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ECONOMIC DEVELOPMENT IN MODERN EUROPE

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ECONOMIC DEVELOPMENT
IN
MODERN EUROPE

BY

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1933

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PREFACE

In this sketch of economic development I have attempted something approaching the form of constitutional history. The reader must look elsewhere for the incidents of the economic narrative, and for a more extended treatment of such particular topics as commerce, credit, and labor. This book aims to present for study the institutions of the two most important branches of production, — agriculture and manufacture, and to suggest their relations to the political and social conditions of the times.

For permission to reproduce the maps showing field arrangements I am indebted to the kindness of the authors and publishers of the following books: *The English Peasantry and the Enclosure of Common Fields* by Gilbert Slater, London, Constable & Co., and *Die russissche Agrarreform* by W. D. Preyer, Jena, Gustav Fischer.

CLIVE DAY

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ECONOMIC DEVELOPMENT IN MODERN EUROPE

ECONOMIC DEVELOPMENT IN MODERN EUROPE

CHAPTER I

ENGLAND IN THE EIGHTEENTH CENTURY

Occupations about 1700

Shortly before 1700 an intelligent and well-informed Englishman, Gregory King, made an estimate of the distribution of the people in different occupations, and of their earnings in each. Recasting his figures, to make possible a comparison with the statistics of a modern census, we get for the more important branches of occupation the following results, stated in percentages of the total number employed or receiving an income:

Countries	*Agriculture*	*Manufacturing and Mining*	*Trade and Transport*
England, 1696	77	5	8
England (and Wales), 1921	7	47	21
United States, 1920. . .	26	33	18
Bulgaria, 1920	82	8	4
Poland, 1921	76	9	6

Making full allowance for inaccuracy in the figures thus compared, we find the general picture which they present confirmed by other evidence. The economic organization of England in 1700 was much more like that of the Middle Ages than that of the present day. It was in a stage of development comparable to that of a contemporary people in eastern Europe or in the Balkan peninsula. Three workers out of four were still engaged in the primary occupation of wresting a food supply from the soil.

A people living in that fashion, particularly when internal and foreign trade are undeveloped, must lead a simple life. It is impossible to give a single statistical measure by which the standard of living then and later can be compared. Gregory King, it is

true, gives estimates not only of the number of people but also of the total national income about 1700, which would make the average income per family in England then about £33, say $165, and the income per capita, say $40 a head. But these figures, stated with such appearance of precision, may be based on estimates far from the facts, and do not tell us, at best, how much the money of that time would buy. Taking one commodity, for example, the price of wheat varied in different places and different years from 3 to 6 shillings ($0.75 to $1.50) a bushel, and we do not even know just how important wheat was in the people's diet, for many ate "horse-corn," oats, peas, beans, barley, and the like. This much is certain, that the cost of living did not differ so much from the present that we need to make a great allowance; and that when all allowances are made, the standard of living then would seem to many moderns impossibly low.

Distribution of income

Gregory King gives figures which enable us to calculate the distribution of the national income among different classes of society. The figures are, of course, based on guesswork, and must not be taken too seriously, but they are at least approximations to reality and supply the most careful estimates which we have on this important subject. They are presented below, in round numbers, with recent American figures for comparison.

Group	England, 1696		United States, 1918	
	Per Cent of Population	Per Cent of Income	Per Cent of Population	Per Cent of Income
I	1+	14	1+	15
II	5	17	5	13
III	32	47	33	38
IV	62	22	61	34

Classes

The groups distinguished in the table according to their share in the national income correspond pretty closely to the accepted class divisions of the time. At the top, Group I, comprising 1 to 2% of the families in the country, were the nobility and gentry, starting with peers of the realm, both temporal lords and bishops, and run-

ning down through baronets and knights to esquires and simple gentlemen. The family income of the ordinary gentleman was set at £280. The distinguishing characteristic of this class was still, as it had been when Sir Thomas Smith described the English constitution in the sixteenth century, that members of it were able to "live idly and without manuall labour."

Groups II and III together composed the middle class. In its upper level this included merchants, of whom many had incomes exceeding those of the gentry but had no such social standing, also the upper ranks of government officials, and representatives of the professions, particularly clergymen and lawyers. Members of this class did not "live idly" but did live "without manuall labour."

Group III, the lower middle class, was much larger. It included mainly small landholders and farmers, with family incomes corresponding roughly to those of the clergymen in the group above (say about £50), but insufficient to enable them to live as gentlemen. Men in this class would have laborers to help in the work but would share in the work with them. Less numerous in this group were the representatives of trade and industry: shopkeepers and petty tradesmen, artisans, and handicraftsmen, with incomes about £40.

The fourth group, by far the most numerous, nearer two-thirds than half of the population, included some soldiers and common seamen; but was made up for the most part of manual laborers working in agriculture. King distinguished two classes among these last: the regular agricultural laborers to whom he ascribed an average *family* income of £15 a year, and below them the "Cottagers and Paupers" with a family income less than half that (£6/10*s*.). And these "Cottagers and Paupers," with the dependents in their families, formed almost one-quarter of the total population (1,300,000 out of 5,500,000)! The reader might well ask how a family could manage to survive on an income of some $35 a year, and King's answer would be that it did not. He estimated that the living expenses of all the people in this last group, comprising more than half of the population, exceeded their regular income and that they lived in part at the expense of other classes, receiving poor relief or picking up a supplement in other ways. He estimated that a supplement of 4*s*. ($1) a head, on the average, enabled them to get along.

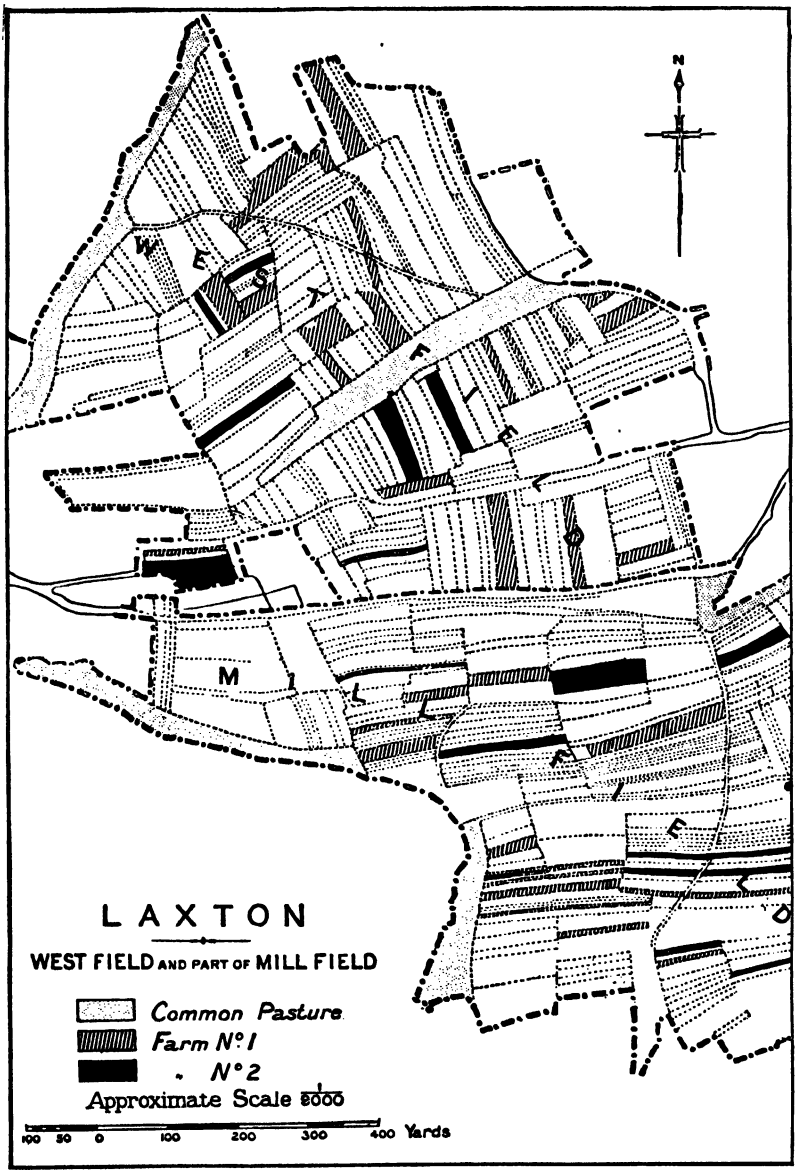
It will be necessary to return to some of the subjects touched on

above, to fill in the details of the picture, but two comments of a general nature may be made here. In the first place, "capitalism" as we know it now was not responsible for the structure of society sketched above, but rather was destined to dissolve and recast it. In the second place, England was better off than other countries with which we shall have occasion to compare it. David Hume, a shrewd observer, writing when conditions were worse than at this time, congratulated the English on their unparalleled combination of a large national income and a relatively equal distribution of it. "In this circumstance consists the great advantage of ENGLAND above any nation at present in the world, or that appears in the records of any story."

Agriculture

Agriculture, by far the most important industry in England at this time, was transformed in character in the eighteenth century. The later stages in the development, which had an important influence on the Industrial Revolution, will be considered in the next chapter. To understand the changes it is necessary to have a general idea of conditions as they were about 1700.

A large part of the country was still in "open fields," so called because of the absence of fences. Fencing was impracticable because the land belonging to a given individual did not consist of one lot but of many separate fragments scattered among the fragments belonging to others; the only dividing lines were paths or bits of turf. The accompanying plan shows part of the parish of Laxton in Nottinghamshire, of which about half the area still lay in open fields after 1900. The relatively small extent of common pasture explains the importance which the people attached to the right to let their animals graze on the stubble and fallow of the plowland, as will be explained in the next paragraph. The reader will note how the land of the two farms, distinguished in the plan, was scattered over the fields, and will realize how the size and shape of the fragments made effective cultivation difficult. A typical fragment was a strip of land, 40 rods by 4 (one acre), or by 2 (one-half acre), so that a farm of 20 acres might lie in 20 pieces or more, separated by considerable distances. This arrangement dated from very early times; it prevailed also in many countries on the Continent; and it has lasted even into the twentieth century. There is doubt as to the reasons which led to its original


N
LAXTON
WEST FIELD AND PART OF MILL FIELD
Common Pasture
Farm N°1
" N°2
Approximate Scale 1/8000
100 50 0 100 200 300 400 Yards

establishment, but there is no doubt that it had become a serious hindrance to good agriculture. Some disadvantages are obvious: waste of land, for marking the division between strips; waste of time, when a man had to go from one to another of his strips; difficulty in raising animals because of the absence of fences. The most serious disadvantage is not quite so obvious. As it was impossible to provide a separate road to each fragment, and a man often could reach a strip of his own land only by passing over the land of others, all the people had to follow the same system of agriculture, raising the same crops at the same time and in the same way. They followed still a medieval system of cropping, the three-field system.

Three-field system

Under the three-field system the plowland of the village was divided, and in this case by permanent hedges or fences, into three parts, nearly equal. One part was used for a winter grain, such as wheat or rye, sowed in the fall and reaped the next summer; one part for a legume or cereal sowed in the early spring, illustrated by the verse still current in children's games, "oats, pease, beans and barley grow"; while the third part was left fallow, to grow up in weeds and be grazed upon by the farm animals. The succession can best be illustrated by a table.

Date	*Field I*	*Field II*	*Field III*
1700	Wheat	Barley, etc.	Fallow
1701	Barley, etc.	Fallow	Wheat
1702	Fallow	Wheat	Barley, etc.

The persistence of a system like this for a period of roughly a thousand years had impoverished the soil, and still kept the mass of the people poor.

Enclosure

The disadvantages of the open-field and the three-field systems, inextricably intertwined, had led people long before 1700 to attempt to free themselves and their agriculture from these bonds. It was not easy to arrange the necessary exchanges of the strips of plowland; and when the "commons" of the village, the pasture and woodland, were to be divided, it was particularly difficult to make a distribution which gave fair recognition to the various rights of

different classes of villagers. The movement to "enclosure," the division of the village land into as many blocks as there were landholders, so that each might have his land in one piece and use it in whatever way he thought best, had gone so far that by 1700 a large part of the plowland had been enclosed. The methods and yield of agriculture were distinctly better on the enclosed land. The process of enclosure continued throughout the eighteenth century and grew greatly in importance towards its close; but a consideration of its nature and effects can better be deferred to the next chapter.

National wealth

Much of the land belonged to the ruling class, the nobility and gentry, and furnished them with the income which enabled them to live without work. Stocks and bonds were already in existence; speculation in them had caused a stock exchange panic before 1700, and was to lead to the more serious panic connected with the South Sea Bubble in 1720. All these institutions of modern investment were, however, still in their infancy, and were of interest mainly to a small part of the middle class. Agricultural land was by far the largest item in a census of national wealth; capital investments in means of transportation and of manufacture were of almost negligible importance. Even as regards commerce it is significant that a good economist, writing shortly before King, estimated the value of live stock on the land as exceeding that of all the shipping plus the sum of wares and merchandise.

While the ruling class owned a large part of the land, and so were enabled to live a life of leisure, they had no such monopoly of ownership as they were later to attain. Far exceeding them in number was a class of small landholders, who had practically full property right in their land, and hence were termed freeholders. A writer of the time thought that the freeholders of England were more extensive and were better off than those of any other country of Europe.

Doubtless to some readers this sketch of English agriculture about 1700 will seem a tangle. Open-field system, three-field system, classes of landowners: all these things have to be distinguished, yet all were combined. The truth of the matter is that any economic society *is* a tangle, in which all the people are bound together by threads of custom and contract. It is the business of the student of

history to trace the more important of these bonds, to realize their change in the course of development, and so be better prepared to understand the tangle of our contemporary civilization.

Economic organization

Carrying on the analogy of the last paragraph it may be said that most of the threads binding people together were short, that is, a man's most important relations were with his immediate neighbors. Most of the people lived in villages secluded from the outer world. A man lived and died in the tangle of the open-field and three-field systems; he knew little of more distant interests. Transportation, by which regions could be bound together, was still medieval in character. The author of *Pilgrim's Progress* is supposed to have drawn his picture of the Slough of Despond from the roads about London. Some roads were actually worse than they had been in the Middle Ages. They had been worn down by use until they were far below the level of the land, a condition reminding one of contemporary China, and suggesting what sloughs they must have been in a wet season. Some of the roads near Birmingham were worn so deep that a hay cart could pass in them without being seen. Defoe told of seeing wagons drawn by ten or twelve horses apiece, so great a number being needed to drag them. So bad were the roads that preference was given to transportation by pack animals, which were strung out like a caravan, following the bell of the leader in single file, and able to take to the side when the road became impassable. Under these conditions the charge for transporting freight was necessarily heavy. A rate of one shilling per ton-mile (to be compared with one cent a ton-mile on a modern American railroad) is instanced as typical. Obviously the movement of freight, under these conditions, would be restricted to the most necessary and most valuable wares. It follows that most goods were produced near the place where they were consumed. As the extent of the market was thus limited, there could be little specialization. We lack, of course, precise figures on which to base an account of the organization, but it is important to have an idea, even if it is inaccurate in detail, of the way a society of this sort would satisfy its economic needs. An attempt is made below, therefore, to sketch in outline a rough scheme of the organization of the period.

The village

The village, of a few hundred inhabitants, was the important unit. It must be thought of as a block only one or two miles square, shut off for the most part from the outside world. Most of the food consumed was produced within sight of the village church. Tea, sugar, and tobacco made their way into the country districts in the eighteenth century, but the ordinary villager could spare little for such luxuries. He would have his grain ground by the village miller, and his wife would seek the service of the local baker, for the simple villager could not afford to build and fire an oven merely for his own family. His cottage would be built of local material by local artisans. He would have to import glass if he could afford it, but he would get from the local blacksmith most of the ironwork he needed for house and implements.

The town

A larger block, say ten miles square and including some fifty villages, more or less, would have at its center a town, counting a few thousand instead of a few hundred inhabitants. Each town would have its regular market day, when the country people would come to do their trading, and would satisfy needs which the village workman could not meet. They would get leather tanned and curried, and would get their harness of the saddler; they might get their shoes made in the town or in the village, for the cobbler's trade was widespread. They would get casks and barrels of the cooper, possibly some furniture from the turner and cabinet maker, metal ware from the brazier and tinman. They would get here the cloth for dresses and clothes, and a few other things which had not been made in the town but had been manufactured in some place more or less distant. To pay for these things they would bring with them the surplus of their simple agriculture, and such products as they could make in their spare time: baskets, brooms, wicker-ware, and the like. The towns included some trades which served the townspeople and the people of quality in the surrounding country: tailors and dressmakers, pastry cooks and brewers. For the finer products of these artisans the village folk made little demand.

