though perhaps not always a higher, form of organization is needed for almost all branches of trade which cater for individual idiosyncrasies, and not merely for the staple requirements of various classes and sub-classes of customers. In some of its branches an alert knowledge of mankind and command of a moderate capital will suffice; but in others some high faculty is needed. In many directions the dominance of large capitals is on the increase, even in these trades.

Electricity cannot be stored conveniently; and, partly for that reason, it is supplied more cheaply for uses chiefly in the daytime, than for lighting, the demand for which reaches high peaks on winter afternoons. In similar case is the imperious demand for accommodation at bracing summer resorts during August, when weather and school arrangements make it specially desirable: and no one complains that the charges at hotels and lodging houses are exceptionally high during that month. But it is not generally recognized that the same reasoning affords a partial justification for the practice of some shopkeepers at such places, who sell more cheaply to residents than to visitors¹.

¹ This practice though equitable is not always expedient. On Swiss railways it would be reasonable, but not expedient, to charge higher fares to those whose demands require specially costly provision for a short summer season. But the difficulty is partially evaded by issuing cheap tickets on various plans, of which advantage can be taken easily by permanent residents, though not by tourists.

The class of questions opened in this Section is further discussed in Appendix J.

6. *Heavy industries seek access to their materials. Light industries, and especially the highest and the lowest of them, seek large cities and their environment. Causes of the enduring hold which an alert centre of industry, handling light products, keeps on its markets.* II, vi, 6.

(See remarked in 1880 that goods of few varieties, which can be sold by portable samples, should always seek the cheapest locality for production; but that factories for those things which are massive and individual should be easily accessible to a multitude of buyers¹.) The buyers whom he had in view were partly middlemen; partly ultimate consumers for business purposes, and especially manufacturers in search of plant. It is important to bear in mind that such purchasers will often go far in order to obtain the things best suited for their purposes: price is never neglected; but it is seldom the primary consideration in regard to plant, which is a main factor in efficient production.

Until well on in the eighteenth century, English iron industries sought the neighbourhood of oak forests, where they used up miscellaneous shallow veins of iron ore: their total iron product was very small². Later on they sought to be near to coal, the heaviest of their materials; and to rich veins of ore, even though lying very deep. But quite recently successive economies in the consumption of coal have lowered the importance of near access to coal mines, relatively to those of easy access to iron ore and to markets for their products. As a result the heavy British steel industries are moving to the sea-coast, or the lower reaches of deep rivers. For there they obtain easily imported ore; and can put much of their product on board ship for exportation, or even into the frame of the ship itself, which is ever more greedy of steel³.

¹ *Chordal's Letters*, ch. XIV.

² See above, p. 60.

³ The American demand for steel products grows so fast, that advantageous sites for steel works can be developed easily. The excellent coke of West Pennsylvania holds them on a long rope, and the Atlantic coast has had little attraction for them; so they have tended towards the Great Lakes. Before the world-war the Lakes carried the chief weight of the American shipping; and they give good access to the ores of Lake Superior. The dependence of Britain on foreign supplies of copper has moved her copper industries to the coast of South Wales.

II, vi, 6. This movement towards the sea is eased by the largeness of the capitals which are invested in a massive industry; for a giant steel firm can set up subsidiary establishments to supply some of its needs. But an industry which does not use massive material, and needs skill that cannot be quickly acquired, remains as of yore loth to quit a good market for its labour. Sheffield and Solingen have acquired industrial "atmospheres" of their own; which yield gratis to the manufacturers of cutlery great advantages, that are not easily to be had elsewhere: and an atmosphere cannot be moved¹.

As we have seen, the high value of land in large cities tends to drive away those branches of production which have been taken over by massive machinery, and especially those which must be accommodated in low wide spreading sheds; though large cities retain some hold of work in which each of many floors of a high building can afford space for a multitude of workers, each tending a machine that does light work. Thus many of them are chief centres of printing, especially for newspapers: and of course they are the chief centres of commerce and finance.

But their industrial specialities are mainly of two kinds. They do nearly the whole of the finest manual work, and especially such as has an artistic element; while of course they use subtle mechanical appliances, where these are serviceable. They also make goods of all kinds, and especially clothes to orders of rich customers, that are conveyed to the producers through a special class of shopkeepers: who themselves do much constructive work in designing; pay very highly for the work they put out; and at the same time make extraordinarily high profits on the turnover.

The other industrial speciality of large cities has been in the past, and is still to some extent, the employment of vast numbers of workers who have inherited weakness of body, mind and character from several generations, that have lived unwholesome lives and overstrained their nerves. The large supplies of labour of this class which the conditions of cities have produced together with those which their great facilities for buying the

¹ In this connection may be compared two instructive monographs:—*The cutlery trades*, by G. L. H. Lloyd; and *The tin-plate industry*, by J. H. Jones.

materials and selling the products that appertain to such industries have attracted, have been a blot on almost every old civilization, and not least that of the modern western world. But better knowledge, especially in regard to sanitary matters; a higher sense of social responsibility; and increasing facilities for cheap traffic even over the whole area of such a city as London (which surpasses in population many considerable States) are tending to lighten the dark shade of this blot, if not to remove it altogether.

In short, personal contact is most needed (1) in trade between allied branches of production, at all events in regard to things which have not yet been brought completely under the dominion of either General or Particular standardization; and (2) in all dealings, especially retail, connected with dress, ornaments and other goods, which need to be adapted to individual requirements and idiosyncrasies. The largest industries, and especially those that need massive plant, are located increasingly in industrial districts; the central cities of which are giving themselves more and more to work directly or indirectly connected with marketing. But (the advantages to be derived from personal contact between customer, trader and producer have caused capital cities to become the homes of miscellaneous industries of all grades and especially of high grades; and to offer unrivalled opportunities to middlemen, who procure from working artisans and small masters the making of high-class goods to the order of wealthy customers.)

Almost every industrial district has been focussed in one or more large towns. Each such large town, or city, has been at first the leader in the technique of industry, as well as in trade: and the greater part of its inhabitants have been artisans. After a time factories, requiring more space than was easily to be had where ground values were high, tended to the outskirts of the city; and new factories grew up increasingly in surrounding rural districts and small towns. Meanwhile the trading functions of the city developed. Warehouses for the products of the district took the place of factories: shops for the accommodation of the district were enlarged; and banks and mercantile houses of all kinds became prominent. Clerks

II, vi, 6. and travellers on behalf of manufacturers and wholesale dealers multiplied; and artisans ceased to completely dominate the town as of yore.

But later still there has been developed in Lancashire, and to a less extent in other great homes of textile industry, a tendency to take advantage of modern means of locomotion; and to use the central city as the starting point, from which visits can be made to factories suitable for the purposes of a particular buyer, even though they may be somewhat remote from the centre. Thus Manchester is now increasingly sought by representatives of merchants and large dealers of various kinds, who are not content with the conveniences offered even by the great warehouses of the city. They prefer to make rounds over an area of some two hundred square miles, visiting many factories, where they can see displayed in "the piece" varieties of some particular classes of fabric in which they have a special interest; and where they can discuss with the manufacturer himself any suggestions which may occur to them for modifications in detail, to suit their individual judgments, or to meet the special tastes or requirements of localities with which they are connected. Appointments can be made by telephone: and a great distance can be covered in a day by motor car, or even by the almost ubiquitous tramways and railways¹.

We are thus brought back to the suggestion made above that (heavy steel industries move readily from one place to

¹ The unrivalled growth of the trade, thus centred in Manchester, owes much to foreign merchants. "The English traveller found it difficult to get in touch with demand; and he could not gauge it as the local merchant could. Consequently, a complete reversal of arrangements took place as regards much of the trade. Foreign houses established offices in Manchester. Every important country, and many unimportant ones, in this way affixed commercial tentacles to the metropolis of the Lancashire cotton industry...and it is now commonly agreed that without the foreign houses in Manchester our foreign trade in cotton textiles could not have grown as it has. The late and uncertain advice received from travellers abroad was infinitely inferior to the instantaneous transmission of foreign demand through Manchester foreign houses with ramified connections in the countries to which they related." Of course there is another side to this and "commercial outposts have been thrown out by English houses all the world over." From an account of the Lancashire cotton industry in *The Times*, 27. 6. 1913.

A little is said below (Appendix J, 5) on peculiar features of the industrial conditions of some capital cities.

another, in order to get better access to their materials; but that an atmosphere is not so lightly to be treated.) II, vi, 6.

The leadership in a special industry, which a district derives from an industrial atmosphere, such as that of Sheffield or Solingen, has shown more vitality than might have seemed probable in view of the incessant changes of technique. The explanation is perhaps to be found in the fact that an established centre of specialized skill, unless dominated by a guild or trade-union of an exceptionally obstructive character, is generally in a position to turn to account quickly any new departure affecting its work; and if the change comes gradually, there is no particular time at which strong incitement is offered to open up the industry elsewhere. It is to be remembered that a man can generally pass easily from one machine to another; but that the manual handling of a material often requires a fine skill that is not easily acquired in middle age: for that is characteristic of a special industrial atmosphere. Thus, although even a little obstinacy or inertia may ruin an old home of industry whose conditions are changing; and although the opening out of new sources of supply or new markets for sale may quickly overbear the strength which old districts have inherited from past conditions: yet history shows that a strong centre of specialized industry often attracts much new shrewd energy to supplement that of native origin, and is thus able to expand and maintain its lead. Even the changeful conditions of America show a surprising permanence of many localized industries, which have sprung up almost by accident, and have been maintained in this way¹.

¹ It has already been noticed (I, viii, 4) that in spite of the constant westward movement of the population of the United States, the influence of inherited manual skill in sustaining a local industry is shown by the fact that six of the fifteen industries which were highly localized in 1900 were very late in making use of machinery.

It may be added that accidents, such as the arrival in times far back of energetic artisan immigrants, have founded industries, which have maintained their preeminence till now, under conditions just described: all these industries handle light and valuable products which will bear carriage easily, and have little occasion for expensive plant. Thus, according to the Census for 1900. Gloversville and its neighbourhood, which produce half the leather gloves of the country, owe their skill to some Scotch glovers who settled there in 1780: Troy had a practical monopoly of detached collars; as the result of the enterprise of a working woman about 1830. Similar, though less extreme cases are those

11, vi, 8. A certain limitation is however imposed on a narrowly localized industry which sends its products for sale over a large territory. For they must be either such as are in general use and not very changeful in character; or such as can be efficiently represented by illustrated catalogues, or in the large packages sent out to wholesale and retail dealers through travelling agents. This resource is indeed well within the grasp of a powerful firm: for that can advantageously supply for itself many things, which smaller firms buy from subsidiary local industries: but when once an industry has fallen for the greater part into the hands of producers on a very large scale, there is on the balance a tendency to a loosening of the ties that bound it to its old home.

of hosiery at Cohoes; of cheap jewelry at Attleboro; of fur hats at Danbury and Bethel.

CHAPTER VII

PROBLEMS OF GENERAL MARKETING CONTINUED: MASSIVE RETAIL TRADE

1. *Massive retail trade is commonly associated with eager forms of competition. But some of its methods were pioneered by workmen's cooperative societies, in which the spirit of brotherhood strengthened the policy of economy.* II, VII, 1

(Modern massive retailing is in some respects a counterpart to massive production.) But it was pioneered by cooperative trading: which owes relatively little to massive production; and scarcely anything to the faculties of trained men of business of the new world, or even of the old. It is almost exclusively the work of British working-men: it has perhaps narrower limitations than are recognized by its more ardent adherents; but it will be found to have led the way, in a larger degree than appears at first sight, to much that distinguishes present modes of retail marketing from those that prevailed until quite recently.

(The founder of cooperation was Owen: he was, on the one side, a brilliant practical business genius; and, on the other, a passionate enthusiast for the improvement of human character as an end in itself, and as the means to an increase of well-being.) Numerous small cooperative societies were formed under his inspiration; chiefly as experiments that made for communistic production, with common ownership of the land as the pivotal idea: the cooperative congresses of 1831—2 were rich in social ideals, though lacking in sense of proportion.

But a little later some Rochdale weavers realized that the most wasteful and ill-managed business of the country was that of marketing goods to the working classes: and that, if those

II, VII, 1. classes perceived the bearing of social ideals on that particular piece of bad business, they would have the remedy in their own hands: their social faith could hold them together in business, and their business would give material strength to their faith. Their fundamental notions were to club together small sums—£5 each as a minimum—on which they might begin business: to charge the average retail prices of a working-class district, which were high; and to use the excess of receipts over costs as the basis of further strength. The earlier cooperative societies had desired that all funds subscribed should at once become common property: but the Rochdale weavers recognized that human nature was not ready for that; so, after paying interest on capital, and making a liberal contribution to a social and general education fund, the surplus was used as a Dividend. That is, their surplus was divided among the members in proportion to their purchases. It was a clever contrivance for the reduction of retail prices to reasonably low levels, without running the risk of failure, which might have been brought about if they had started with prices so low as to leave no margin for unfortunate accident. The plan seemed small and even petty from the standpoint of the rich trader: (but its combination of idealism and common sense has led the way to large improvements in marketing, some of which have indeed been reached by other routes: but it appears as a whole to stand without a rival in the history of trade.)

The Rochdale weavers and their immediate followers gathered men and women into their fold, partly by urging that cooperative stores sold only genuine goods; and sold these at wholesale prices, after deducting (when Dividend was reckoned in) little more than the actual costs of handling them by simple people, whose time was charged at about an average artisan wage rate. But the great force, which drew the faithful to come past many brilliant shops to a humble store, was the faith that competition should give way to cooperation: and, though much of the rude eloquence, in which this doctrine was set out, would hardly bear the test of exact scientific analysis, it had a solid kernel: for it meant that the movement was one by the weak to help the weak: that a new comer was to be welcomed, because he wanted help; and not, according to the joint stock

company rule, in proportion to the capital which he contributed. By this ethical incitement, even more than by their good business, cooperators were able to attain at once, though on a very small scale, the chief advantages of the twentieth century Universal Provider: their sales were large relatively to their stocks: their turnovers were rapid, and they had no bad debts. This "Rochdale" method was generally adopted, and has long been regarded as the "British" method of cooperative retailing¹.

But as time went on their very success brought to light a weak point in their system. They had organized a particular class of retail trade on the side of selling: but not on the side of buying. So long as their rivals, the shopkeepers, charged the old exorbitant additions to wholesale prices, the stores could make good business without buying well. But a new race of

¹ "The ideals of the earlier Cooperative congresses" and the rules of the Rochdale Pioneer Society, supplied by representatives of the Cooperative movement to the Labour Commission 1894, were printed in the *Appendix to the Evidence before the Commission as a Whole*. The exceptionally strong international literature of Cooperation is indicated at the end of C. R. Fay's *Co-operation at home and abroad*; which is itself a clear and well-balanced account of principles and practice alike.

A few more details may be added here. As soon as it was practicable, the Stores reduced the contribution necessary for membership to £1: and some of them now allow a new member to start with a first payment of half-a-crown, making up the remainder out of the Dividend. Though the ordinary procedure of a cooperative store is generally known, it may be well to say that the policy of charging the full current market price and then returning part of it as a share of the profits at the end of the year was adopted, with the purpose, which has been accomplished, of attaining several ends. The policy moderated, though it did not quench, the opposition of local shopkeepers: it avoided discussion as to the prices which could be safely charged: and it diminished the strain on the simple working-men, who were serving an apprenticeship to a difficult business. It further afforded a small inducement to continue purchasing at the store, and persuade others to join it; because everything that quickened the turnover of the store, added to the profits which (after deducting interest on capital subscribed and borrowed) would be available for paying Dividend. And there was yet another and a higher motive: the working classes then, even more than now, were apt to get into the habit of living from hand to mouth; so that they lacked the power to buy outright a solid piece of furniture, or a useful implement. The Dividend has taught hundreds of thousands to know the pleasure of possessing two or three sovereigns, free from any mortgage. This motive operates still; though in this richer age, the Dividend is often applied to defray the expenses direct and indirect of a summer holiday at the sea-side. The Dividend relieves many anxieties of the sick-room: and nearly £100,000 are spent by the Stores annually on education.

II, vii, 1. alert shopkeepers came on the scene; who watched and copied cooperative methods of selling good things cheaply for cash; thus leaving the improvident customer to those of the old-fashioned shopkeepers who still remained. In order to compete with these new rivals, the cooperators had first to learn how much harder a task it was to buy well than they had thought; and then to face the difficulty that the affinities and sympathies of wholesale dealers lay with the "regular" retail trade. So they decided to extend the cooperative principle to wholesale purchases. In the course of time the English and Scottish "Wholesale Cooperative Societies" were set up. They have gradually developed many branches of production. They manufactured in 1913 about eight million pounds' worth of goods: and their total sales, exclusively to retail cooperative stores, amounted to about forty million; that is, about half the total sales of those stores. These Wholesale Societies are owned by retail cooperative societies, to which they sell at current wholesale prices; while the greater part of the excess of receipts over costs, after deducting interest on capital, is returned to those societies as a Dividend on purchases. But the Scottish Wholesale gave till recently a share of the profits on its productive departments to the workers in them¹.

¹ The Society which is now called the English Cooperative Wholesale Society, was founded in 1864, twenty years after the present model of cooperative retailing had been set up at Rochdale; when the total sales of the retail stores were under three million pounds. The cooperative movement is strongest, relatively to population, in Scotland. Ireland is notable for the new vigour of cooperation in dairying, to which reference has already been made. There are also many independent cooperative societies for production; which maintain "Copartnership," under which the workers, as workers, have a share in the control of the work as well as in profits. This high ideal is rejected by the English Cooperative Wholesale, which treats its employees in the same way as a joint-stock company does: the workers in one of its factories have no control over the policy of that factory beyond that which falls to every one of the more than two million members of the retail stores who own the Wholesale. There are many who regard this action as out of harmony with the fundamental principle to which the cooperative movement owes its success: they argue that even though there be some immediate commercial gain in it, it yet is akin to the selling of a birthright for a mess of pottage. In 1892, the able and zealous chairman of the English Wholesale, when asked whether the policy, if complete, would not result in putting all the industries of the country into the hands of Government officials; so that a worker would have no more control over the conduct of the business, in which he was engaged, than the worker in a Government factory has now, replied:—"To a large extent

2. *Some remarks on the strength and the limitations of cooperative trading.* II, vii, 2.

The managing committees of the cooperative societies on the Rochdale model, and of their Wholesales, are for the greater part working-men: and, though they now pay rather high salaries to a few expert officials, their total expenditure on management is far below the aggregate of the incomes (exclusive of interest on capital and insurance against risks) of the owners and officials of private businesses with an equal aggregate of marketing and production. And yet goods made or imported by cooperative methods, and retailed by the same, are not sold conspicuously cheaper (deduction from full prices being of course made on account of Dividends) than similar goods, made and handled avowedly on commercial principles by those "regular" retailers, who give no credit, and confine themselves—as the cooperative stores mainly do—to goods which are marketed easily with a quick turnover.

This result falls somewhat below the sanguine expectations of those, who had thought that the profits of wholesale and retail trade, even under the severely competitive conditions of modern times, left a huge margin over costs; and that therefore an organization which controlled the production of one half of the things which it sold, and bought the remainder wholesale from primary sources, could sell without loss at prices which (Dividend being reckoned in) would be very much lower than those of the regular retail trade. But some at least of the causes, which have prevented that result from being achieved, are now well understood.

(To begin with, the giant fortunes, that are made both in production and trade by some men of exceptional genius, impress the imagination: but yet, when such fortunes are added

it would tend in that direction, and the sooner the better." (*Evidence before Labour Commission as a Whole*, Q. 287—290.) In 1913 the work-people employed in the productive departments in the Wholesale numbered less than 10,000: showing an output per head of over £800: this is due to the fact that the work consists largely of flour milling and other work in which very little value is added to the product. Many retail societies have productive branches: but the trades of the butcher and the baker are prominent among them; and consequently they show a large gross output in proportion to work done. See *The Story of the Cooperative Society 1863—1913*, by P. Redfern.

II, vii, 2. together, they are a very small percentage on the total capitals that have been invested in their several branches of business.) The returns on large parts of those capitals have been but moderate, while other large parts have disappeared through losses: but those who fail are lost to sight¹.

(Next, an army commanded by a committee, has seldom given a good account of itself.) Many decisions in the course of business require prompt action, based in large part on intuition associated with reason: the time and strain, involved in proving to other members of a committee that the best course is not that which appears best at first sight, are very great; and only a man who possesses the rare combination of fine and sensitive insight with a strong and even rugged character, is likely to persist and succeed in his efforts to bring a committee composed of ordinary men round to his point of view².

(Lastly, every successive step in the marvellous progress of the cooperative movement has tended to weaken the relative strength in its counsels of those in whose breasts the original cooperative faith is cherished.) It is becoming more and more a huge business managed by men, many of whom are of high natural ability, though few of them have had extensive business training. Its problems are approaching to those of ordinary

¹ The average rate of profits of small shopkeepers is to be found by deducting the aggregate of the capitals that have been lost in the trade from the aggregate profits of those who survive; and dividing the remainder by the aggregate capitals which have been brought into the trade by those who survive and those who have failed. The result thus obtained is on a fair basis for comparison with the profits of cooperative stores made out on a similar plan: but in fact the failures among them are almost negligible.

² The Committees of cooperative societies have some privileges as to attendance, with expenses paid, at congresses and other meetings: and sometimes a Committee man who has had his share of them, makes room on democratic principle for another: he thus goes out of office, just when he is beginning to get an expert grasp of its work. The standard of duty is probably a good deal higher among active cooperators than among almost any other non-professional body of nearly equal size; but yet those who are responsible for their purchases are offered bribes, sometimes direct and sometimes indirect, by agents of large mercantile houses. No doubt bribes are seldom accepted; but the difficulty of ascertaining whether they are or not causes friction, and prevents the buyers from acting with that full freedom, which is allowed to his buyers by a strong business man: for he knows that they know that any tortuous dealings of theirs are likely to be soon detected. It is true that joint stock companies and Government Departments share some of these difficulties: but that is another story.

rade in their general character: and though they have taught, II, vii, 3. and are teaching, some great lessons—especially in relation to the importance of cash payments and a quick turnover—yet many of these lessons are assimilated by alert traders: and thus cooperators find themselves opposed by their own weapons in the hands of keen combatants. There are no doubt exceptions to this rule: but they seem to be of minor importance with one exception.

That exception is that, although the English Cooperative Wholesale Society has been charged by some cooperators, with a lack of adequate sympathy with independent "Partnership" productive societies; (yet on the whole, cooperative trade spends little on advertisement.) On the other hand, some sorts of private retail trade are spending lavishly on competitive advertisements, most of which waste much of their force in neutralizing the force of rivals.) In America, where they have been developed with more energy and inventive force than anywhere else, it has been said recently by a high authority that it is to the field of cooperative trading on the "cash plan" which shuns advertising in all its forms, that America "may look for very important developments of retail trade within a comparatively few years". "Cooperation has not done the impossible: but it has rendered, and is rendering, noble service to the British people."

3. *Other developments of massive retail trading. Grands Magasins, and Department-stores: Multiple-shop Companies, and Chain-stores.*

In 1866, shortly after the foundation of the English Cooperative Wholesale Society, the success of the workingmen's cooperative movement prompted some members of the British Civil Service and the British Army and Navy to adopt the name, a considerable part of the method, and a very small part of the principles of the Rochdale stores. The founders were groups of fellow workers, without technical knowledge of retail trade, who cooperated in providing for all willing members of that group a supply for cash of things

¹ Chorington, *Advertising as a business force*, p. 203.

II, vii, 3. similar to those handled by the workmen's stores, of good quality, and at a low advance on wholesale prices. (*Esprit de corps*, combined with the commercial benefits offered, brought customers past hundreds of shops suitable for their purposes to an unattractive building in a quiet street. Though free use was made of printed catalogues, etc., nothing was spent on advertisements. Thus in several respects the method was "cooperative.")

(But after a time they and other "cooperative" stores founded of similar lines, became in effect "Universal Providers" or "Department-stores," worked by joint stock companies, and deriving a moderate profit on their capital from cheap cash sales to almost anyone who applied for membership. The minute element of the cooperative spirit, with which they had started, had evaporated: but they continued to be an obstacle to any attempts at anti-social combination among retailers.)

Meanwhile the alert and prosperous population of Paris had created an excellent market for good ordinary commodities, sold cheaply at cash prices, with but little trouble to the purchaser. Probably the English cooperative experience had some influence in moving the founders of the "Bon Marché" and the "Louvre" (about 1852) to develop two unpretending businesses into what soon came to be known as "Grands Magasins." There was much genuine philanthropy in their administration; but they were frankly competitive¹.

(France is thus the original home of Department-stores, and they have prospered in Britain, Germany and other countries.) But their methods and their potentialities are congruous with American character and conditions, both economic and geographical; and their most notable developments belong to the New rather than the Old World. Some American Department-stores have attracted custom by methods not altogether admirable. But the chief of them appear to have recognized the principle that, though a giant store can, and must, use many expensive means for making its claims known, its best resource

¹ It appears that most of the Grands Magasins were originally connected either with linen drapery, etc. or with furniture; and after increasing the number of branches of these trades which they represented, gradually went out into diverse trades. In the English cooperative societies on the other hand groceries have generally taken a chief place, if not the first.

is in that highest form of advertisement, which comes from the recommendations of one customer to another; and from the inducements which dealings with one department offer to dealings with another¹.

(A vast store has many large economies in administration and in buying. It saves especially in ground-rent: for a single first-rate frontage on a good thoroughfare serves as an introduction to many acres of flooring, well lighted from the centre and sides. It does not need to keep a sufficient staff in each department to meet exceptional demands; for some employees are so trained as to be servicable in each of several departments: each of its motor vans can deliver parcels containing purchases from several departments: and so on. It saves also in buying: for the quickness of its turnover and its general strength make its credit good; and it is able to obtain at least as favourable terms as an ordinary wholesale dealer from the producers, whether the goods are made under contract to a special order or not.) But, as the head of a Department-store has a specially large range of marketing to handle, he should not, in Mr Wanamaker's opinion, become a manufacturer himself².

¹ Some of them claim to act up to the rule that no small gain should be sought through action, that tends to cause complaint; and that every doubtful question between a customer and a department, shall be decided in favour of the customer: no one is to be persuaded into an unwilling purchase. And a new principle is being adopted by some stores with the highest ambitions, that as a rule no new department shall be opened, till provision can be made for as high-class control and stock as those of "the average exclusive stores" of a similar scope. (See Mr Wanamaker's testimony before the Industrial Commission in 1899, *Report*, vol. III. 454.) The testimony of witnesses for and against Department-stores, gave a full view of the situation: its drift is set out clearly in the official Digest (pp. 17—27).

The economies of time and trouble, and the general conveniences which are offered to customers by the largest retail businesses in London, and on still larger scales in some American cities, may appear to be merely trivial: but in fact they are exercising a considerable influence on the structure of business. Commodious lifts and moving staircases enable a customer to visit without effort or loss of time the equivalent of a large number of different shops.

² On the other hand, Mr Selfridge, an American who has set up a mighty Department-store in London, gives (*Romance of Commerce*, 1917, p. 366) a chart of an ideal dry-goods store, which includes a considerable Production Department. He says (p. 365) that an American store already has sometimes fifteen storeys, with two million square feet of flooring, connected by between one and two hundred lifts. He remarks (p. 377) that "window displays are designed, constructed and actually dressed in the studios before they are placed in the windows. They often require months of study, and months of execution."

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A Department-store may indeed be hampered by the need of numerous checks and counter-checks, which are obstructive in many ways. But a group of men, or even a single man of great energy and insight into character, can dispense with some and make short cuts in regard to others: and so great are its opportunities in the hands of an exceptional genius, that it sometimes rises with meteor-like rapidity and splendour. Experience does not suffice to show how far it may generally be able to obtain adequate successors to those who have created its position and its fame. But, so great is the attractive force of a well-established massive business, that it may continue long to keep most of the ground which it has gained, even in the hands of men of no great initiative; provided they are careful to watch the signs of the times, and to avail themselves promptly and generously of any strong mind with a large imagination, that may be found among their subordinates. While they beat steady time, others will follow in the steps of their own predecessors. New Department-stores, slight variants from the old, will arise: and, unless some new capabilities are shown by the small shopkeeper, the scope for his usefulness seems likely further to dwindle¹.

(A Department-store sets itself to concentrate in one place opportunities for the satisfaction of innumerable wants of customers scattered over a wide area: and thus develops by purely commercial force one of the chief purposes which the Rochdale store set itself to attain by a combination of commercial and ethical force.) Retail stores cooperate with one another in establishing and controlling a wholesale centre, from which they draw their resources: and their lead in this respect may be said to be followed and surpassed in regard to particular branches of retail trade by ("Branch-shop Companies" or "Chain-stores"—the second great group of massive organizations of retail trade on purely competitive lines.) For they

¹ But it is thought that "regular" retailers still hold six-sevenths of the whole of the trade of America (Cherington, *l.c.* p. 20). Department-stores and other large businesses have developed a large "mail-order" trade, with distant customers; and thus supplemented the ordinary retail trade of a great part of the United States, and in a less degree of other countries. But though the volume of this business would have seemed incredible not long ago, it is small relatively to that of the total retail trade of country districts and small towns.

aim at bringing near to the doors of vast numbers of customers II, vii, 2. in different parts of the same town, in small towns, and even sometimes in rural districts, the attractions of a prompt supply of fresh goods delivered from great central reservoirs, with the smallest possible handling by middlemen.)

Such a company buys on the most advantageous terms direct from the producer or importer; it sometimes owns factories or at least makes contracts for the delivery of large quantities of goods; and perhaps it imports directly from abroad, or even owns plantations for tea or other commodities. Decisions as to what things shall be bought, and how they shall be priced are made by the central control, with high-class expert assistance. The accounts of each separate shop, including statements of its stocks of all important things, are at the central office. Comparisons of the accounts of various shops will show which are efficiently managed; and will afford an answer to vain excuses; though, of course, allowance must be made for the different facilities for marketing of each individual shop, for the general conditions of its neighbourhood, and especially for any severe competition that it may have to meet, and so on. The activity of the head of each shop, and perhaps of his assistants, is stimulated by the establishment of some sort of connection between their salaries and their sales. Lastly, stock, which does not sell well in one locality, can often be marketed without loss when transferred to another¹.