There were, of course, larger towns with more specialized trades, and on the waterways there were cities such as London and Bristol with a commerce sufficient to support a large population. In

contrast to most of the large English towns of the present day these places were populated mainly by middlemen; they lived by trade, not by manufacture. In no respect was England so different then from the present as in the subordinate position of manufacture, and the way in which manufacture was dispersed through the country instead of being concentrated in factories and factory towns. These two points need to be illustrated in some detail.

Manufacture

Reference to the table at the beginning of the chapter will show that manufacture was estimated about 1700 to occupy less than one-tenth of the people, a proportion smaller than is shown by a country of the present day in southeastern Europe. It is fair to recognize that the English figures included only those persons who gave all their time to manufacture, and did not count the great amount of work done by the agricultural population in their spare time. Yet when their work was included, and the importance of manufacture was judged by the total value added to the materials on which it worked, it fell far below agriculture. Even about 1770, when the Industrial Revolution was just beginning, a good judge set the value contributed by agriculture at more than threefold that contributed by specialized manufacture, at much more than double the industrial contribution even when the work of petty craftsmen and shopkeepers was included. The woolen industry was, as it had long been, the leading branch, providing not only the population at home with clothing materials, but making also a considerable surplus for export. Next in order of importance came the metals, then manufactures of leather, while the remaining branches (silk, cotton, flax, hemp, glass, paper, porcelain) did not, all together, reach in importance any one of the three leading branches.

Stages of industry

It is convenient to distinguish four stages of organization in the development of manufacture, and England, even in 1700, could furnish examples of all four, although the last and most highly developed, the factory system, became dominant only after the Industrial Revolution. The simplest form, that in which goods are made in the household by members of the family, was still widespread. It persists still, of course, in such activities as cooking and sewing, which are properly manufacturing operations. In an

earlier period, when incomes were small and opportunities to trade were restricted, people had in most cases to make things themselves, or go without. The reader can readily imagine what would be his choice if that alternative were put before him and he were faced by the difficulty of exercising a dozen different trades, with clumsy homemade tools. So even in the Middle Ages specialized trades grew up, carried on in the towns by handicraftsmen who supplied the immediate neighborhood with their products.

Handicraft

The typical craftsman worked in a small shop for a local market, with one or two or a few helpers at most. The modern representative is the village blacksmith or garage mechanic. In England, in 1700, a large part of the industrial work was done by people of this class; their contribution was described in the sketch above of the village and town organization.

The craftsman can keep his place when he has an assured market in the neighborhood, and has no serious problems to solve in buying and selling, and can follow time-honored methods in making his goods. But the very fact that he is a manual laborer keeps him bent over his work, and restricts his vision to that which is under his eyes. He does not see the opportunities to make advantageous purchases and advantageous sales at a distance, maybe in large quantities; he does not realize the possibilities of changes in the processes and in the form of his products; he is not able to direct workmen beyond the range of his voice. With the development of society, at different times in different trades, others saw the chance to which he was blind, stepped in and organized the trade; manufacture had advanced to a third stage, variously called the commission, the putting-out, or the merchant employer system.

Merchant employers

The active figure in this third stage was the merchant. In the course of trade he had learned to look far afield; he had made it his business to get information about the conditions of demand and supply, at different places and at different times. He knew how to overcome the difficulties of transportation. He made his profit by dealing in considerable quantities of goods, and from bitter experience he had realized that he could make a profit only by careful calculation and by keeping accurate accounts. By correspond-

ence and through agents he had established relations with many scattered people; he had "built up an organization," to use a modern phrase. He had capital in the form of liquid assets, and he knew how to extend it by credit operations. He was the prototype of the modern business man. In all these respects he was far superior to the simple craftsman. The result was inevitable; the brain-worker made the hand-worker subject to him. The merchant inserted himself between producer and consumer; the middleman took direction of the trade. In branches like the silk industry, of which the raw material was costly and imported from a great distance, the merchant early got control. He bought the raw silk, distributed it among workmen, but kept his ownership in it and paid them merely a piece-wage, then sold the product and made his profit. In the woolen branch, in which the raw material was easily got, he entered the trade from the other end, organizing the market for the finished product in distant towns or foreign countries, and giving out work to be done according to the opportunities of the market at the time. In many districts he built up an industry which had not existed before, discovering there a surplus of unoccupied labor which was available at cheap rates, and which so promised him low production costs and a good profit.

The third stage of industry, that of the merchant employer, had serious faults, as will soon appear. In a debased form it still persists and is known as the sweating system. In its time, however, roughly from 1500 to 1800, it marked a great advance, building up industries, breaking down barriers to trade, satisfying consumers' wants and giving a living, although a poor one, to multitudes of people.

Characteristics

In contrast to the factory system, as said above, the merchant employer system was marked by the dispersion of the workers. They were not gathered in one building, not even in one town; the people working for one employer would be scattered at considerable distances through town and countryside. The employer would have agents making their rounds, giving out raw material and gathering the finished product, which was brought to the merchant's warehouse to be distributed in the trade. Obviously the employer had little control over the action of the workers. He found it hard to check and improve the quality of their work.

He could not count on the quantity. He suffered constantly from embezzlement of his raw material. A special group, " endgatherers," grew up to trade in stolen wool; and so far did the evil extend that the old idea that an Englishman's house was his castle was abandoned to allow employers to search the cottages of their workers for stolen material.

The workers had their troubles also. If they seem better off than modern factory hands in that they did their work at home, when and how they pleased, the reader must not suppose that they led such an idyllic existence as is sometimes pictured. A pitifully low wage made the system possible, from the employer's standpoint, but required long hours of work, and frequently work by all in the family, if existence was to be maintained. The laborers were often obliged to take payment in kind, " truck," instead of money. They were not sure of steady work; the employer had low overhead costs as he had no factory or machinery to maintain, and simply stopped operations in dull times.

Condition of labor

In a period nearer our own times, when an interest in the working classes had sprung up which was entirely new, and the evils attending the factory system were recognized, it was supposed that these evils also were new, that they were the result of machinery, and that the period preceding the Industrial Revolution was a sort of golden age for the industrial worker. Pleasant pictures were drawn of the home life in which a man could work when and how he pleased, with his family about him, and of the village life when the women and children on a bright day would bring the spinning wheels to some favorite spot outdoors where they could spin and gossip together. The subject appealed to writers of literature rather than to students of history, and a description of it, almost altogether fanciful, was accepted as correct.

Actually, the industrial worker of this period was desperately poor. The one respect in which he appears better off than the factory laborer, his independence to work where, when, and how he pleased, was of little value if, as was often the case, he had to work all the time as best he could with the help of the whole family to make a bare living. If the worker had a little land of his own, could keep some fowls and a pig or maybe a cow, and had rights of common in the village, he would be tolerably well off. The very

fact, however, that many did combine agriculture and industry made them willing to accept a lower return for their industrial labor, and reduced wages to a pitifully low level for those dependent entirely on them.

Macaulay quoted from a broadside in the British Museum some verse which shows the feeling of the woolen workers toward the master clothiers, their employers. The master clothiers are supposed to be speaking.

> In former ages we used to give
> So that our workfolks like farmers did live;
> But the times are changed, we will make them know.
>
> . . . . .
>
> We will make them to work hard for sixpense a day,
> Though a shilling they deserve if they had their just pay;
> If at all they murmer and say 'tis too small
> We bid them choose whether they'll work at all.
> And thus we do gain all our wealth and estate,
> By many poor men that work early and late.
> Then hey for the clothing trade! *

Hours

The low wages, which made the system possible from the employer's standpoint, required laborers to work inordinately long hours to make a living. Adam Smith said: "A shepherd has much leisure, a husbandman some, a manufacturer [the current term for an industrial worker] none at all." Weavers in the seventeenth century worked from 4 A.M. to 8, 9, or 10 P.M. for 7 to 10 shillings a week. Nailers are said (1713) to have worked from 4 A.M. Monday to late on Saturday for 3 shillings. The hours of weavers in the eighteenth century are described as 14, sometimes 15 or 16, including meals. Gloucestershire weavers complained that they got only 4 pence for 16 hours' work.

Economic pressure forced parents to set the children at work at the earliest possible age. A man of the period said he would not

* As an example from the eighteenth century may be quoted "The File Hewer's Lamentation," by William Mather, living 1737–1804, and brought up to the trade of making files.

> As negroes in Virginia
> In Maryland or Guinea
> Like them I must continue
> To be both bought and sold.
> While negro ships are filling
> I ne'er can save one shilling,
> And must — which is more killing —
> A pauper die when old.

— Lloyd, *The Cutlery Trades*, 1913, p. 166.

choose to live again if he would have to endure a second childhood; those were the "days of infant slavery," "the creatures were set to work as soon as they could crawl." Daniel Defoe was told in Taunton "That there was not a Child in the Town, or in the Villages round it, of above five Years old, but, if it was not neglected by its Parents and untaught, could earn its own Bread"; likewise in Yorkshire, "scarce any Thing above four Years old but its Hands are sufficient for its own Support." The very old had to share the family task alongside the very young. A characteristic evil of the system was the payment of wages in truck instead of cash. Even in the sixteenth century a statute forbade the master clothiers to force the people they employed to take pins, girdles, and other "unprofitable wares" instead of money; "the clothiers shall pay ready money to their work people." Truck payment remained an evil throughout the period.

Housing, food

Finally, as regards the workplace, we must realize that a factory of the present day would seem a palace to the people of this period, and that even the earlier factories offered improved conditions to many of them. The word "cottage" now suggests comfort, maybe embellished with roses. In the seventeenth and eighteenth centuries it means generally what we should now term a hovel, a single room with a dirt floor and a loft above, dark and damp. It must have been intolerably dreary, especially in the short days of winter, when work had to be carried on by the light of the expensive and ineffective candle, and the scarcity of fuel forbade heating.

Regarding the food of the working classes we may refer again to Gregory King. He estimated that less than half of the population ate meat regularly. Over one-quarter were "families, who, by reason of their poverty, do not contribute to church or poor, and consequently eat not flesh above 2 days in 7"; the remainder, not much less than a quarter of the whole, were "families who receive alms, and consequently eat not flesh above once a week." Conditions varied from trade to trade, and from time to time. Norwich weavers, in the later eighteenth century, dressed like the gentry and made a point of having roast goose for Sunday dinner; the next generation of them was in abject want. Sheffield cutlers in the eighteenth century rarely saw roast meat, the most they could hope for was to "boil the pot" once a week. The cutler had

a shop and living room with a dirt floor; behind it was a lean-to smithy, and from it a ladder led to the chamber above, open to the slates; only the better class had glass windows instead of oiled paper.

Social classes

The case of the Norwich weavers, who imitated the gentry, has a significance which deserves to be explained and emphasized. England had still at this time marked class distinctions, and indeed, as will appear, they persisted into much later times. The separation of classes was, however, not nearly so sharp as it had been, or as it long continued to be in other countries of Europe. Costume was still a pretty good indication of class, and the imitation of the costume of a superior class was an indication of social ambition which was distinctly modern. A writer of about 1700 (Bernard Mandeville, whose *Fable of the Bees: or private vices publick benefits* roused a great stir) found this social emulation in many classes. The wife of the poorest laborer half starved the family to get a second-hand gown and petticoat because they were more genteel; the weaver, shoemaker, tailor, barber, " and every mean working fellow " had the impudence to dress like a tradesman of substance if he could. The system of classes based on birth and the hereditary transmission of a definite place in society was breaking down.

Even in the sixteenth century Smith complained, " As for gentlemen, they be made good cheape in England "; a man needed only to have the money to support the position, then " he shall be called master, for that is the title which men give to esquires and other gentlemen, and shall be taken for a gentleman." A writer on economics toward 1700 thought that manufacture was injured by the fact " that the Passages to other Preferments are made so open and easie." He complained of free schools " where every ordinary Man's Son is taught Latin, Greek, and Hebrew for a small matter; and then is above Manufacture." He denounced the scholarships at the universities as tempting parents to send children to follow " a sort of *Gentlemen-like* ways of living which entitle them to be called *Masters*." It was still difficult and very exceptional for a man to get out of the lower laboring class; he might imitate his betters but could hardly hope to get a place among them. English history from 1650 on is full, however, of examples of men rising from the middle class to the gentry and even

the peerage. Defoe, who knew England well, cites examples of great country houses built with money made by a merchant, a brewer, a linen draper, a stock jobber.

The old law had required a man to assume the duties of a knight if he had an estate in land of a certain size. The new practice encouraged a man to aspire to the privileges of rank if he had accumulated sufficient property to support the position. The requisite amount grew with the general increase of wealth. When Smith wrote, a man would not hope to be made a peer unless he had an annual income approaching £1,000. In the time of Mandeville, "if a Peer has not above Three or Four Thousand a Year, his Lordship is counted Poor." When Pitt declared, toward 1800, that every man with an estate of £10,000 a year had a right to a peerage he sounded, in Disraeli's opinion, the knell of a true aristocracy.

The ruling class

It is not easy to appraise the ruling class of England in this period, "that blind, selfish, indomitable aristocracy of county families, which made the British Empire and ruined a considerable proportion of the English nation." The author last quoted, R. H. Tawney, must be allowed to continue his sketch. "From the galleries of their great mansions and the walls of their old inns their calm, proud faces, set off with an occasional drunkard, stare down on us with the unshakable assurance of men who are untroubled by regrets or perplexities, men who have deserved well of their order and their descendants, and await with confidence an eternity where preserves will be closer, family settlements stricter, dependents more respectful, cards more reliable, than in this imperfect world they well can be."

The private vices and public faults of this ruling class are well known to every student of English history, and will be illustrated only in some particular respects in this book. What merits, if any, did they have?

One merit must be ascribed not to them as individuals, but to the system by which they had attained their position. Sordid and ignoble as might be the motive of men below them to struggle to attain their rank, by wealth to reach power, this motive worked with almost explosive force. Regarded merely as bait to men's senses, the life of luxury and self-indulgence stimulated to exertion

men who were too coarse to be moved by higher thoughts. The very spread between classes, so long as the gulf between them was not impassable, inspired bold men to try to work upward. These men, by their movement, broke the cohesion of old custom, and prepared society for the economic revolution of the following period.

One distinct merit, further, must be ascribed to the upper class as rulers. If they sought primarily their own selfish interests, they recognized that they were bound up with the interests of the country as a whole. They might spend their personal incomes extravagantly, but they realized that these incomes came from the labor of classes below them, and they guarded jealously the resources from which the national income flowed. They followed carefully the course of commerce, and listened with attention to merchants who could tell them how and where England might gain. They often engaged the country in war, but at least they had much less respect for military glory than for the solid material advantages to be secured when peace was made.

When the reader has followed the course of development in other countries, he will realize that even these slight merits were of inestimable value to England. If he seeks something beyond them, and inquires what positive contributions the ruling class made to the civilization of the country and the elevation of the people, he will find little. The expenditures of the central government were devoted almost entirely to the army and navy, the court, and an administration which was treated as a source of income by the rulers. To such services as education or care of the public health the government paid practically no attention. The burden of taxation was inevitably heavy in a period of frequent wars, and bore with especial weight on the lower classes. They were too poor to pay anything directly to the treasury but were reached by a system of indirect taxes which raised the price of the articles which they consumed. The condition may be illustrated by an estimate of 1756, applying to the indirect taxes on an agricultural laborer whose wages were assumed to be 5 shillings a week, or £13, say $65, for the year.

A tax of 6% on the income, such as is represented by the following figures, is easily borne by a man in comfortable circumstances, but is a very different thing to a person on the verge of destitution. Actually, it was a common assumption by the economists of the

period that the laboring class could bear no taxes at all; they were supposed to be on the very margin of subsistence, so that a tax levied on them must be shifted to others if they were to live.

Articles	£	*s.*	*d.*
Beer		4	7
Salt		3	4
Sugar, etc.		2	0
Leather		2	2
Soap and candles		1	3
Drugs, tobacco, etc.		2	6
Total		15	10

QUESTIONS

What was the relative importance of agriculture and of manufacture in England about 1700? What contemporary countries show a similar organization? How does it compare with the organization in later England and U. S.?

What is the estimate of average income per family or per capita? Compare with the following estimates of pre-war (1914) average per capita income: U. S., $335; United Kingdom, $243; France, $185; Germany, $146; Italy, $112; Spain, $54; Japan, $29.

How was the income distributed among classes? How does this distribution compare with that in the U. S.?

What were the economic and social characteristics of the different income classes?

How did England compare with other countries, as regards amount and distribution of income?

Explain the term "open fields." How many fragments were comprised in the part of Laxton shown in Farm No. 1? in Farm No. 2?

What was the three-field system? What was the succession of crops on a given field?

What was the meaning of enclosure or consolidation and how far had it progressed?

What were the most important forms of national wealth?

How did means of transportation affect the organization?

What needs were supplied in the village?

What needs were supplied by the town?

What were two important points of contrast in manufacture between then and now?

Distinguish four stages of industrial development.

What were the characteristics of handicraft, and the condition under which it survived?

In what respects was the merchant superior?

What were characteristics of manufacture under a merchant employer? What were its faults?

What were the conditions of labor, as regards hours, pay, child labor?

What were conditions as regards housing and food?
What indications were there of a change in social classes?
What were the advantages of the social-political system?
What were its faults?
Illustrate the income and taxes of an agricultural laborer.

READING

Suggestions under this head, in this and the following chapters, have been restricted to a small list of topics and references. The three books named below, which cover much the same field as that treated in the present volume, contain bibliographies of which some are quite elaborate; they will provide teachers with abundant material for the extension of the present list, and the authorities cited at the end of this volume may also be used for that purpose. Further extension is possible in two directions. The encyclopedias, notably the *Encyclopaedia of the Social Sciences* now in course of publication, contain excellent articles applicable in almost every chapter of the book. Periodical literature begins where the histories and encyclopedias leave off, and offers an indispensable source of information on contemporary conditions. The *Readers' Guide* and the *International Index*, reaching almost to date in their cumulative form of publication, offer a key to all of the popular and to some of the scientific literature. Even more important is *Social Science Abstracts*, covering the periodical literature of the whole world, and providing not only references but also brief abstracts of the articles. Nearly 20,000 articles are listed in a year, and the reader who consults the annual index under the head of the country in which he is interested, or under some general head (agriculture, reparations, etc.), will probably be amazed by the wealth of the material presented.

The three books of general application are Ogg and Sharp, *Economic Development of Modern Europe*, revised edition, N. Y., 1926; Knight, Barnes, and Flügel, *Economic History of Europe in Modern Times*, Boston, 1928; and Arthur Birnie, *An Economic History of Europe, 1760–1930*, N. Y., 1930. The books are listed in chronological order; each has its particular method of treatment, and is best for one or another purpose.

The little book which best supplements the subject of the present chapter is M. Dorothy George, *England in Transition*, London, 1931. Of use also for the present chapter, but of particular importance for the chapters following, is Gilbert Slater, *The Making of Modern England*, American revised edition, Boston, 1915; this edition contains a notably full bibliographical appendix, xix-xli. Excellent reading in addition will be found in other books by Mrs. George, and the books of J. L. and Barbara Hammond.

Conditions and classes about 1700. (George, chap. 1, pp. 1–30.)
Agriculture and industry about 1700. (Slater, Introduction, Part I, pp. xiii–xxix.)
The earlier agricultural organization. (Ogg, chap. 2, pp. 17–33.)
The village and enclosure. (George, chap. 5, pp. 106–141; Slater, chap. 2, pp. 21–48.)

The earlier industrial organization. (George, chap. 3, pp. 54–86; Ogg, chap. 3, pp. 43–60.)
The English silk industry in the eighteenth century. (G. B. Hertz in *English Historical Review*, 1909, 24: 710–727.)
Child labor. (George, chap. 7, pp. 166–191.)
Foreign trade. (Ogg, chap. 4, pp. 62–84.)
Reforms in the eighteenth century. (George, chap. 4, pp. 87–105.)

CHAPTER II

THE INDUSTRIAL REVOLUTION IN ENGLAND

Political background of industrial revolution

The year 1688, shortly before the date of Gregory King's figures, was a momentous year in the history of England and of Europe. It was the date of the "Glorious Revolution," which marked the end of absolutism and the beginning of parliamentary government in England. It was the beginning of a century-long strife between England and France, in which France wrecked its opportunities by fruitless struggle to dominate the continent of Europe, while England laid the foundations of its empire across the seas. These are, of course, matters of politics, not of economics, but an attempt will be made in this and following chapters to show that the economic development then as always was conditioned by political factors, that the English Industrial Revolution of the eighteenth century depended upon the political revolutions of the seventeenth.

In economic matters the English were still behind the leaders. They envied the Dutch their abundant capital, their credit institutions, their low rate of interest. They envied the French their manufactures and commerce. They envied even the Germans their superiority in the mining industry. England was still struggling for a place.

A century later all was changed. In the interval, indeed in one generation at the close of the century, England had risen to a new stage of economic organization, it had passed through an Industrial Revolution. In this respect it stood alone. Through a large part of the nineteenth century it was, in economic matters, the leader and the teacher of other countries in the world.

The Industrial Revolution started in the textile industry, in the manufacture of cotton goods. The course of it is sketched usually about as follows. Some ingenious persons realized the inefficiency of the old spinning wheel, by which one worker made only one

strand of yarn at a time, and invented machines in which there was a considerable number of spindles, all tended by one worker. To run these machines some power besides that furnished by the worker was desirable, if not necessary, so water wheels and shortly afterwards steam engines were applied, and the workers were grouped in factory buildings. The output, multiplied many-fold, could now be produced at lower cost, sold at lower prices, and distributed in a much broader market. The new procedure, introduced in the spinning of cotton, spread to other processes, such as weaving, and to other branches of textiles and was adopted by other industries. The result was a tremendous increase in efficiency, expansion of trade, and accumulation of wealth.

Competition

These are all accepted facts, and all are important; they will be described in greater detail in following pages. They are still only the external marks of the development. Less obvious but not less important were changes in men's ideas and men's activities without which the revolution would have been impossible. One author has summed the matter up in the following sentence: "The essence of the Industrial Revolution is the substitution of competition for the mediaeval regulations which had previously controlled the production and distribution of wealth."

What is competition? The word is constantly on our lips and yet it is not one easy to define. In the quotation above it is opposed to custom, the habits persisting in the craftsman since the time of the gilds. Another element involved in the word is that of struggle, an effort to do something better than somebody else. It suggests a certain amount of personal freedom. Laws there must be, in every civilized society, but in a competitive society these laws are reduced to a minimum. They do not tell a man what he must do; they refrain, even, so far as possible, from telling a man what he may not do. They aim to let a man do what he chooses, but force him to take the consequences. They set simple rules for a race in which the winner is spurred on by the hope of a great prize, and the losers by the fear that the devil will take the hindmost. The evils of the system are known to all of us. Those evils appear in a shocking form, in the early days of the system; illustrations of them will be given later. On the other side, the system showed, even in its early days, that capacity to unloose human

energy to which religion alone furnishes a parallel. The Industrial Revolution took place in England, not elsewhere, in the eighteenth century, not earlier or later, because in England then alone of all countries, conditions were ripe for the rise of the modern competitive system. The two things went together. Nothing less than the tremendous force unloosed, one may say created, by competition, would have availed to impose the new industrial order on a reluctant or hostile world.

Early inventions

The complexity of the development can be best illustrated by tracing the history of invention in England. The English had not demonstrated, before the eighteenth century, that capacity for invention which a later English economist (Jevons) was to claim for them. The best that a careful student of the subject can say for them is that the mechanical inventions patented " represent a fair state of mechanical activity, some ingenuity, and considerable teachableness." Both Germans and French were regarded as distinctly superior in technical ability. The one important English invention of the period was that of the stocking frame, due, it is said, to the desire of the inventor to have the undivided attention of the young lady he was courting, without the distraction of her constant knitting. The stocking frame, invented in 1589, did not get established in England, was taken over to France, and only later was brought back to the country of its origin.

Foreign ideas

If England in this period was not inventive, the country was at least getting ready to take advantage of invention. It imported many good industrial ideas, in the fashion of the time, by importing the men who had them. While the Continent suffered from religious persecutions and from the ravages of wars of religion, England offered a place of security, and a fair amount of religious toleration. The Huguenots, driven out from France in 1685 by the revocation of the Edict of Nantes, were the most striking but not the only example of alien immigrants who paid richly for the refuge furnished them. Some 80,000 Huguenots landed, of whom about half remained. The number seems small, less than one per cent of the population, but these were picked people, and acted like a ferment in the mass. Of the immigrants of the seventeenth century

it was said, " There was not a beggar among them." " Honest as a Huguenot " was a proverb; a drop of Huguenot blood in the veins was worth thousands of pounds sterling, said Huxley later.

English manufacturing industry through this period was developing to a large extent in the hands of foreign workmen. The old woolen industry was improved by them and brought to make finer cloth, the " new drapery." The finishing trades, by which cloth was dressed and dyed, were brought in from Holland. The silk manufacture was never firmly established until the French refugees came in. According to a story of the time, the French learned that a refugee was teaching the English Lustring Company the difficult art of giving luster to the finished silk. They could not get him back to France, as he was a Protestant, but tempted him to Switzerland; " when they had him there, he was soon put out of the Way, and never heard of afterwards." The English probably owed the introduction of the cotton manufacture to aliens, and certainly owed to the Dutch improvements in the looms for weaving, and the art of calico printing. The influence of the French on the development of the glass manufacture is proved by the persistence of French names for implements employed in it. Even the metal trades developed under the influence of French, Dutch, and Germans; in Sheffield, in the nineteenth century, French terms were still used for parts of a knife. The reader should not assume from this list (which could be considerably extended) that the English were completely passive, and made no contributions to industrial technique. Their woolens and worsteds came to be considered the best in Europe, for the price; foreign manufacturers tried to secure English cloth makers, and workers in some branches of the metal trades. Yet, on the whole, they had more to learn than to teach in the period preceding the Industrial Revolution. Then, of a sudden, came a flood of epoch-making inventions, " an outburst of inventive genius " it has been termed, which seem to have changed the course of the world's history. How can this extraordinary phenomenon be explained?

Theory of invention

The old theory taught that the inventions proceeded from particular men, heroes, who happened to be on the scene, and without whom history would be altogether different. It substituted one mystery for another. The modern theory is Darwinian in char-

acter. It believes that in all periods of history there have been individuals who had a strong taste and a great capacity for invention, but that their ideas commonly died with them. Either they did not express them, or at any rate they could not realize them, in an unfavorable environment. Watt or Arkwright would have amounted to little in a medieval craft gild. Research has shown, in fact, a great number of inventions which died in their infancy because they were prematurely born, and for one of these that we know there must be hundreds and thousands which we do not know, because they disappeared without leaving a trace. On the other hand, when the time is ripe, when society is really ready to make good use of inventions, they flow in from all sources: a spinning machine from a barber, a loom from a clergyman, and so on. In recent times they may be said to jostle on each other's heels. A list has been made of 148 instances in which rival inventions have been made almost simultaneously. Alexander Graham Bell applied for a patent for his telephone in the morning of February 15, 1876; only a few hours later on the same day Elisha Gray arrived at the Patent Office with almost the same idea in mind.

There was an " outburst of inventive genius " in England shortly before 1800, not because a new race of heroes had come into existence, but because a whole society had become ready to appreciate and apply inventions, to discover and stimulate them. Associations were formed, prizes were established, periodicals were founded to develop the inventive faculty. A man who, a hundred years before, would have died unknown, became a great inventor. The reader may have seen the striking change which occurs in the saturated solution of some salt when it suddenly crystallizes. At the critical point a mere accident, a grain of dust, will change the whole nature of the substance. English economic society, in 1760, was ready to crystallize in a new form. The process needed, for its start, only a slight shock; it could then run rapidly through the whole mass.

Elements in manufacture

What were the conditions under which this transformation could and did take place? The matter may be made more clear by following a ware in the course of manufacture, and thus realizing the links that must be present if the chain is to be complete.

ELEMENTS IN COURSE OF MANUFACTURE

External	*Connective*	*Internal*	*Combination*
Extractive industry	Transportation, Purchasing	Raw material, Technique, Labor, Capital, Finished ware	Management
Consumers' market	Selling, Shipping		

The external conditions may be taken for granted: sources of raw material somewhere, people somewhere who would buy the finished product. Conditions must make possible the transportation of crude material and finished ware. The successful manufacturer must make contracts of purchase and sale, which will cover all costs of shipping and handling plus the cost of manufacture, and will leave him a profit. He must know how to "make" his ware, must follow good processes and use effective tools or machinery. He must hire laborers, train them, direct them, pay them. There must be capital available to pay expenses until returns come in, and to be invested in fixed plant, buildings, and equipment; the manufacturer must be able to borrow from others to supply his own deficiencies.

Problem of origins

Not one but *all* of these links must be present to make the chain effective. Let the reader review them, one by one, and he will realize that weakness in any link would destroy the strength of the chain. The question now before us is this: what link was made so much stronger, in England after 1760, that English manufacture reached a new standard of efficiency, far surpassing that of any other country? It was certainly not any unique advantage in the supply of capital. An agrarian revolution, to be described later, did contribute to a supply of cheap labor, but did not thereby offer a decisive advantage. Most authors have sought the answer in the technical changes involved in the mechanical inventions, or have emphasized the broader market opened up by the spread of commerce. Against this last view can be cited the figures of foreign trade (pictured in a graph, page 73), showing that the expansion of commerce followed rather than preceded the great inventions.

Rise of captains of industry

At the risk of appearing to exaggerate the importance of one element in a series, I shall present here the view that England owed her Industrial Revolution to a class of men who had not previously existed there and who did not yet exist elsewhere, a class of industrial managers, " captains of industry." These men saw the opportunities offered by the economic society of the time; they found separate parts and combined them in a whole. Other countries had the parts and later, following the English example, learned how to combine them. No other country, as yet, offered similar opportunities. Old laws and customs in them stifled individual initiative, diverted men of vigor and originality from attempts to establish new forms in industry, or repressed them in any effort to accomplish that end. The reader will understand better why the Industrial Revolution came in England after he has studied the conditions then prevailing in France and other countries.

Freedom of manufacture

The Puritan revolution against the Stuart kings, in the seventeenth century, had broken the power of the crown to grant monopolies to favorites. A statute of 1624, the foundation of the present patent system, granted a monopoly limited to fourteen years, " of the sole working or making of any manner of new manufactures within this realm, to the true and first inventor and inventors of such manufactures "; with this proper exception the field was free for all to enter it. The national government even in the eighteenth century still interfered with the development of manufacture by laws of taxation and regulation which roused the wrath of Adam Smith and which seem now very burdensome, but which were freedom itself compared with conditions on the Continent.

The towns, acting through the municipal government or the gilds, attempted to maintain their medieval monopolies of trade and manufacture, but were engaged in a losing fight, and in most cases had lost their privileges by the middle of the eighteenth century. Mr. Ogle of Newcastle, forbidden by the Merchant Adventurers of that town to sell figs, replied that " if he could make profit he would not onely sell figgs, but sugar allso, and that after the figgs he had were sold he would order to London for twenty barralls more." A law case of 1724 finally decided that a custom

restricting trade in a town to members of the Gild Merchant was bad, that it was a restraint of trade in opposition to the public interest. The craftsmen rebelled against the claim of the gilds to regulate industry, and for the most part won their freedom. Gild restrictions persisted in some places and were one of the reasons why the Industrial Revolution started not in the South but in the North, where freedom and individual enterprise were more general; the coal deposits were of small importance in comparison, at the beginning of the mechanical era.

Social conditions

England differed from the continental countries not only in the amount of economic freedom. Its social organization also approached much more nearly to the modern type. The aristocracy which ruled the country was a class, not a caste; it was open to newcomers, and was rapidly becoming an aristocracy of wealth rather than of blood. A Frenchman of the period, the Abbé Coyer, wrote a book, *La noblesse commerçante*, extolling the merits of the English trading nobility. Any man, however humble his origin, could hope to rise to the very top of the social order; examples could be cited of many who did so. Again in this respect we find in England, as we do not elsewhere, a source of energy of incalculable importance, unloosing new forces in society. Economic conditions offered an opportunity, social conditions stimulated the able and ambitious to seize it. In no period of English history has a greater number of poor men risen to distinction. "Nothing has so directly contributed to the pre-eminence of Great Britain in manufactures as her race of laborious, skilful and inventive artisans, cherished as they have been by the institutions of a free country, which opened to the possessors of talents and knowledge, in however humble a station, the amplest career of honour and fortune to stimulate effort and dignify success," wrote an early historian of the Industrial Revolution.

Source of manufacturers

From every source, as one author has said, men flocked to the rising manufacture as to a newly discovered gold mine. One exception only must be made; characteristic representatives of the old order, the landed gentry, showed their unfitness for the competitive system. "There seems a fatality to attend country

gentlemen whenever they attempt trade or manufacture," wrote Arthur Young. "In England I never knew a man of landed property, with the education and habits of landed property, attempt either, but they were infallibly ruined; or if not ruined, considerably hurt by them." Many men, be it noted, entered manufacture from agriculture, left the fields to build up a factory, but they had been workers, not members of a leisure class. Men of yeoman stock established great manufactures of cotton, of iron, or pottery. Men who became rich in the cotton manufacture had worked in early life as "hatters, shoemakers, carters, weavers, or some other trade." Some men who had been merchant employers under the old system extended their activities and became manufacturers under the new system. Gott, of Leeds, the first great wool spinner, entered the trade as a capitalist, pure and simple. But in general the men who made the Industrial Revolution entered the branch in which they succeeded not from above or from the side, but from below. Only in England could a democratic revolution of this kind take place.