Appeal is sometimes made by small retailers for sympathy on the ground that the percentage of people who are called on to use their own initiative in one of these great magazines is relatively small; and that the routine and mechanical checks, which occupy the greater part of the employees, are not as conducive to the formation of a strong and enterprising national character, as are the risks and excitements of a multitude of

¹ See some suggestive facts and analyses by Cherington, *l.c.* pp. 171—196. It appears that in 1914 there were in Philadelphia 1260 grocery stores belonging to nine chain-companies. It may be added that in America and elsewhere some independent retailers have grouped themselves into chain-stores for the purpose of buying large quantities wholesale on favourable terms; thus moving very much on the lines of the numerous cooperative societies which peasants and small farmers have formed in Central Europe and elsewhere for buying feeding stuffs, manures, and farm stores generally.

II. VII. 4. independent retailers. Some weight may be conceded to this appeal, in spite of the facts that the occupation of the retailer gives little scope for the highest constructive effort, and does not create cumulative progress in the same way as does the best work of the manufacturer; and that therefore combinations, which sustained the retailer's profit above what would be adequate if his time were well occupied, cause social waste¹.

4. *Influences on the methods of marketing of goods, "branded" with a mark which conveys a guarantee of quality.*

We are now to inquire whether some considerable changes, economic and social, may not be latent in the apparently insignificant fact that an increasing vogue is being obtained, by goods which are so far standardized, that their character is certified by a trade-mark, or other brand. For it has behind it forces which have taken many branches of manufacture out of the hands of small local producers, and given them over to giant businesses, or to strong centres of localized industry. (The direct influence of these brands does not always extend to the ultimate consumer. But the retailer of cutlery or cloth knows that he is safe in selling things that bear certain brands: a trustworthy brand gives the maker a good connection, because it enables the retailer, who uses it, to get a good connection. Few men know the source of the cloth of which their clothes are made: but the tailor knows well that his reputation runs no risk when he recommends a cloth from the pattern book of a particular maker. It is however different in regard to food and medicines: fifty years ago biscuits etc. used to be bought from a neighbouring baker; now they come almost exclusively from giant firms who have established high reputations. (And American experience, which pioneers in many matters of this kind, suggests that brands and other trade-marks on things for domestic consumption will ere long become an important factor in the spread of large capitalistic control over industry and life.)

¹ A law, which effectively doubled the present charges for cabs, etc., would not make cab-proprietors or cab-drivers permanently more prosperous: but it would very much increase the number of cabs which loitered idly in hope of a fare. Of course the trade in artistic products, no two of which are alike, involves the exercise of high faculties; and it is to the public interest that those who do this work well should be rewarded: but such cases are not numerous.

Whereas till recently the process of obtaining a high public favour for a brand was a slow one, it is often cut short in the modern age. For now a wealthy individual, or an alert joint stock company, sometimes starts at once with the devotion of large resources to setting up the most advanced plant for making a thing which seems likely to meet a general want; together with a vast system of advertising its merits to traders and consumers alike by vigorous, various, and well-planned measures (A little more capital may need to be sunk in selling to dealers at prices which enable the thing to be retailed at a very high rate of profit: but when it has won its way, the dealers can be forced to handle it at a low rate of profit¹.)

Branded goods occupied a relatively small place in retail trade in the early days of Cooperation: but they were at once turned to account to attract customers, who might be suspicious of the competency of amateur dealers to make good selections of things which could not be well judged without expert knowledge. So cooperative stores, and some independent retailers who sold a great variety of goods cheaply for cash, were inclined to sell branded goods—as well as sugar, and some other things which many customers commonly supposed themselves able to judge and compare—at prices that barely covered expenses; in order that they might act as “decoys” or “leaders” for other sales. But retailers, who preferred to give credit and charge high prices, were aggrieved. They had little defence against the selling cheaply of those few branded goods, which had already

¹ Another generation may possibly see large extensions of methods, still more or less in an experimental stage, by which slot machines may be made to sell not only standardized goods, but fruit and even the hot dishes of a restaurant, each separate consignment being visible through a glass door when an appropriate coin is put in the slot.

Meanwhile some curious difficulties are rising in regard to the ownership of trade-marks. A merchant sometimes designs a new device, and contracts with a manufacturer to work to it by well-known means; then the product should, as a rule, bear the trade-mark of the merchant. Again a merchant in high repute can sell such things as cutlery, made by unknown men, at higher prices if they bear his name, than if they bear the names of the makers. But sometimes one of these makers develops exceptional ability, and his goods add considerably to the value of the merchant's trade-mark: and he may then wish to claim the merits of his advance; but if he insists on issuing his own name or trade-mark, he will need to begin to build up a connection for himself.

II, vii, 4. so strong a hold on the public, that a refusal to handle them would simply drive away customers. In fact the proprietors of such goods sometimes sell them wholesale at relatively high prices, leaving retail prices to take care of themselves.

But a brand, not yet dominant, might be grievously injured by a general unwillingness on the part of dealers to bring it to the notice of their customers: and the "protection" of branded goods on their way to consumers has been developed by American producers into a fine art. On one side, measures are taken to prevent the goods from being sold in poor condition, and thus bringing the brand into disfavour among consumers: and, on the other, "price maintenance" is enforced on wholesalers and on retailers alike, in order to keep the brand in the favour of traders. Similar policies have been pursued, though perhaps with somewhat less vehemence, in other countries¹.

¹ Anticipating a subject which will hold a large place in Book III, it may be observed that the famous official inquiry into cartels, held early in this century (the *Kartellen Enquête*), was occupied for three days with the profits in the booksellers' trade. On the one side it is urged that the skilled bookseller is something more than a retailer: and that many authors would do better for the world in some other occupation. On the other side stress is laid on the poverty through which many authors have to struggle on their way to work, which cannot in any case bring a considerable monetary reward to either publisher or writer; and which yet is so important to the world that lavish subsidies to it would be well spent, were it not practically impossible to administer them rightly on a large scale, though a little is done in this direction by Universities and Learned Societies. It may perhaps be true that a wise use of the retailer's power of combination might have tended to lessen this social discord, if they handled such books at a lower rate than is demanded on popular literature and reprints of books of which the copyright has expired. But in fact the tendency of combination in this case is to discriminate in the opposite direction. No doubt this action follows the path of least resistance; but none the less is it suggestive as to the social influences of trade combinations.

On the other hand, the publisher often performs important services by taking the high risks of loss on scientific and other high-class books addressed to limited numbers of readers—risks which a young and unknown author often could not carry himself: and the few words of advice which the publisher gives to the young author are often of inestimable value.

The controversy as to the maintenance of a high retailer's profit on branded goods, is closely connected with another as to the expediency of allowing "Grands Magasins" to retail a great variety of goods, which has occupied a good deal of attention in France. See Appendix J, 5 as to some other matters connected with the struggle of small shops for their existence.

5. *The great ability and energy, which have been devoted in America to massive retail trade, tend to lower prices: but they are still rather high.* II, VII, 5.

During the last few decades the prices received by the manufacturers for many goods have fallen in America faster than in the rest of the western world; and they are indeed in some cases the lowest that are known anywhere. But the retail prices of nearly all goods in America (the exceptions are almost confined to a few cases in which there are special local facilities for supply) are higher than in Britain and some other western countries. Important causes of this contrast are to be found in the peculiar physical conditions of the United States and in the racial characteristics of her people. Let us glance back at these.

In the course of the notice of the industrial leadership of the United States in Book I, stress was laid on the great market which the homogeneous demand of her vast population offers for standardized goods made by the most powerful plant, under the guidance of the strongest of brains, and handled in great part by sturdy immigrants. Almost every chief raw material is supplied by Nature on easy terms in some part of her area: and many causes have contributed to enable her railroads to offer low rates per ton-mile for the carriage of massive consignments over large distances. Thus her giant single businesses have increased even more rapidly than her largest cities. Many of the immigrants who work in her mines, steel works, factories, etc., are rather highly paid in comparison with most other western countries: but some classes of them work so hard and for so long hours, that they enable the employer to make the most out of his plant; and, though they may exhaust most of their strength in a comparatively short time, the arrival of fresh immigrants prevents the supply of labour from becoming scarce. Also larger use is made of mechanical power in America than anywhere else. (Massive production therefore is nearly always relatively cheap there; and it is in a few cases absolutely cheap¹.)

¹ The economics of massive production of men's clothing have been carried much further in America than elsewhere: and it is said that fairly well fitting men's clothes can be bought there at a less advance on the cost of material

II, vii, 3. (We have seen how massive production tends to foster massive methods of wholesale and retail dealing; while the low rates for massive freights on American railroads have helped powerful wholesale dealers, department-stores and chain-stores: but, though the rates for such traffic are low per ton-mile, the total charge per ton is kept high by the very great distances, which separate the producer from the average consumer of his goods.) More important are the facts that the ordinary American retailer has seldom an old-established business, well supplied with capital relatively to its requirements; that he cannot always obtain advances on easy terms; that he generally belongs to a race and social order in which a much higher average level of incomes prevails than in Europe; and lastly that the temper of nearly the whole American people, including even those of foreign birth, inclines to impatience of assiduous care as to small savings on petty purchases.)

Each of these considerations goes some way towards explaining the paradox that the nation, which excels all others in the energy and inventive ability devoted to developing the efficiency of retail trade, is also the nation that pays the most dearly for the services of that trade. But there remains a less obvious cause to be considered: it is that much of the modern expenditure on advertising is not constructive, but combative.

6. *Constructive uses of "advertisement" in that original broad use of the term, in which it includes all measures designed to draw the attention of people to opportunities for buying or selling, of which they may be willing to avail themselves.*

Some of the implements of constructive advertisement are prominent in all large cities. (For instance a good frontage on a leading thoroughfare; adequate space for the convenience of

than in England: for since many well-to-do people are willing to buy ready-made clothes, the trade in them is of gigantic dimensions, and gives scope for lavish advertising. American "makers and distributors of trade-marked clothing, who spend in some cases upwards of half a million dollars a year on publicity," find their "selling cost per suit less now than before they began advertising. They manufacture and market suits by the hundred thousand"; and they thus even reduce their advertising outlay per sale, as well as costs of "buying, manufacturing, selling, and the handling of reserve stocks" (A. W. Shaw, *An approach to business problems*, pp. 204—5).

employees and for customers; lifts and moving staircases, etc., are all constructive, so long as they do not exceed the requirements of the business.) That is to say, the assistance, which they afford to customers by enabling them to satisfy their wants without inordinate fatigue or loss of time, would be appropriate, even if the business were not in strong rivalry with others. (But eager rivalry often causes them to be carried to an excess, which involves social waste; and ultimately tends to raise the charges which the public have to meet without adequate return.)

Again, printed advertisements regarding particular transactions, such as horses for sale, or hire; contracts to be let out; vacancies, etc., have seldom any considerable combative effect. The sending to customers of samples of a special kind of prepared food or other common product is an effective instrument of combat, the use of which is confined to powerful capitalists: but it is of little avail unless the product is approved; and on the whole it is constructive. Similar remarks apply to the sending out by producers or wholesale dealers, of samples in the charge of persuasive travellers. Again, advertisements in trade newspapers; and, especially such as are largely occupied with technical and scientific discussions, are generally terse, explanatory and constructive: though indeed a powerful firm, whose resources and specialities are well known, may sometimes prefer a few words in impressive type, or perhaps a bold illustration, to an explanatory statement: for that cannot be adequate, and yet confined within narrow limits.

(Exceptionally constructive are all those measures needed for explaining to people generally the claims of some new thing, which is capable of supplying a great but latent want.) If the thing is in small compass, easily handled, and not costly, samples of it can be distributed in various ways. But if it is expensive, and above all if it cannot be adequately handled without considerable training, then people can be fully informed of its usefulness only by seeing it at work. In such a case as that of the typewriter, when first introduced, efficient demonstration is beyond the scope of any but powerful capitalists¹.

¹ When the idea of a typewriter was first conceived, very few people were inclined to take seriously the suggestion that it could rival the pen in efficiency. It could not therefore be sold by mere printed notices: and the retailers of

II, VII 7.

7. *Advertisements which are mainly combative generally involve social waste.*

On the other hand the combative force of mere capital obtrudes itself in the incessant iteration of the name of a product, coupled perhaps with a claim that it is of excellent quality. Of course no amount of expenditure on advertising will enable any thing, which the customers can fairly test for themselves by experience (this condition excludes medicines which claim to be appropriate to subtle diseases, etc.), to get a permanent hold on the people, unless it is fairly good relatively to its price. The chief influence of such advertisement is exerted, not through the reason, but through the blind force of habit: people in general are, for good and for evil, inclined to prefer that which is familiar to that which is not.

(The lavish advertiser must deduct his expenses from the gross profits of his additional sales: while the rivals whom he

writing materials were not inclined to master its manipulation. The only practicable method therefore was to show it working rapidly in the hands of expert agents throughout the land. This involved vast expense: but it led the way to even vaster gains. For the typewriter, though a complex instrument, belongs to a class which can be brought so completely within the range of mechanical production, that it can be made on a large scale cheaply: and its uses are now so important that some people would pay £100 for one, if they could not get it for less. Thus lavish expenditure on developing a new want, being based on clear foresight, was well justified by its results to the venturers. And, in a broad view of its social results, there is perhaps no very great cause for regretting that the proprietors of the chief patents for the machines have been able by agreement among themselves to maintain (subject to some partial exceptions) for a long while at £20, the price of things, which ere long will probably be sold at little more than their direct cost of production; and that is reported even now not to exceed £5. If a new and perfectly efficient typewriter could have been produced by a moderate outlay, and without infringing the many wide-reaching patents still in force, a great reduction in price might have come long ago: and in this respect the typewriter, though a brilliant, is not a generally representative instance of the commercial success which is to be obtained by creating a new want and meeting it. For the main constructive acts are often confined to discovering the existence of a latent want, and educating the public in regard to it: these being accomplished, a number of independent routes, by which the want may be met, may perhaps be opened out, all about equally good. Indeed experience of the route followed by the pioneer, may itself furnish quickly hints to fresh minds; and thus lead to the discovery of a new route, which is better than his, and is not covered by his patent, though no one would have been likely to find it unaided. In such a case the pioneer bears the chief burden and others enter into his heritage. There is much suggestion on all these matters in Cherington's *Advertising as a business force*.

ousts lose their gross profits, and thus there enters one element of social waste.) It is true that his additional sales may slightly lower his costs of production per unit: but in fact nearly all the products, in the advertisement of which iteration has been carried to extravagant excess, offer occupation for many firms each strong enough to command all the chief economies of large scale production. (A second element of social waste, caused by bold displayed advertisements, is the relative obscurity into which they are designed to throw, and do throw, the smaller advertisements of less wealthy men; some of whom may have high constructive faculty¹.)

In conclusion it should be noted that academic students and professional advertising agents in America have united in applying modern methods of systematic and progressive analysis, observation, experiment, record, and provisional conclusion, in successive cycles to ascertaining the most effective forms of appeal. Psychology has been pressed into the service: the influence which repetition of an advertisement exerts has been subsumed as a special instance of the educative effect of repetition².

¹ Large questions are opened up by the consideration of the dependence of newspapers and magazines on receipts from advertisements. They are thereby enabled to provide a larger amount of reading matter than would otherwise be possible: but this influence does not work wholly for good. In the United States, £50,000,000 a year are estimated to be spent on advertising in newspapers; and £70,000,000 on other kinds of advertising: one periodical received on a long contract £600 for each use of its back outside page. One French house sends out £20,000 worth of patterns of dress materials annually.

² The task is more difficult than appears at first sight. It has indeed been shown that test experiments in regard to different modes of advertising a particular product, may be of much service in regard to that product. But the attainment of trustworthy general results seems yet far off. For instance, a number of notices, some on full page, others on half and quarter pages, were set before a group of observers; and the results indicated that the larger notices impressed the eye more strongly in proportion to their size than the smaller ones did. (Munsterberg, *Psychology and industrial efficiency*, ch. xx.) But the indication seems to be inconclusive. For instance, if a person is in need of some particular thing, such as an aid to imperfect hearing, or a folding chair suitable for travelling, his eye is likely to be arrested by even a short notice of it. In such a case small advertisements in many periodicals are likely to give better results relatively to a few displayed advertisements than is suggested by such a test. An excellent account of laboratory study in such matters is given in A. W. Shaw's *Approach to business problems*: and there is much to a similar effect in Cherington, *l.c.*

CHAPTER VIII

BUSINESS ORGANIZATION: THE GROWTH AND INFLUENCE OF JOINT STOCK COMPANIES

- II, VIII, 1. 1. *Some of the modern problems of administration on a large scale were anticipated long ago by private and corporate owners of great estates: though they did not often need to balance their incomings against their outgoings closely. The fiduciary element in corporate administration.*

Recent chapters have been concerned mainly with the external relations of a business to other businesses, and to consumers of its products or services: we now pass to consider modern developments of the internal relations of a large business, with special reference to its administration, whether under individual or joint stock control. Several suggestions in recent chapters have pointed towards the growing need for progressive detailed study as a means towards the efficient and economic conduct of business: and the last chapter of this Book will be occupied with applications of such study, to measure the economic efficiency of various methods of working. They can claim at present only a very partial success: and yet they have attained in some directions to a degree of accuracy, which, though far from ideal perfection, is yet much in excess of what appeared practicable in tasks so large and complex even a generation ago. But this tendency of business administration will not come into view in this chapter or the next two: they will be occupied mainly with matters specially relating to joint stock association; to finance; and to the faculties and resources which are required of the head of a large business and its chief officers, in regard both to the general scheme of the business, and to the control of its subordinate employees.

But before settling down to our main task there may be

some interest in considering how far the problems of administration of the present age differ in essential character from those of earlier times. Their forms are certainly far apart: but perhaps they differ in substance less than appears at first sight. II, viii, 1.

Let us look at the business side of the functions of a great landed proprietor, and especially of one who has no easy access to the assistance of skilled professional business men equipped with the powerful appliances of modern times. Like a mediaeval baron or abbot, he is called upon to carry responsibilities as a capitalist undertaker and as an employer of labour, which may fairly be compared with those of the heads of very considerable businesses in the modern world. He must indeed look far ahead, estimate chances and balance risks when he decides whether to invest resources in (say) opening out a quarry, or setting up an additional mill: and, subject perhaps to some partial customary rights over persons on his estate, he will need to select those who are to superintend each new undertaking. If he is able, industrious, and alert, he will see that all men are put on work for which they are fit; and that each instrument of his resources is carried up to that margin or limit, at which any further employment of it would be inappropriate. On such an estate, everywhere and in all times, there will be found much delegation of authority, and a rough gradation of the difficulty and responsibility of each man's task: the lower rewards generally going to those whose physical toil is severe; and the higher to those who are called on to exercise discernment, judgment, tact, and a power of bearing responsibility, together perhaps with some modicum of initiative. On the estate, as in the modern business, the extent to which specialization, subordination, and the coordination of faculties and of tasks are carried has varied with the general conditions of the undertaking: but the governing principles will be always the same.

It is indeed true that the organization of a private estate is designed to afford gratification to its owner either directly; or through his friends and others to whose comfort, admiration, and perhaps envy, it contributes. If the arrangement of a stable is pleasing, it can be maintained, though the horses

11, VIII, 1. might be cared for equally well on a less expensive plan: if a tree is beautiful, it may be spared, although its trunk is not straight enough to make good timber: and so on. That is to say, although the organization of the private establishment gives scope for that scientific management, which attains a desired end by the least costly means; yet the means themselves are generally a considerable part of the desired end; and the end itself is not expressed in terms of money. It is not therefore under as rigorous a rule of arithmetical balance sheets, as is a modern business, which is closely run by competitors working for the same market with similar resources: but the differences between the two are not fundamental.

A somewhat similar freedom from the yoke of an exact balance sheet seems to have been enjoyed by those great merchants of early times, whose financial strength enabled them to gain increasing profits with ever increasing ease, so long as strength lasted and fortune favoured. The power of a Fugger, or even a de la Pole or a Canynge, controlled the fate of monarchs and of nations: and so vast, relatively to the aggregate movable wealth of Europe at the time, were the gains which resulted from their larger transactions, that they had little occasion to spend strength on petty economies. Although there was but little trustworthy information of distant affairs, beyond what could be obtained only at great cost and slow speed from private agents and correspondents, a few of them grasped the main threads of most of the chief business problems of Western Europe.

Even those features of large modern business, which are chiefly associated with joint stock ownership and control, were in some measure anticipated by the administration of powerful monasteries; and of other bodies in which the individual had no exclusive dominant rights. It will be seen presently that the partial supersession of individual by joint stock enterprise has not changed the problems of business administration very greatly. But it has introduced a distinct new element into those problems, as to which a little must be said. Many corporate bodies of to-day, and especially colleges at Oxford and Cambridge, retain much of the spirit of old religious houses. The official Head, if a strong man, has great power; as has the

Chairman or President of a great joint stock company: and as a rule every member of the Governing Body cares for the future efficiency and prosperity of the deathless corporation with nearly the same zeal as if it were his own property. Much of this traditional uprightness of purpose and fine ambition is found among the directors of joint stock companies: the purity of their motives is seldom much influenced by the extent of the pecuniary interests which they and their heirs have in its well-being; though it is true that their active zeal, and the time which they devote to its affairs, in preference to their private affairs, is apt to be influenced by the extent of their interest in the company. II, VIII, 2.

Here it may be observed that the directors of a company are, strictly speaking, employees of it. Except in so far as they are themselves shareholders, they run no risks from its failure, beyond some loss of prestige; and a possible loss of employment, which they share with other employees. The shareholders bear the risks, but delegate nearly the whole of their functions, as owners of the business, to the directors and other employees. But in practice the directors, even though they own but a small part of the shares, are seldom displaced unless they have made grave errors: thus they may be regarded as "the head" of the company, in the sense in which decisions on large issues connected with a business belong to its "head"; though he may delegate decisions on minor issues to subordinates. Of course the directors of a company, like the partners in a private business, often share out among themselves the main control of particular groups of these issues, the collective meeting remaining the ultimate authority in large matters. But more of this hereafter.

2. *The growth of the legal freedom and of the inclination to develop businesses in joint stock: their paramount influence on economic structure.*

It is indicated elsewhere that the term "Joint Stock Company" has had many different connotations in different stages of the world's history¹. (In early times it meant little more than association of a few members of the same family, or a few

¹ See above, p. 36: also Appendix C, 3, and Appendix D, 2.

II, viii, 2. neighbours having intimate knowledge of one another, who united their resources, or parts of them, for some venture.) As a rule the venture was one which required a larger capital than any one of them possessed; or else it involved risks, the whole burden of which was too great for any one of them. Especially were companies needed for many tasks which in modern times are generally recognized as belonging to Government; though the recent development of Rhodesia has been effected for the greater part by a company, which worked with special privileges reminiscent of those of the great Joint Stock and Regulated companies.

The founders of those companies were for the greater part merchants, directly cognisant of the nature of the work to be done: and for a long while the supreme control of the business of each company was largely under the supervision of experienced men of affairs, who owned a great part of the capital: even late in the eighteenth century the great East India Company was chiefly owned by about eighty men, many of whom were in close touch with its administration. It might have been expected that joint stock administration would have spread over English business in the eighteenth century: but several causes retarded its progress.

A chief cause was the misuse of joint stock machinery in the "Bubbles" period (1700—1720). It evoked a law, under which the privilege of trading in joint stock could be obtained only by special charter. So associations abounded that were called "companies," but had no legal status as such. As each member of such a company was liable for all its debts, a prudent and responsible man was unwilling to take a share in it, even though it afforded reasonable prospects of high gains; unless he knew enough of his fellow members to be sure that he would not have to bear a great part of the burden in case of failure. Under the influence of this law only those businesses, which were sufficiently important to obtain private charters, were open to legal recognition in England as joint stock companies: the rigour of the rule was relaxed in 1825 and again in 1844; but the full privilege of Limited Liability was not made general till 1862¹.

¹ The law of Scotland was more liberal than that of England. A common

It has been generally agreed that the vehement fury of II, viii, 2.

speculation during most of the eighteenth century in the few stock exchange securities which were accessible, indicates that the time had not arrived at which more gain than loss was likely to arise from opportunities offered to the general public to hand over the control of their capital directly to businesses, of which they had no personal or technical knowledge. No objection was taken to direct mortgages on real property; which long remained a chief, if not the chief, investment of small funds. But, especially when industry was unsettled by the introduction of new methods, and unknown men were rising rapidly to the front, it seemed to be to the general advantage

partnership could by the law of France obtain many of the advantages of Limited Liability: for the responsibility of a sleeping partner, often a retired member of the firm, who took no share in its application, could be limited, by due announcement, to his share of the capital. Mill strenuously advocated the introduction of this principle of *en commandite*: and many of his arguments still remain valid.

The history of early crises has been much advanced in Prof. W. R. Scott's *Joint Stock Companies to 1720*. Attention was called by Rogers to the violent fluctuations of the prices of stock in *The first nine years of the Bank of England*. Adam Smith regarded banking as eminently suitable for joint stock control: but he had in view the excellent management of local affairs by the joint stock banks of Scotland: and their task was relatively easy, because connection with England enabled them to have nearly all the advantages in regard to foreign trade of an expensive gold basis for their currency; while they turned to the account of themselves and their customers the right of issuing paper money, which a more exacting Government might have claimed for itself. However their splendid work, and the reckless misconduct of many private English banks early in the nineteenth century, forced the door to open for joint stock banks in England: and curiously enough the English banking system has developed on lines, in which routine has a larger place than in that of any other great commercial country. But this runs beyond our present subject.

It may however be relevant to note at once that the Bank of England has gradually led the way towards a management of financial difficulties, which is a pattern for the world: and that its best strength has been derived from directors, who have not been mere nominees of its own shareholders, but have in effect represented the chief business houses of London. It has been the leader; and there has been a continuous independent movement upwards, in regard to the management of the financial affairs of the country, especially in regard to joint stock company ventures. The joint stock companies mania of 1825—6 was far less wild than the South Sea and the Mississippi Bubbles in England and France early in the eighteenth century: and, when an underestimation of the costs of developing the English railway system led to another grievous crisis twenty years later, the credit given was found to have been less intemperate than in 1826. Since then, there has been no crisis as intense, and extending to so large a proportion of the business of the country.

II, viii, 2. that bankers and other professional dealers in command ^{with} capital should act as intermediaries. So they lent, mainly, ^{As a} their own risks, the command over capital, deposited with them, ^{and} to such manufacturers and others as seemed to them able and trusty: the people were shy of investments in businesses beyond their immediate ken.

(The expansion of joint stock companies has resulted in the general democratization of the ownership, as distinguished from the control of business.) England was the only country fully ready for such a democratization on a large scale in the first half of the nineteenth century: and there was gain as well as loss in her being withheld from making the experiment till education and the new means of obtaining information about distant events had rendered the venture comparatively safe.

The concession of Limited Liability to any seven persons, who chose to pay a small fee and register themselves as a company, was made in a law so crudely worded as to invite the most inexperienced and poverty stricken rogues to use it as a means of plundering the public: and the reports of the Board of Trade on the winding up of companies contain many ludicrous tales of petty misdoing by methods which are not yet wholly stopped. But they never covered much of the business of the country; and they are now rare.

Next, we may consider some influences on the substance and on the wording of economic doctrine, which arise from the extension of joint stock company control over a great part of the business of all western countries. Let us look back a little. Not very long ago the representative firm in most industries and trades was a private partnership; which in the course of one or two generations had attained a goodly reputation, of a personal and individual character. Its plant had become larger and more various, until it commanded all, or nearly all, those economies of production on a large scale, that were inherent in the most advanced methods then known for its particular branch of business. Its own (Internal) economies were not great: but it took its part in affording a large market for firms in branches of manufacture, which supplied it with made or half-made materials: and in developing (External)

economies of general organization, which gradually became II, viii, 2.
 non property. Thus each firm, though of moderate size,
 can reasonably hope to obtain most of the advantages in pro-
 duction, which would be accessible only to vast businesses, if
 each had been mainly dependent on its own resources. Under
 these conditions, a very large capital in the aggregate was dis-
 tributed over many firms of moderate size, each with its own
 individual life, its own power of initiative, and its own personal
 relations with its employees. If any firm became slack in enter-
 prise, or weak in purpose, it passed away and made room for
 others, with but little disturbance to the industrial organism;
 just as a forest tree, which has lost its vigour, passes and leaves
 an opening, through which some strong young plant may shoot
 up towards the light.

But in the new age joint stock control has become uni-
 versal in regard to railroads; and it has become general even
 in regard to manufacturing and other industries, which have an
 urgent need for alert and versatile administration. In most
 of these industries a tendency to Increasing Return prevails:
 that is, an increasing output can generally be produced at a
 diminishing rate of cost. It is obvious that, under this tendency
 a firm, which had once obtained the start of its rivals, would be
 in a position to undersell them progressively, provided its own
 vigour remained unimpaired, and it could obtain all the capital
 it needed. In old times there was often much difficulty on this
 score: but that has diminished greatly during the last three or
 four generations. It seems therefore that, if there were no
 other difficulty in the way of the unlimited expansion of a strong
 manufacturing business, each step that the firm took forwards
 in supplanting its rivals, would enable it to produce profitably
 to itself at prices below those which they could reach. That is,
 each step would make the next step surer, longer and quicker:
 so that ere long it would have no rivals left, at all events in its
 own neighbourhood. That condition must of course not be
 omitted; because the expense of marketing heavy goods at a
 distance might overbear the economies of large scale production.
 But for goods, of which the cost of transport is low, and which
 are under the law of Increasing Return, there might have
 seemed to be nothing to prevent the concentration in the hands

II, VIII, 3. of a single firm of the whole production of the world, except so far as it was closed by tariff barriers. The reason why result did not follow was simply that no firm ever had sufficiently long life of unabated energy and power of initiative for the purpose. It is not possible to say how far this position is now changed by the expansion of joint stock companies with a potentially perpetual life: but every recent decade has contained some episodes which suggest that it may probably be greatly changed, either in substance, or in the methods by which new life is brought into old bodies.

A private firm without great vigour is sure to die: a large joint stock company has special advantages, many of which do not materially dwindle with age. Its hindrances arising from its routine methods do not increase as fast as the increase in its business, while each step of that increase is likely to give access to new technical economies. And, even if it be somewhat lacking in energy and initiative, it can often utilize (as industrial enterprises under Governmental management habitually do) new ideas and new appliances that have been created by independent workers: and it has special opportunities for the introduction of new blood into its management. It has also this dominating financial advantage, that the salaries, which it pays to its directors and chief managers, are much less in the aggregate than that excess of the profits of a successful private business over the mere interest on its capital, which is required to induce men already wealthy to continue to bear the burden of business.

3. So wide are the varieties of the arrangements between ownership and control of capital, which are now included under the common name of joint stock association, that almost any class of business can be properly conducted by some one or more of them.

Every successive decade has brought new developments of the structure of joint stock companies, and their relations with other financial businesses. The chief initiative has come from America. But Germany has contributed much: her legislation in regard to the obligations of the promoters and directors of joint stock companies, if not achieving all that has

been claimed for it, has at least indicated a direction in which other countries are likely to move, and have indeed begun to move. II, VIII, 3.

The varieties of joint stock company organization are numerous and plastic: scarcely any business is conceivable which could not be efficiently managed by some one or more of them. When a private firm is thrown into joint stock form, for the convenience of members of the family who are not able and willing to take part in its administration, there is often no real change in its administration: whatever it did well as a private firm, it can continue to do as a company; so long at least as the men at its head are of the same stamp as formerly, and other members of the family do not interfere with them. Again, when a group of wealthy capitalists retain the complete effective control of all the affairs of a company in their own hands, they can act with as much freedom and vigour as if they remained in simple partnership. They may distribute widely among the public preferred shares so arranged as to give no votes; and debenture bonds which of course give none. They may even distribute widely half or two thirds or even more of the ordinary shares: for even two-thirds of them, if scattered in small lots among the public, cannot be brought to bear in a conflict for the control of the company, except by slow preparation: and that can generally be countered in time. There is no sort of business which the Standard Oil Company could not set up, and manage with the freedom of a private firm, if it thought the affair worth the necessary trouble.

(The distinctive conditions of joint stock administration come into view only, when the ownership of capital is effectively divorced from its control: so that those, who are in control, have not nearly the same pecuniary interest in its economic and efficient working as they would have, if they owned the business themselves.) Its higher officials may watch its lower officials, and its directors may watch its higher officials. But its directors can generally keep their positions by faithful, steady work, without showing special initiative; and they often content themselves with that.

A man of restless constructive force, who finds himself on such a Board, may urge a reorganization of some parts of the

II, VIII, 4. procedure on more advanced lines, or the scrapping of some plant that is no longer in the front rank: but he is not unlikely to appeal in vain, if the change would cause much trouble, suggest some criticism of past management, and be of such a nature that its ultimate pecuniary advantage cannot be proved with absolute certainty. As a separate business man he would make the venture; and, if he were a member of a private firm, he might probably succeed in carrying his partners with him. But the *vis inertiae* of a great company is against him: he can seldom argue the case effectively with numerous scattered shareholders, who do not understand the business. He is therefore inclined to acquiesce, however unwillingly, in the general opinion, that a company, the ownership of whose capital is almost wholly in the hands of the public, must for the greater part adhere rather closely to routine.

For this evil there is a possible remedy; which has been largely adopted in America. The shareholders may decide to give their votes in favour of those who will support the almost autocratic power of some man, or group of men, whom they know to be able, resolute, and perhaps to have a large pecuniary interest in the company. This plan has answered admirably in many cases: but has failed in others. Its success seems to require rather peculiar conditions: and the time has not yet come for a good estimate of the chance that it may prove a generally effective remedy for the malaise to which joint stock companies are liable in their old age.

4. *The obscurity of the affairs of many small companies: the exceptional case of manufacturing companies owned largely by working-men.*

The above considerations tend to show that the ordinary investor can seldom safely buy the shares of a small joint stock business, unless he has personal knowledge of those who control it, or is able to form a sound technical opinion on the manner in which it is being operated. He is therefore, if wise, commonly inclined to seek businesses in which he believes many competent and experienced men hold shares: for then he has some sort of assurance that the manner in which the directors and officials of the company discharge their duties, will be noted by a

sufficient number of men, capable of forming a fairly good opinion on it, to give security against grave negligence or malfeasance. II, VIII, 4.

An inexperienced small buyer or seller of commodities generally deals at a disadvantage. But the goods of the Stock Exchange are absolutely standardized, to the extent that each security is of the same value as every other of the same nominal amount and the same issue: and the small inexperienced purchaser pays almost exactly the same price as anyone else, who buys at the same time. Of course slight exceptions are to be made for dealers, who transact their own business; for powerful capitalists, who make special terms with chosen dealers; etc. But in the main, a small buyer is on the same footing as anyone else, who has the same knowledge and judgment as to the selection of securities to be bought and the time for buying; and information as to a large company is often accessible through the public press. No doubt the strong financier can often obtain early information, partly confidential, as to causes which are likely to alter the price of any security; and he can on occasion take part in strategic combinations for the purpose of moving the price in a direction that will suit his schemes. But yet it is on the whole true that (dealings in the securities of large companies tend in the direction of democratizing the ownership of capital; while the expansion of private businesses, and to a less extent of companies, tends even more strongly to render the control of capital oligarchic.)

Attention has already been called to the ability of joint stock companies to dominate the manufacture of staple goods, of which large quantities, alike in every respect, are steadily consumed; especially if the appropriate plant has already advanced so far towards perfection, as to be almost exempt from organic change. Even working-men often have exceptional opportunities for starting and controlling cooperative, co-partnership, and ordinary joint stock undertakings for work, with which they are familiar. Such companies can draw on the specialized knowledge and experience of many operatives, who are themselves at work in the most advanced factories engaged in the same branch of industry, or in others which sell to that branch, or buy from it. And, whereas in a great company, the

II, VII, 4. shareholders generally pay large salaries to directors, who are expected to bring high technical knowledge to bear in their judgment of the efficiency of its chief officers; these companies, consisting mainly of smaller men, bring much of the requisite knowledge to bear themselves. Their appearance in the midst of our complex modern industrial organism may perhaps help to explain the success of some companies in early times, which seem to have grappled with tasks, that required considerable technical knowledge, without the aid of any elaborate organization¹.

It is to be noted that these companies, and many others of recent origin, issue shares of very small amounts: so that an investor of limited means can increase his holdings gradually, as small savings are made; and he can obtain the advantage, formerly beyond his reach, of distributing his risks rather widely. This change is not without its drawbacks from some points of view: but it suggests developments of economic organization, which the new education and wealth of the working classes may possibly effect ere long.

¹ The following facts are taken from Professor Chapman's *The Lancashire Cotton Industry*; and a paper contributed by him and Mr Marquis in the *Statistical Journal*, 1912. Many cotton spinning factories have been originated by joint stock companies; whereas in most other industries, a new company is generally developed out of a private concern. Cotton spinning, in spite of its simplicity, of course requires a rather large capital; larger for instance than is needed for weaving; therefore profits in it are not cut down much by the competition of rising small men. Good cotton yarns almost sell themselves, and therefore do not demand exceptionally able, alert and enterprising managers; and the simpler qualities are easily tested. Consequently when cooperative spinning-mills have wished to change their constitutions, they have become joint stock companies; whereas cooperative weaving businesses have frequently split up into several distinct private undertakings.

When a new spinning-mill is projected, a large part of the necessary capital is obtained, in an exceptional manner, by loans. They "are nominally at short notice; but they are seldom withdrawn, when their removal would place a business in jeopardy." The rate of interest is very low "because the money is found on the one hand by people, who are engaged in the industry, and feel that there is a real security in contact with everyday experience; and on the other hand by people who are acquainted with local conditions, and to a large extent lend on the basis of personal knowledge."

5. *Temptations of joint stock companies to excessive enlargement of scope.* II, VIII, 5.

Meanwhile there has been a constant increase in the number of people of high principle and sound judgment, who are willing to serve as directors; and among these may be found not a few with good business experience. For indeed in many a large private business the charge of details is assigned to responsible subordinates so fully, that the head need seldom concern himself directly with any but the broader and more fundamental problems; and he is therefore able to give a few hours a week to the service of a railway or other important company. Further, the number of intelligent investors has increased. There are far more people than formerly engaged in business of their own, who yet have spare capital to invest in Stock Exchange securities. Such men often know what information as to the affairs of a company should be demanded: and they exercise a wholesome control over the directors; and over the influences, which unwise or designing shareholders may bring to bear on the directors.

The number of intelligent and upright directors increases. But unfortunately many of them are unable to give the large time and energy needed for obtaining a thorough mastery of the affairs of the companies for which they are responsible; and (the chief service, which most of them render to the public, is through their common sense; their power of reading character; and the safeguard which their presence offers against gross fraud or folly on the part of the chief officials, or of a managing director.)

This passive uprightness is an important asset: but it does not always compensate for the indolence and blindness of directors, who are accomplices in wrong-doing in this sense that they receive their fees, and yet plead ignorance of matters which a sense of their duty should have caused them to investigate. The Law courts of England, in spite of great recent improvements, appear still to treat this form of wrong-doing too indulgently.

There is one direction in which the extension of its operations by a great company, or by a department of municipal administration, is a source of danger that may be overlooked:

11, VIII, 5. it is that routine work by departments of a large business may expand at the expense of small businesses with greater elasticity and power of origination. The growth of a sense of moral responsibility among the chief technical employees of large concerns may be a partial remedy for this danger: but they cannot always approach a proposal for enlarging an existing department, or starting a new one, without some bias.

That bias shows itself in the tendency of some joint stock companies and municipalities to make things, which it would perhaps have been better for themselves and for others that they should have bought. The temptations in this direction are strong. If the officials can get a free hand in the matter, they enter into the new branch of production with a large capital at their backs. They have no difficulty in absorbing most of the best knowledge that is floating about on the subject. The new department is equipped with the most recent appliances; with the most effective, economical, and labour saving machines. It goes along bravely, wind and stream being with it. It can show a saving on the prices at which the company used to buy the goods now made by it, even after allowing good salaries for those concerned in it. Perhaps some managers with special knowledge of its work will be imported: but many of those engaged in it will be drafted in from other departments, at somewhat increased salaries for themselves; and at the same time making vacancies in their own departments which are filled by juniors. There is a move upwards, and an increase of salaries all along the line, and everyone is pleased. So the movement grows; while a true balance of its advantages and disadvantages is perhaps never made out.

The difficulties arising from the multifarious enterprises of railway and other large companies are sometimes partially overcome by telling off a committee of the directors to be specially responsible for the department; and giving them a free hand in all changes that do not vitally affect the general, and especially the financial, position of the company: and perhaps some of the higher officials may be able to render valuable aid. (These are palliatives; but, even with them, divided responsibility increases the temptations to laxity which are inherent in joint stock company management.) If the ablest directors are

attracted to the subsidiary committee, it may do well: but they might render better service in regard to the main work of the company: for, if they do not do their best in that, the best will not be done: and the work of lateral extensions, such as rolling mills and shops for the erection of locomotives, would presumably be done at least as well by firms that attempted nothing else. It is possible that British locomotives might have nearly the same commanding position in the world as is possessed by her ships and marine engines, if British railway companies adhered more closely to the general practice of British shipowners in buying their ships¹.

6. *The mechanical methods of administration, which are inevitable in a joint stock company, are often mitigated by the professional emulation and the esprit de corps of its officials. Good and evil of the progressive supersession of private businesses by joint stock companies².*

The wholesale transference of authority and responsibility from the owners of each business to salaried managers and officials would have been impossible had there not been a great improvement in the morality and uprightness of the average man: for even as late as the seventeenth and eighteenth

¹ We are told:—"Railway manufacturing establishments lack the incentive of competition, the output of the works being designed for service on the system of the owning company. The works trade in a closed and fully protected market, and are therefore not in any real sense commercial enterprises. The result is evident to those who have had the opportunity of inspecting these works, and of comparing their organization and equipment with those of the great joint stock companies of locomotive and rolling stock manufacturers. In the case of new shops the equipment is perhaps equal to that to be found in the shops of the private manufacturer, but there is a tendency, partly owing to the absence of competition, but also arising from the fact that the railway manufacturing establishments are not run as separate enterprises, but are merged in the general railway undertaking, to allow the equipment to fall behind current practice, and to be, to an extent unsuspected by those responsible to the stockholders of the company, quite unrepresentative of modern methods of manufacture. The plant does the work required, and that would often appear to be the sole criterion of efficiency; there is no one whose business it is to count the cost." (Financial Supplement to *The Times*, 23 August, 1911.)

² A considerable part of this Section is reproduced from "The old generation of economists and the new" in the *Quarterly Journal of Economics* for January, 1897.

II, VIII, 6. centuries we find the great trading companies breaking down largely in consequence of the corruption and selfishness of their officials. But men, who are above such gross iniquity, as was common then relatively to the few opportunities for it, are yet likely to succumb to subtler temptations; and especially to the temptation to consult their own ease by jogging along quietly in accustomed routes, and avoiding the trouble and worry of new initiative.

(The owner of a business, when contemplating any change, is led by his own interest to weigh the whole gain that it would probably bring to the business, against the whole loss. But the private interest of the salaried manager, or official, often draws him in another direction: the path of least resistance, of greatest comfort and least risk to himself, is generally that of not striving very energetically for improvement; and of finding plausible excuses for not trying an improvement suggested by others, until its success is established beyond question.)

Again the single owner, responsible to no one, may trouble little about mechanical checks on the honesty of his employees; for he may trust to his reading of human character, and his power of detecting unfaithfulness by sharp verbal inquiries. But the officials of a joint stock company, being themselves trustees for others, can seldom take such risks: and they have little chance of taking them safely. Their accountant's work for every department must be full and precise; and so arranged as to be part of a system of elaborate checks and counterchecks.

(Such a system is necessarily wasteful of effort, and hostile to elasticity: and here lies a chief disadvantage under which a joint stock company lies in competition with a private firm.) But this disadvantage does not increase materially with an extension of the scope of the company's business. A mechanical system of checks and counterchecks, when once introduced, adapts itself almost automatically to enlargements: it of course becomes more complex, but on the whole its cost is not likely to grow faster than the size of the business.

In so far as a system of checks represses elasticity and initiative, it is an injury to the community as well as to the company: and though this injury to the company may not be intensified by an increase in the scale of its operations, some

little injury to the community arises from every addition to the number of officials whose character is affected by it. Moreover *vis inertiae* opposes the removal of any check to which people are accustomed, even though it is no longer of much use. For those who remove it will get little thanks for their pains, if their judgment turns out to be right; and they run the risk of great blame, should perverse chance bring a flagrant misdeed, that might have been arrested by the check which they have removed. II, viii, 6.

If this were the whole of the case, then every new advantage, that modern changes confer on large businesses in their contests with small, would be a source of danger to social progress. For the economies of the large business as against the small are mostly a matter of private concern and bear little further fruit: but the improvement of methods spreads from its first home all over the country, all over the world; and the private gain, which results from it to the inventor, is seldom a hundredth part—sometimes not a millionth part—of the social gain. A tendency to ossification of the social organism might therefore be feared as the result of bureaucratic habits of shirking troublesome initiative, the main benefits of which would accrue to those who had not borne the burden.

From this tendency the world is in some measure saved by the influence of motives other than the desire for pecuniary gain. (To begin with, the increase in the size of industries is often accompanied by the substitution of scientific methods for empirical: while a sound basis of scientific technique is largely provided by laboratory work, to which an ever increasing number of elastic and enterprising minds are rising from among the people; being stimulated a little by the hope of gain, and much by intellectual ambition, and the sympathy of other students of science.) And, in addition to this general energizing force, a special force somewhat similar to it is coming into play to preserve from stagnation the more exclusively practical side of business management. For business experts are getting more and more into the habit of writing and reading specialist journals, of holding congresses, and in other ways coming under the judgment of one another: and thus the thankless task of attempting an improvement which may after all turn

II, viii, 6. out badly, and to which a man's official superiors and the public at large may be indifferent, assumes a new shape; since it is likely to be judged by a critical and appreciative audience, who know the technical difficulties of the problem. The most important improvements often remain for years just short of yielding financial profit: but such an audience applauds the clever and bold endeavour even though its financial fruit is not ripe; even though the interest of a manufacturer in charge of his own business might not impel him to use it. Thus the modern intercourse of expert officials with one another is bringing into the business world some part of that great progressive force, which pure science has long derived from the approbation awarded to successful research by audiences fit though few. Such approbation is a reward; and like every other reward, present or deferred, it appeals to elements of our nature that are not the very highest of all: but, partly for that reason, it may be trusted to act steadfastly. It is not only a reward: it is also a sympathy; and sympathy is the one solid and strong force which has in it nothing sordid, and permeates the whole of human nature.

This is more important with regard to joint stock companies than to private businesses. For, when once the ownership of a business has left the hands of an individual, who might attach his chief employees to him by bonds of personal friendship; when once faithfulness to the business has ceased to be enforced by the warm instincts of loyalty, and has been left to the colder support of impersonal duty; from that time forward the moral coherence and strength of the business depend largely on the growth of an *esprit de corps*, of a spirit of loyalty to the business itself. As time goes on, and the name of the business becomes hallowed by traditions of good achievements in the past, the best of its employees find a pleasure and a pride in its success and glory, as they do in that of their country: they love it as a student loves his University, as a soldier loves his Regiment; less heartily perhaps, but yet sincerely. And indeed in many a great joint stock company there arise from time to time managers, who evoke among their subordinates a high regard for themselves; and through themselves for the company: and, when they pass away, an increased tradition of loyalty to the

company remains. In this matter also the great long-lived company may stand at no disadvantage relatively to a new company, which has more of the vigour of young blood, but is held together by little beyond a mere cash nexus. II, viii, 6.

This loyalty is being fostered by a multitude of movements, designed to give the employees a direct interest in the prosperity of the business for which they work: while others aim at developing their intelligence and ability in ways, some of which are likely to promote their efficiency as employees; and some, which are desired only as contributing to their higher well-being, are among the best fruits of the larger sense of social duty which is characteristic of the present age.

America appeared rather late in this field, but she is already a chief leader in it: in particular she has made it clear that when a business takes the form of a joint stock company, it does not thereby lose the freedom to make large expenditure for improving the condition of its employees. This seems to be due partly to a certain generosity of spirit, which has always accompanied the keen pursuit of wealth by her people; partly to the clearness with which her employers recognize the economy of attracting those workers who will get the greatest amount of good work out of the expensive plant which is committed to their charge. They not merely pay high wages, but often also offer opportunities for high grade social gratifications; especially if the work to be done calls for the finer industrial qualities; rather than for that heavy manual work, which Americans prefer to leave to immigrants. Lastly something may be allowed here for the autocratic, or at all events oligarchic, constitution of American companies. As a rule the President may, and indeed must, exercise an authority such as is rare in British companies, though not very rare in some of the more ambitious of the German: and a full control at meetings of shareholders is generally exercised by a few wealthy and able business men, who do not grasp crudely at small savings, but support a far-seeing policy.

We may conclude provisionally that recent developments call only for some mitigation, not for a reversal, of the judgment of English business men that the conversion of a private business into a joint stock company, though occasionally inevitable and

II, VIII, 6. very frequently convenient to those immediately concerned, sometimes acts adversely to national prosperity and industrial leadership¹.

¹ *The Statist* (14 Jan. 1905) gave strong expression to this opinion: "The general rule is that the private owner is more diligent, more assiduous in attention to business, more intimately acquainted with all its details, and better trained for the position he fills, than are the directors of a joint stock company.... They are paid exceedingly badly. Very often a man with a large business of his own, quite sufficient to occupy all his thoughts and all his time, is invited to take part in the management of another large business, and is offered a few hundreds a year as remuneration. Is it seriously expected that such a man will give the same attention to the business of the company that he gives to his own private affairs? Everybody knows that he will not.... The successful private firm is eager to have the best advice in every department, and therefore its managers and its secretaries are exceedingly able men, and usually have the full confidence of the employers. But, for all that, the partners are very careful to know all the facts themselves and to watch constantly over the course of business.... Consequently, when great firms transfer their businesses to companies, as they have been doing for many years past on a very considerable scale, they are taking a step which, from the necessity of the case, renders it certain that the management will be less competent in the future."

CHAPTER IX

BUSINESS ORGANIZATION: ITS FINANCIAL BASIS

1. *Functions of the promoter in relation to joint stock companies.* II, ix, 1.

The function of the promoter is to organize industrial cooperation on purely business lines. This cooperation is not of so fine a quality as that, to which the name "cooperation" is technically applied: for it does not assume a conscious working by each for the good of all, and a readiness to sacrifice, when occasion calls, something of private gain in pursuit of a common end, and the working out of a common ideal. But the two forms of cooperation are often divided only by thin partitions.

For instance, a better organization of some branches of dairy farming might greatly increase the net gains of the producer, without involving any injury to the consumer. Cooperation in the technical sense is effecting this in many districts of Europe and in Ireland, though England herself still lags behind. The work might have been done more quickly, if the conditions of dairying had been such as to invite the services of the able business promoter and organizer. But he is seldom able to get a hold of those industries which are chiefly in the hands of small capitalists: they remain undeveloped largely because his help is not forthcoming, and they have not leaders of their own ready for the work.

There are nearly always some businesses with a greater future before them than is generally known: an able promoter may perceive their capabilities, procure the capital they need, bring them into unison, and push them on their way to success faster than they could otherwise have gone. Again, he may find a district, the agricultural or mineral riches of which have

II, IX, I. lain undeveloped, because the people in possession are neither wealthy nor enterprising: the company which he promotes may bring them a railway, and develop the latent resources by modern methods. Here again (the promoter creates a position which is an addition to national wealth: he benefits all concerned, while reaping a good harvest himself.)

The services of the promoter are easier, but also less necessary in relation to those industries, which are in the hands of men accustomed to deal with large capitals, and familiar with the modern methods of production and marketing. In such industries indeed the owners of the various properties concerned sometimes arrange a fusion without external aid. But often the initiative in starting a new company, or in fusing existing businesses to form a single great concern, comes from a professional organizer.

He makes it his business to study ways in which new inventions, new methods of production, new developments of demand, or new facilities for transport, offer opportunities for profitable alliances between industries that have had little in common as yet. He watches the wastes of competition between rivals: and, being detached from the details, he is generally able to take a broader view of fundamentals, and to discover their true relations and proportions better, than those whose energies are chiefly occupied with practical work in their several lines.

If he decides to aim at a fusion of existing businesses, he endeavours to obtain from each of them, in return for a small price paid down, "an option," or right to demand the sale of that business to him within a given period; and on specified terms, which commonly include the delivery of both money and securities of the new company. He reckons the extra money required for bringing up to date any plant which is behind-hand, and capable of improvement: also structural changes, etc. Unless provided with exceptional resources, he then approaches some financiers. A case having been made out for the conclusion that the company can earn good dividends on a certain capital, the financiers are asked to underwrite a certain part of the securities on that basis. That is to say, they are asked to promise to buy right out a considerable part of the securities of the new company at a price perhaps twenty per cent. lower

than that of issue to the public; thus securing the promoter his necessary supply of cash. If the comparison of these two sets of options, the one to demand the sale of properties, the other to demand the purchase of new securities, shows a sufficient margin to himself in cash and new securities combined, he launches his project. The highest demands on his diplomatic finesse are in his interviews with those whose properties he desires to purchase. But his chief expenditure generally goes to preparing the public to accept a high valuation of the new company. There are few who do more to increase the efficiency of labour in creating material wealth than an able and upright company promoter: he forecasts coming developments, and he aids the public to invest their resources in those fields of industry which will yield the best harvest in coming years.

In strong contrast with him is the promoter, whose ventures are commonly chosen; because he thinks he can induce others to believe they have a good chance of success, though he himself suspects they have none; and who is careful to clear out from them before they collapse. Speaking generally however the course of progress is hostile to the fraudulent promoter. The ground-plans of most of his devices are one or two centuries old: perhaps he may, with consummate skill, deck them out in a new garb, and add new details; but the detective forces of organized knowledge in the public press and elsewhere grow cumulatively, and the new elements in his guiles are less in each generation than in the preceding.

During the last few years, however, there has been a great increase of promotions, the leading feature of which has been the assertion that great economies are to be attained, in marketing as well as in production, by very large businesses; especially where they can practically monopolize a considerable market. This assertion contains much truth: but in many cases it is an overstatement prompted by a strong bias. In America and some other countries, vast gains have often accrued to promoters who have succeeded in inducing the public to accept a high estimate of the economies to be obtained by the fusion of competitive businesses. For instance, it may appear that when several businesses of which the aggregate capital

II, ix, f. value is, say, twenty million dollars, have been amalgamated into one, its net earning power will be so much greater than the aggregate of theirs, that its capital value may fairly be estimated at, say, thirty millions. In this, which is not an extreme case, a few months' work will have put into the hands of the promoter, and those who work with him, a gross sum of ten million dollars: and, in spite of great incidental expenses in securing options, advertising, etc., more than half may be net gain. Such rich rewards have never been reached so quickly as those which have fallen to some dozen or score of promoters of the first rank in America¹.

These gains appeal to the common desire for wealth as a means of mere physical enjoyment; and they appeal, in some cases, even more strongly to the higher and more intense desire for success in great strategical enterprises. They fascinate upright men, who have earned a good reputation by a long career of solid work. And they give unprecedented scope for the use of all those subtle devices for misleading the public which have been developed by successive generations of astute knaves. Meanwhile the contrivances of the law for the defence of the public against them plod with heavy steps some way in the rear; but on the whole gaining ground relatively to the wayward progress of the evil-doers.

¹ See Meade, *Trust Finance*, p. 196.

Mr Flint, an experienced promoter, stated that in 1900, a year of high inflation, forty-seven of the chief industrial amalgamations paid an average of 13.6 per cent. on the market value of all their securities, including common stock; and 7.44 per cent. on their nominal value: whereas the figures for 37 of the chief railroads were 4.85, on both market and nominal value: and he inferred that the industrials could not be over-capitalized (*North American Review*, May, 1901, pp. 667, 671).

But this inference was invalid. The return to investment in industrial securities was high because many industrials had entirely disappeared from the list, so that their capitalization was not reckoned in to swell the total; while the investor warned by their fate demanded a high premium for insurance against the risks which may yet await the survivors. What the figures really prove, is that the market so distrusted the capitalization of these securities as to refuse to raise their total price much above half of their nominal value, even in 1900, when tempted by the high immediate return of 13.6 per cent. on investment. He remarked significantly that "it is not an easy matter to find a man of sufficient ability and financial responsibility to take up" a new promotion, and that "there has to be a high inducement offered, because it involves a risk and a very high class of work," *Report of Industrial Commission*, XIII, p. 92.

When a fusion is over-capitalized the promoters and their friends gain, at the expense of an ultimate loss which falls on the investors: but this transference of wealth from one set of people to another is mainly a matter of private concern. And investors are learning as they go: in so far as the hopes held out by the promoter of recent amalgamations are unduly high, and are falsified by experience in coming years, the task of his successors will be more difficult. II, ix, 2.

2. Some difficulties connected with the valuation of a company, and especially an amalgamation of several companies. Opportunities for, and temptations to, excessive valuation.

If all the nominal capital of a company represented actual outlay, an approximate estimate of the cost of creating a business might often be formed on that basis. But, as has been seen, much of the nominal capital is often "water": that is, it is issued without any actual payment of a corresponding sum of money. Even if it were possible to ascertain to what extent this has been done, the result would not necessarily be a good guide. For instance, a railway in a deserted mining district is almost valueless; and, if its nominal capital represents its original cost, nearly the whole of it will be really, though not technically, water: and the same is true of buildings or plant which are obsolete, or otherwise no longer well suited for their work. On the other hand, a concern may have bought cheaply a great deal of land, which has unsuspected supplies of rich ore: its nominal capital may in consequence have been increased five-fold, by the issue of additional stock to the original investors; and thus four-fifths of it may technically be water, and yet not be in excess of the true value of the business.

Therefore in estimating the value of a property which he proposes to buy for himself, a reasonable man seldom pays his chief attention to its cost. He forms the best opinion he can of its probable net earning power in future years: he discounts each item with reference to the time that he would have to wait for it. Account being taken of the chance that it may turn out either less or greater than he expected, the aggregate of

II, ix, 2. these items truly reckoned, *i.e.* the "capitalized future net earnings" of the property, is the true value for which he is in search.

Estimates of the future earnings of a business must indeed be based largely on a knowledge of the past. The promoter is sure to take a hopeful view in every doubtful case: and he does not always assist the investor to get at all the facts. For instance, most promotions of new companies, and reorganizations of old companies, are made in the years just before an inflation of credit and prices reaches its bursting point. Those years show exceptionally high profits on nearly all manufacturing operations; and investors discount this fact to some extent, though seldom sufficiently. Part of the apparent profit is commonly due to the fact that stocks in trade, that were on hand at the end of each of these prosperous years, were entered in the accounts at higher prices than similar stocks had been entered twelve months before. Few investors allow for such influences, and indeed the necessary facts are seldom before them.

Again, if a business has been losing ground, a promoter who is reorganizing it, is apt to base his estimates of its success on the average of many years, and to ignore the fact that its recent net income has been small. In the opposite case, he will sometimes base himself chiefly on the profits of the last few years, and give hopes of continued increase: but in fact those interested in the sale of the business may have contrived to defer some expenses which properly belong to those years; and, in particular, they may have let the plant run without adequate renewals or even repairs, till it is nearly valueless. They have even been known to pay out of their own pockets some of its legitimate expenses; trusting to get back five thousand pounds from the investor for every thousand that they have gifted to the business.

The shipping trade affords a good instance. There is, even in peace time, about one year in ten, in which the net earnings of a ship about equal its total cost; but, for every such year, there are several in which a great many ships earn far less than their costs of working. If therefore a promoter selects for his basis a prosperous year, and one in which very small charges have been made to income on account of depreciation, a capitalization at two or three years' purchase may be excessive.

In these cases the excessive capitalization is based on an overestimate of resources. But perhaps an equally common cause of excess is to be found in the assumption that a business which has been created by a man of exceptional organizing or inventive genius, or by one who has a great faculty for anticipating coming movements of taste or fashion, will retain its vigour after a reorganization. This assumption is not likely to be justified, if meanwhile he loses effective control, even though retaining some nominal connection with it. II, ix, 2.