Functions of manufacturer

In this analysis of the leaders in the Industrial Revolution one thing is especially significant: the small number of inventors among them. There were prominent exceptions, possibly Arkwright in cotton and Darby in iron, but as a rule inventors did not succeed in managing a competitive industry. Cartwright, the clergyman who invented the power loom, used a fortune which he had inherited in the attempt to establish a business, and lost it. Radcliffe, who developed a machine for dressing the warp of cloth, failed in business two or three times. He is described as "invincibly obstinate and contracted." What the times demanded was, above all, breadth of view. If the reader will review again the elements that enter into the course of manufacture, the links in the chain, he cannot but be impressed by the variety of functions which the manufacturer must exercise. The "captain of industry" had to have all the trading ability of the merchant; on the contracts of purchase and sale into which he entered depended the success of the enterprise. He must develop markets for his increasing output. Beyond any of these mercantile activities, however, he had to exercise functions which the merchant employer of the old system had never undertaken. He had to determine the process of manu-

facture in a period of rapid technical change. He had to choose materials, implements, and machines, not simply because they were best, but because they would pay best. He had to recruit and train a labor force. The difficulty of this task can hardly be conceived by us today, after generations of experience; it is more apparent in a new country, like Russia. Laborers could not be adapted to the work, so the work must be adapted to them; the process was divided into elementary fragments, in one of which a laborer could be taught to specialize. He had to discipline and organize this labor force, make of it an effective unit. As regards capital and credit he had the needs of the merchant plus the demands of a large fixed plant, with its serious problem of depreciation. The one thing which, apparently, he needed least was the faculty of invention. He could hire inventors to work for him as, to a surprising extent, he hired technical experts to direct the details of manufacture. The combination of inventor and business man in one person has been rare in history; the combination of engineer and business man has not been common. The active leaders in the Industrial Revolution were in most cases simply business men.

Qualities of manufacturer

In the careers of these leaders two characteristics stand out prominently. One was their indomitable energy. Arkwright, the pioneer cotton spinner, worked commonly from five in the morning to nine at night. He was a severe economist of time and as he was obliged to travel much to visit his scattered factories he took the road at night in a chaise drawn by four horses. He was the model for his successors. "We all had our eyes fixed on him," said Peel later. Another characteristic was boundless ambition. Arkwright thought of buying up all the cotton in the world, to benefit by the monopoly; he dreamed of amassing a fortune equal to the English national debt. Wedgwood, who supplied all Europe with table ware, planned to introduce earthenware pipe lines first in London, then in the whole world. Boulton, the business man who made the steam engine a practical success, wrote a correspondent, "I should be glad to work for all Europe," and when the proposal to manufacture steam engines for a limited territory was presented to him replied, "It would not be worth my while to make engines for three counties only; but it might be worth my while to make for all the world."

Factories

The Industrial Revolution is sometimes characterized by one distinguishing mark, the factory system. The spread of factories in this period was, certainly, the most obvious external change. Views of the European towns in the preceding period show a few large buildings — churches, hospitals, town halls, gild halls — but nothing to indicate that local concentration of manufacturing industry which was to become one of their most characteristic features. Yet little factories had long existed. So far back as 1339 complaint was made in Bristol that weavers and other workmen were employed in the homes of their masters; a manufacturer of Gloucestershire testified in 1834 that a factory there had been used for the making of fine woolens for about 500 years past. A story or novel written about 1600 described the factory of its hero, John Winchcombe, who married his employer's widow, " a very comley auncient woman, and of reasonable wealth."

> Within one roome, being large and long,
> There stood two hundred loomes full strong.
> Two hundred men, the truth is so,
> Wrought in these loomes all in a row.
> By every one a prettie boy
> Sat making quils with mickle joy;
> And in another place hard by,
> An hundred women merrily
> Were carding hard with joyfull cheere,
> Who singing sat with voyces cleere.

There were further 200 " prettie maids " who spun, 150 children of " poore silly men " who for a penny a day and their keep picked over the wool, various cloth finishers, a complete " integrated " establishment, to use the modern phrase. The story is of no value as a record of fact, but testifies at least to the currency of the idea. Some manufactures, particularly those of glass and metal, early took on the factory form. Defoe (1738) described the Temple Mills on the Thames above London, where brass was made, cast into plates, then beaten into kettles and pans by great hammers worked by water. Even more elaborate was the silk mill at Derby, run by water and said to have included some 26,000 wheels in its mechanism. Even before the great inventions not only factories but active competition between them existed, " as, for Instance, the Struggle that has subsisted many Years between our two eminent *Fire-Engine-makers* " (1747).

Advantages of the factory

There were reasons for the rise of the factory quite distinct from any advantage to be attained by the application of machinery and the use of outside power. It offered to the manufacturer the opportunity, denied to the merchant employer, of organizing and directing his working force. "The factory system is as distinguishable from the commission [merchant employer] system as the well organized, uniformly equipped regular army from the motley volunteer militia." In a period in which the market was broadening by the spread of trade, in which competition was becoming a vital element, with great rewards for the efficient and corresponding penalties for the inefficient, the advantage of a regular working force, organized and directed on a definite plan, became more and more apparent; and this advantage could be attained only by bringing the workers together, under the eye of the supervisor and directly subject to his commands. So even in industries in which the labor was still hand work the factory was spreading, before the Industrial Revolution.

The advantage of the factory form of organization, already apparent before the application of machinery and power, was magnified many fold as those new elements were recognized. Campbell, in his book on London trades (1747), said that house painting was "at a very low ebb, on account of the methods practised by some color-shops; who have set up horse-mills to grind the colors, and sell them to noblemen and gentlemen ready mixed at a low price, and by the help of a few printed directions a house may be painted by any common laborer at one-third of the expense it would have cost before the mistery was made public." The example is trivial, but it obviously includes important elements: the broad competitive market as opposed to the local monopoly of traditional handicraft, the technical changes in the process, the superior efficiency measured by the cost to the consumer, and the displacement of labor involved.

Power and machinery

Not only could the factory system develop without machinery or power; machinery and power had been employed for centuries without leading to any important development of the factory system. Grist mills were run by water or by wind; blast furnaces were blown and forge hammers were worked by outside power:

the fulling mill established itself (against opposition, as will be seen) in the woolen industry. Already in 1719 an English author could boast that "silk stockings are wove; tobacco is cut by engine; deal boards are sawn with mills; lead is smelted by wind-furnaces," and could assert that prices of some manufactures had fallen almost one-half, without any attendant reduction in wages. But the society of the period was still not ready to accept machinery as a natural part of its economic system. Time and again attempts to introduce machinery into established trades were nullified either by the opposition of the workers, the action of the government or the unwillingness of leaders to run counter to those influences. Fulling mills were forbidden by statute, so as to provide more work for laborers. The saw mill, introduced by a Dutchman and run by wind power, "by which machine, with the sole attendance of one man and one boy as much work was sawed as twenty men can perform in the usual way . . . was afterwards put down, lest our labouring people should want employment." The author quoted, writing in 1787, did not then know of a mill of the kind in England, and for many years afterwards boards were still obtained from the labor of men in saw pits, one working from above and one from below the log. Opposition to the introduction of machinery was as strong among the people before and even after 1800 as it had been for centuries earlier; the Luddite riots of 1812 and 1816 were late manifestations of a long series of attacks by armed men aiming to destroy new machinery and discourage its introduction. Yet the use of machinery spread rapidly in this period because at last a class of men had developed who were intelligent enough to realize its possibilities, and who were strong and bold enough to fight for their realization, and because in the government the regard for the rights of property now predominated over the concern for the fortunes of the laboring class.

Gain by machinery

Anyone conversant with the economics of manufacture knows how prodigious is the gain which can, in some cases, be achieved by the introduction of power-driven machinery. At the Atlanta Cotton Exposition of 1881 some people were brought from the mountains to demonstrate the old methods which they still practiced to supply domestic needs. The labor of 2 carders, 2 spinners, and 1 weaver produced 8 yards of coarse cotton cloth in a day of

10 hours. It was estimated that the same number of persons in a factory would produce 800 yards. A machine has been devised which ties 250 knots a minute in the warp of cloth, and can do the work of 20 girls. Similar examples abound. Such comparisons are dangerous because they omit such an important factor as the labor needed to construct the machine and the engine driving it. When account is taken of this and other neglected factors, the apparent gain is much reduced. A modern economist, whose opinions are entitled to respect, estimates that the productivity of industry has been increased not 10- or 20-fold, but merely has been doubled by the application of machinery. Accepting this as a conservative estimate we have still, of course, a revolutionary change, transforming the whole organization.

The textiles

The application of machinery in its developed form, and the spread of the factory system, appeared first in the textile industry. Of man's primary wants, for food, shelter, and clothing, the last named offered by far the best opportunity for the local concentration of production, with its necessary accompaniment, the distribution of the product over a wide area. Agriculture was necessarily extensive, spreading out the producers and keeping them in movement, so making difficult the application of machinery or of power beyond that furnished by the farm animals. Building, again, was a local and dispersed industry, tied to the place of consumption. Clothing, however, comprised large value in a small bulk; the producer did not need to seek out the place of production of the primary materials or the home of the consumer; he could rely on trade to bring him the raw products and to distribute the finished goods. Clothing is not only necessary to health and comfort, it appeals also to such fundamental motives as self-respect and vanity. At the present day the ordinary family spends 10 to 15% of its income on clothing. Finally, the preparation of clothing from the raw materials is a difficult process, requiring special implements and consuming a great amount of time if all the work is done in the household.

So from the early Middle Ages the most difficult processes were turned over to professionals; among the earliest craft gilds noted in the English records were those of the weavers, fullers, shoemakers, hosiers, and glovers. Estimates of the importance of

different branches of manufacture in 1770, just at the outbreak of the Industrial Revolution, show the textiles in the lead among the organized industries. The figures aim to show the value added to the raw materials, and the total, 20.5 or 27 million pounds, should be compared with a total of 66 attributed to agriculture, to realize how far England still was from being an industrial country.

Wool	£ 7 million
Metals	6
Leather	4
Flax, hemp, glass, paper, porcelain	2
Silk, cotton	1.5
	20.5
Work of artisans and shopkeepers	6.5
Total	27.0

Early textile manufacture

In spite of its importance in the national economy, the textile industry was still primitive in its organization and methods. The raw material, usually wool or flax, was carded or combed by hand, to get the fibers cleaned and parallel. The loose band of fibers was then drawn out with a slight twist, and this again was spun into the finer and more compact yarn needed for the making of cloth. Hand implements, the distaff and spindle, were still in use, but a machine, the spinning wheel, had been introduced at the close of the Middle Ages and had become general. A spinning wheel was an ordinary part of the equipment of a cottage, for almost all of the spinning was done at home; women worked at that while the men worked in the fields. The price paid for spinning a hank (skein) of 840 yards was 1 penny. The yarn was collected from the countryside either by the agents of a merchant employer or by the weaver himself, to whom it passed for the next important operation. Weaving involved a more elaborate machine, the loom, and more strength and skill; it was performed by men, professionals, but they still worked at home or in sheds attached to the home. Only in the final processes, dyeing and finishing, was the cloth collected in little shops, embryo factories.

Spinning

Under conditions as they were then, 1 weaver needed 5 or 6 spinners to provide the yarn for his work. The balance of the industry was disturbed in 1733 by Kay's invention of the fly shuttle,

thrown between the threads of the warp not directly by the weaver's hand but by little mallets actuated by a cord. This arrangement enabled the weaver to increase both the breadth of his cloth and the speed of his work; it was so manifestly superior that it won adoption in spite of the violent opposition of those committed to the old style of loom. But the weaver now could use the product of 8 or 10 spinners. Weavers scoured the country to get the yarn needed for their livelihood. In Germany even the soldiers in barracks were set to spinning. The need of some improvement in the spinning process became a matter of common knowledge in a society which was now prepared to rationalize its problems, instead of appealing hopelessly to tradition. The Society of Arts, founded in 1754, and itself an index of the quickening of intelligent public interest, offered premiums for the suggestion of improvements in the spinning wheel, and in 1760 set the specific problem of a machine which would enable one person to spin 6 threads at once. Within a few years (1761–67) 6 different models were submitted. It is of little importance that none of them was a practical success. The times were ripe; success was bound to come. It came simultaneously from two different sources, in two different forms. The jenny of Hargreaves and the water frame of Arkwright were both put into practical operation in the spinning of cotton in 1768; they had been invented shortly before that date and were patented shortly after it. It is not possible here to describe in detail either these or other inventions or the careers of the inventors. It must suffice to say that the application of machinery to the spinning of cotton gave such a convincing demonstration of the possibilities of the new method as to make certain its extension to other processes, to other branches of the textile industry, and to other manufactures.

Weaving

The abundance of yarn supplied by the new machinery reversed the situation previously existing, and put pressure on the weaving industry, which had to turn it into cloth. The demand for weavers, working with the old hand looms, was so keen that they prospered greatly. The Bolton weavers, working on fancy muslin, dressed like members of the upper middle class, walked the streets with a cane and with a £5 note stuck in the hat band, and would not enter inns where ordinary tradesmen drank. Their prosperity did

not endure long, as will appear in the next chapter. A Kentish clergyman, Cartwright, who had never seen a weaver at work and who had no mechanical training, reasoned that if automatic machinery could be applied to spinning it was equally applicable to weaving. He got a carpenter and a smith to construct from his designs a loom to be run by power, which he patented in 1785, and which, in the hands of others with more worldly wisdom and more technical experience, was gradually introduced in competition with the work of the hand loom weavers.

Cotton and wool

The mechanical inventions were applied mainly in the cotton industry, not in the old established woolen industries.* There were two reasons for this, one technical, one historical. The cotton fiber is more uniform and is stronger than the hair of sheep, and lends itself better to mechanical manipulation. The second reason was, however, much the more important. The woolen industries had been established for centuries and were rooted deep in tradition; in form, at least, they were still strictly regulated by statutes which prescribed even the details of processes. The cotton industry had started only after 1600 and enjoyed some of the advantages of neglect. In 1750 it was still relatively unimportant, but it was flexible and open to innovation. Only after the new machinery had proved itself in the cotton manufacture was it adopted, and then slowly, in the woolen industries.

Power

In this early but decisive stage of the Industrial Revolution steam power played no part. The early factories were operated by water power or by animals. One of the earliest inventors of a spinning machine (Wyatt, 1733) assumed that power would be supplied by horses, wind, or water; the little factory in which the machine was put in operation was run, in fact, by two donkeys. Arkwright's earliest factory was run by horses; one little mill is said to have been operated by a Newfoundland dog. Water power was preferred when it was available, and Arkwright's second factory, containing several thousand spindles and serving as a model for others, was run by water.

* Strictly, the woolen industry and the worsted industry should be distinguished. The term "woolen industries" is used in the plural to include both.

If the movement destined to transform the world began and would have continued without the aid of steam, its progress would have been immeasurably slowed, of course, without the contribution of the steam engine. There followed a later period in which steam, particularly as applied to transportation, became a prime factor, and intensified many-fold the rate of advance. But the steam engine, in its developed and efficient form, was a result rather than a cause of the Industrial Revolution. The condition seems to have been the opposite of that pictured by the socialists in their "materialist interpretation of history." "The hand mill creates a society with the feudal lord," said Marx; "the steam mill a society with the industrial capitalist." It would be more nearly correct to say that feudal society made an advance beyond the hand mill impossible, that a capitalist society such as that presented by England in the eighteenth century made the steam mill inevitable.

The steam engine

There had actually been a steam engine of a sort in existence for some 1900 years. Hero of Alexandria had developed a device similar to the steam reaction turbine or the common lawn sprinkler of the present day. Society had no use for it except for such a trivial application as to turn the spit in the kitchen. By 1600 need was felt for some device to provide a water supply for houses and towns, and to pump water from mines. A crude and wasteful application of steam, Savery's engine, was used to a slight extent. After 1700 the demand for a pumping engine for the mines became more insistent, and was met by an improvement of Newcomen. He used "low-pressure" steam, so avoiding the technical difficulty of making working parts and connections perfectly tight; when the steam under a piston was condensed, a vacuum was created and the pressure of the atmosphere drove the piston down for the pumping stroke. About 100 of these engines were in use in English coal, tin, and copper mines, and a smaller number for the water supply of canals and towns. Some of them were already applied to manufacture, but their use for this purpose may be described as incidental, rather than necessary. The water power at any site was limited and irregular. In a few cases Newcomen engines were introduced which pumped water up and delivered it to an ordinary water wheel. But for any and all of these purposes the use of the

Newcomen engine was limited by its extravagance in fuel. At every stroke the cylinder was cooled by a jet of water, and had to be heated again for the next stroke at the expense of a great amount of steam. In districts distant from the coal mines, such as Cornwall, there was a question whether horses were not really a cheaper source of power than steam.

James Watt

The need of an improvement in the steam engine was obvious, and would unquestionably have been met if James Watt had never lived. He was, however, exceptionally qualified, and doubtless saved the world much time. He was a born inventor, a skilled manual worker, employed as instrument maker in the University of Glasgow, and was studying the action of steam even before he was set to repair a model of the Newcomen engine. To avoid waste he aimed to keep the cylinder always as hot as the steam entering it, an ideal impossible of accomplishment but which at least in large part he attained by the introduction of a separate condenser in which the steam was cooled, while the cylinder itself was kept hot by steam on both sides of the piston and in a jacket around it. The change seems simple; it actually was revolutionary, making practically available the enormous store of energy in coal.

Boulton and Watt

Watt was the characteristic inventor, lacking most of the qualities of the business man. He said he would "rather face a loaded cannon than settle a disputed account or make a bargain." Helpless himself to transform his invention into an industrial enterprise, and failing in his first partnership, he had the good fortune to be taken up by Boulton, a man so distinguished for his business ability that he has been nominated as the first to deserve the title "captain of industry." Boulton manufactured small metal wares at Soho near Birmingham, in a factory which for the time was immense, built to contain 600 workmen. He got power from a water wheel, but during the drought of summer had to connect 6 to 10 horses to it, an arrangement which was both costly and inconvenient. Even before Watt's invention he had thought of introducing steam power, and had corresponded with Benjamin Franklin on the subject. He was a creditor of Watt's first partner, Roebuck, and at Roebuck's bankruptcy in 1773 took over his

rights in the new invention, which had been patented in 1769. It was still, as Boulton said, "a shadow as regarded its practical utility and value." The tools for metal working were still so primitive that years of costly experiment and failure were needed to make the engine an assured success. Although engines of the new model were delivered from Soho as early as 1775, the business did not return a profit for more than 10 years later, and was carried meanwhile by the profits of Boulton's other enterprises, by the sacrifice of some of his capital, and by money which he managed to raise from private individuals and from bankers. The world would have had an improved steam engine if Watt and Boulton had never lived, but it would have had to wait long if either of them had been lacking, and it would have had to wait still longer if England had not furnished a field of business enterprise in which this expensive innovation could fight its way to success. Even in England a steam grist mill, built to advertise the new engine, was burnt by incendiaries, and a plan to start a cotton mill run by steam power in Bradford was abandoned because residents threatened legal steps against it as a "nuisance."

Application of steam

Some idea of the application of the new engine is afforded by the figures of the accompanying table, which give both the number and the horse power of engines in different uses.

STEAM ENGINES BUILT BY BOULTON AND WATT, NUMBER AND HORSE POWER

PERIOD	COTTON MILLS		IRON WORKS		WATER WORKS, CANALS, ETC.		COAL MINES		COPPER MINES		OTHER USES		TOTAL	
	No.	H.P.	No.	H.P.	No.	H.P.	No.	H.P.	No.	H.P.	No.	H.P.	No.	H.P.
1775–1785	2	9	17	428	10	164	5	100	22	440	10	97	66	1238
1785–1795	47	736	9	150	14	243	22	220	...	...	52	1349	144	2009
1795–1800	35	637	2	40	7	95	3	60	...	...	47	832	79	1296

The reciprocating action of the piston could be used directly for pumping, but had to be transformed into rotary motion for the operation of most machinery. Watt had thought of the simple crank as the obvious means to this end, but the idea had been stolen and patented by another, and he had to use the more cumbrous sun and planet motion. The conquest of the factory by

steam power was not immediate. Even in 1838, the first year for which full statistics are available, nearly one-fifth of the power in cotton and worsted factories, nearly two-fifths of the power in woolen factories, were obtained from water.

Iron

The mechanical contrivances of the present age, said an English economist (Jevons), "are mainly but the completion of a system of machine labour, in which steam is the motive power, and iron the fulcrum and the lever." The reader undoubtedly carries iron in some form on his person, is surrounded by it in his building, consumes food and manufactures in the production and transportation of which it has played an essential part. The world could not be what it is today without iron, further, without cheap iron.

In England, before the Industrial Revolution, iron was far from cheap. A ton of bar iron cost £14 to £17 ($70 to $85) by the primitive methods still in use, smelting and refining the metal by charcoal, in little enterprises employing each perhaps half a dozen people. The English industry was threatened with extinction by a growing scarcity of wood, and the larger part of the iron used in manufacture was imported from the Baltic countries, where abundant forests supplied the fuel. The salvation of the English industry was, of course, the substitution for charcoal of coal as the word is now used. This change, in the long run, effected a sweeping reversal of the conditions of production, but it encountered great difficulties due to the impurities in coal, and came about very gradually. The smelting of iron from the ore with mineral fuel was accomplished early in the eighteenth century by the use of coke, from which many of the impurities had been driven off, and by the use of a stronger blast than was needed in the charcoal furnace. The improvement of the steam engine, providing power for the blast, confirmed the victory of coke over coal in this first process. But the crude product, pig or cast iron, had still to be refined for smith's work by the use of great quantities of charcoal, and even then was inferior to the imported product. This was a period in which the attempt was made to substitute cast for wrought iron or steel in many uses, for nails, hinges, agricultural implements, even cutlery. The English iron industry now held its own, but grew very slowly.

Improvements by Cort

The turning point came in 1783–84, from improvements introduced by Cort, a naval contractor. It is significant that one of these, the puddling process, was discovered independently in two different parts of the country at dates only a few months apart; the times were ripe for the change. By the use of a reverberatory furnace, in which the metal was kept away from the fuel and subject only to hot gases, the pig iron could be cooked and worked until it had lost its surplus carbon and taken on the pasty nature of wrought iron. Then, according to Cort's new treatment, the slow hammer of the forge was used only to prepare the mass for passage between rolls, which turned out a superior product, and reduced greatly the time required. The new process, puddling and rolling, turned out 15 times the product which the tilt hammers had been able to give. The English iron industry developed rapidly from this time. Measuring by the primary product, pig iron, the output was as follows, in thousands of tons:

Year	*Amount*
1740	17
1788	68
1796	125
1806	258

Steel

That particular form of iron which has the property of taking a temper, tool steel, had formerly been produced from bar iron by an expensive and time-consuming process; the product sold for £50 to £60 ($250 to $300) a ton. A French scientist, Réaumur (inventor of the thermometer), had conceived the idea of melting in an airtight crucible the necessary ingredients, so obtaining a thorough mixture with the proper proportions of iron and carbon. In France the process was never practically applied. In England a clockmaker, Huntsman, of German or Dutch parentage, succeeded after many experiments in developing a similar process, which gave crucible or cast steel of superior quality at a reduced cost. He attained success about 1750, and it is interesting to note that in a recent year (1924) the firm of Huntsman was mentioned as having still a high reputation for its steel, and having on its books accounts still active which had been opened in the eighteenth century.

Thus English industry was now prepared to provide iron in its

three important forms, cast, wrought, and steel, in large quantities. The improvements ran parallel in time to the improvements in the textile manufacture, another testimony to the fact that the Industrial Revolution was the product of forces which permeated the whole society and was no haphazard event. There remained still one important task to be accomplished.

Machinery and the steam engine had become realities, iron and steel were provided for their construction, but machine tools to work the metals, machines to make machinery, were still lacking. The mechanical equipment was still medieval in its simplicity, all depending on the hammer, chisel, and file in the hand of the individual workman. The cylinder of Watt's first engine was not bored, it was hammered into shape; a cylinder of 18-inch diameter might be out of round by $\frac{3}{8}$ of an inch. One of the cylinders of the early engines was cast of solid block tin to facilitate manipulation. The first effective machine tool was a boring mill (1776), which would turn out a 50-inch cylinder not out of round by the "thickness of an old shilling." All of the descriptions and pictures of the early machinery show that wood was used wherever possible. Some of Arkwright's original water frames were still spinning in 1836, "the wooden teeth of the wheels and pinions having ground themselves into the best shapes for diminishing friction." When, however, the first steps had been accomplished in improving the lathe for turning round shapes and devising a planer to give flat surfaces, the results were cumulative; every machine tool made could be used for building a better one. As early as 1800 a screw-cutting lathe of the modern type had been made by Maudsley, whose regard for accuracy was evidenced by his "Lord Chancellor," a micrometer which would measure differences of $\frac{1}{1000}$ of an inch, "quite beyond all the requirements of engineering mechanism," as was said much later.

Agriculture

While the manufacture of England was being transformed, the older and still the more important occupation, agriculture, was passing also through a revolution. Slowly before 1700, rapidly after that date, changes were made in the established methods of cropping and cultivation which increased greatly the yield of land. The introduction of root crops (turnip, carrot), and of artificial grasses (clover, saintfoin), did away with the need of leaving land

fallow, since they made entirely different demands on the soil from those of the cereal crops. They supported a greatly increased number of live stock, used as draft animals and for meat; and the extra manure enhanced the yield of the cereals. Turnips, barley, clover, wheat in rotation returned from a given piece of land double or more what it had yielded under the three-field system. A book by Jethro Tull, *The Horse Hoeing Husbandry* (1733), taught the value of the cultivator, as the implement is called in America today, and had widespread influence.

The improved crop systems were not discoveries of the English; they had been practiced for a long time on the Continent, and were now imported and adapted to English conditions. Their introduction and spread in England were made possible by the important position taken there by the landed gentry. This class, not highly cultivated in the intellectual sense but endowed at least with an acute perception of its economic interests, provided with sufficient capital, and secure in its social and political position, took the lead in the transformation of agriculture as the business men did in the transformation of industry. Without "spirited proprietors," as they have been called, there would have been slow development but no such sweeping change as actually occurred.

Enclosure

Obviously the improvements could not be reconciled with the field systems inherited from the Middle Ages. In a village with open fields and intermixed properties, "unless a large body of ignorant, prejudiced, suspicious co-proprietors agreed to adopt turnips or clover, it was impossible to introduce them into cultivation. The enterprise of twenty farmers might be checked by the apathy or caution of one." The introduction of the new methods involved a sharp break with tradition, of which the outstanding feature was enclosure, the consolidation of the fragments of land so that each proprietor could surround his holding with a ring fence. Then he could manage it as he chose: introducing new crops; arranging for efficient drainage; plowing, cultivating, and manuring more thoroughly; freed from vexatious restrictions and the injuries suffered from negligent neighbors.

The process of enclosure had been going on for centuries, but very gradually. As the advantages of the new methods became evident the process quickened, and in the course of the eighteenth and early

nineteenth centuries it swept away the medieval arrangements which still persisted over a large part of England. The process of enclosure and consolidation has always presented a very difficult problem. If exact justice was to be done, the holder of, say, 20 acres in the intermixed strips should receive a compact farm larger or smaller than that acreage, graded nicely according to the particular quality of the land. Further, a villager had certain rights in meadow, pasture, wood, and waste land, and these rights, varying greatly for different classes in the village, should all be recognized in the final division. There is no need to dwell upon the ideal. The reality departed too far from it. Enclosure in England in this period was a ruthless process carried through by "spirited proprietors" who had sufficient social and political power to be able to press their own economic interests with little regard for those of others. In an early period enclosure could be effected by a secret application to Parliament, a body in which the landed gentry were the dominant class. A requirement (1774) that the villagers should be notified of the application by a notice on the church door gave but slight protection. It was a period in which the rights of property were recognized before those of persons. Consent to enclosure in a village was determined by a census of property, in which the large proprietor was given influence according to his acreage; the commissioners who administered the process were nominated by the lord of the manor, the tithe owner, and the proprietors rated according to wealth; in the division of land none went to those who had not already a clear title to land in the village. The numerous class of cottagers, living in rented quarters, who previously had kept cows, geese, or pigs, and had gathered their fuel on the common land, and the squatters who by sufferance had enjoyed similar privileges, found themselves fenced out. Just because a man already owned a large part of the land in a village he could force enclosure, and could appropriate a corresponding part of the land which previously had not been divided.

The class which suffered most from enclosure was the very large class of "laboring poor," which was now forced to rely entirely upon labor in the service of others. The changes do not seem to have entailed actual depopulation in the rural districts, but they caused shifts of population which unsettled the people. In connection with the hard times of the Napoleonic wars, and abuses in the administration of the poor laws, they helped to make a pro-

letariat, raw material for the working force of factories, and so contributed to the Industrial Revolution.

The class which gained the most from enclosure was the landed gentry, with sufficient knowledge and capital to introduce improved methods. The more modest members of this class, the simple squires, were not so well off. Forced by their social position to a life of some extravagance, many became embarrassed by debt. "There are not poorer men in the world than these gentlemen of small estates and great families."

Decline of small holders

Between the top and the bottom of the agricultural classes were the small freeholders, the yeomen, who had once been so strong and numerous that they were regarded as the mainstay of the English organization. By the middle of the nineteenth century this class had almost entirely disappeared; peasants of the kind so common in continental Europe persisted only in small numbers in a few districts. The reason for their decline appears to have been social and political rather than economic. Their position was not menaced either by the new methods or by the enclosures to which these led. If they had been content, like their ancestors, to lead a life of simple self-sufficiency, they could have held their own indefinitely. They were, however, surrounded by temptations. With the new methods large landholders could make an acre pay more than could the petty proprietor, and could offer an attractive price for the land. They would offer a price even larger than the return of the land would warrant because of the social distinction and the very practical political advantages attached to the ownership of great landed estates. Men who had made money in trade or manufacture and were ambitious to found a family sought landed property not only as the safest investment but also as the surest avenue to prominence. Alderman Thomson made a fortune in business, married his daughter to an earl, and directed in his will that his money be used for the purchase of land. The earl's property in Westmoreland was made up of 226 separate purchases from yeomen; the yield of the land was doubled, but the price paid for it was so high that the return on the investment was under 3%. During the period of high prices attending the Napoleonic wars many were forced to sell because they had incurred debts which they could liquidate in no other way. The small freeholder found

that he could make a much better living if he sold out and used the proceeds to stock a farm of considerable size. The "piddling husbandry of petty farms" was not nearly so efficient as the agriculture which could now be practiced on farms of several hundred acres. It was commonly estimated that a farmer taking the land of another needed £5 ($25) an acre for the proper provision of live stock, implements, furniture, and other items. For a farm of 300 or 400 acres, therefore, he would need £1500 to £2000 ($7500 to $10,000); the nest egg for the accumulation of this considerable capital would almost certainly come from the sale of land. In the manufacture of the period the artisan either fought his way up to the position of a capitalist manufacturer, or sank to the position of wage laborer. So in agriculture the small landholder, if he was ambitious and efficient, rose to become a capitalist employer of labor; if he was shiftless or extravagant he had to work for others.

QUESTIONS

What was the significance of the English revolution of 1688?
What is the conventional account of the Industrial Revolution?
What is competition? What new elements were introduced by it?
Illustrate the dependence of England on foreigners in technical matters.
Contrast different theories of invention.
Explain the "outburst of inventive genius" in England.
Distinguish elements in the course of manufacture.
In which element was the English advantage most marked?
In what respects did England offer more freedom than other countries?
How did the English social organization further economic progress?
From what sources were the new manufacturers derived?
Explain why inventors did not commonly succeed in business.
Illustrate characteristic qualities of the new leaders.
Were factories first introduced by the Industrial Revolution?
What were the advantages of the factory system?
Was power-driven machinery first introduced by the Industrial Revolution?
Illustrate the apparent and the real gain by machinery.
Explain why the new methods first appeared in textile manufacture.
What was the early organization of the textile manufacture?
What was the course of invention in the textile manufacture?
Why were the inventions applied to cotton rather than wool?
What was the relation of power to the Industrial Revolution?
What was the course of invention in the case of the steam engine?
What were the peculiar qualifications and the great improvement of James Watt?
What were the qualifications and contribution of Boulton?
To what uses was Watt's engine first applied and in what uses did it find an expanding field?

What improvements were effected in the English iron and steel manufacture, 1700 to 1800, and with what results?

Illustrate improvement in machine tools.

Explain the nature and advantages of the new system of rotation of crops and its relation to enclosure.

What were the theoretical difficulty and the practical process of enclosure?

What class gained, what classes lost by enclosure?

Explain the disappearance of the peasant class.

READING

The best book on the subject of this chapter is the translation of Paul Mantoux, *The Industrial Revolution*, N. Y., 1928. A teacher desiring to extend the topics below will find every chapter in that book of interest and importance. The encyclopedias also provide excellent reading on the development of different branches of manufacture (cotton, wool, iron, steel), on the steam engine, and on the careers of inventors (Arkwright, Crompton, Cartwright, Watt, etc.). Eileen Power, *The Industrial Revolution, 1757–1850* (Economic History Society, London, 1927), provides an admirable select bibliography of 30 pages, with references to other bibliographies.