The natural bias of a promoter to put a high value in his prospectus on the good-will of a constituent company of his proposed amalgamation, is very great in the case of a moribund concern, which he has included only because it might weaken his strategical position if it were left outside, and open to purchase by a powerful capitalist: and several promoters, when giving testimony before the American Industrial Commission, made no secret of their having been forced to buy such businesses.

But in the most notable amalgamations the promoter has occupied himself chiefly with vigorous concerns. He has then maintained that they were capable of paying fair dividends on a nominal capital larger than their present, even if still subject to the wastes of separate administration and mutual competition: and that, if working together under able management, they would yield a large additional surplus. Accordingly he has asked the public to subscribe for "preferred" stock equal in amount to the whole nominal capital of the separate concerns, and has issued also "common" stock to an equal nominal amount. In a few cases the public have been explicitly told that in buying the common stock they were getting nothing but the right to a share in the chance of additional economy and efficiency which the amalgamation would bring. Its ownership of course gives a share in the control of the company: but, as that is of less use to the public than to financiers, the common stock has often been retained largely in their hands. In such cases as these, the movement towards amalgamation is pushed forward by the hope of gains which the promoter and his friends may reap after the conversion, in addition to those rising directly out of it. An increase of nominal capital is sometimes favoured by investors, because they think that a high rate of

11, ix, 2. profits on a nominally small capital may attract new competition, and invite popular jealousy and hostile legislation. But, when carried far, it is apt to injure the credit of the company in the long run: for in a time of depression the stock may fall far below par.

In the case of railways, and other partial monopolies, stock-watering must be jealously watched; because it may be, and in fact has been, used to show that concessions demanded from the company in the public interest would depress its dividends below a reasonable return on its capital: it is not always easy to prove that the capital is watered, and therefore has no right to a large dividend¹. It may be admitted that every such company charges as a rule the price that will gain it the best net return, whatever its nominal capital may be; and there is no good ground for the common belief that watering capital causes prices generally to be *much* higher than they otherwise would be. But there are many cases in which it screens a harsh use of monopoly power; and, as President Hadley says, "If the directors so arrange their books as to make it appear that money has been invested, which actually has never passed through their hands, they are under a great temptation to make false reports concerning other parts of their business²."

Finally, a few minor causes may be briefly noted which tend to promote amalgamation. A local concern must often borrow at a high rate of interest: if it is amalgamated with many others, the securities of the whole find a market on the great Stock Exchanges, and it can borrow more easily. And indeed it is a universal rule that a bond which is part of a small issue always has a rather lower price than one of exactly the same rank which belongs to a large issue; because if the owner should want to sell, a buyer will more promptly be found for the large issue than the small. Again, the launch and the subsequent history of a vast company, like those of an exceptionally large ship, are treated by the newspapers as of general

¹ See below, p. 530 and Appendix M, 5.

² *The Education of the American Citizen*, p. 46. German law prohibits the watering of stocks directly: it is ineffective against the purchase at a high price of a business as a going concern, and is largely evaded; but yet its influence has been shown in the high average prices of, and dividends on, German industrial securities.

interest: and the gratuitous advertisement thus afforded is often an asset of considerable value. Again, though publicity generally helps honest dealings; and puts difficulties in the way of some crude forms of dishonesty, it is sometimes used to further the ends of astute and powerful financiers: for it broadens the Stock Exchange transactions, in which there is a harvest to be reaped by those who know in advance whether the next information that is imparted to the public will tend to raise or to lower prices. II, 12, 3.

Again it often happens that those who control a company want to shake the public out, and acquire a yet greater control of it. They then charge expensive improvements to income account; and prepare a balance sheet, which will show that little or no dividend can be paid: and meanwhile they make large sales of the stock by concealed routes. When the price of the stock has thus been lowered, they quietly buy all that they have sold, and a great deal more. In the next few years it may probably appear that the charges, which had to be made to income account in order to keep the plant up to date, are not very heavy. The greater the attention the public pays to the affairs of the company, the more skill is required for such manoeuvres: but also the larger is the volume of amateur and professional speculation, on which toll can be levied by those who can control events, and rumours of events, which control Stock Exchange prices¹.

3. *The part played by banks and other financial agencies in the adaptation of industry and trade to the enlarged financial requirements of the modern age. British banks.*

We have seen how in the joint stock era, the population at large hands over an ever increasing part of its spare resources to be employed in business, without calling in the services of any intermediary. But latterly "banks" (in the broad use of the term in which it includes many classes of financial houses in Germany, and to a less degree in some other countries) have taken a large part, in underwriting and otherwise financing

¹ Much suggestive information on the above and allied subjects is given in Professor Meade's *Corporation Finance*.

II, IX, 3. great businesses, almost exclusively in joint stock form: and from that they have proceeded to exercise a strong control on the general course of business in various ways, and especially by nominating their own representatives on the boards of direction of leading industrial and trading companies: a matter which will call for much attention in the next Book.

Many recent changes have contributed to increase the financial element in the directorate and management of industrial concerns; and, in not a few cases, to relegate those, whose faculty is constructive rather than commercial, to subordinate positions. Not only trade secrets, but even trained industrial instincts, often count for less than they used to in comparison with command over capital, and skill in buying and selling. This would be inevitable even if joint stock company finance did not offer a field for great achievements by relatively small efforts of able and wealthy capitalists.

Thus the movement towards the consolidation of industry under high financial control is strong in many countries. It will suffice to consider three; Britain, where the movement is opposed by tradition and perhaps by national character, and where it is not very prominent; Germany, where its development is perhaps most typical and uniform; and the United States, where the movement has been irregular, but has gone very far in several great departments of industry.

The Scottish banking system a century ago was different from, and in many respects superior to, the English system generally; though it was under greater obligations than it seemed to recognize to the Bank of England, in regard to the maintenance of foreign exchanges: but for the present purpose the Scottish banks may be associated with the English. British banking problems are often discussed mainly in connection with the currency: the present reference to them is concentrated on a single point; and it ignores many matters which would be vital in a broad study¹.

¹ The name "Lombard Street" indicates that England owed much to Italian bankers. Venice seems to have led the way in deposit banking. The Bank of Genoa may perhaps claim to have pioneered giant financial operations for the development of trade.

As is well known, a representative British bank makes its profits, as a rule, chiefly by lending command over capital, most of which has been placed with it by its regular customers: it pays them little or no interest on their capital: but it renders them gratuitously the great services of receiving payments from, and making payments to, all parts of the country. The command of capital thus placed with it constitutes the basis of its "deposits": but another great part of it consists of mere book entries, each of which indicates that the bank has made a loan (probably covered by the placing of some securities in the custody of the bank) to a customer; the loan is not generally taken out at once, but is placed to his credit to be drawn against. Every cheque drawn against any of the bank's "deposits," of whatever sort, must be instantly paid by the bank; which must therefore have a good stock of cash in hand, or at call; together with a considerable holding of bills etc. which automatically give a speedy command over cash. It cannot safely lock up any considerable part of its resources in loans based, directly or indirectly, on the standing securities of any single business, whether a private firm or a company; unless indeed that company be a first-class railway or other concern of vast size and high repute, whose securities can be promptly marketed on fairly good terms to almost any extent¹.

The burden of supplying to any ordinary business, the main body of the capital which it needs, otherwise than for temporary uses, must therefore be left in England to the Stock Exchange, and to financial agencies that are not under obligation to pay on demand cheques drawn against them. The chief of these agencies are "accepting houses" sometimes called "merchant bankers," because some of them first established their position as wealthy merchants; together with several other classes of dealers in credit, who still retain the name of bill-brokers. The currency of each bill is of course short: under favourable con-

¹ The above remarks indicate that a great part, very often the greater part, of the "deposits" of a bank are in effect statements of loans made by itself, or based on loans made by other banks; and therefore these deposits are not to be reckoned in an inventory of the national wealth, in addition to the value of the material properties and business reputations and connections on which they are in some measure based. But yet it would not be correct to take no account of them in such an inventory.

II, ix, 3. ditions, continued credit can be obtained by a series of bills; and the rate of interest charged is low, partly because the lender can speedily recover command of his capital in time of pressure. But, for that and other reasons, a long-period credit would often be more serviceable to the borrower.

A cheque paying bank can seldom safely make a large advance on securities that are not eminently marketable: but the term "large" is relative. The general increase in the size of the business unit, whether a private firm or a joint stock company, causes an increase in the size of the advances for which it is likely to have a legitimate occasion: and a bank, which wishes to be active in important affairs, and at the same time prudent, finds in this general expansion of the business unit a subsidiary impulse, prompting it to consider plans of amalgamation with other banks¹.

This quiet policy has its drawbacks: but it gives stability to a system which is worked on a very slender basis of gold reserve, and is liable to great foreign drains. And, what is more to our present purpose, it offers no inducements to powerful speculators to capture those banks on whose solidity the ordinary business of the country depends: since the resources of such a bank could not be used in financial campaigns. It must be admitted that the banks, while stable themselves, have sometimes been rather niggardly in their holdings of the gold basis of the credit on which their cheque system rests: and that they have not always exercised an adequate organized control over speculative tendencies on the Stock Exchange and elsewhere. The burden laid on the Bank of England should perhaps be shared by them in a rather larger degree. But such considerations bear only indirectly on the question whether the present organization of British banking suffices for all the needs of

¹ The economies, which a bank obtains by an increase in the number of its branches in different parts of the country, are in some respects similar to those which a railway derives from an increase in the number of points, at which it can receive and deliver goods. The transport of command over money effected by a bank involves a prodigious amount of routine work, which does little towards the development of the higher faculties; and it does not tend directly, as the open air work of railway men does, to improve the physical vigour of the race. Possibly the demand for the most mechanical parts of it may be considerably checked by the further development of automatic tabulating, reckoning and printing machines.

industry and trade: before coming to that point, it will be well to look abroad. II, ix, 4.

4. *Relations of banks to industry and trade in Germany and America.*

The French banks have something in common with the quietude of the British. They do not indeed occupy themselves much with transferring payments from one man to another: and the *Crédit Mobilier*, founded in 1852, was one of the chief pioneers of large industrial ventures. But, with a few exceptions, they have avoided extreme speculative courses: and they have not stretched out their hands towards a concentrated direction or control of trade and manufacture; being perhaps to some extent warned off by that spirit of individuality which we have noted as underlying representative French industries.

In Germany however large capitals and great industrial enterprises are of recent origin and have grown rapidly: the masterly financial genius, and faculty for associated speculative action of the Semitic race count generally for more in the east of Europe than in the west.

Sixty or seventy years ago Germany was not equipped with any organized credit system: the credit banks which then began their work were obliged, as Professor Riesser tells us, "to occupy in the national economy the place held by the maid of all-work in the private household, . . . and to take upon themselves all or nearly all the tasks which in England are apportioned as a rule, under a strict division of labour," among numerous financial agencies¹.

* This quotation from p. 220 of the translation, issued by the American National Monetary Commission in 1911, of Dr Riesser's *Die deutschen Grossbanken und ihre Konzentration*, is the starting point of a long and weighty argument that the form taken by Germany's organization of banking was first, an inevitable consequence of her conditions; and, secondly, on the whole superior to the British system, the claims of which had been strongly urged by the late Adolf Wagner and others. Dr Riesser seems to be mistaken in holding that system responsible (pp. 557 and 848) for the great number of failures recorded in the history of British banks. There have been comparatively few failures of considerable joint stock banks in England; and those few were almost without exception caused by flagrant violations of the principles of the present system.

II, ix, 4. A chief part of their work consisted in granting short-term credits, such as have been given in one form or another to business men by almost every sort of bank: but the credits had to be renewed, and gradually were merged in long-term credits; and these in their turn developed into the issue of shares and bonds. "By such an issue the connection between the banks... and industrial production is drawn so tight that they are thereafter joined 'for better or worse.' Sooner or later this connection finds further expression in the appointment of members of the bank directorate to the supervisory council of industrial enterprises.... This practice is virtually caused by the necessity for the banks to maintain the influence, which they have gained through the issue, and to retain such permanent control.... Conversely 'captains of industry' are appointed as members of the supervisory councils of banks; where as a rule they have much less influence than the representatives of banks in the management of industrial companies¹."

The German great banks are, as a rule, remarkably well managed. But they are also inclined to ventures which have something of American boldness: and some good judges think that they are inclined to venture beyond their strength; especially by carrying to excess the locking up of their capital in loans, which cannot be called in under grave emergency. It is however claimed that their intimate association with large industrial movements keeps them alert: that they earn a higher rate of interest on their advances and can pay higher interest to their depositors than they otherwise could; and that they can in some cases undertake the flotation of new securities at lower charges than would be required by English financial houses².

No doubt there were very many disgraceful failures of private English banks, when the Bank of England's monopoly of a joint stock constitution was still in force: for that monopoly deterred many responsible people from taking part in banking; and it gave an indirect premium to petty traders who opened "banks" without system and without resource.

¹ Riesser, *loc. cit.* pp. 336—7. He gives a long table of representatives of banks or industrial companies; a point to which we must return in Book III.

² Some highly coloured, but instructive, observations on Germany's banks, her study of markets, and her commercial penetration, will be found in Prof. Hauser's *Germany's commercial grip of the world*.

The Social Verein published a remarkable set of monographs on the dis-

The consolidation of banks proceeds apace in Germany, as in England. Its motives are partly the same: they include economy in the transmission business, and in the keeping of cash reserves; together with a greater independence of the varying fortunes and activities of particular fields of investment. But in addition, a German bank consolidation has generally some connection with the needs and opportunities of some industry in which one or more of the banks concerned has a special interest. Thus the power of the High-finance, embodied in the great banks of Germany, is becoming an *imperium in imperio*. It is fostering cartellization in every branch of industry, and in this and other ways it is helping the commercial element to obtain the upper hand over the constructive, faster perhaps in Germany than anywhere else: but more of this later on¹. II, ix, 4.

turbances in German business (*Störungen in deutschen Wirtschaftsleben*) at the turn of the century; and one of these relating to the influence of the great banks, by Dr Ernest Loeb, brought out the facts that most of the banks took what proved to be too optimistic a view of the situation in 1899; but that the older banks were generally more cautious than their newer rivals, and especially than those which had recently increased their capital very fast (*Schriften*, No. 110, p. 313).

¹ Herr Calwer, who is friendly towards cartellization, frequently calls attention to the influence which the banks have exerted in promoting it. And yet he complains, *Handel und Wandel*, 1900, p. 155, that great banks arrive at mutual understandings which enable them to regulate prices in the money market very much as an ordinary cartel does in the market for its own special wares. "Berlin High-finance unquestionably dominates the most representative and the largest businesses in every branch of production." He gives the titles of the chief of the 350 large industrial companies in which one or other of seven banks named by him has a seat on the directorate. This matter is discussed from another point of view below, pp. 566—570.

The position that a country, poorly supplied with capital, is almost compelled to look to its banks for aid in speculative business; but that Germany has reached a stage at which some of her banks might with advantage devote themselves more exclusively to the narrower affairs of deposit and transmittance, is taken by Dr Adolf Weber, *Depositenbanken und Speculationsbanken*.

It is however noteworthy that in Silesia the iron and steel industries are in the hands of wealthy families, who dominate the banks; and that even in Westphalia, where expansion has been more rapid, the chief industrialists are becoming independent of the banks. Prof. Schumacher (in Schmoller's *Jahrbuch* for 1906) notes this, and attributes it in part to the fact that few bank officials have been found capable of conducting large enterprises.

This picture of course relates to conditions antecedent to the great war. The changes in it, which may result from the destruction of capital and other influences of the war, are not to be foreseen.

II, IX, 4. Passing to the United States, we find the concentrated force of capital even more striking there than in Germany. But its organization has been less bureaucratic, less symmetrical, and more fitful in its action. According to common repute, there is no set of bankers and banking officials that is shrewder, more alert, or more generally capable than those of New York: but the banking system, as a whole, has lacked something of that symmetry and caution, and perhaps also that restraining influence of public opinion, which older banking systems have derived from their slow growth and their respect for traditions. Traditions indeed are to-day little better than fetters in some branches of business: but they are supports rather than fetters in banking; where the welfare of all requires imperatively that the enterprise of each should take account of considerations other than those enforced by the letter of the law, and his own immediate profit. The absence of such traditions has been emphasized by the predominating power in American finance, exercised by a relatively small group of men, who have combined the ownership of vast wealth with the ambition to show a Napoleonic faculty in its use. They have owned some private banks, which take a leading part in great financial operations; and they have controlled some large joint stock banks. But the greater part of their fortunes has been acquired by constructive and strategic faculties; which have been applied to railways, to mining, or to manufacture, or to all combined. The peculiar conditions of American business and finance caused at one time some anxiety lest an implicit "trust" or combination of financiers should dominate the business of the country: that fear seems to have been definitely laid by the great Federal Reserve Act of 1913¹.

That Act aims at preserving the full freedom of enterprise of all classes of banks, in so far as their action does not indirectly make for general instability of credit: and at keeping only such control over them, as is necessary for combining a solid basis of the currency with adequate elasticity in times of need. This control is to be exercised in the main by the Federal Reserve Board; which is so constituted as to secure in explicit terms recognition of that supreme obligation of the banking community to the general business community. This has been in effect, though not in form, obtained by the predominance of representatives of general business on the Board of Directors of the Bank of England: the influence of Government is however greater and more direct

But no banking reform can remove some of the dangers which are inherent in the power of very rich men, who have not retired into the quietude which is preferred by most of the wealthy families of old countries, but are still eager for the excitements of the chase in the hunting ground of Wall Street. Their power is increased by the facts that absolute control of a joint stock company is given by the possession of fifty-one per cent. of its stock, or sometimes even only of special issues of its stock; and that, as has already been observed, when a great part of the stock is held in small lots by people far removed from one another, one-third or even much less of the whole stock will give practically safe control. Now, if as often happens, one company holds a controlling share of the stock of another, then those who control the first control the second: and an investment of one million in the first may give control of four millions in the second, or even more. Next, the changing conditions of life are making it desirable to employ companies, rather than to ask private friends, to act as trustees for property: so "trust companies" (not to be confounded with "trusts") have been founded for this purpose; and they, together with insurance companies, hold large quantities of shares in railways and industrial concerns. Now it is comparatively easy either to control these companies directly (for of course their own stock is not very large); or to make terms with their directors, and to command the voting power given by the shares which they hold.

Last, but not least, "communities of interests" are constantly created for various purposes, more or less permanent, by informal agreements that the Board of Directors of each of several great companies is to include some members of each of the other

in the American, than in the English, control of the gold reserve of the country.

It is to be observed that the movement towards the aggregation of banks into large units, each having many branches and sub-offices, which has been conspicuous in England and Germany, has not gone far in America. There are a few powerful banks, chiefly in New York: but conditions somewhat similar to those of England early in last century have promoted the growth of an immense number of small local banks: and the new law, which gives somewhat increased security for their good guidance, seems likely to maintain a notable diffusion of the minor forces of finance by the side of intense concentration of its main forces.

II, 12, 5. Boards: and this often acts as an intermediate stage to an interchange of the holdings of the several companies. If this interchange is complete, the result is in effect a fusion of the companies: if it is partial, it forms a strong bond between them, which is not very likely to be dissolved. Thus the total indirect control, which the great capitalist groups exert, becomes very extensive; insomuch that campaigns in which either side is equipped with an effective voting force, amounting to several scores or even hundreds of millions of dollars, are very common.

5. *Suggestions that Britain's industry and trade might derive material assistance from powerful and prominent financial institutions, which would supplement, and cooperate with, her great banks.*

We now resume the consideration of the British banking system. Its unrivalled efficiency in those tasks, to which its chief energies are devoted, has some defects of its qualities. Its general rule, that credits must be covered by handing over marketable securities to the custody of the bank, is a necessary condition for the maintenance of its power to meet any sudden and violent call for return of funds given into its charge. But this rule is relaxed in special cases: for otherwise the banking system while working largely with capital placed in its custody by men of but small means, would be compelled to refuse aid to any whose total capital did not overflow the most urgent needs of their business; except in so far as it can be obtained by discounting bills, a process not always convenient.

The private banker whose life was spent in one locality was able to ascertain the characters, habits, and prospects of his neighbours more thoroughly than is possible for the branch-manager of a great bank, who is often almost a stranger to the locality: and therefore loans on "personal" credit to businesses which are not strong, are perhaps rather scantier, and yet not more safe, than they would be, if a considerable number of the smaller private banks could hold their own. But, as Bagehot argued in his epoch-making *Lombard Street*, 1873, the trend of events has moved increasingly against them since about 1850. The borrower must therefore be content with the reflection, that, when he can supply the needed security, he is certain to

obtain immediately almost unlimited funds at a rather low rate of interest: and thus a little evil is mingled with the great good effected by the consolidation of banking interests¹. II, ix, 5.

Larger issues are now being raised by the question whether this consolidation has made full use of its strength. Great banks do nearly all the work that used to be done by small banks, with ever increasing efficiency. But, it is asked, whether they should not approach some larger tasks, which were beyond the reach of smaller banks; and which, as the experience of Germany and other countries has shown, are within the reach of great banks.

In particular it is suggested that, in this age of rapid progress, attention needs to be directed to ventures that show a promise of becoming strong, at least as much as to those which are already strong: and that some enlargement of the scope of the work of giant banks in this direction would be of public service. A little may perhaps be effected by the direct action of great banks of the ordinary type: but there seems to be a large and rapidly widening scope for prominent and powerful financial institutions, which would be called "banks" in other countries; though, to avoid misapprehension they should avoid that title in Britain. For instance it seems to have been fully established that prompt and strong assistance is not always to be had for such inventions and other new ideas, as are in the minds of men whose financial position is not already strong; and who do not know their way about the City of London. In Germany, on the other hand, "the pioneer would take his proposal to one of the great banks with an Industrial department; and the proposal would immediately be put before experts, scientific and technical, well known to the bank and thoroughly trusted who (on the assumption that the proposed business was really good) would report well on it, *and would be believed*."²

¹ The benefits of a fusion of banks already strong are perhaps greatest when a bank in a residential district finds an outlet for the savings of its clients by alliance with another, whose chief connections are with industrial districts, greedy of capital. And a recent fusion of a colonial bank with a British bank promises even larger advantages of the same kind.

² From a pamphlet by Mr William Olsson, a Swede who has had exceptional opportunities of comparing the methods of high finance in Germany, Britain and other countries. Some account of it is given in *The Economist*, 5 Feb. 1916.

II, ix, 5.

Of course work of this kind is done in London by various financial houses: but their scientific and technical equipments are not organized on as massive a scale as those of (say) the Deutsche Bank. Some of them are powerful: but they do not seek prominence; and the guide posts, which might point the inexperienced inventor to them, are not as clear as those which point to a great bank. These and other considerations have led to the establishment of "The British Trade Corporation" starting with an initial capital of £2,000,000. Its chief immediate purpose seems to be the granting of relatively long credits to merchants and producers engaged in business over-seas; so that they may be on equal terms with competitors, who are aided by foreign, and especially by German banks. But, though this be the most pressing matter at the time, the largest scope for institutions similar to it, is likely to be found in connection with the development of industry at home: for, if recent developments may be taken as true indications of the future, a great part of the material plant of many industries will need to be recast in each coming generation. And indeed the Prospectus of the Trade Corporation points in that direction:—"There exists to-day no large financial institution possessing an industrial department or an organization for study and research into new ideas and inventions, which is specially equipped to examine and nurse new schemes or developments until sufficiently proved and ripe for public investment. The Corporation will make this a special feature of its business, and will aim at becoming a link between British industry and the British investor."

Its affairs are in such strong hands that it is not likely to over-reach its strength. But so many and so large are the suggestions already made for the work to be done by it, and similar institutions, that their accomplishment would need the locking up of capital amounting to many scores of millions of pounds: therefore, these financial institutions must speed on its way to the Stock Exchange many a venture which they will be unable to support permanently¹.

¹ The foundation of the Corporation was the chief immediate result of the appointment in 1916 of a very strong Committee of the Board of Trade, with Lord Faringdon in the chair. The following passages are taken from its Report—"There exist to a considerable extent at the present time in this country

the machinery and facilities for the finance alike of home trade and of large over-seas contracts, and for carrying through much of the business which has been done by foreign banks. The British banks afford, we believe, liberal accommodation to the home producer. British bankers are not shy in making advances on the strength of their customers' known ability and integrity, and the charges for accommodation are we believe often lower than the corresponding charges in foreign countries. Similarly, the Colonial Banks and British-Foreign Banks and Banking Houses render immense assistance to British trade abroad; and certainly in the Far East and in many parts of South America British banking facilities do not fall short of those of any other nation. We find also that, in the case of large contract operations, British contractors with the assistance of Financial Houses have in the past been ready to provide large amounts of capital, and to take considerable risks in connection with the operations which they have undertaken.

"Our arrangements, however, are faulty in our not co-ordinating many of the facilities mentioned in the previous paragraph. We recognize also that the British manufacturer may be frequently in want of finance of a kind which a British Joint Stock Bank with liabilities as above described could not prudently provide, whereas the German Banks in particular seem to have been able to afford special assistance at the inception of undertakings of the most varied description, and to have laid themselves out for stimulating their promotion and for carrying them through to a successful conclusion."

"Foreign banks have, in most of their operations, adopted the course of forming syndicates to undertake any business of considerable magnitude. They have headed such syndicates and they have taken the labouring oar in connection with investigations. The members of the syndicate have generally included other banks: and associated with them have been those who were particularly interested in the class of business proposed to be done. These syndicates are formed after the first superficial enquiry has satisfied the banks that there is apparently a good business to be done. Directly this point is reached, the expenditure in connection with thorough investigation is on account of the syndicate. If the business is ultimately proceeded with, the profits or losses on the wind-up of the business are shared *pro rata* after allowance to the bank for management. Some such procedure should be followed here. It would enable the Institution to undertake business of a comprehensive character, and its 'imprimatur' would have value when issues were made to the public."

The Report suggests also that the Institution should receive aid from Government Officials; especially from Commercial Attachés and Consuls. It is further suggested that each such Institution should be specialized for particular localities or for particular large groups of industry: also that the present great banks, either collectively or in groups, should own the capital of one or more such institutions; each of which should have a highly organized staff of technical advisers. In that case, a business man with a new idea, but without special technical or financial experience, might get advice through his own bank from experts of the Corporation: and, if they reported favourably on his idea, his way to needed financial aid would be made smooth. But such suggestions have to run the gauntlet of much criticism and perhaps some hard experience. Expert technical guidance on some matters can be better obtained by the associated efforts of particular branches of industry, than by aid of financial institutions: but this matter belongs to the end of Book III.

CHAPTER X

BUSINESS ORGANIZATION. ITS TASKS AND REQUIREMENTS OF FACULTY

II, 2, 1.

1. *The value of a machine to a business can be calculated on the basis of its efficiency for its immediate work. But the value of an employee must be estimated, partly by instinct, with a view to the probable development of his capacities: and the difficulty of this task is increased by the conditions of modern business.*

Although human nature is nearly the same now as of old time, while the plant and processes of almost every industry have changed fundamentally more than once during the last five generations; yet the problems which the head of a business has to solve in relation to its personnel have changed and are changing their character much more completely than those which he has to solve in relation to its plant and processes, except in a few industries. For his plant and his processes are always under his eye; and though he must trust to second-hand information in regard to many of their details, yet any information that he needs is always to be had with certainty and precision. On the other hand a certain and precise knowledge of the characters of employees by close contact and continuous observation, such as prevailed in the small workshops of former times, is not to be had at all: and the head of a large modern business must delegate to others nearly all responsibility in regard to the greater number of his employees. He is indeed directly responsible for the choice of his chief subordinates: he needs quick insight into character, and some power of influencing it; and he must exercise this insight and power largely in calling to his assistance men who are possessed in various degrees of like endowments.

(The relations of an employer to his employees generally contain some elements which have little connection with business: and, even from a merely business point of view, account is to be taken of the fact that the trust, esteem and affection of his staff are a valuable business asset, of a kind which his machinery cannot supply.) But, for the moment, we are to watch him when considering how much it is worth his while to pay a certain employee, from nearly the same point of view as that from which he would consider how much it is worth his while to pay for the use of a certain machine. II x, 1.

When the master manufacturer was the leader and perhaps the most skilled artisan of a workshop, assisted by a few workers of various ages, his instincts had full opportunity for putting each one to the task appropriate for him within the narrow range of the shop. There was no subtle analysis of character and its potentialities: but experienced instinct carried far. Education by imitation began in early youth, when mind and body were most plastic: and the experience of rowing and other athletic exercises, has led the way towards many modern improvements in school education: an hour's rowing behind a first-class oar teaches more than much verbal exhortation¹.

For great good on the balance, but for evil in some degree, the boy now remains at school till his susceptibility to the supreme educational influence of imitation has been somewhat dulled: and meanwhile the scope for boy labour in those occupations, which used to afford the most excellent training, has greatly diminished, for the work is done now mainly by machines. Some compensation for these losses is found in the movement for technical education in continuation schools: but, since those, whose example is to be followed, are relatively few in a school, though they are numerous in workshops, imitation in it has to yield the first place to formal instruction. On the other hand the boy's general faculties are now more highly developed when he comes into the workshop: and there is more material to work upon in the selection of the most fitting

¹ Prof. W. D. Scott, in his suggestive study of means of *Increasing human efficiency in business*, puts the educative influence of imitation into the foreground.

ii, x, 1. task for him. In businesses of small, and even of medium size, each employee can be to a certain extent treated as an individual human being: his strong points and his weak points are known; and his latent efficiency may be evoked by a word or two of authoritative advice on one occasion, and a tentative change in his work on another. The methods of school education have improved greatly, and tend increasingly to strengthen the children's minds. But to this general statement there is one deplorable exception in English-speaking countries. In learning by rote the vagaries of English spelling, as misleading historically as they are tedious in practice, no constructive faculty is strengthened. A rational system of spelling might set the equivalent of at least a year's work in elementary schools free for drawing, and for studies of nature: these would sow germs of the faculties of observation and reasoning; and thus prepare the mind in elastic youth for the work and responsibilities of after life. The divergence of pronunciation from spelling presses on all classes of the population: but it is most oppressive to those classes whose school-term is short¹.

As a rule, there is no one in a large business who has at once the authority, the opportunity and the interest that might empower and impel him to make a careful study of the abilities and aptitudes of each employee in the lower grades; to direct those abilities and aptitudes to their most appropriate work and educate them in it. Foremen and other subordinate officials have some interest in getting the most work that they can out of each man as he is; but they seldom take account of what he might possibly become. This is one cause of a certain tendency on the part of the less energetic members of a trade union to press for a somewhat high standard of pay for an amount of work, that is far below the maximum which they can easily

¹ Of course it would need to be framed by a convention of men of high philological and educational authority, appointed by the Governments of English-speaking countries. It would not aim at forcing the written language into exact conformity with any one variety of the spoken: but it would seek a mean position, that represented fairly well the common usage of the English-speaking world: and a spoken language, in ever closer correspondence with the new written language, would in the course of a generation become the general language of international intercourse. The notion that existing spelling has a sound historical basis is of course erroneous.

accomplish; and to be relatively indifferent to a prospect of high rewards for enlarged efficiency. II, x, 1.

Increasing attention is being paid to this evil by far-seeing and public-spirited men in control of large establishments. Some of them make it a rule that failure to succeed in one kind of work shall not be taken as ground for dismissing a willing worker; and that he shall first be tried in work of other kinds. "By such shifting the right place can often be found for him. Young people, to whom in spite of long trial and the best will it seems impossible to supply certain automatic machines, become excellent workers at much more difficult labour in the same establishment. Women, who are apparently careless and inattentive when they have to distribute their attention over a number of operations, do high-class work when they are engaged in a single activity; and in other cases the opposite is reported." But as things are the operative who is a failure at one task, seldom has any opportunity for showing his strength in other work: he is simply dismissed, and his fate in his next employment may be no better¹.

Again there are some exceptional works in which the standard of intelligence required of nearly all the operatives is so high, that labour becomes an education. A splendid instance of this is the Zeiss glass works, which, under the noble guidance of Abbé, steadfastly pursued ideal perfection in manufacture, secure in the confidence that good work would bring adequate profits. He knew that "in order that an article may really excel, it must be the outcome of thorough theoretical knowledge, combined with great technical skill"; that is, when "everyone participating in the manufacture devotes his whole experience, intelligence, and time solely to the production of this one article." But he "recognized that even this principle of the subdivision of labour has its limits."

For he gradually found that, while the works were making nothing but microscopes, "the worker suffering from the mono-

¹ Something may be accomplished by direct applications of science. But from the time of Owen down to that of yet living leaders of industry, such as those whose endeavours and achievements are recorded in *McCain's Model Factories and Villages*, the chief pioneers of progress have been plain men, whose enthusiasm and ardent sympathy have been guided only by instinct and business judgment.

II, 1, 2. tony of always having to work in the same groove whether with the hand or brain, has his mental vision thereby dulled for anything situated beyond his own narrow horizon, and loses the power of utilizing at the right moment for his own particular purpose, anything lying a little beyond his ordinary everyday path." So, true to the proverb "to rest is to rust," he multiplied the products of the works, and let in fresh air past the barriers of monotony¹.

But in spite of such broad movements, the large majority of employers and their officers are still apt to keep philanthropy and business in different compartments of their minds: partly because, though the aggregate profits of business are large, they are a diminishing percentage on outlay. In some uniform industries this percentage is very low; and it might indeed be wiped out by a comparatively small increase in outlay, unless it was in some degree remunerative from the purely business point of view. This consideration suggests the great social importance of evidence that has recently been collected to the effect that much of that care for employees, which has been prompted in the past mainly by altruistic motives, is commercially profitable.

2. *Faculties needed by the head of a large business; and by its chief officials.*

The following observations are so worded, for the sake of simplicity, as to apply specially to the case of a business, owned and controlled by a single individual: they imply throughout the possibility of maintaining unity of purpose and continuity of policy. They apply to a company, the "head" of which is a Board; provided either tradition or the predominance of a single masterful mind and will enables the Board to act coherently, in spite of some divergence of temperament and interest among its members.

The tasks of the head of a large business are heavier than those of a small one, and yet they may be fewer in number. For

¹ The German proverb is "*Rast ich, so rast ich*": but his work was not complete till he had shortened the hours of labour and made other provision for the rest, which is recuperative and develops energy, under the variant proverb "*Rast ich, so rüst ich*"; i.e. "To rest is to prepare" (Auerbach, *The Zeiss Works*, pp. 5, 6, and 113).

he must delegate multitudinous business details to others: and the details even of a small business are generally more numerous than the broad problems of a large one. He is primarily responsible for the general plan of the business: but second in importance only to that is his selection and quiet control of officials who are responsible for details. In a very large business he may indeed delegate the greater part even of that responsibility to chief officials: but he bears the weighty task of reading the characters of strong men: and therefore he must be very strong. Meanwhile the study of the organization and policy of his business is likely to require a larger originality, and a wider outlook than are needed for similar tasks in a business of medium size. Let us go into some details.

II, x, 2.

(An adequate supply of capital being assumed, the chief requisites of the head of a considerable business may be classed as (a) judgment, prudence, enterprise, and fortitude in undertaking and carrying risks: (b) an alert acquaintance with appropriate technique; and some power of initiating advance: (c) a high power of organization; in which system plays a great part, but "always as a servant, never as a master": (d) a power of reading character in subordinates; together with resolution, tact, trust and sympathy in handling them: (e) prompt diligence in assigning to each the highest work of which he is capable, or can be made capable within a moderate time.) All these qualities are needed in the head of a business of even moderate size: and, if it is to be thoroughly well administered, all of them are required more or less in its chief officials; for the head cannot be directly in touch with details. He needs men immediately under him who would be capable heads of small businesses: but their tasks are lighter than his, because the range of the responsibilities of each of them is narrower than his. He must hold all departments in view; partly because he needs frequently to revise his estimate of the energy, ability and integrity of each departmental chief; but mainly because the changing courses of industry and trade require continual alert watching of the mutual relations and proportions of the various departments of the business. This task belongs to the head alone: it cannot be delegated; though work preparatory to it is often shared out among several directors of a joint stock company, and even among trusted

II, x, 3. chief officers of large businesses generally. In the case of a giant business the responsibilities of the chiefs of particular establishments, and even of particular departments of one establishment, may be as heavy, and almost as wide-spreading, as those of the head of an independent business of moderate size: though some large questions of organization, and nearly all large questions of finance will be ultimately determined by the head of the whole business.

3. *The education of business faculty.*

As will be argued presently, constructive genius of the highest kind seldom owes much to education: but, with that exception, all orders of business ability may be fostered by appropriate preparation in early years. The circumstances, which have impaired the forces of British education in past times, have already been indicated¹. But a little may fitly be said here as to the functions of education in promoting the alertness, sense of proportion, and strength of reasoning which are required in business.

(The main point is that the chief function of education is to "educate" faculties, that is to bring them out and develop them.) A great part of the instruction, given in most schools and many universities, imparts information, with scarcely any education in the true sense of the term: much of it even tends to hinder the movements of faculty by clogging it with inert matter. For indeed a man, whose own mind is stagnant, can impart knowledge without effort: but the education of faculty is a task which calls for vitality and initiative on the part of the educator. Therefore paths of least resistance have commonly been sought in many classes of schools, especially where the teachers have been few in number relatively to the pupils; and even to some extent in universities. But continuous description and explanation tend to deaden the minds of the hearers; and should not find place in oral instruction except for some urgent reason².

¹ Above, pp. 95—99.

² Injury is done by the continuous reading aloud of matter, which could conveniently be printed, and is perhaps already accessible in good text-books. The students should be required to read such books; and any explanation given in lecture should be supplemented by occasional questions pointing towards the next step in description, in explanation, and above all in reasoning. There is something to be said for a plan, under which the lecturer prepares beforehand

The higher branches of education in America lagged for some time a little behind the best European methods: but their rapid advance in recent times has brought them into the first rank, at all events in those studies which look towards the future rather than the past: and Britain may profit much by some of her suggestions. The character of the German people differs from that of Americans and Britons. It has more patience and steady assiduity; so that methodical, orderly procedure in school and college has peculiar attractions for them. The splendid organization of their *Real* schools and colleges, devoted to the direct preparation of youths for the practical work of after life, is specially suitable to their temperament: and any danger to intellectual individuality, which it might threaten, is in great measure warded off by the abundance of their Universities, in which high ideals of study are maintained. But Britain's Universities are still rather few: and, partly for that reason, the new desire for education, as a source of strength in industry and trade, might conceivably be turned to but indifferent account, if German *Real* education were too closely followed. Fortunately however the last few years have seen an increasing tendency on the part of the British Government and people to seek in such matters the counsel of leaders of scientific study: and in that tendency there is safety¹.

II, x, 8.

sufficiently to require to use only a few notes as guide-posts: he then thinks the matter out as he goes, and gets his class to think with him. If he strays into an unpremeditated illustration or inference; the class, seeing the effort of his mind, and stimulated to work with it, will have their strength brought out more in a few minutes than it would be in an hour in which information is loaded into their minds as goods are loaded into trucks. If they seem bent on passive entries into note-books, they may be forced into an active and even critical attitude, by the quiet insertion of an inaccurate statement, or invalid argument, into the lecture; and by questions being asked about it.

The importance of developing power, rather than knowledge, is well urged by President Hadley, *The Education of the American Citizen*, pp. 175—190.

¹ A notable article on education for business men (*Unternehmer*), in Schmolzer's *Jahrbuch*, 1916, complains however that German Universities themselves devote too much attention to preparing those, who aim at employment under Government, for official examinations. The writer insists that the education of business men should be more free; and bring them more into contact with those whose minds and associations are less distinctively official: it should include some study of economic science. The subjects of this Section are considered further in Appendix K.

- II, x, 4. 4. *In periods of economic reconstruction there is an urgent demand for creative faculty; and those who come to the front, seldom owe much to any formal preparation for their work.*

"The poet is born not made." The original meaning of the word *poet* is "a man who creates": and it is a commonplace in University life, that while the merely able man's success depends greatly on the teachers into whose hands he has fallen, the man of genius is fashioned mainly by himself. In like manner it seems to be true that the man, who proves to be endowed with business genius, has seldom owed very much to formal education. The peculiarity of his mind does not lie in the power of doing any one thing in particular. He penetrates quickly to the root of each of the many conditions of success in the attainment of a proposed practical end: he coordinates them, moulding and combining them anew. He formulates large schemes of operations, measuring their risks, and facing steadily those which his judgment approves. He may not have the faculties needed for scientific research, or even for highly specialized invention: even if he has them, he can hardly give them full exercise without blunting the edge of his energy in that work which bears most directly on his immediate end. But he watches all new thoughts and inventions which point to that end; and he is quick to adapt them, or to cause them to be adapted, for his special uses. These considerations were most strikingly illustrated by American industry in the phase in which it was about a generation ago.

But the earlier history of British industries was on similar lines; for, as we have seen, the leaders of those industries in the last quarter of the eighteenth and the first quarter of the nineteenth centuries were mostly rugged men, with a much narrower outlook than that of most of the later leaders of American industry; but with like self-reliant, self-contained characters. A bold, vigorous use of the newest machinery and methods put them for a time beyond the range of competition by those, who were much occupied with careful attention to details and the teachings of long experience. The stream of inventions never slackened; but yet, when the main outlines

of the new methods were fairly settled, machines with the last improvement but one could hold their own fairly well. From that time forward strong self-reliant energy lost some of its importance relatively to a sedulous care for detail; and also to careful account-keeping and other irksome matters, in which organized experience is more serviceable than quick flashes of individual initiative. Consequently, before businesses began to fall largely under Joint Stock ownership, they again became hereditary. The son of a manufacturer profited by traditions as to things, methods and persons handed down to his father; and a youth who rose from the ranks into business had to overcome more difficulties on his way than during times of revolutionary change. II, x, 4.

Those who held the chief places in American industry at the end of the nineteenth century, had lived through a period of transformation similar to that which British industry had undergone several generations earlier. Thus, as already noted, Mr Carnegie sets out a long array of leading industrial businesses, which have been founded in America during the last two generations by mechanics, clerks and office boys; and of great commercial houses that have been founded by clerks and office boys: but he can make only a short list of those which have been founded by men whose early lives were spent under easy conditions¹.

¹ He concludes: "Neither capital, nor influence, nor college learning, nor all combined have proved able to contend in business successfully against the energy and indomitable will which spring from all-conquering poverty." He lays stress on the fact that an alert office boy has opportunities for reading the characters of all conditions of men; while the lad who lives at home, at school and in college till he is twenty-two is often brought into direct contact with only one thin stratum of human character. Mr J. D. Rockefeller's account in his *Reminiscences* of the education, which he got by keeping his ears open while doing menial work in the offices of a small business, is very illuminating. It is however to be remembered that the percentage of the mechanics, clerks, office boys and others, who have used these advantages as ladders, by which to climb to the highest posts of business, is not very great: it may be less than that of the college lads who have turned their connection with business to good account.

Mr Archbold, a vice-president of the Standard Oil Company, ascribes Mr Rockefeller's success to the marvellous "power of control" by which he "can so draw together the best men in mechanics, in executive work, in buying and selling, that they work as a unit."

Mr Gates, who ultimately became a chief leader of the iron and steel industry, was put into a responsible position, though without any experience in

II, x, 5. 5. *The increasing scope for trained faculty and methodical organization of detail in industry and trade.*

Opportunities for economic reconstruction, offered by the opening out of unknown Continents and of new communications between old Continents, belong in great measure to the past. And, though it is true that the industrial evolution caused by the advance of technique during the last few decades has been much more rapid than at any other time; yet (the leading characteristic of modern advance is its increasing dependence on faculties and aptitudes that need to be developed by patient study, if not by some sort of academic discipline.)

Even on the side of business speculation we find that individual initiative is being in some measure supplanted by agencies; which give great scope to alert diligence combined with moderate natural ability and resource. The ordinary newspaper press and special trade journals now supply at a nominal cost detailed information on nearly every affair, in which a business man is interested; and he can supplement it more quickly than formerly by confidential information as to any matter of private interest. He can, if he will, know all that is happening at home and abroad in regard to things in which he is interested as buyer or seller; what new sources of supply are being opened up; what new demands are growing and which of them are likely to be permanent; what new technique is being tried, and how the trials are going; what new uses of by-products are being developed; and what progress is being made by industries cognate to his own, on which its progress may largely depend. In these and other ways the new age gives ever increasing opportunities to the business man to strengthen his enterprise by making good use of information, which is generally accessible, but yet cannot be

business, because Mr Rockefeller had observed that he showed capacity in his work for the Baptist Education Society; and later on, Mr Gates appointed Mr Bowers, "an honest, enterprising, keen and thrifty man," but one without any experience in the management of shipping, to control the company's fleet of lake steamers. The splendid career of the electrical works of Siemens and Halske owed much to the decision of Halske to call to his aid the artillery officer Wiener Siemens, who had then no knowledge of the business. And the Zeiss works profited in like manner by annexing the University professor Abbé

turned to account without some mental effort; and if he does not avail himself of them, he must make way for more alert competitors. II, x, 5.

Moreover the man whose originating ability, though considerable, is not of the first order, must depend largely on a careful study of the best results that have been attained by others. For otherwise he may be outpaced by those who have scarcely any high initiative, but can bring to bear on their work a sound trained faculty in thinking clearly; and who have learnt under good guidance how to turn to account the multitudinous knowledge, which modern resources place at the disposal of those who seek them rightly. This training is not necessary for the man of high natural genius: he is eager for work in which his great strength tells, and has too much self-respect to refuse helpful guidance from any source: but a man of less exceptional ability, whose mind and character have not been disciplined, is apt to humour a false pride by a partiality for his own devices. Thus America, while following the lead of Germany in the subtler technical applications of science, is pioneering applications of a broad University training in the conduct of business. As Mr Carnegie says:—"the trained mechanic of the past, who has hitherto carried off most of the honours in our industrial works, is now to meet a rival in the scientifically educated youth, who will push him very hard indeed.... The mechanic is disposed to adopt narrow views of affairs, for he is generally well up in years before he comes into power; while the scientifically trained boy has no prejudices, and goes in for the latest invention or newest method, no matter if another has discovered it¹."

¹ There is much helpful suggestion in the contrasts drawn by Dr Youngman, *Economic causes of great fortunes*, between the origin of representative fortunes in three stages of American history, viz. (1) John Jacob Astor's many sided work, on lines not very different from those of the eighteenth century; (2) the powerful, if often malignant, Stock Exchange speculations of Jay Gould; and (3) the even stronger building up of "group fortunes" by quiet incessant, financial operations, not always above criticism from the social point of view; but in which "constructive speculation" has predominated on the whole. His study points to the conclusion that there is no one route by which even any one great fortune has been reached; and that versatility, as well as imagination, judgment and assiduity have been conspicuous in the making of every sort of great fortune. See also Dr Watkins' *The growth of great fortunes*.

- II, x, 6. 6. *The organizing faculty of a masterful mind can sometimes make itself felt over the whole of a large business, even when owned in joint stock; largely through its influence on well-chosen chiefs of departments.*

The position of an able man, conducting a business which he owns, is very strong in industries in which almost the maximum of efficiency can be attained by a comparatively small capital; which are constantly changing their form; which require restless care and initiative; and in which the selection of the right man for any post of responsibility is too critical and difficult a task to be performed adequately by salaried officials.

A business owned by one man seldom offers scope for quite the highest forms of organization. But under modern conditions, and especially in the New World, a man of exceptional genius may build up so large a business, while he is still in the prime of life, that it becomes an organic whole, more complete, more carefully organized, and more efficient than any which could have been created, before steam and electricity and large mobile stocks of capital had quickened the growth of great enterprises. All its various departments are coordinated; means are nicely adapted to ends; and human capacities are adjusted by sympathetic insight to their several tasks. Only a little of this harmony is sacrificed, and fresh strength is generally gained, when the head of a business takes to himself fitting partners; and even when the partnership is turned into a joint stock company with limited liability, with the understanding that its shares are not to be put on the market, but to be held by those who are actually conducting its affairs. Under favourable conditions such a business may flourish for many years, as is shown by much experience in England and other Western countries. So long as the men who have made it remain at the helm, it is likely to retain nearly all the energy and resource of individual management, combined with greater breadth and solidity. For such men are able to decide freely each question on its merits. They can boldly invest large sums in improvements, the importance of which is not obvious to the onlooker, but which will bear rich fruit in due time. They can throw away plant that is almost new, if

more efficient plant has just been invented; for they are in no fear of the censure of shareholders, who cannot understand either the merits of the new plant, or the conditions which made the purchase of the abandoned plant reasonable at the time¹. II, x, 6.

But this brings us back to the difficulty suggested at the beginning of Section 2, that continuity of policy, and unity of purpose are not always to be had on a Board of Directors; especially in a business, which can get but little guidance from tradition. In fact, a joint stock company, when exceptionally progressive, generally shows the impress of an individual mind and character. This is marked in the railway history of England: and in America the president of a railway system of some ten thousand miles, especially if he and his friends hold a considerable part of its stock, may fashion the railway, and even to some extent the district which it serves, largely on his own model. But after all, the main work of a railway is relatively uniform and amenable to routine methods: it may flourish if that is well done, even though its minor departments are not highly efficient. The difficulties of centralized administration are greater in vast manufacturing undertakings².

The creation of vast businesses involves great risks unless there be good reason to expect that men competent to manage them will be forthcoming. It is often assumed that they are sure to be forthcoming: but history gives little support to this belief. "There are many who can manage a million dollars, few who can manage ten million, and next to none who can

¹ This arrangement may be adopted in order to enable some members of a partnership, or small company, to retire from active participation in the business and to limit their risks to their holdings:—a plan which may work well if the active members are strong, and the passive members give them a free hand.

² Sometimes the inevitable difficulties of vast size are increased by making provision for the heads of secondary businesses which have been absorbed in order to strengthen the strategical position of a great amalgamation.

Centralized administration of railways has always owed much to the telegraphic communication which the exigencies of the traffic require to be maintained even with the smallest station. But the telephone is more efficient than the telegraph in enabling the chief to read the character of his subordinates, and it is lending its aid in a special degree to scattered branches of a manufacturing business. It enables, for instance, the chief chemist to be largely responsible for the chemical side of the work of the branches: this promotes order and economy in the first instance, but may weaken the character of his assistants.

II, x, 6. manage fifty million. The mere work of centralized administration puts a tax on the brains of men who are accustomed to a smaller range of duties, which very few find themselves able to bear¹."

¹ Hadley, *The Education of the American Citizen*, p. 42. Evidence to a similar effect was given before the Industrial Commission by eminent promoters of the tendency towards industrial consolidation. Mr Flint, an authority of almost unrivalled experience, admitted that a consolidation, that can be worked efficiently by "an intellectual giant," may be in great danger in the hands of anyone else (*Report of Industrial Commission*, vol. XIII, p. 84). In the *North American Review*, May, 1901, he said: "Had A. T. Stewart been a member of an industrial combination at the time of his death, of which combination John Wanamaker had also been a member, the business of A. T. Stewart & Co. would never have declined." But this takes no account of the chance that Wanamaker's full faculties might not have developed under such conditions.

Mr Schwab, who was then President of the United States Steel Corporation, told the Commission that the limit of a single man's power of controlling a great concern had not been reached; but he admitted that "it is a matter of the greatest difficulty to-day to hire administrative ability sufficient to run a concern without loss." And, so far from laying great stress on the economy of unified administration in a very large business, he "was careful to throw the whole responsibility for the results and the manufacture upon the subsidiary organizations." He thought it better in the long run to put three rollings under the independent controls of three men, than to put all under that of the ablest. He set the three to rival one another; and thus in effect supported the principle of competition against that of monopoly. He described the U.S. Steel Corporation as "largely a clearing house for information" between the presidents of the subsidiary companies. Each is allowed to make bargains freely with the others; and "each company is so interested in its own business that it is hard to get them to make bargains, each wants to drive so close a bargain with the other." But of course all are ultimately controlled by the power, which the possession of the majority of the shares in each subsidiary company gives to the central administration, of displacing at the next annual meeting any director or other officer who does not fall in with the central policy; and Mr Schwab told the Commission that Mr Carnegie had started by forming a separate company for each branch of his business, while he himself of course retained a controlling interest in each, corresponding to that which is held by the central administration of the U.S. Steel Corporation; but at last Mr Carnegie fused all these companies into one; because he considered it was not for the good of the whole that those in (say) the coke department should have their own special interests to look after, when a contract was being arranged between it and (say) the steel department. (*Ib.* pp. 493, 450—3, and 463.)

CHAPTER XI

BUSINESS ORGANIZATION: APPLICATIONS OF SCIENTIFIC METHOD

1. *Movements towards the general application of scientific methods in business administration were pioneered by studies of cost-accounts.* II, xi, 1.

We have seen how modern industry is compelled to make increasing use of the results obtained by professional students of science; and even to set up great laboratories for the intensive study of particular scientific problems, which lie in the course of its higher developments. (We are now to consider recent developments of an old tendency to apply scientific methods to the organization and administration of business as a whole.) The tendency to the use of systematic analysis as an engine of business, first attracted general attention as the result of dissatisfaction with the crudity of customary methods of making up "cost-accounts"; that is, accounts which claim to show the total charges to be attributed to each particular class of product. Incidentally progress was made in the easier task of enabling the accounts of a large business to act as a substitute for the eye of the master of a small business, in regard to the prevention of waste.

Absolutely exact cost-accounting would of course require that the path of each element of material, on its way to becoming a finished product, be traced sufficiently to show how much of it was embodied in the product, how much was consumed in the process, and how much was wasted or otherwise lost, and so on. In ordinary practice such matters are of course not set out fully in the accounts; but foremen and other officers are intrusted to see that material is not

II, XI, 1. wasted, and that the operatives give a fair return for each hour's wages. Such checks as are applied are commonly rather general in character. Experience is trusted to show about how much consumption of material, and expenditure of labour is required for a given output of any kind: a certain normal allowance is made for wastage; and any considerable excess can be met by a special inquiry. Also, when several works in the same ownership are engaged on the same process of manufacture, the supreme control can infer, from a comparison of their accounts, which of them is the most economically and efficiently managed: such comparisons tend to strengthen large aggregations of business on a side on which they are apt to be weak. For indeed the personal observations, and the instinctive judgments on matters of detail, which are within the competency of a small master "whose eye is everywhere," are chief sources of his strength. They enable him with but little effort or outlay to exercise so effective a check on sluggishness and waste, that a large business, conducted on traditional lines, cannot attain to it even by lavish expenditure¹.

In a large business the vigilance of trusty officials may furnish an adequate safeguard against some wastes: but there are many for which no check seems possible except that furnished by a comparison of written records of the various sides of each transaction. This is one of the tasks of the science of accounting,

¹ This fact was impressed on me in one of the tours which I made formerly in the manufacturing districts of England and some other countries. I may record the extreme instance of the owner of a lock factory, employing some thirty hands. I was directed to him as one whose goods were of high quality, and commanded a price somewhat above the average. His method of working without any clerks, and with but few written accounts, was instructive. His materials were all under lock; and the keys were never out of his control, except when he left them with his sister during his absence from home. He gave out to each man from time to time such material as was appropriate; and he knew without consulting books whether the man made good use of it. He knew this partly by general reasoning, and partly by observation: for in constant presence among the men, he had learnt to measure narrowly the skill, diligence, judgment and carefulness of each. He knew, without any aid from records, almost exactly what each thing produced in his factory had cost him, and therefore what rate of profits he was making on each class of his work: for, his work being all of one kind, he could frame his estimates of indirect outlay on each task by means of his knowledge of the direct outlay on it.

which has received a very high development during the last few generations. But its finest work is too laborious, intricate, and costly to be appropriate to any but very strong businesses: and in fact the check, which accountants exert on waste, has often been limited to ascertaining that the entries made in a broad statement of one side of the work of a business correspond to those made in a similar broad statement of another side. Even now they often merely apply a few broad rules, which represent broad results fairly well, while making no pretence of being adapted closely to the special circumstances of each individual case. II, xi, 1.

Gradually however increasing attention has been paid to the actual extent to which each process of production has laid under contribution, directly or indirectly, the several material resources and human energies belonging to the business: and, in so far as this is done, opportunity is afforded for ascertaining which of its elements have yielded the best results, and where there has been any waste. It is for instance ascertained how much use was made during the production in question of each class of plant: account is taken of the cost of that plant, its wear and tear, its consumption of power; and in some cases even of its liability to rapid depreciation, in consequence of the dependence of the demand for its services on evanescent fashions, etc. Similarly the charges to be set against any particular product on account of storage accommodation, and expenses of internal movement, are specially examined, in cases in which these charges are likely to be exceptionally light or exceptionally heavy: for it is obvious that goods which occupy little space, but demand much high grade labour, are easily marketed and are made of expensive material, ought to be charged on these accounts at a low rate relatively to their prime costs; while a high rate is appropriate to things which have the opposite characteristics. Again an hour's work of a machine for which there is but little appropriate work must be charged more highly than that of a machine which is seldom idle: machines, that do little work, are often engaged on things that are not in general demand; therefore sell slowly; and have high traders costs on the turnover: and so on.

II, XI, 2. 2. *A general view of the aims and methods of the movement that goes by the title, "Scientific Management."*

A little while ago no one would have been likely to suggest that it would be profitable to keep elaborate records of every detail of the expenditure of material and labour in a factory with a large and various output. But a scheme has been already brought into operation on a considerable scale in America, under which it is claimed that such records are obtained as by-products of a movement for applying to the mental work of business those general methods of extreme subdivision and specialization of labour, which have greatly increased the aggregate efficiency of manual labour¹.

Its chief originator was the late F. W. Taylor: it was developed, with some variations from the original plan, by Mr Emerson, Mr Gantt and others; and it has now a powerful band of constructive advocates. It does not claim to set up a science of business: that is not yet in sight, and perhaps it is unattainable. But it has in great measure made good its claim to carry the application of scientific methods to the broader problems of business, much further than they had been carried before. Many of its chief proposals have been applied by able business men in past times, and especially in recent decades: but it has given them such coherence, and power of progressive development by aid of organized records, that it seems likely to influence economic advance on many sides; even though it may be found that some of its claims are pitched too high, and that some others are opposed by too strong drifts of opinion and sentiment, especially among British operatives, to be likely to meet with general acceptance in the near future.

The present Volume is concerned chiefly with the business point of view of industry and trade: but their human aspect must be made prominent in the present chapter. For Scientific Management is in the main a method of redistributing and reorganizing the functions and the mutual relations of the personnel of a great business, with the purpose of increasing aggregate efficiency by narrowing the range of responsibility of

¹ Some explanation on this subject is given at the end of the following Section.

most of its employees, and bringing careful studies to bear on the instructions given in regard to the simplest manual operations. II, xi, 3.

The chief outward token of the new plan is the elaboration of a system of cards so full, and so carefully organized that the central control shall have a firm basis for arranging the details of its work. Other cards, partly duplicates of cards which remain with the central control, pass downwards through heads and subheads of departments, and minor officials; while some reach the manual operative. They cover very many details, of which no record had been kept previously even in the most highly organized businesses: but almost all of those details, which an expert cost-accountant desires, are entered on some classes of them. It is claimed for instance that the cards, issued for the purpose of insuring that each department and sub-department shall be always supplied with the material needed for uninterrupted work, afford automatically a basis for reckoning the obligations under which a cost-accountant would need to put them; and the special purposes of those obligations. Meanwhile the cards, being passed from hand to hand, may discharge various executive functions in all departments of the business; whereas entries in ledgers, or on cards designed for exclusive use in the office, have a much narrower sphere of influence¹.

3. *The chief responsibility for the affairs of a great business in Scientific Management is intrusted to a Planning Department: and this, together with the higher control under which it works, develops the organization of the business according to "function" rather than "line."*

Thus one main drift of Scientific Management is towards concentration, combined with specialization of control in regard to all matters that require thought and judgment: a second main drift has its chief origin in studies of machine tools, and of the relative efficiencies of various manual operations. The

¹ Some tendency to underrate previous progress can often be noted in a bold strong new venture: and models of entries in ledgers and other office records, which seem to anticipate some cards that are prominent in the new movement, may be noted in as old a book as *Factory Accounts* (by Garcke and Falls, London, 1887).