The commercial revolution. (Knight, chap. 2, pp. 297–337.)

The industrial revolution. (George, chap. 6, pp. 142–165; Ogg, chap. 7, pp. 128–149; Knight, chap. 3, pp. 344–377; Birnie, chap. 1, pp. 1–13; Slater, Introd., Part 2, pp. xxix-xli.)

Comparison of conditions before and after the revolution. (George, chap. 8, pp. 192–212.)

Development of agriculture. (Ogg, chap. 6, pp. 113–124.)

Machinery in sixteenth century English industry. (Julius W. Pratt in *Journal of Political Economy*, Oct., 1914, 22 : 775–790.)

Industrial invention: heroic or systematic? (Article with that title in *Quarterly Journal of Economics*, Feb., 1926, 40 : 232–272.)

Are inventions inevitable? (W. F. Ogburn and Dorothy Thomas in *Political Science Quarterly*, March, 1922, 37 : 83–98.)

The potteries in the Industrial Revolution. (V. W. Bladen in *Economic Journal*, Supplement No. 1, Jan., 1926, pp. 117–130.)

The English silk industry in the eighteenth century. (Gerald B. Hertz in *English Historical Review*, Oct., 1909, 24 : 710–727.)

The cotton industry and the Industrial Revolution in Scotland. (W. H. Marwick in *Scottish Historical Review*, 1924, 21 : 207–218.)

The beginnings of calico printing in England. (P. J. Thomas in *English Historical Review*, April, 1924, 39 : 206–216.)

The rise of the coal trade. (R. L. Galloway in *Contemporary Review*, 1892, 62 : 569–578.)

CHAPTER III

ENGLAND IN THE NINETEENTH CENTURY

If we take the date 1769, marked by the inventions of Arkwright and Watt, as the beginning of the Industrial Revolution, we have just about a generation left at the close of the eighteenth century in which the Revolution pursued its course. That was a period of beginnings, momentous in establishing new types of organization and a new spirit of competition, but still showing little of the latent possibilities. The nineteenth century was a period of realization, in which these possibilities were developed to an extent of which the wildest imagination had not dared to dream.

Growth of population

A measure of the change is supplied by figures of population. The efficiency of an organization can be tested in a rough way by the number of people it will support on a given territory. In round millions the population of England and Wales was at different dates as follows:

Year	*Population*	*Year*	*Population*
1500	3 million	1830	14 million
1600	4 million	1850	18 million
1700	6 million	1870	23 million
1750	6 million	1890	29 million
1800	9 million	1910	36 million

When King wrote, about 1700, he expected the population to double in 600 years, and to double again in the succeeding 1200 years, so that at the date 3500 A.D., "in case the world should last so long," it would amount to 22 million, and would be incapable of further increase because there would be only 2 acres of agricultural land per head. A comparison of these estimates with the actual figures shows why we are justified in speaking of an economic "revolution" about 1800. Contemporary thinkers were not blind to the import of the change. Malthus focussed attention on it by the book published in 1798, finding the growth of population

checked by "the grinding law of necessity; misery and the fear of misery." Much later Disraeli made one of the characters in his novels ask: What was the invasion of the Roman Empire by the barbarians compared with the census figures of population? Over 300,000 strangers arrive each year! How will you feed — clothe — house them? What kingdom can stand against it?

Turning point in 1873

Answers to these questions will be attempted in the following pages. It will be shown that the Industrial Revolution initiated a growth in economic efficiency so powerful that it not only could provide for these increasing numbers but even could raise their standard of living above any known in previous history. The progress, however, was not without a check. A commercial crisis, in 1873, affecting the whole world, was a turning point. After that date, as before it, England continued to develop in population and wealth. The position of unquestioned primacy, however, which England held, both in industry and in commerce, through three-quarters of the century, was in doubt at its close. The present chapter will survey the history of the English organization up to 1873, in the period through which England led all other countries in developing the possibilities of the Industrial Revolution. The next chapter will cover the period from 1873 to 1914, in which the pace of progress appeared to slacken, measured in comparison with the advances of some other countries.

Political conditions

England entered the nineteenth century with political institutions which seem to a later generation intolerably bad. Laws were made and executed by an aristocracy of landed gentry. The House of Commons, elected by little over 15,000 voters, was in fact under the control of members of the House of Lords, who determined elections in the "rotten boroughs" by family influence and by bribes of money and office. The administration was full of sinecures, and was used as a source of profit to the ruling class. Lord Stowell wrote Peel in 1829, asking the place of Comptroller of Customs at Newcastle for his nephew. The nephew, "an excellent young man, was not able to acquire sufficient knowledge to answer the expectations of the examiners of the present day at Oxford," but his mother said he had "considerable arithmetical skill and

information," and the appointment would be "of immense importance to him as it would introduce him to a highly advantageous marriage." The later fortunes of the young man are not recorded; he serves well enough as an illustration of the conditions prevailing.

Social conditions

A deep chasm separated this leisure class from the mass of the people. The workers and the people were becoming conscious of it. A paper posted in the Manchester market place in 1801 set forth the situation in the form of a dialogue between a large group of poor laborers and a small group of the ruling class.

People. And what business do you follow in our society?
Distinguished Class. None: we are not made to work.
People. How then have you acquired your Riches?
Distinguished Class. By taking the trouble to govern you.

Writing considerably later, Disraeli pictures a delegate of the people saying to a peer, "You govern the most miserable people on the face of the globe." Are they lower than the Portuguese, Poles, Russians, Neapolitans? "Infinitely lower, for they are not only degraded, but conscious of their degradation. . . . They are sufficiently enlightened to feel they are victims."

Scattered through the country districts the agricultural workers could do little to organize resistance against this situation; sporadic agrarian outbreaks, marked by rick burning and the destruction of agricultural machinery, were of slight effect. The industrial workers, on the other hand, concentrated in the growing towns, were a real menace. Neglected by the government in regard to education, health, and moral welfare, they appear to modern eyes as rough barbarians. "Lancashire brute" was a common and appropriate appellation. A stranger, an "out-comling," was hooted in the towns and sometimes pelted with stones and brickbats. For sports they ran races naked through the streets, forced old women to race in sacks, fought "up and down," that is nearly to a finish, with kicking and throttling allowed. A crowd of them was a threat that shops might be plundered.

Reforms

Some authors think that England in the early part of the nineteenth century was on the brink of a great social revolution. The danger was averted by a concession of the ruling classes, in accept-

ing a reform of the House of Commons in 1832. It is interesting and significant that the threat which brought this concession was aimed not so much at the military as at the economic position of the government. Such movements as had occurred in the past, parades of men with pikes and with flags "Bread or Blood," could be put down by force. Army and police were powerless, however, against a movement of a new kind organized by a London tailor, Francis Place. He proposed to ruin the credit of the government and to dislocate the normal functioning of trade; he believed that the stoppage of supplies to London would, in a very few days, throw "a starving and an enraged populace" into revolution. In May, 1832, cards began to appear in windows, "No taxes paid here," and people began to worry about their food supply. The Duke of Wellington, at the head of the government, was determined still to preserve the old political system. Then Place drew up a placard, "To stop the Duke, go for Gold," and had this printed and distributed not only in London but through the country. There was a run on the Bank of England, the authorities became frightened, the duke yielded, and the Reform Bill was passed.

The Reform Bill was very far from a democratic measure, according to modern standards. It left the landed gentry still in control both of the House of Lords and of the House of Commons, although it did make the latter easier of access by members of the middle class. Its significance lay in the recognition by the ruling class that there was a power in the people which, however little it counted in constitutional forms, could not be disregarded in fact. It is no mere coincidence that the reform of the House of Commons was followed by reforms in education, in the poor law, in the municipal governments, in the protection of factory labor, in the systems of taxation and of trade regulation. The student of the period faces a difficulty in that he must appreciate some progressive elements in English legislation from this time on, while he finds still persisting in the minds of the legislators some fundamental ideas, carried over from the eighteenth century, which often determined the policy of the government and the fate of people, and which seem to us now almost shocking.

Burke's theory

We may choose for illustration a pamphlet written by Edmund Burke, addressed to the government in a time of serious dearth.

Burke was a noble thinker; we must recognize the peculiar difficulties of the time, and must note that Burke accepted charity as a Christian duty but would have it a matter of private discretion. Here are some extracts. "Labour is a commodity like every other, and rises or falls according to the demand"; * "labour must be subject to all the laws and principles of trade." We must manfully resist the idea "that it is within the competence of Government, taken as Government, or even of the rich, as rich, to supply to the poor, those necessaries which it has pleased the Divine Providence for a while to with-hold from them. We, the people, ought to be made sensible, that it is not in breaking the laws of commerce, which are the laws of nature and consequently the laws of God, that we are to place our hope of softening the divine displeasure to remove any calamity under which we suffer, or which hangs over us."

Property versus persons

The ruling class was a propertied class, the working class had practically no property. Time and again, in surveying the legislation of the period, the student is reminded of Goldsmith's line, "Laws grind the poor, and rich men rule the law." The emphasis on property, at the expense of persons, is the keynote of the period. When Fox set out to define liberty he began with property. "Freedom, according to my conception of it, consists in the safe and sacred possession of a man's property, governed by laws defined and certain; with many personal privileges, natural, civil and religious, which he cannot surrender." A committee of the House of Commons, in 1806, gave a new reading of the rights of Englishmen: "The right of every man to employ the Capital he inherits or has acquired according to his own discretion, so long as he does not infringe on the rights or property of others, is one of those privileges which the free and happy Constitution of this Country has long accustomed every Briton to consider as his birth-right." The people passively accepted this view. *John Halifax, Gentleman*, a book written by Mrs. Craik in 1857 giving a vivid picture of English life in the first half of the century, tells how John quieted a mob which was angry because a miller would not sell flour in a time of scarcity. "'It was *his* wheat, not yours. May not a man do

* The Clayton Act of Oct. 15, 1914, U. S. Statutes, 28: 730, enacted: "Sec. 6. That the labor of a human being is not a commodity or article of commerce."

what he likes with his own?'* The argument seemed to strike home. There is always a lurking sense of real justice in a mob — at least a British mob." The most extraordinary instance of the confusion of property and liberty appears in the report of a committee in 1816. A child of four years had been sold by a beggar woman for 8 guineas to serve as a chimney sweep; the sweeping of chimneys was still done by children who in some cases were forced to enter flues so small that they suffocated in them. "Is not £8 a large price?" "Oh yes, very large," replied the master sweep. "Why was so large a price asked for that boy?" "Because this is a free country." "Was he a small boy?" "Yes, very small of his age."

Rich and poor

Disraeli, the great Conservative statesman, gave to his novel *Sybil* the subtitle "The two nations," meaning by that the rich and the poor. His object was to bring the two nations together, keeping political power in the hands of an aristocracy but exercising it for the benefit of all. Most people at the time assumed the contrast of rich and poor as natural and inevitable. Some even preached it as desirable, carrying into the nineteenth century a doctrine which had been generally held in the seventeenth. An English clergyman, writing on the poor laws, represented this attitude. "It seems to be a law of nature that the poor should be to a certain degree improvident, that there may always be some to fulfil the servile, the most sordid and the most ignoble offices in the community. The stock of human happiness is thereby much increased, whilst the more delicate are not only relieved from drudgery and freed from those occasional employments which would make them miserable, but are left without interruption to pursue those callings which are suited to their various dispositions and most useful to the state." The author, who appeared on the title-page as "a Well-wisher to Mankind," thought that the poor became "reconciled to the meanest occupations . . . whilst the hope of their reward makes them chearful in the midst of all their dangers and their toils," and this "chearful" doctrine was not infrequently preached. It was losing ground, however; enlightened economists and clergymen were beginning to teach the desirability,

* The phrase, "Have I not the right to do what I like with my own?" is commonly ascribed to the Duke of Newcastle, in answer to a reproach for selling a rotten borough to the highest bidder in 1829.

from the standpoint of society, of a more equal distribution of incomes.

Social classes

Class distinctions of an earlier period persisted, although the lines of separation were not so sharp and the barriers to promotion were not so serious. John Halifax, who in the story rose from the rank of tanner's apprentice to that of gentleman, told a young lady that they were not equals, " 'and I doubt if even you yourself would wish us to be friends.' 'Why not?' 'Because you are a gentlewoman and I am a tradesman.' The news was evidently a shock to her; it could not but be, reared as she had been." She colored and remained silent.

People continued commonly not only in the same class but even in the very occupation of the father. A London doctor who gathered statistics which showed this fact reflected that in the society of the time circumstances placed " those who enjoy the great blessing of legal freedom in bonds almost as hard to break as those which bind the limbs of the slave."

A report of the time (1842) distinguished three classes in society, grouping those who might naturally sit at table together and who would intermarry: the gentry, from the peer down to the rural doctor and attorney; tradesmen, from the London merchant to the village retailer; laborers, from the skilled artisan to the pauper. The practical importance of being born into one class or the other is vividly illustrated by a table accompanying the report, which gives the " expectation of life," the average age at which people would die, under different conditions. The table is reproduced here with the figures rounded, and with the caution that they must be taken as rough estimates.

Locality	*Gentry*	*Tradesmen*	*Laborers*
London	35–45	20–30	15–25
Country	50	45	35

In tracing the history of the industrial workers it will be convenient to consider first the fortunes of those who had been trained to work by hand, and who continued to produce with simple machinery, at home or in little shops, while the factories grew up about them. They were in many cases fighting a losing fight, and their history is one of the saddest features of the period.

Hand loom weavers

The hand loom weavers had been a prosperous class in the eighteenth century; they were gradually killed off in the nineteenth, although some few actually plied their trade even after 1900. They were a prey both to the system of competition, which found in them scattered individuals easily exploited by employers and middlemen, and to the system of machinery, as the power loom was developed. Their earnings dropped to 10 and even 5 shillings a week. A surgeon investigating conditions at Preston in 1831 found earnings a little over 5 shillings, but found about a quarter of the poorest families with little over one penny per head per day for food and clothing. A government official thought that he discovered evidence of decaying intelligence among the hand loom weavers of Scotland. They had formerly supported book societies, and had read history, travel, science, and philosophy; in 1839 they were reading newspapers, *Chambers's Journal*, and Scott's novels (!). But it was in Scotland, when hand loom weavers were working 18 and 19 hours a day to earn 4 to 7 shillings a week, that a weaver gave this answer to the question whether he considered the introduction of machinery objectionable. "We do not. The weavers in general of Glasgow and its vicinity do not consider that machinery can or ought to be stopped or put down. They know perfectly well that machinery must go on, that it will go on, and that it is impossible to stop it." It was from Dumfermline in Scotland that Carnegie, a damask weaver thrown out of work by the introduction of machinery, emigrated to Pennsylvania with his son Andrew, then ten years old.

Frame work knitters

The frame work knitters, making stockings at home with a machine worked by hand, were another declining class which, little by little, was submerged. A report of 1833 described them as earning 6 or 7 shillings a week by working 14 hours a day. They were a prey to competition rather than to machinery; they bid against each other for work and offered their labor at such low rates that it was unprofitable to introduce power machinery and the factory system.

These hand trades and others like them fell a sacrifice to the new order. Some writers think that they might at least have been assured a "painless death" if the principles of later times had

prevailed, if the workers had insisted on maintaining a decent standard of living and had left the trade (as did Carnegie) when that was threatened. Scattered, unorganized, bewildered, and hopeless in a world which they did not understand, they lacked the support from above which, if it did not rescue them, might at least have alleviated their wretchedness.

The labor class

Long before 1800 there had appeared in English industry the beginnings of a labor class: a group of people destined throughout their lives to work for the profit of others, and destined to transmit this position to their children. They had not been so numerous, however, as to constitute a problem; and they did their work scattered in little shops or in their homes. The Industrial Revolution, in its outcome, made this class the most numerous in the community. It drew workers from shop and cottage into the factory, subjected them to rules fixing hours and methods of work, established a dependence which seemed to threaten their lives as individuals.

Naturally enough no one would work in a factory who could make a living outside, who was not forced to it by "the grinding law of necessity, misery and the fear of misery." Even the village cobbler looked down on a factory worker. Factories were associated in the minds of the people with the work-houses which had been used to exploit the labor of paupers. In Scotland, "the more respectable part of the surrounding inhabitants were at first averse to seek employment in the works [cotton mills], as they considered it disreputable to be employed in what they called 'a public work.'" In other Scottish mills the work people "were gradually moulded into a respectable community"; "the better part of the surrounding population were ultimately attracted to the work"; in 1843 "the population connected with the works are much respected by the population of the surrounding country, and associate freely with those of their own grade; and intermarriages with the agricultural population are not infrequent."