II, xi, 3. result of the second may be epitomized in the phrase that traditional methods of work, and especially of manual work, are "excellent servants, but not good masters." They are the heirs of the progressive experience of ages: and it would be foolish to attempt to build up new methods without care for the many fine and subtle indications that are latent in the old. But nevertheless the promoters of Scientific Management have shown some surprising instances of economy of effort, obtained by the suggestions of an expert in mechanical science; and by practice, working on the basis of traditional methods of manual work.

✓ These two drifts, the one towards extreme subdivision of mental effort, and the other towards the bringing of specially trained intelligence to bear in turning to account the traditional methods of ordinary labour, have issued almost necessarily in a proposal to set up a "Planning Department"; which has the duty of making provision for every need of every operative who will be called upon to contribute to any process of production. This proposal, though not the starting point of the movement, is the best starting point for a general description of its influence on business administration. The movement is in effect a bold effort towards the progressive application of analysis, observation, experiment, and reason to a class of problems which have until recently been in the hands of men little addicted to analysis; and in which much virgin soil awaits, even in old countries, those who bring powerful methods of thought to bear on it. But America offers an exceptionally large scope for the movement: for her problems are newer and her artisans have less set habits and traditions than those of Britain, or even of Germany; and her business men, if less sedulous students of science in the narrower sense of the term than those of Germany, have developed a more conspicuous faculty for the application of laboratory and other scientific methods to the larger problems of business administration.

The movement has not escaped the danger of exaggeration by enthusiastic adherents: but its chief leaders regard it as a development on a large scale of certain well-known principles. They urge that progress has been most rapid, where experience

in bulk has been supplemented by well-considered experiments in detail. They lay stress on the two facts that every business has some problems of administration to solve, which are peculiar to it, just as it may have occasion to use some special machines; and that most of its problems have much in common with many that have to be faced in other businesses¹. II, xi, 3.

The exigencies of an army in the field require that complete authority be given to every officer, commissioned or non-commissioned, in regard to all doubtful matters, as to which no instructions from a higher authority are available on the spot. But the organization of the army as a whole, in preparation for war and in war, is committed to a large staff, consisting of many departments, each specialized on a distinct *function*, under a supreme control. Traditionary business arrangements, it is urged, follow the order of "line organization," in which each one receives all his instructions from the same superior; though the exigencies of a campaign, out of which this order arose, have seldom any existence in a compact business, however large: "staff" or "functional" organization is more efficient under favourable conditions, such as are often found in large businesses. The particular details of staff organization must vary from one industry to another. But the same underlying principle applies to all: and we may with advantage follow Taylor in taking large engineering works as representative of conditions in which the advantages of Scientific Management carry furthest.

On his plan the central office under the immediate direction of the head of the business (practically the old counting house rearranged) deals with questions of general policy, especially in regard to sales: as, *e.g.*, what things to make for stock, what

¹ Some of the adherents of the new scheme have indeed brought it under the suspicion of being "top-heavy" by proposing to apply it to small businesses, for which it is not designed. Perhaps there have also been some departures from Taylor's position that, in its essence, the movement is one for the supersession of unreasoned routine by elastic methods; to the concoction of which there have gone three parts in four of analysis, the remaining fourth being common sense. The thought and experience of half a generation have already brought out a number of variations on the original proposal, chiefly tending to soften its rigid outlines; and in particular to mitigate the severity with which the personal relations between the operative and those from whom he took his instructions were at first subordinated to the technical.

II, XI, 3. orders have to be accepted, and so on: it procures cost-estimates by aid of the lower departments, and information as to prices to be obtained by sale in different markets from its agents and other sources. When it has decided that a certain thing is to be made in any quantity, the Engineering and Drafting room, or rooms, develop their rough estimates of quantities, and prepare complete working drawings. All this is according to customary routine: but under Scientific Management details are worked out in advance; partly in order that working "instruction cards" may be prepared for every operative.

These instruction cards represent the combined work of several men in the department, each of whom has his own function. One is a specialist on cutting tools, and the use of slide-rules in regard to speeds. Another knows the best and quickest motions to be made in setting up the work and removing it, etc. A third gives the proper time for each element of the work. All these details are written on a single card¹. "A ticket made up in the central planning department, when combined with the instruction card, serves to plan the work in advance; then it is used to control the order of work by being placed on the bulletin board... On this ticket is stamped the time at which the work begins, and when it ends. It checks off the progress of the work on the route-sheet. Then it goes to the accounting department, from which the man's pay is made up. It is then redistributed and furnishes the labour cost of the particular operation on the cost-sheet of the job. From cost-sheets similar to this are summarized not only the cost on all jobs, but department expenses and charges, which appear in each four-week period statement²."

A little will be said in the next Section as to the nature of

¹ The "instruction card," in an engineering shop, instructs "both the executive bosses and the men in all the details of their work. It tells them briefly the general and detail drawing to refer to; the piece number and the cost order number to charge the work to; the special jigs, fixtures, or tools to use; where to start each cut, the exact depth of each cut and how many cuts to take; the speed and feed to be used for each cut; and the time within which each operation must be finished." This description of course refers to work that is not of a routine character. A few words on the card suffice in regard to familiar repetition work.

² See p. 126 of the *Report of a conference on Scientific Management* held in 1911 at the Tuok School of administration and finance.

the economies of manual effort which are claimed as resulting from the application of analysis, experiment and measurement to common operations. Assuming these economies to be highly important, the following general positions are laid down: "If practicable the work of each man should be confined to the performance of a single leading duty...All possible brain-work should be removed from the shop and centered in the planning or laying out department, leaving for the foremen and gang bosses work strictly executive in its nature...Each man must learn how to give up his own particular way of doing things, adapt his methods to the many new standards, and grow accustomed to receiving and obeying directions covering details large and small, which in the past have been left to his individual judgment...The high priced mechanic needs (even more than the cheap labourer) the cooperation of men better educated than himself in finding the laws [appropriate for guiding him in his work], and then in selecting, developing and training him to think in accordance with these laws¹."

II, xi, 3.

In the new system, as in the old, orders seldom go past subordinate officers: each man receives them from someone immediately above him. But, whereas the operative was under the exclusive direction and influence of a single foreman for nearly all purposes; under the new system he takes orders in regard to different sides of his work from eight (or some other considerable number of) specialized foremen, commonly called "bosses." Each boss acts as technical guide over a rather narrow area for a large number of workmen; and therefore his relations to each of them are so slight and impersonal, as to

¹ See Taylor, *Shop Management*, pp. 98—100 and 113; and *Scientific Management*, p. 97.

Emerson's method differs from Taylor's mainly by maintaining "line" foremanship as far as possible: his "functional" experts are relatively few; and every foreman or other officer in each line has access to an appropriate expert in any difficulty: the expert instructs the line officer, who passes on the instruction. Time alone can decide between the two. Taylor's method seems to have as yet the greater number of adherents: but yet it is said that the full system of functional foremanship has seldom been installed, and when installed has in some measure yielded to a return of the old military order. Differences among the systems of Taylor, Gantt and Emerson, the chief leaders of the movement, are implicit in their writings; and are set out in many books; for instance Thompson, *l.c.*; Drury, *Scientific Management* (where there are some interesting personal details); and Hoxie, *Scientific Management and Labor*.

II, XI, 8. / have little control over his general conduct. A special "shop disciplinarian" is therefore invoked in case of his wrongdoing. Such a system, when thoroughly set up, and worked by able and enthusiastic adherents, may not improbably turn the existing faculties of the operative to the best account in the production of material wealth. It is not irrelevant to remark that international comparative statistics show the output per head in engineering industries generally to be a great deal higher in America than anywhere else; though it is true that much of this difference is due to her extended use of standardized mechanical processes. There is a notable excess in the horsepower that aids each thousand operatives in America even over that which prevails in Britain¹.

In so far as the cards relate to payments for labour and consumption of material, they afford a direct check always available against waste and other forms of leakage. In so far as they can be used to show how much time of any particular machine has been given to the job, they contribute to an accurate estimate of the cost of each product; on the assumption that an hour's work of any machine is to be charged at the same price to every class of product on which it is used².

¹ The shop disciplinarian "sees that a complete record of each man's virtues or defects is kept." He has much to do with readjusting wages: and he should be "peace-maker" (Taylor, *Shop Management*, pp. 103—4; following a luminous account of the functions of the seven other "bosses"). Mr C. Bertrand Thompson says that "the time study and instruction methods of Scientific Management have increased the output of hand operatives from 10 per cent. to about 300 per cent., the majority of cases lying between 60 per cent. and 100 per cent." (*Q. J. of E.* Feb. 1915, p. 278). But he points out that these results involved elaborate organization: and the expense of that organization may have outweighed the savings on the cost of manual labour in some cases. It may be added that the personal influence of able exponents of the new system must have counted for much.

² Parkhurst, *Applied Methods of Scientific Management*, goes into this matter in some detail. The time clerk's card, aided with appropriate clocks, shows the time which each man (known by his number) is allowed for a job; also the time, during which he is to use a certain machine for it. The cost clerk's sheets show all materials requisitioned from stores or outside purchase for the job: and also all charges actually made for labour spent on it. "All time posted on the cost sheets is distributed into a daily wage distribution book, which agrees with the similar entry made daily by the time clerk, so that the time card coupons from which these postings are made, are sure to agree with the total on the man's time cards, as shown by the time clock. A limit of error, not to exceed four hours in time, or one dollar in money, or both, is allowed to

The planning department arranges that nothing shall go into store or leave it without records, so made out as to check one another automatically: that material shall be ready for every job, and yet not be stored in excess; that each job shall be pressed forward according to its relative importance, that every class of machine shall, as far as possible, be in fairly constant employment; and, of course, that the total "route" traversed by each product during manufacture shall be short and easy. The men in the shop follow their instructions; they are not required to use any forethought, or any considerable discretion¹. II, xi, 4.

Probably another generation must pass before experience has taught how much of this vast detail is worth what it costs: and in particular how far it is expedient to use the instruction cards as a basis for exact accounts of all operations and their costs. No doubt the same restless genius which has brought Scientific Management to its present high level of achievement will improve it progressively; till all the more obvious criticisms on its general scheme will have become obsolete².

4. In Scientific Management it is arranged that, as far as possible, each frequently recurring manual operation shall be made the subject of elemental time studies, conducted under favourable conditions by highly trained observers, who seek guidance from the traditional practice of skilled operatives.

A movement making for large change is seldom both entirely new, and very important. It is not likely to be very important go uncorrected per week" (ib. 3 G). Stress is laid on the fact that the records of the stores clerk afford an exact inventory up to date, without the cost and disturbance of periodical stock-takings (ib. 3 F and 5 A).

¹ A little may be added as to the work of the route clerk. He makes out a "next-work order" for each piece needed for any job: and in this he is guided (subject to certain technical considerations) by the geographical conveniences of the order of movement; and by the extent to which the several machines happen to be busy. Information on this last point is supplied to him by the order-of-work clerk. He is present at the factory board meetings, so that he may learn the relative importance of the different jobs, and bring the various parts through for completion in the proper time. All next-work cards are received by him; and the order, in which he arranges them, decides the order in which the foremen take them out and act on them. For further details, see Taylor, *Shop Management*, pp. 110—120; and Knöppel, *Installing efficiency methods*.

² Influences of the movement can be traced in many directions. For instance Mr Selfridge's "Organization Chart of a twentieth century Department Store,"

- II, xi, 4. unless it has its roots in broad principles of human or material nature: such broad principles have often suggested ideas, which have been forgotten because they were not ripe, or because the time was not ripe for them. In a later age they are thought out anew, and attract general attention by their own strength and by the favour of circumstances. One of the chief ideas of Scientific Management was worked out a considerable way by Babbage in the middle of last century; and, for good reasons, he took as his chief illustration the common task of shovelling earth, which Taylor was to use for the same purpose later on¹.

with some 4000 employees, shows seven managers of departments. Four of these are specialized vertically on the line system. But the Managers of Staff, of Systems, and of Expenses, are functional, and are responsible for particular sides of the whole business. The duties of the last of these are delicate: he is to make suggestions for economy wherever he can see room for it.

¹ Babbage says: "In taking a comprehensive view of any subject, it is very desirable to throw into the shade all its minor points: but, in estimating the consequences of any set of facts, there is another condition which must be fulfilled, before we can arrive at accurate conclusions. If we are about to neglect a cause on account of its apparent insignificance, it is *essential* that it should not be one of frequent recurrence." He remarked that the weaker of two men, engaged on shovelling earth, could do more work than the stronger, provided he had made a more careful study of his work, and had hit upon a better weight of earth to be raised at each stroke, a better number of strokes to be made in an hour; and better weights, sizes and forms for his shovel and his barrow. He further argues that, "if a labourer inconsiderately lifts his shovel but an inch or two more than is necessary to throw its load into his barrow, although the exertion of force is trivial in each instance, its repeated occurrence during the whole day will produce at its conclusion a very sensible difference either in fatigue or in the amount of the work done. Napoleon is said to have remarked of Laplace, when he was Minister of the Interior, that he was too much occupied with considering *les infimement petites*. To dwell upon small affairs, which are isolated, is not the province of a statesman: but to integrate the effect of their constant recurrence is worthy of the greatest." And he lays down clearly the great maxim, which has guided most of the best work of students of economics as of other sciences: "One of the most important processes in all inquiry is to divide the subject to be considered into as many different questions as it will admit of, and then to examine each separately; or, in other words, to suppose that each single cause successively varies, while all the others remain constant." (See his little known, *The Exposition of 1851*, pp. 3 and 4.) Mr Thompson justly remarks (*Scientific Management*, p. 6) that, though the modern movement in the same direction as Babbage's thought owes nothing directly to him, yet "the extension of specialization beyond manual labour to mental labour, which is at the basis of the Taylor doctrines of functional foremanship and the separation of planning from execution," was suggested in Babbage's well known *Economy of Manufactures*. Reference has been made (above, p. 224) to the fundamental

A great deal has been learnt as to what education can do and cannot do for the workman, since Babbage proposed that improvement in such methods should be sought by education: the workman must "when a boy have been taught to examine *separately*" the details of his work. More is known now than then as to the extent to which a thorough education of the masses of the people can contribute to industrial efficiency, as well as to the elevation of life: but experience has also shown that mere education cannot easily fit a man for such complex tasks as are demanded by the leaders of Scientific Management. Moreover their judgment has perhaps been a little biased by the contrast between the intellectual agility of the class and race to which they belong, and the crude physical strength of many of the manual workers whom they direct. They therefore propose to build themselves on the foundation laid by tradition and the individual intelligence of the worker, but not to make great demands upon it.

Further they urge that the fallibility of tradition as a guide is evidenced by the multitude, "fifty or a hundred," of traditional methods of performing almost every manual operation: and that, on the other hand, the fundamental accuracy of traditional guidance is shown by the facts that almost all traditional methods conform to the rules that rhythmical movements are physio-

idea of his famous chapter on "The division of [manual] labour": his less known chapter on "The division of mental labour" ends with a eulogy of the partial system of functional foremanship which already prevailed in mines.

Babbage and Taylor were similar in other ways. Babbage spent much of his life in working on his "Differential Machine," for mathematical calculations, —probably the most marvellous mechanism ever devised: his analysis of the cost of making pins is quoted in a Report of a Committee of American Engineers, 1912, reprinted by C. B. Thompson, *l.c.* pp. 171—2.

Taylor having been impressed by the haphazard adjustments of cutting tools, and the machines in which they were set to their tasks, resolved to find general principles which should govern the shape of the tool; and also the relations between the amount of power supplied to the driving tool, the rate of its movement, the rate of feed of the material, the depth of the cut to be made and so on. He claimed to have connected these elements by mathematical formulæ; which, when embodied in a set of four special slide-rules, will enable engineering artisans to obtain at once the adjustments most suitable for any particular case. His expenses during the twenty-six years spent on this task, in the course of which he cut four hundred tons of metal into chips, were defrayed by ten industrial companies: and it appears that the result amply justified the outlay.

II, xi, 4. logically advantageous; that economy of nervous stimulus is attained by avoiding the use of large muscles when the work can be done efficiently by small muscles; and so on. They have set themselves to "induce each workman to use his best endeavours, his hardest work, all his traditional knowledge, his skill, his ingenuity and his goodwill—in a word, his 'initiative,' so as to yield the largest possible return¹."

These general principles can be most easily apprehended by a detailed instance: and none better can be taken than that of shovelling; which, as has just been said, Babbage and Taylor have alike recognized as combining the advantages of familiarity, definiteness, and a greater complexity of movement than is generally recognized.

Two first-class shovellers in a business, that employed many, were invited to work for two or three months, on the understanding that, while complying with instructions, they should receive double their usual wages. A man stood over them all day with a stop-watch; so as to find out how much they did in a given time, with varying shovels and loads and periods of rest. The bargain with them was that they were neither to hurry, nor to "soldier," but just to go at their ordinary fair pace. Patient experiments ultimately brought out a standard weight of twenty-one pounds for each lift: a standard lifting movement in which the shovel rested on the left leg, and the weight of the body was thrown on the right arm so as to start the weight of the shovel upwards by its own fall. Then the standard wage rate per ton raised was so adjusted that a first-rate man, not one of exceptional excellence, would earn when working on the new method nearly two dollars; that is about half as much again as had been ordinarily received in the district for shovelling work: but for all that the use of the left leg as a fulcrum does not seem to become general in shovelling.

After standards of the mode of handling the work, of the amount done by a high-class shoveller, and of the payment for it, had been thus settled; the next step was to set up an office, in which three college men with their clerks and assistants,

¹ See Taylor, *Scientific Management*, ch. II, and Münsterberg, *Psychology and Industrial Efficiency*; also Bücher's *Arbeit und Rhythmus*.

planned the work for each of the 500 workmen employed in the business, at least one day in advance. Each man in the morning got a slip of paper telling him what shovel to get from the store-room, and where to begin work; while a second paper told him what wage he had earned according to the new standards. If that wage fell much below the standard wage, a "teacher" was sent to improve his methods: if he was obstinate he was dismissed: if he was weak, he was tried at another job. In the result the average earnings of those who remained at the work were sixty per cent. higher than those of the earlier and less carefully selected group had been: but the combined costs of the work and its organization had been halved¹. II, xi, 4.

The method of time studies is in the main unaltered when a particular job in an engineering workshop is the subject of experiments. An intelligent and willing artisan is selected, and a specially qualified officer set to superintend him. The job has been considered beforehand, and analysed into its various elements. All necessary provision of appropriate material, tools, etc., are ready to hand; so that he is not required to make any movements save those which belong necessarily to the job, and is never held up for want of any requisite. He is induced to work hard, but not so hard as to overtire himself: for his output is wanted to be representative of that which can be maintained steadily by workmen generally; provided, of course, they are supplied with the same standard appliances and subsidiary care, as have been prepared for him. A full record is made at each observation of all details; such as the sequence of operations, the tools and their adjustments, and the speeds, feeds, cuts, etc., employed: these may throughout follow a standard; or they may be varied from one experiment to another; the times being taken in every case with a stop-watch.

The superintending officer has perhaps made many such studies of elementary motions or groups of motions in regard

¹ Further details will be found in Taylor's address to the Tuck School Conference, 1912; and in his *Scientific Management*, pp. 65—77. He "had never met a shovel-contractor to whom it had ever occurred that there was such a thing as a science of shovelling."

II, xi, 4. to similar work. He takes account of them, and of similar studies recorded by others: and he looks at the physiological and psychological elements of the whole, as well as at the mechanical. Thus he is able from time to time to make suggestions for changing the method of various movements and perhaps their order: and he continues to experiment till he can no longer effect any further economy of effort¹.

¹ When systematic stop-watch observations of a number of miscellaneous jobs have been made, an almost incredibly large part of the workers' whole time is found to be taken up with minor elementary operations, which are often but little heeded; such as raising different things from floor to machine by hand or crane; and again clamping with different sorts of clamps and bolts. Elemental times for such actions have very wide application, not only in almost every workshop, but also to many different classes of work in each. Mr Sanford E. Thompson, whose investigations formed the basis of the detailed account of time studies (*Shop Management*, 149—158), reports later that there are "instances of data, taken in Philadelphia on the manufacture of one type of machinery, being used in Boston for the manufacture of an entirely different type" (*Journal of Political Economy*, May, 1913, p. 380).

In these studies experiments are made as to the periods of rest, which are found most conducive to lasting efficiency in work which puts great strain on particular muscles or nerves. They sometimes extend to minute motions, too small to be recorded by an ordinary watch, but yet important in the aggregate. Mr Gilbreth applied to them "a motion-picture apparatus, including in the field of vision a large faced clock, the rapid movements of whose hands record small divisions of a second. In the back-ground is a close net-work of fine lines." The result can be read with a magnifying glass; so that, "even in the nimblest work, an expert can detect false motions, and tell the worker which of his various ways of working are the most efficient."

As might be supposed, the practical applications of this method in business are more interesting than important. But it has recently proved of excellent service in helping soldiers who have lost a limb, or are otherwise crippled, to do industrial work. It enables many customary motions to be eliminated, and others modified; so that, for instance, a man who had lost both his arms has been taught to drive a motor car safely at 100 miles an hour. (*Times Engineering Supplement*, December, 1916.)

CHAPTER XII

BUSINESS ORGANIZATION: APPLICATIONS OF SCIENTIFIC METHOD, CONTINUED

1. *The principles of Scientific Management lead up to a careful analysis, partly on lines which have long been followed in some British and other industries, of the notion implied in the term "a standard rate of wages." A claim to be working towards "absolute" standards.* II, XII, 1.

The problems of remuneration of labour, so far as appropriate to this work, belong to its second Volume: but there seems to be an advantage in making a few observations in the present place on the attitude of Scientific Management towards some of them. Although the general tendency of the increase of knowledge and the improvement of communications has been to facilitate contracts, yet the bargaining between employer and employee as to the amount of work to be done, and the wage to be paid for it, has become in some respects less easy and less free than formerly. An operative, who worked more strenuously than was the custom, was always likely to be rebuked by his shopmates. But now he is likely to be called to account at a trade-union meeting, and incur grave censure: for it is argued that his example will tend to make a bad precedent, from the operatives' point of view, in regard to the work expected to be done for a given wage throughout the district, and even beyond.

(The method of payment by piece is preferred in most industries by employers; and, for various reasons, it is increasingly tolerated, and even in some industries insisted upon by employees.) But the spread of a uniform piece-rate throughout a large district introduces a new social discord: for a fixed

II, XII, 1. rate of payment for work done under varying conditions yields a varying, and not a uniform, rate of remuneration for a given amount of good work. In some shops the plant is the best attainable; and every provision is made for the regular supply to each artisan of work to be done, and of the implements and materials which he needs: the piece-rate required to enable a man to earn good wages in them is lower than in others, which are ill managed. The alert employer is therefore liable to be held to piece-rates so high as to give him little or no reward for his enterprise and energy: an improvement which costs £100, might yield him a return of £200 if he were free to lower the piece-rate to a level which enabled the same wage as before, or even a little above it, to be earned by equal exertions; but, if he must pay the old piece-rate, he may lose nearly the whole £100. The pressure of a standard piece-rate, without provision for standard conditions, hampers some of the best businesses. (It retards industrial progress in England and some other countries; in spite of the fact that with a uniform piece-rate the employer, whose plant and methods are the best, can generally secure an abler and steadier set of employees than the average.)

America has suffered relatively little from this particular evil. For her conditions change so rapidly that fixed rates of any sort have seldom a very strong footing: her employers are specially alert and resolute; and—the chief cause of all—the workers in her great industries, being of many races and generally strangers to one another, have as yet but little cohesion. These same conditions have aided the endeavour of the leaders of Scientific Management to introduce standard rates of remuneration for work done under standard conditions; and to make provision for increase of the payment, wherever the conditions fall short of the standard set for them.

And yet the most important successes in the attainment of "standard rates of pay by piece," in this the only true sense of the term, have their origin in different and nearly opposite circumstances. They are found in industries in which almost precisely the same task has long been performed by many thousands of workers in almost the same way. Especially in the Lancashire cotton industry the standard piece-rate of wages

is a true standard rate: for experience has gradually set up II, XII, 1. understandings as to the allowances to be made in regard to both quantity and quality of output for particular shortcomings in plant, material or other elements. If an operative thinks that insufficient allowance is made on these accounts in any case, an official of his Trade-union is called to arbitrate, with or without the presence of an official of the Employers' Federation. In many cases the judgment of the Trade-union official alone is accepted: if both officials are summoned, they nearly always agree, and their decision is adopted without demur. This standard is in no sense an "absolute" standard: it does no more than to insure a fair approach to uniformity of remuneration to equally efficient workers in different factories. The enterprising employer is rewarded for his good deeds, and so is the skilful and energetic employee: there is an almost perfectly level rate of real remuneration throughout each subdivision of the industry.

The method is excellent within its limitations. Being based on the experience of the past, it is not fully applicable to industries whose technique changes rapidly. And of course it does little towards answering the questions whether the levels are equitable, as between various classes of those interested, and especially between employers generally and employees generally; and whether they are those best calculated to promote human well-being and to accelerate economic progress. The only substitutes for answers that are available practically, perhaps about the only substitutes for which human nature is fully prepared in its present stage of evolution, are in the arbitrament of conflict, actual or threatened, between the organized forces of employers on the one side and employees on the other: the relative strengths of these forces being influenced from time to time by strategical devices, and accidental incidents. But the controlling force in the background is exercised by the fact, that if profits in any industry are abnormally low relatively to the faculties and the capital required for working it efficiently, employment will dwindle, and therefore the standard of wages must come down: while conversely, if that standard falls materially below the level of wages in occupations of similar difficulty and strain, employers will ere long be so

II, CH. 2. stinted of labour, as to have no strategical defence against a strike for a rise in the standard.

The standard wage for each manual labour task, which Scientific Management would set up, is in like manner liable to be altered by changes in economic circumstances, which may tend to strengthen or weaken the strategic force of employers and employed, whether organized or not. Nevertheless the standards toward which Scientific Management is working have real, though very narrowly limited, claims to be described as in some degree "absolute." For, in the first place, its standard rates depend in a less degree, than do those reached by older methods, on specific customs relating to each particular task: and, in the second place, they claim to have a foundation in the mechanics of elemental movements of the human body, the measurements of which have something of that aloofness from irrelevant accidents, which belongs to laboratory experiments. Let us look back a little.

2. Suggestions that very high efficiency of plant can be obtained without overstraining the operative in charge of it, by supplying him with high standard conditions of work, and causing his remuneration for each job to increase with every increase in the speed of its performance.

Scientific Management approaches the problem of remuneration for manual labour by the reflections that time-wages give no direct stimulus towards efficiency; and that piece-rate wages err by yielding the same payment to two men, using similar plant for the same job; though one of them has occupied his plant with it for a day and a half, and the other only for a day. It insists that the importance of setting up a direct connection between an operative's remuneration for a job and the shortness of the time during which he keeps his plant occupied on it, grows with the present rapid increase of the costly plant, for which he is responsible. Moreover the life of many kinds of plant is being rapidly shortened: high-grade plant is seldom worn out; its power of work lasts longer than its claim to be the most efficient of its kind, and the additional wear and tear caused by keeping it more fully at work is almost negligible. These facts are

indeed at the base of the "Rowan" and other simple systems of remuneration, which have already some vogue in Britain¹. II, xii, 2.

(But Scientific Management claims that a change in the mode of reckoning remuneration does not suffice: there is needed in addition a "scientific" ascertainment of the time which the job requires when performed with standard provision of accessories, and by a workman of fair average ability.) It therefore starts each problem of standard wage fixation by arranging the conditions of the operative's work in all details, and by so instructing him as to his method of work that he is able to get more out of his plant, without undue effort, than he could otherwise. It sets its standard time by observation of the work of a willing operative of fair, but not exceptional ability; it sets the standard wage which corresponds to that standard time, a good deal higher than that which the same man would get if employed in the ordinary way; and finally it increases the wage for the whole of his job for every diminution below the standard of the time during which he detains his plant on it². It claims that standardization of the conditions and methods of work secures the employer against the danger of finding himself unable to keep any promise that he may have made that the rate of remuneration, when once settled, shall not be lowered, unless some definite change in technique, or the auxiliaries, or the general conditions of the labour market renders obsolete the basis on which the standards were set up. Professor Hoxie, "Investigator of Scientific Management for the United States Commission on industrial relations," amassed a vast amount of information on this and similar subjects from operatives and

¹ Diagrams illustrating the working of the schemes of remuneration on this plan, proposed under Scientific Management, the Rowan scheme and others are shown in *A rational wages system*, by Henry Atkinson; and their several principles are explained by C. B. Thompson, *lc.* pp. 684—706.

² Under the Taylor system the operative is penalized severely if he takes more than the standard time, but rewarded highly if he takes much less. Gantt and Emerson are gentler towards rather low efficiency; and not quite so liberal towards that which is high. The terms of the definition of a standard wage for a standard task under standard conditions allow in effect for reconsideration of the money-wage in consequence of an established change in the purchasing power of money

II, XII, 2. employers; and he holds that this claim of employers is substantiated, though many others are not¹.

The leaders of the movement are emphatic in their assertion that "strenuousness is the opposite of efficiency": if a man is tempted (save in some exceptional emergency) to be strenuous, that proves that the preparation for his work has been inadequate, and not on the lines advocated by the leaders of the movement. They have indeed gone beyond most other students of business administration, in their sedulous applications of the teachings of advanced modern physiology and psychology as to the increase of efficiency which may result from appropriate rest, relaxation, and amusement².

Some opposition to the movement has arisen from the erroneous notion that it proposes to put so great a strain on the worker as to exhaust him in a few years. The employer, it is supposed, may find his advantage in paying strong men highly for turning his expensive plant to the best account; but the wages so earned will really be at the cost of their future efficiency: and that cost will fall on them; for the employer will meanwhile have filled their places by others whose fresh strength he will shortly exhaust. There seems to be no good ground for this charge; though, no doubt, some unguarded phrases as to the real cheapness of the exceptionally vigorous labour with which the new scheme is to supply the employer are partly responsible for the misunderstanding³.

It is admitted that the plant which an operative controls, is to have no rest: but it is urged that the time, which under otiose management he often spends in arranging for the con-

¹ Hoxie, *Scientific Management and Labor*, p. 84.

² They have characteristically tabulated the numerical results got from a study of the strain involved during every second in which a heavy weight is carried: they show that in such cases, many periods of rest combined with rather rapid movements during less than half the working day, gave the best result. And again that when pig iron is being handled (each pig weighing 92 pounds) a first-class workman can only be under load 43 per cent. of the day. Of course, the lighter the load, the greater the percentage of the day in which activity is advantageous.

³ Probably too great stress has been laid on the fact that at Bethlehem Steel Works, under Mr Taylor's management, "the tasks were all purposely made so severe that not more than one out of five labourers (perhaps even a smaller percentage) could keep up" (*Shop Management*, pp. 54—55): that was exceptional, and its example has not been followed.

tinuance of the machine's work, is to be given to keeping the machine at work: his occupation is not intensified, though that of his plant is: the various specialized "bosses" see to it that he has nothing else to do. Strain on the worker is to be shunned for business reasons, as well as humanitarian: and heavy work is to be done by carefully picked men, who can do it without strain. Every man is to be carefully selected as appropriate for the work he is to do, whether it be heavy and suitable for an "ox-like" man, or light and needing agile fingers and delicate care: he is to be specially taught how to do that work: and he is to do no other. The standard price for the work is to be set at such a level that a willing, good, but not exceptionally able, worker under standard conditions will earn as much as he did under the old conditions; though his output is considerably lower than that which emerged in the standard-making experiments. So far all seems well.

But doubts begin to rise, when advocates of the new order hint that no room can be found in it for any worker who is not somewhat highly endowed with manual energy; that a great part of the mental work, which used to be committed to operatives and foremen, will be absorbed by the Planning department; and that nearly all the machines of an engineering shop may "be run by men who are of smaller calibre and attainments, and are therefore cheaper, than those required under the old system¹." They are, no doubt, justified in saying that the ordinary man underrates greatly the amount and the difficulty of the work, he can do under the best conditions; and that their method will progressively enable him to increase that work without overstraining himself. But there seems to be at present no considerable body of experience at the back of their sanguine expectation, that the new system will overcome the difficulties, with which modern business has to contend, in organizing the work of those operatives, who are not marked out by exceptional energy and individuality as specially adapted to it.

It is true that under the new system, working with the freedom which is allowed to it by the special conditions of America, unskilled labourers of good physique and moderate

¹ Taylor, *Shop Management*, p. 106.

II, xiv, 3. natural intelligence are educated in certain narrow tasks; pushed into work which used to be regarded as appropriate to skilled artisans; and enabled often to earn very high wages at them. It is true that the ablest of the artisans, whose places are thus filled, are promoted to still more highly paid work as special "bosses," if not to yet more responsible posts; and that some of the works, in which the system is fully developed, have an output exceptionally great in proportion to the number of their employees, and are making very large additions to the aggregate production and wealth of the country. These are great achievements: and yet we are bound to reflect that the effects of taking away from the operative any duty, save that of carrying out his instructions carefully, are not likely to be altogether good.

(The system has indeed been defended against the charge of monotony, by reference to the fact that the endeavour to work up to a high standard of output keeps the mind active. But that sort of activity is not educative: it may even prevent the mind from getting the rest during monotonous work, which might fit it for taking part in those higher activities of mind and spirit, which used to belong almost exclusively to the dominant classes and now belong to the entire people.) It is true that leisurely walking is often an aid to thought, partly because it is monotonous: but walking up a steep hill under a heavy load, though equally monotonous, is not conducive to mental activity: and Scientific Management, though averse to strenuousness, requires attention to be kept close to the work. But yet there may be more force in some of the pleas advanced in defence of the treatment of labour under Scientific Management than appears at first sight: let us look more closely into the matter.

3. *General relations of Scientific Management to the remuneration of manual labour and to the democratic control of industry.*

The movements which are classed under the name Scientific Management had to overcome great obstacles. Many sound reasons and more prejudices in favour of established methods were urged against them. If no step had been taken until all

objections had been answered to the satisfaction of the objectors, progress would have been slow. Strong resolution has been needed and has threatened to bring the movement under the suspicion of autocratic tendency. II, xii, 3.

This danger has indeed not been entirely overlooked: the leaders of the movement have themselves pointed out that the scientific establishment of standard elemental times, could be undertaken by employers and employed acting together, through joint committees, or otherwise. Undivided responsibility and prompt autocratic decision were indeed necessary at first: but, though they will always facilitate progress in some directions, they are no longer necessary. There is no fundamental obstacle to their being so developed as to meet all the reasonable needs of working-men who are gregarious in habit, with a bias towards collective action; and who have but moderate ability and but a moderate desire for hard work.

The difficulties in the way of a democratic adjustment of standards for the wages of work under standard conditions are moreover increased by the incessant changefulness of methods and of plant. It has already been observed that the trouble is not greatly felt in the Lancashire cotton industry in which the products are relatively uniform, and the plant has been settling down towards its present shape during a century. But in industries that are new, or are being rapidly transformed, standard conditions must be incessantly changing; and allowances for deviation from them may probably be demanded in so many cases, that to deal with each by democratic procedure will, for some time at least, be scarcely practicable. It is to be remembered that a chief ground for holding the new method to be "scientific" is that in such cases an estimate of the effort required for any piece of work can be based in part on previous stored-up records of elemental times: but this is a highly complex matter: and the organized removal of all need for the use of individual discretion from the operative, which is a main feature of the movement, is not a good preparation for so extremely arduous a task. (There is however another side of the matter; and we shall see that an alert workman may find under Scientific Management considerable opportunities for obtaining insight into administrative problems, with which

II, XII, 3. the ordinary working-man is seldom much concerned, unless he be in a cooperative or a copartnership factory¹.)

(The leaders of Scientific Management claim that, on the balance, it develops the intelligence of the workers: that it "trains them mechanically as they were never trained before, energizes them intellectually, and extends their opportunities for advancement; and it gathers up and systematically *transmits* to the workers all the traditional craft, knowledge and skill which is being lost and destroyed under the current industrial methods." They assert further that in fact promotion is exceptionally rapid under Scientific Management; and that efficient operatives seldom move from under it except to take posts of high responsibility elsewhere. There is no doubt that the Taylor system of remuneration attracts workers of exceptional capacity, and deliberately penalizes those who are incompetent; and there is no reason to question the statement that promotion is rapid under it. But trade-unions assert that "it looks on the worker as a mere instrument of production, and does not tend to develop general or long time efficiency": and far from being grateful for its supplying them with the quintessence of the experience of the ablest workers; they complain that it "tends to gather up and transfer to the management all the traditional knowledge, the judgment and the skill, and monopolizes the initiative of the worker in connection with the work." They claim also that it greatly increases the number of "unproductive workers"; i.e. those engaged in clerical work, and often squeezes out of the workers vast overhead charges.

¹ Professor Person, the Director of the Tuck School, told the American Economic Association: "It is possible to conceive of the time when the management of a business and a board from the union shall together make the time studies, set the task, and determine the differential rate; and then the board turn to the members of the union, and say, 'The rate is just, even according to your respective abilities.' Under scientific management one element of trouble in the bargaining between management and labour, a lack of knowledge of the facts, would be absent. Scientific management determines with extraordinary exactness the facts of production under any given conditions. Labour when it knows the facts is reasonable." But representatives of labour are not to be satisfied that Scientific Management acted fully up to its profession of putting no unreasonable pressure on the operatives. See for instance the contributions of Mr Tobin on behalf of the Boot and Shoe Workers' Union, pp. 204—238. See also the discussion of Scientific Management on Mr Cadbury's initiative published for the Sociological Society in 1915.

On the other hand, leaders of the movement claim that it does away with the need, under which manual workers have previously lain, for the support of collective bargaining in regard to their remuneration. But this is not admitted by the trade-unions: and the careful investigation of Prof. Hoxie points to the conclusion that "even where the employers have no special autocratic tendencies...the workers have no real voice" in the conditions of their employment; and that "with rare exceptions democracy under scientific management does not and cannot exist apart from unionism and collective bargaining¹." II, XII, 4.

4. *Though the wage systems of Scientific Management give small scope for collective action by employees, its open methods of planning may do a little towards fitting manual workers for the responsibilities of democratic control.*

In Britain, though not in an equal degree in America, industrial traditions are powerful. Class consciousness is cherished by the manual worker with an almost religious fervour, which commands respect; even though a more penetrating knowledge of the questions at issue might often convince him that a claim made on him in the name of duty to his class, is not truly in the interest even of that class. It seems therefore probable that, while Britain may derive great and almost unmingled gains from the technical adjustment of each worker's plant, methods of work, and auxiliary conditions to the highest standard which Scientific Management can devise; yet adjustments of a standard

¹ Hoxie, *l.c.* p. 109. The above description relates mainly to the Taylor system; from which the Gantt system differs little. Mr Emerson's attitude is more sympathetic than Taylor's; but even Prof. Hoxie's careful comparison of the two (*l.c.* pp. 152—168) leaves some matters obscure. Emerson says indeed that "What can be done in an hour [with standard plant and subsidiary arrangements] is for neither the man nor the employer to determine. It is as technical a problem as calculating an eclipse. The share of the worker in the gain, as cost-efficiency increases, is a proper subject for bargaining" (*Tuck School Conference Report*, p. 104). And, though he is not always consistent (see Hoxie, p. 105), it seems that he is in large measure tolerant of trade-union cooperation in the bargaining; as to which there is great difficulty under Scientific Management, even with the best intentions. The Taylor system proposes to welcome it: but asserts that it makes "collective bargaining and trade unionism unnecessary as means of protection to the workers" (*ib.* p. 147); while the unions assert that it "makes collective bargaining practically impossible, and destroys the union spirit and organization" (*ib.* p. 177).

II, XII, 4. task and a standard wage can seldom be satisfactorily arranged by employers alone. Representatives of the manual workers must, as a rule, be able to take part in them. This cooperation may be facilitated by the present movement towards the setting up of joint committees of employers and employed for each industry as a whole; for each important branch of it; and, in appropriate cases, for individual works. Such cooperation is likely to be the more effective, the more the workers understand that, though the immediate interest of any particular class of workers may point towards easy-going methods of production, the working classes as a body have a very strong interest in the efficiency of those businesses, to which the methods of scientific production are most likely to be applied. Let us look into this.

The growing power and intelligence of the manual labour classes go far towards overcoming the difficulty, which everyone has in some degree when he attempts to measure the abilities of men who are abler than he is. This difficulty has hindered the progress of cooperative production and of profit sharing; though both of those great movements have helped towards a general understanding of the dependence of industrial progress on the provision of expensive plant by private capital: the State has been a borrower of capital; and is not likely soon to be able to provide it for ordinary business. Therefore considerable credit may be given to Scientific Management for the contribution—small though it may be—which its methods make towards enabling a thoughtful manual worker to form some sort of independent judgment on the course of a business, in which he is employed.

In works, which are organized on the ordinary plan, the manual worker is seldom in a position to read the motives of those who issue orders affecting his work; for the general plan of the operations is not conspicuous. But under Scientific Management organized planning is done in the open and made prominent by series of "instruction cards"; each of which, whenever it comes into the hands of a thoughtful man, may suggest to him something of the purposes and methods of those who have constructed it. Comparisons of different sets of cards may further suggest comparisons of the abilities of different sets of officials; and, in these and similar ways, some small insight

into the higher problems of administration may be gained, by aid of the thoroughness with which planning in all its branches is worked out and made manifest. Thus, though it be true that Scientific Management diminishes the need of the operative for resource and judgment in small matters, it may help him at first a very little, and afterwards a good deal more, to estimate the characters of those who bear large responsibilities. Unless and until he can do that, democratic control of industry will be full of hazards. For a people which endeavours to rule its rulers, without being able to enter into the difficulties of the work to be done, is apt to fall under the guidance of plausible speakers. In such case, what appears as democratic control becomes in effect haphazard oligarchy.

American methods of Scientific Management will need to be somewhat modified, before they can obtain a very wide acceptance in British industry; where—it must be repeated—sectional solidarity has an intensity that does not exist at present amid the rapidly changing technical and racial conditions of American industry. But it happens that, at this very juncture there is growing up a strong movement, the leading ideas of which are embodied in the well-known "Whitley Report." It proposes that employers and employed shall discuss matters of common interest, first in "Works Committees" of individual factories, etc., and afterwards in District Industrial Councils, the members of which are elected by Works Committees; while still larger National Councils are to be elected by the Local Councils. This movement is already being turned to account in developing some of the leading ideas of Scientific Management under the organized joint direction of employers and employed¹.

¹ The Whitley Report substantially adopts the "Outlines of a settlement" which are set out at the end of a *Memorandum on the industrial situation after the war*, issued by the Garton Foundation in June, 1916—a document of singular constructive force, but inadequately known. The issues here raised belong to the study of the influences of industrial organization on social well-being, which is proposed to be included in a companion volume to the present on *Industry and Trade*.

But one or two suggestive facts, taken from a *Report on Works Committees*, published in March, 1918, by the Ministry of Labour, may be mentioned. One firm reports that "the management discusses with the [Works] Committee, or those of it concerned, changes of process, while the men according to the

II, XII, 4. The tendencies of the age are, no doubt, towards increased solidarity of those engaged in any industry: the employers act together in various degrees; and each class of employees also act together rather more closely as a separate group as to some matters and in alliance with other groups as to others. Such movements may be productive of great good to the particular industries, or groups of industries concerned; and to the nation as a whole. They are signs of healthy vigour; but they also suggest grounds for anxiety. For grave and far-reaching injuries to the common weal might arise if strongly organized joint committees of employers and employed in industries, or groups of industries, which controlled important products, were tempted to use their power in the furtherance of their sectional interests. There are many ways in which such a policy might benefit, at all events for a decade or more, those who set them up; while their gain, easily visible, might probably be much less than the aggregate loss, which the nation as a whole would suffer in ways that cannot be easily traced.

Some light is thrown on these matters in Book III; which is given to a study of the good and the evil, the strength and the weakness of those combinations and aggregations in industry or trade, which develop monopolistic tendencies, whether of set purpose or not.

view of the management 'have helped the management in many cases on knotty problems of output, and have made suggestions, which were acted upon.' ...The system of base time for premium bonus work prevails throughout the works: and if the base cannot be settled between the foreman of the department and the workmen, the matter is brought by the Convener and Shop Steward of the department before the management" (p. 58).

Again another firm describes (pp. 59—65) its *system for fixing piece-work prices by continuous arbitration*. "One of the greatest objections to present piece-work systems is that the employer works out the price in secret, writes down the time on a card, and then settles the price...The following is the agreement reached between the principal Union of metal workers and ourselves:—On getting out a new job we would calculate the feeds and the speeds, which were suitable for the tool, on which the job was to be performed; and then put forward the time to the man who had to do the job." If he objected he could "go to the Time Study Office" and talk the matter out. If no agreement was then reached, the matter would be referred to a Committee consisting of the workman himself and two others "selected by him, who are operating the same type of machine, or whose work is closely allied to the work in question"; together with three representatives of the firm. If still no agreement was reached, new studies of the matter are to be made.

BOOK III

MONOPOLISTIC TENDENCIES: THEIR RELATIONS TO PUBLIC WELL-BEING

CHAPTER I

VARIOUS INFLUENCES OF MONOPOLY ON PRICES

1. *Introductory.*

III, 1, 1.

The first chapter of the preceding Book contained a broad sketch of the relations between production, consumption and value, on the supposition that the production of a commodity is not restricted by exclusive privileges or advantages: and that consequently, if its supply runs so short that its price is considerably above its expenses of production, an increase of supply will be speedily caused by the high profits held out to those who can bring more of it to market. And the chapter ended with an indication that a companion to that sketch would be presented here, designed to show the nature and extent of the modifications in the problem of value, which may result from the exclusive possession by a single person, or by a group of persons acting in concert, of facilities for producing the commodity. The sketch, contained in this chapter and the next, is of the same character as its precursor; and may for the same reasons (see p. 181) be omitted by some readers.

The contrast between the subjects of this Book and the last is commonly described as the contrast between monopolistic and competitive conditions. This description may often serve on account of its brevity; but it is open to misconception. For, as we shall see presently, the fiercest and cruellest forms

III, 1, 1. of competition are found in markets which are no longer quite free, but have been already brought in some measure under monopolistic control. (In a truly open market, competition is often constructive and not ungenerous. But, when a giant business is striving to attain a monopoly, or to repel rivals from ground which it wishes to make its own, it is under strong temptation to use ferocious and unscrupulous methods to compass their undoing.)

The central fact of the problem of value under competitive conditions is (see II, 1, 3) that scarcely any important result is true in regard to both short periods and long: a great part of the many barren controversies, that have raged on the matter, results from attempts to refute statements relating to long periods by others relating to short periods, or conversely. Speaking broadly we saw that the fluctuating pressures of demand on the market are the chief causes of temporary movements of prices for most things, except those that are derived from the harvests of the land or the sea: but that in the long run the governing force is the relation of cost of production for various annual rates of supply to the prices at which those rates of supply can be marketed. A chief cause of the apparent differences in character between the price movements of different commodities lies in the fact that a period, which is long relatively to the conditions of supply of one thing, may be short relatively to those of another. Ricardo quaintly said "I do not dispute the influence of demand on the price of corn, or on the price of all other things: but supply follows quickly at his heels, and soon takes the power of regulating price in his own hands; and, in regulating it, he is determined by the cost of production¹." Thus the answer to (the question whether variations in demand, or variations in cost of production, exert the stronger influences on value under competitive conditions in a given time, depends mainly on *the ease with which supply can alter its pace.*)

Similarly it will be found, generally speaking, that the ownership of exclusive facilities for production or trade in the modern world does not always suggest to a man of sound judgment that he should pursue a severely monopolistic price policy. On the contrary, he will keep a watchful eye on the

¹ See Dr Bonar's edition of *Ricardo's letters to Malthus*, p. 179.

sources of possible competition, direct or indirect. If it appears that those sources are likely to prove large and strong; and that the pace at which competitive supply runs, is likely to become considerable before long: then he will not make full use of his power, but will adjust his prices to obtaining a firm hold on the market before he can be caught by competitive supply "following quickly at his heels." III, 1, 1

It will in fact presently be seen that, though monopoly and free competition are ideally wide apart, yet in practice they shade into one another by imperceptible degrees: that there is an element of monopoly in nearly all competitive business: and that nearly all the monopolies, that are of any practical importance in the present age, hold much of their power by an uncertain tenure; so that they would lose it ere long, if they ignored the possibilities of competition, direct and indirect.

This interlacing of monopoly price policy and of competitive price policy has indeed always existed. But it needs more careful study now than formerly: and this for several reasons. The temper of the age is increasingly analytical; while the contrast between the influences of cost of production on competitive and on monopoly values is more complex than it was when the foundations of modern economic science were laid. Again, though the progress of analysis has taken nothing of importance from the foundations which were then laid, it has built much upon them; while the progress of events has brought into prominence many considerations, which might reasonably be neglected for the practical purposes of business at that time, but which the modern student is bound to examine with some care. It is to be remembered also that, independently of the general study of combination and monopoly on which we are engaged just now, the relations between monopoly and competition prices have, now more than ever, a large place in problems of international trade.

Stress must be laid on the fact that absolute monopolies are of little importance in modern business as compared with those which are "conditional" or "provisional": that is, which hold their sway only "on condition" that, or "provided" that, they do not put prices much above the levels necessary to cover their outlays with normal profits. If they did, then competition

III, 1, 1. would probably make itself felt; unless stayed by authority, as is the case with patents, copyrights, and some rights of way. The supply of water, gas, or electricity to any locality cannot be distributed over several rivals: for, to say nothing of its wastefulness, that would involve so many encroachments on, and disturbances of roads, etc., that it could not be tolerated. The greater part of the postal system is an absolute Governmental monopoly almost everywhere: though there is some lack of uniformity in relation to the collection and delivery of parcels and other matters. Again in some countries railway work is an absolute Governmental monopoly: and in other countries there are many patches of practically absolute monopoly in railway traffic. But many monopolies, which seem absolute, are yet to some extent liable to be assailed by indirect routes; and are incomplete and subject to the "condition" that the monopolist makes no such extreme use of his power as will induce others to force their way through obstacles and set up effective competition.

These obstacles are mainly of two kinds. The first is the necessity for sinking much capital and effort in setting up the plant and organization, suited for competing on nearly even terms with a strong business, already in possession of the field. Few are able to do it: and fewer still are willing to take the heavy risks involved in it. For this reason some kinds of monopolies, which even a generation ago would have been properly classed as provisional, have now become so strong as to give grounds for raising the question whether authority should be called in to exercise a control, which competition might have been trusted to do in earlier times. This cause of increase in the strength of monopolies in industry and trade, is a main subject of the present Book.

The second obstacle to the setting up of efficient competition with a business, that has acquired a conditional monopoly, is the *vis inertiae*, the opposition to change, which is inherent in human nature and in human conditions. It is being continually diminished by the influences of modern technique, no less than those of modern habits of thought and life: and accordingly some monopolies, so strongly fortified by large capitalistic resources, advanced methods, high ability and large business

connections, that they would have been practically impregnable III, 1, 2.
not long ago, are now often quickly impaired¹.

The industries of transport by land and sea have together occupied more of the thought and energy of the populations of the civilized world than any other, except agriculture. Agriculture has indeed been always a chief source of great fortunes; but the owner of a large landed property has seldom extended his direct control over the whole of it. The concentrated control of large movable capital was pioneered by merchants; though much the largest aggregations of fixed capital were to be found in public highways, until railways began to dispute that place with them. The industries of transport by land and water have frequently changed their methods: but their history is in this sense continuous, that the services rendered by them have been more homogeneous, definite and uniform in character throughout the ages than have been the products of any other group of industries, except perhaps agriculture: and contests for dominion between the methods of competitive and monopolistic organization have developed with more continuity, and can be studied now more closely in them than elsewhere. Britain is the chief inheritor of traditions in regard to the sea: but with regard to railways America has recently taken the lead in the constructive study of the complex relations of competitive and monopolistic policies to public interests; and a large place is given to the results of these and kindred studies in the present Book.

2. *The monopolistic element in the policy of cartels, and other regulative associations of independent producers or traders, is a chief instance of the interpermeation of competitive and monopolistic policies.*

(Monopolistic aggregations have often been slow growths from small roots; and have expanded under the influence of constructive business enterprise, with little or no thought of monopoly, till they had attained great strength.) Monopolistic

¹ Monopolistic policies give scope for important uses of high analytical methods. Cournot led the way: and among those who have made chief advances in it Professors Edgeworth and Pigou are prominent. Readers are referred to their masterly work for an intensive study of the theory of monopoly.

III, 1, 2. federations, which are increasingly described by the German name "Cartels," have their roots deep in the past, where the spirit of comradeship was often as potent, as the desire for the monopolistic regulation of prices.) It seems probable that the total influence exerted on prices by monopolistic associations has been greater than that exerted by monopolistic aggregations.

Understandings and associations for the control of particular markets have prevailed in almost all times and places, and have been prompted by nearly the same motives as are at work to-day. In primitive civilizations people of the same calling or the same locality have generally acted together by habit and instinct, rather than by any formal convention. And, though the overt action of guilds, and other trade and professional associations, has often shown deliberate and elaborate strategy in dealing with the outsider; yet a great part of that collective selfishness, which is thinly covered by some unselfish devotion to the interests of a trading group, has worked through tacit and indefinite understandings¹.

In the modern age human nature remains very much as it was in former times: but intellectual habits and methods have changed fast and progressively. (The old associations of neighbourhood and a common occupation have still considerable force: but new developments of critical and analytical faculties have caused men increasingly to submit their instinctive tendencies to the cold arbitrament of numerical estimates. The gains and the losses, in money and in ease, which are likely to result from any plan of combined action, with its attendant discipline and curtailments of individual freedom, are weighed against one another; and, if the balance of advantage seems to lie with organized regulation of marketing, a cartel or other association is set up for the purpose.) Its immediate and overt aim is to maintain prices in particular markets against inconvenient competition: and especially that of competitors who desire to force their way into those markets by selling goods at, what appears to be, less than their full costs.

¹ The obvious, but important fact that, if the price of a thing which several persons are able to produce, is to be kept much above its cost of production, the inducements to combined action will be cogent, is shown with the aid of diagrams by Prof. Colson, *Cours d'économie politique*, vol. I. ch. III.

Even a man, who occasionally acts somewhat in the same way himself, is apt to regard all such intrusion on his own particular market as "unfair." If his ways are old-fashioned, and his costs are high, he may even regard as unfair the selling at prices, which yield some profit to others, whose plant and organization are superior to his. Thus he is prepared to give a ready ear to suggestions that he should take part in a defensive association or federation, the members of which undertake not to sell at unfairly low prices in a certain area; and to oppose any intrusion of unfairly low priced goods by various strategical devices: the chief of these are underselling the intruder in his own particular markets, and boycotting those who supply his wants. "Defensive" combinations of this kind make out a claim to be morally right: and those, who are in need of defence, eagerly endorse the claim; even though the assailants differ from themselves only in being more able and better equipped with appropriate plant and method. The strength of purpose thus obtained is often developed by combat, and by common exertions for overcoming difficulties. After a time they think less of the defence of markets, in which they had already established themselves; and more of extending control, by alliances and otherwise, over wider markets. If they yield to this temptation, they are on a steep and slippery incline, heading towards a federated monopoly; which is often uncompromising in purpose, though probably limited in extent¹.

(There are three classes of producers who are not tempted to restrictive combination: those who produce for their own consumption; those who produce things for sale in a large open market in such small quantities, that current prices will not be appreciably affected by anything which they may do or abstain from doing; and lastly the owners of absolute monopolies.) The first two classes have indeed grave anxieties: short harvests may inflict hardships on those who rely on the produce of their own farms: glutted markets may grievously distress the small producer for sale; and even the absolute monopolist must think and contrive a great deal if he is to make the best of his property. But on none of these people does the burden lie of guarding

¹ In this connection reference may be made to the first chapter of the previous Book, and especially its last paragraph.

- III, 1, 2. watchfully against the encroachments of others. That burden lies on those who have to defend a market which is open to attack: it is the heavier, the greater is the value of the partially monopolistic advantages which they hold in it, and the greater therefore the eagerness of others to intrude.

When discussing the costs of marketing (above, pp. 271—3) some explanation was offered of causes which lead the seller to court the favour of the buyer in regard to particular transactions, especially in retail trade: although in the long run consumers would suffer more from a restriction of their supplies of urgently needed goods, than producers would by being driven to another occupation. That explanation being assumed, it may be added / briefly that combination tends to aid sellers more than buyers in regard to immediate transactions. For, under ordinary circumstances, if a buyer passes from one seller to another, the seller loses his normal profit, while the buyer is likely to get his needs supplied without difficulty and possibly at some extra advantage; but, if combination has so fixed prices that the purchaser cannot expect to improve his position by passing to other sellers, he is likely to accept the first seller's terms without demur. (This consideration suggests that monopolistic combinations are likely to be more frequent among sellers than among buyers: and that such combinations as are effected among buyers are, for the greater part, evoked as defensive measures by combinations among sellers.) We shall find that this is the case in fact.

It will appear also that in the long run combinations of buyers are on about equal terms with combinations among sellers; except when a combination of sellers controls the chief effective sources of supply of a necessary raw material. The most necessary raw material is that of staple foods. Governments have often been called on to intervene between unorganized consumers and organized dealers in grain: and, as the world-war has reminded us, when ordinary markets are partly closed by military operations, authoritative intervention may be required in regard to dealings in many things besides muniments of war.

3. *Price policies of monopolies, absolute and conditional, in regard to immediate net revenue and to prospects of future development.* III, 1, 3.

In the remainder of this chapter the monopolist will be supposed to make only one product for sale; and to supply it to all purchasers at the same price, subject only to such variations as may correspond to varying costs of delivery. More complex issues will be opened out in the next chapter.

(Unconditional natural monopolies, such as those given by the possession of a unique mineral spring or vineyard are relatively rare. The possession of the only coal-mine in a district may give its owner an almost unconditional monopoly there, because coal cannot be carried great distances by land cheaply. But it has already been observed that, as a rule, unconditional monopolies are the products of authority: they were very common in early times: but now almost the only relics of them are designed merely to prevent people from infringing the reasonable rights of others in their own productions.)

Reference has also been made to the monopolies that some trading companies acquired long ago in regard to spices, salt, and other flavours, which contribute much to enjoyment; but are yet consumed in so small quantities, that a ten-fold rise in price above the cost of obtaining them in a free market makes no very great demand on the purses of customers. When the Dutch, having obtained a monopoly of the trade of the Spice Islands, found it to their advantage to burn a great part of the crop after a large harvest, they were sounding the keynote of extreme policies of absolute industrial monopolies.

Dunlop's simple valve for keeping the air in a cycle tyre at high tension added much to the value of a cycle; and therefore the licence to make use of it could be sold at a considerable percentage on the price of a costly cycle, that is at many times its own cost of production. Again, Coats' trade-mark on sewing-cotton is of exceptional value; because if a person were to experiment with a cheaper sort of thread, which turned out badly, the saving of a halfpenny on thread might so damage expensive costumes, etc. as to cause inconvenience or loss of trade reputation worth many shillings, or even pounds: thus the

III. 1. 3. unique position, which Coats' Combination holds among British monopolistic businesses, results in part from the fact that its products constitute a small but essential link in processes of production which are in the aggregate of very great value.

It will be convenient to refer occasionally to the amount of the profits, which a monopolist is enabled to make by setting his price above that which covers his full costs of production; in which are to be included of course allowance for risk and depreciation, and for the remuneration of his own work in connection with the business. This may be called the *monopoly net revenue*, which he will get from the adoption of that price. Speaking generally the price, at which he offers his goods, will govern the amount of his sales; and therefore of his total costs of production, as just described. (His monopoly net revenue will be the excess of his receipts over those costs.) The higher he sets his price, the less he will sell: and therefore if his costs of production are always in the same proportion to his output, his monopoly net revenue will be greatest for that price, which makes the number of units sold, multiplied into the excess of his price over his costs per unit, to be the greatest. Speaking generally again, his inducement to keep his price rather low in order to increase the demand, will be stronger if his costs of production per unit diminish with increased output, as is the case in manufacturing and other Increasing Return industries, than in Constant Return industries: and it will be least of all in such a case as the production of a wine of unique flavour, which can be raised only from a small area.