Factories

Physical conditions in the early factories would in themselves explain the reluctance of workers to enter. Ceilings were low; one of Arkwright's mills which lasted into the later period had to have every second floor removed to meet the later requirements of air

space. Windows were small, and were often kept closed to retain the moisture desired for textile work. The air was bad at best and became almost intolerable when candles or lamps were lighted for the hours of darkness, so long in a northern latitude. Roebuck wrote his wife from Glasgow in 1838 that he had seen a cotton mill, "a sight that froze my blood. The place was full of women, young, all of them, some large with child, and obliged to stand twelve hours each day. . . . The heat was excessive in some of the rooms, the stink pestiferous, and in all an atmosphere of cotton flue. I nearly fainted." *

Hours

The hours of work in the mill described by Roebuck began at 5 in the morning and closed at 7 at night, with 2 hours off for meals. In the Manchester district, 1825, the working day commonly extended from 6 A.M. to 8 P.M., with half an hour off for breakfast, and an hour for dinner; in the Bradford district, about the same time, the hours were from 6 A.M. to 7 P.M., with no pause for breakfast and half an hour for dinner. Factory girls would subscribe to pay a man who went through the dark streets in the early morning, touching their windows with a pole, to warn them that it was time to get up. Intolerably long as these hours seem, they were no worse than the workers had been used to in handicraft or in cottage industry, and they were exceeded at this time in countries on the Continent.

Wages

It is impossible to state, with any assurance, the average wage paid. A government official, writing in 1839, put it at 10/6 (say $2.65) per week per head in a Lancashire factory. This was less than a journeyman had been paid in the eighteenth century, but this average applied to all employees, men, women, and children, and employment was open now not only to the head but also to other members of the family. Family earnings had certainly increased. Growth in consumption of such articles as tea, sugar, and bacon confirms that fact. Pitifully small as the wages seem, they were, at least, higher than those paid to factory workers at the time in other European countries. An element of uncertainty

* Yet Roebuck opposed factory regulation and in a speech in the House of Commons in 1844 said, "It won't do to come down to this House with exaggerated descriptions of misery, of want and of suffering. I deny them all." "Oh, Oh!" from the House. Hutchins and Harrison, *History of Factory Legislation*, 1903, p. 91. Cf. Wallas, *Life of Place*, p. 174.

attaches to any figures which could be cited, in that the nominal wage was subject to reduction by fines, and too often was paid in truck which the worker had to take at exaggerated prices. John Bright, in a letter written about 1842, said: "Bolling of Bolton gives his men a key of a house when they come to work for him, and they pay rent whether they occupy or not."

Child labor

A feature of the new factory system which is presented in touching form in Mrs. Browning's "Cry of the Children" (1844), and which has horrified a later generation, is the suffering of the young, set to work by public authority (overseers of the poor) or by their parents. The textile factories offered much work which children could do, and were eager to employ workers who were at the same time docile and cheap. Over one-third of the factory operatives in England, about 1835, were young persons, of whom half were under 14 years of age. The cotton mills at Warrington, 1818, working from 5:30 in the morning to 8:30 at night, employed children of whom many were under 8 and some under 6 years of age. The children were called out of bed at 5 and reached home again at 9; they were clad in rags or half naked. The effect on the young generation, both physical and moral, can better be imagined than described. A feature which to us now is perhaps the most shocking is the contemporary defense of the practice. Children's work was pictured as really beneficial; "it is rendered a comfort by the regular hours of rising from and retiring to bed, and the most systematic regulation by which refreshments are brought to them." One author asserted that "juvenile labour . . . in factories is in fact a national blessing." Here again, however, we must be on our guard against a misinterpretation. However bad the facts (and their evil can hardly be exaggerated), they were not the fruit of the factory system. They had existed in a form fully as bad in the period before the Industrial Revolution and they persisted in industries outside the factory system. Actually, as will appear, the spread of the factory system made it possible to remedy the evil by legislation.

Contemporary criticism

John Stuart Mill, who in his sympathy for the laboring class struck a new note in political economy, wrote in 1848: "I confess

I am not charmed with the ideal of life held out by those who think that the normal state of human beings is that of struggling to get on; that the trampling, crushing, elbowing and treading on each other's heels, which form the existing type of social life, are the most desirable lot of human kind, or anything but the disagreeable symptoms of one of the phases of human progress." "Hitherto it is questionable if all the mechanical inventions yet made have lightened the day's toil of any human being. They have enabled a greater population to live the same life of drudgery and imprisonment." The status of the factory worker was often compared to that of the slave. A West Indian slave master said: "I have always thought myself disgraced by being the owner of slaves, but we never in the West Indies thought it possible for any human being to be so cruel as to require a child of nine years old to work twelve and a half hours a day." Robert Owen, an English manufacturer wrote regarding Jamaica: "The slaves . . . are better dressed, more independent in their look, person and manner, and are greatly more free from corroding care and anxiety than a large portion of the working classes in England, Scotland and Ireland." Disraeli made one of his characters say: "There is more serfdom in England now than at any time since the Conquest . . . there is no comfort to cheer and no sentiment to hallow the Home."

Actually, although Mill exaggerated when he said that the new system "had not lightened the day's toil of any human being," and although the working people were in some respects better off than before, there seems little doubt that if we had any measure of happiness we should find this new generation depressed far below its predecessors. We must judge the period, in Mill's words, as "one of the phases of human progress," tolerable only as a stepping-stone to something better.

Town life

The difficulties of the transition were intensified by the migration from the country districts to the towns, from the life of the fields to the life of the factory and city streets. The census of 1851 showed for the first time nearly equal distribution in rural and in urban districts. The towns were not ready and could not be made ready to accommodate the flood of newcomers. A report of 1840, on the Health of Towns, gives a frightful picture of the conditions. In Liverpool one-fifth of the working classes, in Manchester over

one-eighth, lived in cellars, most of them "dark, damp, confined, ill-ventilated and dirty." A Liverpool doctor testified that he had known four families to live in one room about 10 feet square: "that is not a very frequent occurrence; in cellars frequently that is the case." A London official testified: "It is no uncommon thing to find five or six families in one room. I have seen a donkey in the same room; and I have seen, upon another occasion, pigs living in the same room; and also stale fish." Provisions for the supply of water and the disposal of sewage were still rudimentary, and the filth was indescribable. Typhus fever, a filth disease, raged persistently; it never left Glasgow, which was one of the worst of the towns as regards housing. A fever doctor of London stated that it would be false to say that no more attention to health was paid in building houses for human beings than in making sties for pigs; the pigs got more attention because they were the property of an owner who had an interest in them! The table of average age at death, on a previous page, is an awful indictment of the conditions of the time. One author estimated that every individual in Lancashire, on the average, lost 19 years of life by preventable disease. The committee which reported on these conditions said that it was painful to contemplate, in the midst of an opulent community, "the instruments by whose hands these riches were created, condemned for no fault of their own, to the evils so justly complained of, and placed in situations when it is almost impracticable for them to preserve health or decency of deportment, or to keep themselves and their children from moral and physical contamination; to require them to be clean, sober, cheerful, contented, under such circumstances would be a vain and unreasonable expectation."

The concentration of workers in factories, evil as were in many ways its results, contained in itself, nevertheless, new elements of hope for the future. It facilitated the association of workers to represent their particular interests, and it made possible some supervision and regulation by the government.

Organization of labor

From early times there had been "conspiracies" and "lawless clubs" of workers, but the first trade unions, permanent associations of wage earners to maintain and improve the conditions of employment, did not establish themselves until after 1700. Through the greater part of the eighteenth century they remained

obscure and relatively unimportant. The government of that period still proposed to represent the interests of the working classes. Toward 1800 two changes of importance were felt. The government adopted the principle of *laisser faire* and refused now to determine disputes over wages; at the same time it became nervous about the possible dangers presented by free associations of workingmen. Acts of 1799 and 1800 provided for the summary trial and for the imprisonment of workmen who associated themselves to obtain advance of wages, reduction of hours, or any other change in the conditions of employment. Thus in the full tide of the Industrial Revolution the government which had ceased to provide protection refused to allow the workers to protect themselves in the only way in which they could, by association. This action can hardly be excused; it can be explained by fear of revolutionary movements while the war against Napoleon was in progress. The government frankly followed class interests. It allowed employers to combine to depress wages, and to circulate black-lists, while it savagely attacked combinations of employees. The magistrates did not even pretend to be impartial. "Justice was entirely out of the question; the working-men could seldom obtain a hearing before a magistrate — never without impatience and insult; and never could they calculate on even an approximation to a rational conclusion . . . the gross injustice, the foul invective and terrible punishments inflicted would not . . . be credited."

Trade unions

Francis Place, the London tailor from whom this quotation is made, managed to obtain the repeal of the laws against labor combinations in 1824–25. Henceforth a combination for the sole purpose of fixing wages or hours was legal. The term "trade union" now came into use and labor organization extended greatly. The new unions retained some of the characteristics of secret societies, the ritual and initiation ceremonies; they used the weapons of the strike and boycott with a good deal of violence and intimidation; "sometimes feared and hated by the propertied classes; sometimes merely despised; always oppressed and miserably poor." They were in the awkward period of infancy, learning only by bitter experience. Their field of freedom was small, as both law and judges were against them so soon as they overstepped the narrow limits allowed by the statutes of 1825.

Under the old law of master and servant the laborers of the period resembled a subject class. Under the influence of the "wage-fund theory" economists taught that the unions were really opposed to the interests of labor, that an increase of wages for one group of laborers could be obtained only at the expense of other laborers. The unions fought their way up against difficulties which seemed insuperable. Only at the very end of the period, 1875, did they win a fairly secure position. The statute of that year was significant in its very title, "Employers and Workmen Act," instead of the old "master and servant." It made employers and workmen equal parties to a contract. It removed the effects of a court decision which made unions illegal, as acting in restraint of trade, even if they were not criminal; it permitted peaceful picketing, and repealed the provisions of the criminal law under which, for example, seven women had been imprisoned for saying "Bah!" to a blackleg. Trade unions had now so large a membership and were so well organized that even in politics they had to be regarded. They could look forward to the coming period with confidence that now at last they could effectively represent the interests of labor.

In this same period, the first three-quarters of the century, the government itself recognized, little by little, its responsibility for the protection of laborers against exploitation under the new system of competition. Curiously enough we have again at the very end of the period a law which summed up and extended previous legislation and could be taken as a charter of the factory worker for the future, the Factory and Workshops Act of 1878.

Factory acts

The first factory act, passed in 1802, went but a little way in its general provisions, requiring textile factories of any size to be whitewashed twice a year, and to have tolerable window openings. It applied for the most part to the parish apprentices, the children of poor parents who were shipped off in gangs to work in the factories. They were to work not over 12 hours a day, not at all at night; were to be taught the elements of reading, writing, and arithmetic; they were to have a fresh suit of clothes once a year, and were to sleep not more than two in a bed. An extension of the act, to make it apply to "free" children, was vigorously opposed by the manufacturers and was obtained only in 1819, when the

employment of any child under 9 years in a cotton mill was prohibited. This act was, like the other, of little importance, since no provisions were made for a corps of inspectors to see that it was carried out. The experience of many countries has proved that in matters of this kind good laws are of no avail unless they are administered by a staff of trained officials. In this respect an act of 1833 marked a turning point, as it provided for salaried inspectors to execute the law. Even so, however, it proved extraordinarily difficult to prevent the employment of children under nine years of age, who were sent to the mill by their parents, armed with baptismal certificates, extracts from family Bibles, certificates purchased from other children or provided by a dentist or a cow-doctor, to prove that they were over age. Provisions for education of the children were similarly hard to execute. An inspector found one school held in the boiler room by the stoker, when he was not tending the fire; in another case a school voucher was signed with the teacher's mark, as he was unable to read or write! The reports of the inspectors furnished such convincing evidence of the need of regulation that progress was persistent, although uneven, from this time on, and regulation was extended from textile factories to others, and to mines. An epoch in the development was marked by the passage in 1847 of an act which limited the working hours of women and young persons in textile factories to 10 in the day. As other laws were passed to confirm and extend this, and as it was unprofitable to keep men at work when a large part of the force was dismissed, the ten-hour day became normal in the factory industry. The English, first to introduce the factory system, were the first to face the problem of its regulation. Slow and inadequate as seems the progress, judged by the conditions which needed correction, the laws were little by little worked into effective form, and served as models for other countries to follow. How complex was the problem may be judged from the act of 1878, which combined many previous laws into a consistent whole; the text of this act covered 65 pages, and the mere table of contents filled 8.

Agriculture to 1846

When Gregory King wrote, about 1700, three-quarters of the English people were occupied in agriculture, and the country at that time and through most of the eighteenth century produced a surplus of food for export. The Industrial Revolution changed the

balance. About 1800 the proportion in agriculture had declined to something over a third, and a bad season implied a serious dearth. The price of wheat, which had been considerably below 48*s.* a quarter (say, $1.50 a bushel; a quarter contains 8 bushels), rose to 80*s.* and above. In 1801 it reached the price of 155*s.* (nearly $5 a bushel). In this period of the Napoleonic wars the fluctuations in price were tremendous; in 1804 the price had dropped below 50*s.* The speculative possibilities tempted small landowners to sell out, and use the capital to rent large farms; some made fortunes and many were ruined. The corn law of 1815 protected the home market from imports unless the price should rise above 80*s.* (say, $2.50 a bushel), but in fact it rarely reached that figure, and through most of the century, 1820 to 1880, it ranged in general from 50 to 60*s.* (roughly, $1.50 to $2 a bushel). This was the period in which the large landowners confirmed their position by buying out the remnant of the freeholder class. The number employed in agriculture continued to increase slowly up to the middle of the century, when it formed about a fifth of the total; from that point it began to shrink, not only relatively but absolutely. The repeal of the corn laws in 1846 was significant in marking the acceptance by England of the fact that it could not hope to be self-sufficient in the supply of food, but it had no great immediate effect. Only after 1873 did the improvements in means of transportation open the English market fully to the cheap food of North America and of other continents.

Ownership of land

At this time (about 1873), the distribution of landed property in England and Wales had taken the form pictured in the accompanying table.

Class	*Number of Owners*	*Acres* (Millions)	*Typical Estate* (Acres)
Peerage	400	5.7	10,000
Great landowners	1,288	8.5	3,000
Squires	2,529	4.3	1,000
Greater yeomen	9,585	4.8	500
Lesser yeomen	24,412	4.1	200
Other	934,797	7.0	
Total	973,011	34.5	

The table shows an extraordinary concentration of landed property. More than half of the area of England and Wales was owned

by about 4,000 proprietors. The class of small freeholders had practically disappeared. Representatives of it still existed, for example, in Lincolnshire, but an American student who searched for them in 1899 found only a scattering few. Under the head of "Other" in the table came a large amount of waste, and land owned by public bodies; peasant proprietors, as a class, were negligible. The figures refer only to England and Wales. If they were stretched to cover the whole United Kingdom the concentration would appear even more marked, and the correspondence of landed property with social and political prominence would be striking. Taking representatives of different ranks in the peerage, a duke owned a typical estate of some 100,000 acres, a marquis one of 50,000, an earl one of 30,000, and a viscount or baron one of 10,000.

Reason for large estates

These large estates were not economically profitable, as will be shown later. They had to be protected against dispersion by an elaborate system of laws (entails) and customs (family settlements). The motives which led to their establishment and maintenance were social and political. In industrial England of the nineteenth century, as in feudal England of the Middle Ages, the ownership of a considerable estate in land brought social prestige and political influence. Country gentlemen almost engrossed the House of Lords, and predominated in the House of Commons. In local government (before 1888) they were supreme. The squire of a parish was "invested with an authority over its inhabitants, which neither the Saxon chief, nor the Norman lord, in the fullness of his power, ever had the right of exercising." The English country house, so often described in novels of the period, had become an important institution.

If England had suffered in the past from the selfishness and the narrowness of the ruling class of country gentlemen, it had reason as time went on to recognize the importance of the service which they could render. In the difficult period of developing "big business" and world commerce, this leisure class furnished political leaders ruled by ideals of public service, of absolute integrity, intelligent if not inspired, whom the rest of the world might well envy. They governed England in its prime, and if, as seems probable, their power passed with the World War, not the least of the English problems is to provide worthy successors to them.

Farmers

If the English landed system offered great political benefits, it involved difficulties in morals, sufficiently exploited in novels and society newspapers, and some distinct economic and social disadvantages. The proprietor of a large estate might himself superintend the cultivation of the "home farm," but necessarily had to leave the management of most of his property to others. Most of the agricultural area, perhaps five-sixths of the total, was rented to farmers, who supplied the capital ($50 to $100 an acre) needed for the intensive cultivation which returned wheat crops of 30 bushels an acre. The separation of ownership and management is in itself undesirable, and the evils inherent in such a system appeared to be intensified by the peculiar terms on which the farmers held the land. Few held long-term leases; most of them were tenants at will, subject to summary eviction without compensation for any permanent improvements which they had made. In theory such a system was thoroughly bad. In practice it worked tolerably well; most landlords exercised their power not only with justice but even with generous consideration. Their attitude alleviated to some extent another bad feature of the agricultural system, the existence of a large and depressed class of agricultural laborers.