His monopoly revenue is the excess of his receipts over his outlay with normal profits: and (his aim may be to fix his price (and therefore the amount of his sales) at that level which will yield him for the time the highest gains:) that is at his *maximum net revenue price*.) This is often inadequately expressed by saying that the owner of a monopoly aims at the highest charges "which the market will bear"; or, if a railway is under discussion, at the "highest charges which the traffic will bear." Sometimes the same notion is thrown into a negative form without real change of meaning, and it is said that the monopolist will take care in his own interest not to charge more than the market will bear. But all these phrases lack

definiteness. For the market will bear a great many prices though it will contract its demand as the price rises; whereas a competitive market will seldom bear permanently any price which does not correspond to cost of production. What is really meant is that he attempts to select a price which will just not drive away a large body of customers, or even prevent him from attracting them. For this purpose he needs to study the elasticity with which demand will respond to a low price, as well as his costs of production¹. III, 1, 4.

4. *Benefits which the public may derive from a far-seeing use of monopolistic power under certain conditions.*

Selling at a price lower than that which would maximize the immediate net revenue of the monopolist, in order to familiarize consumers with his product, is an investment of capital in the expectation of deferred gains; and indeed it may be regarded as a particular form of the investment of capital in lavish advertising. All such expenditure, if well devised, facilitates further advantageous extensions of plant and further subdivision of labour, which tend to reduce costs; and it may lead to so great a reduction of costs that the price, which will maximize his net revenue, will fall below that originally adopted

¹ A numerical example may be helpful. Suppose 10,000 units of a product are being produced at an outlay of 6s. per unit, and sold at 9s.: thus yielding 30,000s. for total profits, i.e. for ordinary profits, together with additional monopolist gains. Suppose that twice the number can be sold at 7s., the demand being elastic. The profits will then rise to 40,000 shillings, if the outlay per unit falls to 5s., under a tendency to Increasing Return (though it would have fallen to 20,000 shillings if the outlay per unit had been constant). If however the demand had been less elastic, so that 20,000 could not be sold at a higher price than 6s., then it would not have been advantageous so to enlarge the plant as to produce 20,000.

It may be well to observe that as the monopolist will, in his own interest, be inclined to favour things that conform to Increasing Return by low charges, in order that he may increase their consumption, and gain the economies of production on a larger scale: so it is a general rule that, *other things being equal*, the Finance Minister should press on products of Decreasing Return industries rather than on products of Increasing Return industries. For a tax on either class tends to diminish consumption: and therefore to lower the price of the untaxed product in the first case and to raise it in the second. Thus the tax raises the price against the consumer by less than its own amount in the first case and by more than its own amount in the second. The above argument, in relation to taxation, is illustrated by diagrams in my *Principles*, Book V, XIII, 4.

III, 1, 4. as an investment for future reward. His net revenue may continue to rise, while his price continues to fall.

Again, though a trade association may undertake a part of the expense of bringing to the notice of the public a product in which its members are interested; no one of many producers of the same thing may have an adequate interest in pushing its claims on the attention of the general public, unless his contiguity with them, or some other cause, may be likely to turn their custom in his direction. The far-sighted monopolist, on the other hand, is constantly considering what new advantages he can afford his customers, present and prospective, which will remunerate him in the long run, even though they reduce his monopoly revenue for the time being: a new suburban railroad sometimes makes temporary concessions, such as cheap or even free season tickets, to induce builders to erect houses in its neighbourhood. Or again a monopolist may go to some expense to aid people in turning to good account what he has to offer¹.

In all such cases the monopolist expects to obtain a large share of the whole benefit that will result from calling the attention of consumers to a commodity that will serve them well; from offering it at a price that will attract them to it, and generate habits of familiarity with it; and from aiding them to use it to the best advantage. In fact he makes a compromise between the prices which he would charge, if his sole object were to increase his immediate revenue; and that which he would charge, if he counted a benefit to consumers as of equal value with a similar benefit to himself.

A great monopolist railway in a new country sometimes finds itself in a position somewhat similar to that of a monarch whose prosperity depends on the well-being of his subjects, which

¹ The care and expenditure which the monopolist owner of a trade-mark, patent, or other speciality devotes to arousing the public to its claims have been considered in II, VII.

A purveyor of night-lights has sold at a very low charge an apparatus for enabling the light to maintain a supply of warm food. And—to take a larger illustration—some railroads in the Western States of America, finding that the badness of the local roads made the cost of transport between farm and local railway station a considerable addition to the freights for long distance traffic, set themselves to educate the farmers in road making: a fully equipped train with a road-engineer and gang of navvies was sent to a station, to stay there till a short piece of road had been made gratis, as a model to be copied.

in its turn is highly sensitive to his care for or neglect of their interests. In such a case the monopolist or the monarch may act in almost the same way under the influence of shrewd business calculations, as he would if his chief aim were to benefit his customers or his subjects. A monopolist's inducement to move in this direction is especially strong if the cost of a large output is relatively less than of a small. It may then be worth his while to sell temporarily at a price below the cost for a small output, and therefore at a loss; looking for his reward when the demand is large, and his costs relatively low. He cares little at what cost a temporary increase of output can be made: his concern is to know at what cost he will be able ultimately to meet the increased demand which he is proposing gradually to develop; it being assumed that he feels confident that his hold on an elastic market will last long. The length of time required of course depends on circumstances. If it were possible to adapt the duration of each patent grant to its peculiar conditions, the public interest would call for a specially long period for patents relating to processes to which the law of Increasing Return applied strongly, but in which its effects are slowly developed.

It is to be noted that, however far-sighted a monopolist is, he may be unable to abstain from grasping at quick returns, if his capital is small, and his credit is poor. An outlay for distant returns which would be profitable, if he could borrow at five per cent. per annum, may be impracticable if he must pay ten per cent. The same difficulty often cripples the energies of an able poor man engaged in competitive business: but if he does not occupy a fitting place, that place may be filled by others. On the other hand the best ideas of an inventor are often lost to the world, because he fails to induce a sanguine estimate of the value of his invention among those who could supply him with capital.

But too much stress has sometimes been laid on the influence, which the rate of interest exerts on the inclination of a monopolist to subordinate his immediate interests in a large net revenue to the development of his resources in such ways as may enable him to make great gains in the future; and meanwhile to supply his products at a price not much above their

III, 1, 4. present cost of production, and possibly even a little below it. This consideration is important; but it is not confined to monopolistic businesses: it applies in some degree to almost every business in an Increasing Return industry. The fall in the rate at which additional capital can be obtained for making expensive experiments, for setting up costly appliances which may specialize and economize labour and so on, has been a chief promoter of that progress, which has greatly increased the command of all, and especially of the working classes over conveniences, comforts and luxuries, that were either unknown, or else the exclusive perquisite of the rich in earlier times. The monopolist of a product has no monopoly of this tendency; but, no doubt he is often in a position to make large use of it: and, in so far as it inclines him to sell at low prices, in order to develop a future consumption which will accrue directly to his benefit, the consumers of his product enter at once into benefits, which would otherwise have been deferred till the technique of its production had been considerably advanced. In this respect therefore the public has an exceptional interest in the supply of large resources to an enterprising and public spirited monopoly.

(But on the other hand its strength, if excessive, may become a source of national danger.) For instance, the coal industry, especially in alliance with the iron industry, might conceivably attain to a monarchic authority throughout a whole country almost as unchallenged as that of the sole railway system in an inland district of a great continent. England was the first to feel this danger: it has been considered in America; but it seems to be more nearly imminent in Germany than anywhere else. The public spirit of American railroads has been stimulated in some directions by legislative and administrative intervention, actual and projected; and similar intervention may be needed in an increasing degree with regard to the few other monopolies that threaten to be both lasting and strong.

But, after all, the most powerful protection to public interests against the possible lassitude and exactions of railway officials and shareholders has not come from Government. It has come from the increasing force of indirect competition as regards railway services. They have seemed ever to be on the point of escaping from competitive influences; and to be able to adjust

their charges to what the traffic would bear with even less regard to cost of service: but in fact the indirect influence of cost has incessantly asserted itself to a degree that could not have been anticipated when Stephenson more than half-a-century ago said, with reference to railways, that "where combination is possible, competition is impossible.") III, 1, 4.

Many of those manufacturing aggregations, which are commonly regarded as monopolies, are in considerable danger from the indirect competition of businesses, which seek to attain ends similar to their own by other routes. This is a danger which is often overlooked, till the new method has already established a firm position within what was thought to be the special territory of the monopoly, and has even introduced some changes in the habits of consumers which cannot easily be reversed. For instance, a high price of gas in some places, in which gas was regarded as having a monopoly, has been reduced under the influence of growing competition from petroleum and electricity: and more recently improvements in electric light have been stimulated by the economy of improved incandescent gas-mantles.

Another illustration may be taken from the case of the partial monopoly of a trade-union. About the year 1880 the masons' union made so harsh a use of their power, that builders were unwilling to bind themselves by penalty to finish in a given time any contract that involved much stone work. So English architects set themselves to substitute the effect of shadows thrown by varied forms of brickwork for that relief to the monotony of buildings, which they had sought in the use of stone work. As a result, their command over brick as an effective material has increased fast; while there has not been a corresponding improvement in their command over stone. Thus English architecture is in some respects richer, and in others poorer, than it otherwise would have been: but perhaps another generation will elapse before the number of skilled masons in England is as large as it would have been if their union had shown more moderation in 1880.

CHAPTER II

VARIOUS INFLUENCES OF MONOPOLY ON PRICES, CONTINUED

III, II, 1. 1. *Partial shiftings of burdens imposed on monopolies.*

The imposition of a tax is commonly taken as representative of the many various burdens which may be imposed on a monopoly: and we may follow that plan. The burden may be caused by a partial failure of supply of some material or labour needed by it; or by onerous conditions of working imposed on it in the interests of public health or by other causes. But so far as the questions now before us are concerned, such burdens have the effect of increasing its costs, or otherwise lowering its revenue: and such effects are conveniently regarded as equivalent to the incidence of taxes imposed specially on it.

If a tax is set on anything that a man uses in business, he endeavours to recover the tax from his customers by putting up the price of what he sells. Others in the same business do the like; and a part of the burden of the tax is thus shifted "forwards" on to consumers. In consequence they are likely to diminish their consumption of his products: and therefore he diminishes his purchases of materials and other things. Thus a part of the burden is probably shifted "backwards" on to those from whom he buys; and they in their turn are likely to shift a part of that part backwards on to those from whom they buy: and so on. Similarly, if those who purchase his products, require them for use in business, they are likely to shift a part of the burden a second time forwards on to their customers. (If industrialists and traders are alert, and but little under the influence of habit; and capital-supply is highly organized—in short, if the general economic conditions are fluid—the shifting will be rapid;

the more viscous they are, the slower and less complete will the shifting be.) Monopoly tends to resist adjustments of means to ends, but in ways rather different from those of simple viscosity or immobility: and its action in presence of a new tax, or other disturbance varies with the nature of the attack made on it¹.

(If a tax on an absolute monopoly is levied either as a fixed sum, or as a percentage on the net income derived from it, the monopolist will be in a position from which no escape can be found by raising his price.) He is supposed already to have put the price so high, that any further rise might so lessen his sales as to lower his net revenue: and a tax, which is not adjusted to the amount of his sales, or the price at which he sells, cannot be evaded by a raising of his price: for that would threaten his net revenue. If the tax is fixed in amount, he will simply pay it out of a smaller net revenue: if the tax is assessed at, say, a tenth of his net revenue, he will retain nine-tenths of that smaller revenue for himself instead of nine-tenths of his full original revenue².)

¹ The general principles which govern the shifting of the burden of a tax from its point of first impact were clearly set out by Ricardo: and subsequent analysis, partly in mathematical form, has greatly developed his work. Our present knowledge does not supply a sufficiently firm foundation of ascertained fact, especially in regard to the ever varying plasticity of industrial and other economic relations, to enable this reasoning to reach exact practical conclusions. Analysis may however indicate broadly the nature of the shifting that will result on various definite assumptions as to the fluidity, the viscosity, or the rigidity of the several elements: and in this direction there seems to be hope of yet further progress.

Where everything is either absolutely rigid or absolutely fluid, a knowledge of the tendencies of change points clearly the way to a knowledge of their results. But in fact scarcely any economic element is either absolutely rigid or absolutely fluid: nearly every one is more or less viscous. If the viscosity is slight, reasoning based on the assumption of perfect fluidity, may be fairly applicable to most problems that range over long periods of time. But, if the viscosity is great, tendencies, indicated by present conditions, may work slowly: and thus may not have completed their work before new conditions have come into being, and set up different, perhaps even reverse, tendencies. Indeed uncertainties in regard to this viscosity are a chief cause of the limitation of the scope of pure reason in real economic problems.

² Nevertheless the common opinion, that such a tax is likely to cause the monopolist to raise his price, is not without some justification. For the monopolist might probably raise his charges, and attribute the rise to the tax. The rise of price would diminish consumption, and therefore the number of employees needed for his work: he might probably dismiss some, and lower the wages of

III, II, 1.

On the other hand a tax proportional either to the amount of his output, or to his gross revenue (that is the amount sold multiplied into the price) would give an inducement to the monopolist to lessen his output and raise his price. For by so doing he would escape a part of the tax: and thus the excess of total receipts over total outlay might probably be increased by a diminution of output, though before the imposition of the tax it would have been lessened. As a consequence of the diminution of his output, he might probably be forced to dismiss some of his employees, and be tempted to lower the wages and salaries of others. In these ways a part of the burden of the tax would be shifted to other shoulders: and, in so far as he diminished his purchases of plant and material, some share of the burden would be diffused over a still wider area¹.

The case of a conditional monopolist is rather different; chiefly because any tax, levied on him, would be likely to be levied, in some degree at all events, on any present or future competitors. He would therefore reflect that he might set his price rather higher than had seemed safe before, without attracting much new capital into his special province. That would be true, even if the tax were of fixed amount, or assessed on his net income: and if it were assessed on his gross income, or on his output, he might perhaps raise his price by nearly the full amount of the tax.

others; always throwing the blame of the change on the tax. It would then appear that he was shifting a part of the burden of the tax on to his employees and another part on to his customers. But the appearance would be illusive. The tax did not give him any new power to gain by raising his charges. It was always open to him to raise his price, to stint his production, and to take advantage of his diminished need for labour to force down wages temporarily at least. He did not take that course, because on the whole he reckoned the price already chosen to be the most advantageous to him; and the tax if immovably fixed would have made no alteration in any of the data on which he founded that conclusion. The only change made by it was to give him a motive for impelling his customers and his employees to intervene between him and the Public Treasury.

¹ The observations in the previous footnote apply to this case also. The analytical side of the subject of this Section is developed with numerical and diagrammatic illustrations in my *Principles*, V, XIV, and in the corresponding Mathematical Appendices.

2. *Influences which various degrees of monopolistic advantage may exert on the distribution of the burden of the general costs of a business among the several groups of its products.* III, II, 2

We must here revert to the consideration that, when a business produces more than one thing, the costs which are incurred on account of each several process of production cannot be definitely ascertained. The costs in view in such a case are not the prime or "out of pocket" expenses, directly incurred on account of a particular small order or contract. They consist of a share of the general costs of the business; due provision being made for keeping the plant in full repair and of suitable capacity for its work.

We have seen¹ that, when the common costs of a group of products are so intimately associated, that each of the products can be produced to good advantage only in association with some or all of the others, then the problem is assimilated in some degree to that of "joint products," such as mutton and sheeps' wool, the production of which cannot be separated; though the relative proportions of the several products may be varied. In this case the distribution of general costs becomes somewhat arbitrary. But the economy of producing (or marketing) together several different products, which can conveniently be handled "in common" by the same plant and organization, though often considerable, is seldom over-mastering. Consequently, if any one of those who produced several varieties of such goods were to try to place on any one variety much more than its due share of the general costs of his business, he might probably find himself undersold by someone who specialized on that variety. Therefore the freedom which he has in distributing those costs, though real and important, is rather narrowly limited: he cannot afford to leave out of mind the principles according to which the general costs of a business are ordinarily distributed among its various products, nor to depart far from them.

The monopolist is bound by no such fetters. He may indeed need to watch the prices of products which, though different from his, might displace some of them, if his were not easily to

¹ Above, II, 1, 5.

III, n, 2. be had: but in the main he has to consider only how to increase the amount by which his own net profits exceed those of ordinary businesses.

Let us take the case of an absolute monopoly, which has already established its market, and has no exceptional reason for sacrificing present income for the sake of a distant future. Of course its owner will not undertake any new outlay, unless he has a fair prospect of recovering it with at least normal profits from the sale of his products. First let us suppose that the outlay is expected to improve their quality, and to enable him to charge higher prices for them, while maintaining or perhaps even increasing their sales; he will then consider which groups of them can bear the greatest increase in price without considerably checking demand; and he will make them carry the chief part of the expenses of his new outlay. If, through political or other pressure, he is prevented from raising the price of any one, he will conclude that he must throw a larger share than he would have wished on other products; or, in an extreme case, abstain from the projected outlay.

Let us now pass to an absolute monopolist who has reason to believe that he may greatly develop the market for some of his products by selling them a good deal below the prices, at which they would yield him the largest net revenue in the present. He may of course reckon that, with a larger output, he will have lower costs of production per unit; so that ere long the prices which will yield him the maximum net revenue, will be as low as, or even lower than, those which he is now charging. (Thus the price policies, which he adopts for different products, are partly dependent on one another. If he receives less than he expected from one product, he may be unable to sacrifice as much immediate revenue for the sake of future gains, as he had proposed: and he may raise some of his other prices.) Similarly, if a tax were imposed on one of his products: he would then be likely, in effect, to throw more of the burden of the general costs of his business on other products¹)

¹ If the taxed product were a "joint product" in the narrowest use of the term with some other that he made; then the lessening of the sale of the first, caused by the tax, would tend to diminish his output of the second; and he would almost certainly raise the price of that.

The conditions which may call for such action on the part of an absolute monopolist are indeed rather infrequent: that is not of much practical importance, because absolute monopolies are rare. But such conditions are common in the much more numerous group of conditional monopolies. For suppose a steamship company, or a large manufacturing company of any kind, has attained a conditional monopoly in a certain area. It will consider the danger that the high aggregate profits which it is making on its business as a whole, are likely to tempt new rivals into its area. If a new tax or some constrictive regulation is imposed on one group of its services or products, it may assume that potential rivals would make account for like treatment, and regard the prospects of making high profits on a competitive undertaking as less bright than before: and in consequence it may probably raise its charges for some services or products, that are not affected by the new legislation, a little nearer to the levels, which would give the maximum net monopoly revenue. Of course it would not raise them above those levels.

(More complex issues are raised when a monopolist's product is sold in several markets, in some of which the demand for it is elastic, and in others inelastic: for he has stronger inducements to lower his price in the former than in the latter. Again, one of two markets, otherwise similar, may be at a much greater distance than the other; and, if his own charge is the same for the two markets, the price of the product when bearing high costs of carriage may be almost prohibitive; though the lower price at which the nearer market obtains it may not be too high. This is one of several causes, legitimate and illegitimate, making for price-discriminations in monopolistic policy.)

3. *Unequal or "discriminating" charges for the same goods or services delivered under dissimilar conditions may be a part of a reasonable, and even of a constructive policy: but the line of demarcation between these and others, which aim at the destruction of inconvenient rivals, is often hard to be drawn.*

So far it has been assumed that the monopolist sells to all purchasers at the same price. But it may be that his goods or

III, n. 3. services are in such urgent demand from some groups of well-to-do customers that their purchases will be but little diminished by a great rise of his prices. Meanwhile other groups may be unwilling or unable to make considerable purchases at any but a low price: they may have convenient access to some tolerable substitute; or they may be relatively poor, or finally have no great occasion for the things he offers. Unequal conditions of these kinds are to be found in connection with the retail supply of many classes of goods.

(In such cases it is generally the rich, who are charged the higher prices. But in large commercial transactions, especially in regard to transport services, any differential treatment that is made, is likely to be in favour of the more powerful customers: and this fact has contributed largely to a hostile attitude towards railway discriminations generally, which was very prominent not long ago, and has considerable strength still.)

This attitude in its turn has fostered the opinion that if a railway, or other partial monopoly, were forced to charge the same price to all, that price would be lower than the average of its charges had been when it was free to vary them to suit its own advantage. There are some cases in which this result would follow. But in other cases the monopolist would simply dispense with those of his sales, which could only be made at a low price: with the result that some of his customers would be seriously prejudiced; and the uniform price, which he charged, would probably be higher than the average of those which he had previously charged.

Whether the first or the second of these results follows, depends on the relative capacities of the markets for which he judges high prices to suit his purpose the better, and those for which he prefers low prices. For instance, in rural districts the only good artificial light to be had is that of mineral oil; in urban districts where gas or electricity is accessible, scarcely anyone would use oil if it were dear. If then the supply of oil were in the hands of a monopolist who was able to discriminate, he would charge a high price in the first set of districts, and a low price in the latter. If he were prevented from discriminating he would consider whether the custom of the urban districts was worth retaining at the cost of charging a low price

in the country. This would depend on the volume of the urban demand; and on the relation between the low price, which alone it would bear, and his costs. If the urban demand at a price considerably above cost of production were very great relatively to that of the country, his single price would be a low one. If not he would prefer sales in the country at a price which gave him a large margin of profit; and, abandoning urban markets, he would charge a higher price than if he were able to discriminate.

(But unfortunately a discrimination, which belongs to legitimate constructive business, is not always capable of being distinguished clearly from one, which is strategic and may involve danger to the body politic. A strategic discrimination nearly always has some constructive value; and its apologists naturally put this into the foreground. It often happens that they alone have the knowledge required for assigning to these two elements their true relative values. The public, in doubt, may be compelled to acquiesce in some discriminations, the real purpose of which it suspects to be destructive: while it must prohibit others that may be constructive under some circumstances, but also may be applied to evil uses by routes which it is not easy to trace¹.)

This matter is becoming increasingly serious with the con-

¹ This difficulty may be illustrated by an extract from the Report of the Commissioner appointed in 1904 to inquire whether the great firms engaged in the beef industry had been acting in violation of the public interest. He refers to the charge that they had injuriously undersold local dealers in small towns by exceptional prices at the season when the local supply was largest; and gives (pp. 80, 81) Mr J. Ogden Armour's defence:—"On account of local conditions we have frequently been obliged to sell meat products at a loss in certain sections for certain periods of time in order to keep our branch houses running. There are, for instance, certain markets in Ohio which, during part of the year, are supplied largely with local cattle grown in the neighbourhood. Of necessity the prices at that time are not good, and the volume of our business is cut down. We nevertheless continue to sell some beef, because we have our investment there and a staff of men, so that the expense goes on constantly, and because we have a certain line of trade which we must keep on our books. We cannot close up one month and open the following with any success. The practice of selling at less than cost has not been pursued in any case with a view to obtaining a virtual monopoly of the supply of any meat product, nor has it in any case resulted in securing to this company any such monopoly in any part of the country." No one can question the *prima facie* validity of the defence: but those who have suffered from the underselling while not definitely asserting that "a virtual monopoly" has been aimed at, may doubt whether the chief motives of the underselling have been made public.

III, II, 4. tinal growth of vast capitalistic aggregations. Thus, returning to the case of mineral oil, let us suppose that the greater part of the trade in it throughout a large district had fallen into the hands of a company, which desired to make its monopoly complete. It might watch for the appearance of competitors with small means; and if allowed to discriminate it might destroy them by selling at a very low price in their immediate neighbourhood. But it could not afford to adopt this price everywhere: and if forced to maintain a single price (after due allowance for differences in costs of delivery), it would reach uniformity by ceasing to sell any oil at a very low price: that is, by raising the average price of its sales. And yet this result might be more in the public interest in the long run than that which would follow from opening the door to malignant discrimination; which might begin by suppressing nascent competition, and end by raising prices generally, though not necessarily to a uniform level, throughout the whole district.

4. *The relations between two monopolies each of which is dependent on the services of the other. Buyers' monopolies. Local and other partial monopolies in multiple ownership.*

If the product of each of the two monopolies is useless without that of the other: if each is absolutely free from the competition of any possible substitute, and the owner of each is able and willing to wait for any length of time; then there is no possible issue to the contest between them for the upper hand; unless it be found in the good nature and sense of one or both. This case has, of course, little practical interest: for the shortness of human life, the changing conditions of demand, and the development of technique have nearly always loosened some one or more of the foundations of any conflict between monopolists, which has appeared to have no solution. Nevertheless any such contests which appear likely to last long, may be of public concern, and give occasion to anxious thought on the part of responsible statesmen.

It is customary to regard the employer as the buyer of labour, and the employee as the seller of it. But a well-known boast of exceptionally powerful trade-union officials is that they practically control their whole industry, and allow the employer

just as much as they consider necessary to keep him at his work: III, n. 4. they claim to be the buyers of the employer's services. The industry is of course dominated by long established routine: a similar boast could not be made in an industry, in which no moderate success could be obtained by an employer, who lacked the faculty and the opportunity for constant readjustments of his methods, and for casting away plant which became obsolete long before it was worn out.

This illustrates the principle that when the services of two sets of people are required for producing a certain result, and neither can be turned to any considerable use unless it has the aid of the other, then it is a matter of small importance which of the two receives the price for the common product, and pays the other for his share of the work. What is important, is the question which of the two is in the better position for bargaining.

Again a railroad serving a purely agricultural district of a new country, must look to freights of farm produce as its main source of revenue; while the farmers are dependent on sales, which they cannot make without the aid of the railway, for the whole reward of their labour beyond their own food. If the railway is strong and uncontrolled, it may in effect say to the farmers either, "We will sell to you or to any purchaser from you, our services at rates that will leave you a bare living," or "We offer you a price for your produce, which will give you a living. If you refuse it, we will not carry your produce at any rate which it can bear." The results are the same in the two cases, though in the one case the railroad appears as a monopolistic seller and in the other as a monopolistic buyer. In either case it would probably have the upper hand, because it could afford to wait.

If, however, the farmers were able to combine and make a railway to reach the ocean, or navigable water leading to it, they might send their produce to markets hitherto inaccessible to them: and, acting in combination, they might refuse to buy any transport from the railway (or, which comes to the same thing ultimately, to sell any produce to it) except on terms only just sufficiently favourable to it, to keep it in business.

Again, consider cartels, each of which controls a stage of a

III, π, 4. single branch of production: as, for instance, that of drawing the wire of which wire nails are made, and that of making the nails. In this case it is possible for those engaged in either stage to undertake the other also. (Movements of this kind are going on in all countries, but especially in Germany: they indicate that, though the buyer generally has the upper hand of the dealer in the ordinary course of trade, a combination of sellers frequently dictates terms to a combination of buyers: and, if the buyers are not ultimate consumers, the public may suffer a two-fold burden.)

This leads to the remark that, if each of two monopolies is essential for the performance of a given public service, and if there is no chance that any effective competition will be offered to either, then it is generally in the public interest that they should be amalgamated.) For when separated, the benefit of any outlay, made by either for the improvement of its efficiency, will accrue partly to the other, until new terms for the division of the earnings of their joint work have been agreed on: whereas a single monopoly would get at once the whole reward of its enterprise.

Monopolies of this class are, however, seldom as absolute and permanent as they appear; and it may be important in the public interest that doors should be left open for the appearance of competitors. Suppose for instance that a line of steamers runs between two ports, each of which is served by only one railway: the immediate effect of a purchase of the steamers by one of the railways might probably add to the efficiency of the service without any increase of cost; and, possibly even at a lower cost. But yet such a purchase might in the long run be contrary to public interests, unless Government exerted a strong influence on the railway to prevent it from making harsh use of its monopolistic power. In the long run, it might have been better that the steamers, in independent hands, should have offered inducements to a second railway to make connection with them at the same, or some other, port¹.

¹ The Railway Act of 1854, clause 30, ordered that a railway company, when authorized to set up a line of steamers, should be required to charge the same fares to passengers on the steamers, who travelled by rival lines, as it charged to its own passengers: and the Act of 1883, clause 30, authorized any port

Sometimes a conditional monopoly is held, not by a single owner, but by a group of owners; who may act sometimes independently of one another, and sometimes in more or less stringent association. (Many such *monopolies in multiple ownership* are local: others are national, and they will call for careful study in connection with the policies of international trade. Others are based on common interests in some branch of industry or trade; which is indeed open to all, but is yet a partial monopoly for the time at least of those actually engaged in it. The most prominent instances of these are cartels, the members of which act in unison. But there are other cases of monopolies in multiple ownership; where the bond of union is very slight. They are largely associated with localized ownership of property: taxes (or rates) levied on them are often spent mainly for their benefit, and are not "onerous") something is said about them in Appendix L. But an imaginary illustration, more appropriate to this chapter, may be given here.

Suppose that there are several patents, all about equally effective for making a thing; and that there is no good method available for making it, which does not infringe one or more of these patents: also that the various patentees do not agree on terms of fusion. Each might look to get a certain monopoly revenue in excess of normal profits on his capital (remuneration for his own work being included); and push the sales of his goods at the expense of his rivals. If the industry yielded a more than proportionate increase of product to increased labour and capital, the well-known conditions of unstable equilibrium would arise: each would hope by increasing his production to undersell his rivals, and thus gain the power of still further underselling them with increased profits to himself. Thus, from a purely abstract point of view, it would appear that the

authority to claim a hearing of the charge that the railway company, or companies, which served it, placed it at a disadvantage as compared with any other port served by the same company or companies.

A somewhat similar critical case arises when the products of one place *A*, can be best marketed at another place, *B*, on the same railway. Then the carriers are likely to say that "the value of their service" is shown by the excess of the *B* prices of those products over the *A* prices: while traders will justify their *B* prices by reference to the carriers' charges. Circular reasonings of this kind will be found to add to the inherent difficulties of many problems of semi-monopolistic production, trading and transport.

III, n, 4. strongest competitor would ere long outbid all his rivals by selling close to mere cost of production, or even below: and reducing the problem to one of simple monopoly. But, in the real world, increase in the size of a business goes with increase of age, which is often a source of manifold weaknesses; and no violence is involved in supposing that several firms with about equal economies of production remain in competition. Then if a tax fixed in amount were levied on each business, the burden of the tax would remain on it, provided of course the tax were not sufficiently heavy to put a stop to the business: and the same would be true of a tax proportionate to the net monopoly profits of the business. On the other hand a tax proportionate to the amount produced, or to the gross receipts of each business would diminish production; and parts of the burden of the tax would be shifted on those who bought the product in question, and on those who produced the materials and plant needed by its producers.