Laborers

The typical farm was of considerable size, 200 acres more or less, and for every 100 acres employed several men. In contrast with the few great landlords at the apex of the social pyramid was at the base a class of nearly a million who earned at best a bare subsistence. Many of them actually lived on less than was paid for the support of paupers. An investigation (1907) showed wages of 15*s*. to 20*s*. a week, including all earnings and payments in kind. These were averages for different counties; in individual cases the weekly earnings were 12*s*. ($3) or even less. Asked how a family could be supported on such an income the answers were: "We don't live, we only linger"; "You can't call it living, it's a dragging of yourself along"; "I couldn't tell you how we do live; it's a mystery." Asked how a neighbor managed, the answer was, "Oh, she died!" Dwelling in old cottages, picturesque but unsanitary, eating the simplest fare, with meat, butter, or eggs coveted luxuries, unable to save and faced by the prospect of the

poorhouse in old age, the class of agricultural laborers entered the twentieth century depressed under conditions which gave it but little share in the progress of civilization. An alleviation, at least, of its situation, was effected during and after the war by the action of wage boards, which raised wages some 20%.

Decline after 1873

Even the upper classes in the agricultural organization suffered, after their kind, from an agricultural crisis which affected all western Europe when cheap grain from the United States, Russia, India, and other countries entered the market. The price of wheat fell below 30*s.* a quarter (say, $1 a bushel), half what it had been, and with it declined the rent of landlords and the profits of farmers. The price of land, comparing records of sales, 1875 and 1900, declined a half. The Holkham estate of Lord Leicester, on which more than a million pounds had been spent, returned in 1891 a sum representing 2% on the improvements, nothing on the outlay for the purchase of the land. When the Duke of Bedford sold the Thorney estate of 20,000 acres in Cambridgeshire, in 1901, similar figures of yield were published. The golden days of the landed gentry had passed. Changes in the law weakened the restrictions of entail and settlement, by which the aristocracy had sought to keep land in the family, and sales of old family estates, which had been only occasional before 1914, became common after 1918. The journals read by the upper class were full of advertisements of fine old houses and landed properties now in the market. Land which had once returned a generous income had become a luxury too costly to be retained under the burden of income and inheritance taxes. The process of deflation was inevitably slow and painful. Naturally it gave rise to a demand for agricultural protection, but a policy which would raise the price of food could not conceivably be accepted by the mass of the English voters.

QUESTIONS

How did the rate of growth of population in the nineteenth century compare with that of previous centuries? with King's forecasts? What questions did it raise?

In what sense did the crisis of 1873 mark a turning point?

What were the political conditions about 1800?

What were the social conditions?

What new tactics forced parliamentary reform in 1832?

What other reforms followed?

What was Burke's theory of labor?

Illustrate the superiority of property to persons.

Illustrate the persistence of old theories of the poor.

Illustrate the character and importance of class distinctions.

Describe and explain the condition of the hand-loom weavers, of the framework knitters. Were these conditions inevitable?

What constitutes a labor class? How did the Industrial Revolution affect labor?

What was the popular opinion of the factories?

What was the physical condition of early factories?

What were typical working hours?

What were typical wages? Compare wages and family earnings with those of the preceding period.

Illustrate conditions and contemporary views of child labor.

Illustrate contemporary criticism of conditions.

Do figures of earnings or food give a sure index of happiness? Illustrate conditions of life in towns.

Distinguish the significance, in the history of labor organization, of the approximate dates 1700, 1800, 1825, 1875.

Describe and explain the attitude of the government to labor about 1800.

What was the character of trade unions after 1825?

What features marked the act of 1875 as a turning point?

Distinguish the significance of the factory acts of 1802, 1833, 1847, and 1878.

What were the features of the act of 1802, and why was it not of practical importance?

What was the course of agriculture to 1873?

Illustrate the concentration of land ownership, and its connection with social rank.

Explain the existence and persistence of the large estates.

Under what conditions was agriculture operated?

What were the conditions of the agricultural laborers?

What were the cause and results of the agricultural crisis after 1873, and the effects on large landed estates?

READING

Depression following Napoleonic wars. (Slater, chap. 1, pp. 1–20.)

The factory system. (Knight, chap. 4, pp. 380–400; Slater, chap. 2, pp. 49–59; Hutt in *Economica*, March, 1926, 16: 78–93.)

Industrial development to 1879. (Slater, chaps. 10, 16, pp. 127–135, 191–200.)

Reforms to 1832. (Slater, chaps. 4–6, pp. 60–95.)

Reforms after 1832. (Slater, chaps. 7–8, pp. 96–118.)

Public health and municipal development. (Slater, chaps. 13, 18, pp. 160–173, 213–227.)

Public elementary education. (Slater, chap. 15, pp. 182–190.)

Development of transportation. (Ogg, chap. 11, pp. 227–242; Birnie, chap. 3, pp. 34–50.)

The free trade movement. (Slater, chap. 11, pp. 135–148; Ogg, chap. 12, pp. 246–256; Birnie, chap. 5, pp. 65–81.)

The labor movement. (Birnie, chap. 9, pp. 140–159; Ogg, chap. 19, pp. 400–412; Slater, chaps. 12, 17, pp. 149–150, 201–212.)

Labor legislation. (Birnie, chap. 12, pp. 199–213; Ogg, chap. 17, pp. 355–368; Knight, chap. 4, pp. 400–409; Slater, chap. 9, pp. 119–126.)

New economic ideas. (Knight, chap. 4, pp. 410–433.)

Socialism. (Birnie, chap. 7, pp. 106–125; Ogg, chap. 21, pp. 457–482.)

Labor in politics. (Birnie, chap. 8, pp. 126–139.)

Coöperation, profit-sharing, etc. (Birnie, chaps. 10, 11, pp. 160–198.)

English agriculture in the nineteenth century. (Knight, chap. 5, pp. 436–456; Ogg, chap. 8, pp. 152–176.)

The agricultural crisis. (*Edinburgh Review*, 1893, 177 : 216–246; *Quarterly Review*, 1893, 176 : 521–548; *Economic Journal*, 1893, 3 : 341–407, 570–583.)

CHAPTER IV

ENGLISH TRADE AND MANUFACTURE, 1873–1914

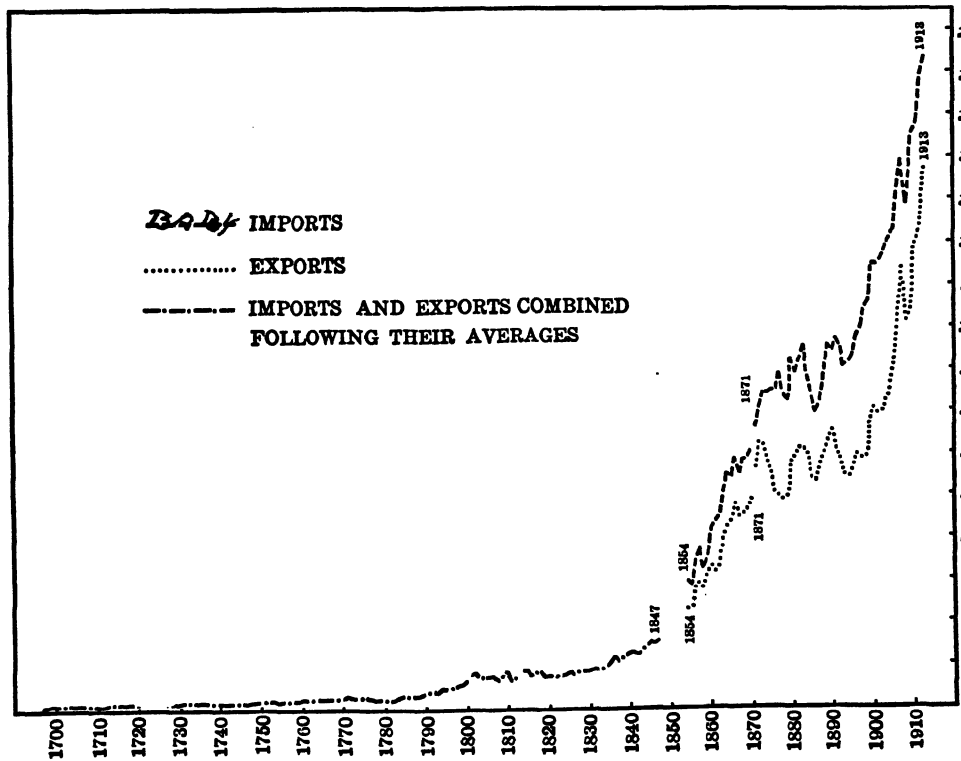
Foreign trade

The revolution in industry, sketched in preceding chapters, was followed by a revolution in commerce. An accompanying chart gives a striking picture of the expansion of English foreign trade in the nineteenth century, particularly in its latter part when the application of steam to transportation on land and sea brought all parts of the world into economic propinquity. Measuring the trade by the unit of value, the pound sterling, it grew 12-fold in the course of the century, and if account be taken of change in the purchasing power of money the growth was actually some 24-fold! Although it is impossible in this book to treat in detail the history of commerce, it is obvious that a change of such sweeping magnitude must have been vitally connected with the development of the organization of production in England, and demands attention here.

In the two preceding centuries England had built up a world empire in which commerce followed the flag. It would be a mistake, however, to assume that the Industrial Revolution was a consequence of this imperial development or even of the commercial development which attended it. The application of power machinery to manufacture would have come to pass in England if America had never been discovered. When the new movement had once started, however, the startling increase in industrial efficiency demanded ever-growing markets for the product, and ever-increasing supplies of raw material for the producers. England specialized more and more as an industrial country, and staked its fortunes on a trade which spread to all parts of the world.

Exports and imports, 1800

At the opening of the century England was already committed to an industrial career. The question of the union of Great Britain and Ireland, just before 1800, led to a study of British trade rela-



English Foreign Trade, 1700–1913.

Down to 1847 the difference between imports and exports is so small, on the scale of the map, that the two curves are merged.

The curve showing imports is based on official values to 1846, computed real values 1854–1870, declared values 1871 ff.

The curve showing exports includes re-exports and is based on official values to 1800, declared values since then. Period 1848–1853 is omitted because figures for re-exports were not compiled.

tions, and provided the figures which are presented below. Stating all figures in millions of pounds sterling, the total exports of England (Great Britain) were 31. The old-established woolen industries contributed the largest item, 8.4; next came manufactures of cotton, 4.1, and of iron and steel, 2.1. Together these three branches of manufacture contributed nearly half of the total exports; the main lines of English industry and trade throughout the nineteenth century were already fixed. Other manufactures (haberdashery, 1.5; linens, 1.2; silks, 0.6; etc.) were of secondary importance. The raw materials which had been the staples of the English export trade in the Middle Ages, wool, lead, and tin, were now of small account, but one new item in this class appeared, which was destined to play a great part later, coal, 0.3.

On the other side of the balance sheet manufactures made up but a small part of the imports. If we exclude linens, 3.1, as the greater part of these (2.6) came from Ireland and would not later be counted in foreign trade, there was only one item of importance among articles manufactured for consumption, piece goods from India, 1.6; the English still got their finest fabrics from Indian looms. Dyestuffs, 1.0, bar iron, 0.9, and linen yarns, 0.9, were destined for further use in manufacture, as were the raw materials, cotton, 2.3, hemp, 1.0, silk, flax, and wool. By far the largest class in the imports, over three-fourths in value of the total of 42.6, was composed of articles of food and drink. "Groceries" (sugar, 7.1; tea, 3.1; coffee, 2.2) made up the largest item; then followed breadstuffs, 2.7; provisions (cured meat, etc.), 2.4; spirits and wine, 2.2; tobacco, 1.0.

Commercial policy

Through the first half of the century the government strove to maintain conditions substantially as they are presented in this balance sheet, restricting by a customs tariff the importation of foreign manufactures and of foodstuffs which could be produced at home. The repeal of the corn laws, in 1846, was a recognition of the fact that England could not hope to feed the increasing factory population with the products of its own agriculture; it marked a significant victory of the industrialists, led by Cobden and Bright, against the landed gentry who sought to maintain their rents by keeping bread dear. Before and after the date 1846 the general tariff underwent revision, first in the way of amendment and then

of repeal of the protective duties; after 1860 England had free trade. In this same period there was a general movement toward lower tariffs in other countries, and while this reform of commercial policy was not the sole cause it was one of the necessary conditions for the expansion of commerce pictured in the chart. England was without a rival, either in commerce or in manufacture. It supplied textiles and iron and steel to all the world. From 1855 to 1884 over 75% of its exports were manufactured wares.

Business all over the world had been stimulated by the gold discoveries about 1850, which initiated a period of inflation leading finally to the crisis of 1873 and the long period of depression following. England recovered from the depression to enjoy greater prosperity than ever, but to find as time went on that it had lost its monopoly of industrial efficiency and that rivals had emerged to menace its leadership. Toward 1900 symptoms of a change in the relative position and progress of England and other countries had become apparent. They will be considered here as an introduction to the discussion of English industrial development.

Importance of export trade

More than any other country England must be concerned in the fortunes of its export trade. Having specialized in manufacture and abandoned the attempt to produce at home the food needed to support the people, it must buy this food abroad in exchange for manufactured wares. Foreign markets had become a necessity of its existence. If other countries surpassed it in industrial efficiency, undersold it throughout the world, and so stopped the flow of its exports, many of the people must emigrate or starve. They had, in a sense, taken service with foreign employers, and if they no longer gave satisfaction and were dismissed, they had no one to look to for employment in England; the manufactured wares which they offered were far too great in quantity to be needed at home, while the food and raw materials which they required were lacking there. England had, it is true, resources beyond those embodied in the soil. It had investments in all parts of the world and received for dividends and interest a steady flow of goods for which it need make no return; it enjoyed a handsome income for its services in banking and in the carrying trade. The items in its balance of indebtedness have been estimated as follows for the year 1910, all figures being in millions of pound sterling.

Credits		*Debits*	
Exports of merchandise	430	Imports of merchandise	678
Re-exports	103	Imports of bullion	71
Exports of bullion	64	New investments abroad	170
Interest on investments	178	Earnings and profits due foreigners	15
Earnings of shipping	100	Total	934
Profits of bankers, etc.	55		
Total (incl. decimals)	931		

Such a showing appears to testify to the prosperity, even the affluence, of the country concerned. If the exports of native products were not enough to pay for the imports from abroad, the difference was made up partly by re-exports, partly by services rendered; the country scarcely needed to draw on its foreign debtors on investment account, and re-invested most of the interest and dividends, so making still stronger its position as a creditor country.

Nevertheless, the export of native products remained and must remain the mainstay of the English economic organization. The bulk of the people were engaged in their manufacture. They could sell some of their goods at home, but if they could not sell the large surplus abroad they must go begging. They could be supported for a time by the earnings and funded incomes of others, but not indefinitely, even if foreign investments were liquidated to maintain them.

Symptoms of change

The situation which caused uneasiness in the period before the World War was not an actual decline of the export trade. From 1872 to 1899, it is true, a period of falling prices, the exports of British produce were almost stationary in value, although they increased in bulk. From 1900 on they increased both in quantity and value. But the rate of growth was not as rapid as that of some other countries, notably Germany and the United States. In outside markets, whether they were under a foreign or under the British flag, England increased its sales (exports) but not so rapidly as they increased their purchases (imports). The reader must guard against a misinterpretation of these facts, to which he might be led by the picture, purely theoretical and purposely extreme, of the preceding paragraph. So far as the facts indicated a decline of British commerce it was relative, not absolute, a decline from leadership, not a decline to destitution. The little islands which

constituted the United Kingdom, with an area like that of a state of the United States (a little less than that of New Mexico), had accounted for nearly a quarter (in 1876 about 23%) of the trade of the world; they still accounted in 1913 for 15% of the total, and actually 40% of the seaborne trade of the world. A position of such eminence could not conceivably be maintained as other countries with larger areas grew in population and developed fresh resources. To some extent the setback of English progress could be attributed to the development of protective tariffs in other countries, bearing heavily on the manufactures which formed the bulk of the English exports. Yet the English had reason to feel concern when they found that in neutral markets and even in British colonies where they enjoyed special advantages their competitors were getting a larger share of the trade than they, and that this shift to their disadvantage must be explained not by the number but by the increasing efficiency of their competitors.

Rank of export industries

There were symptoms of a change not only in the quantity but also in the quality of the export trade. At the end of the century it still consisted mainly of manufactures, with the textiles and iron and steel furnishing the largest part of the whole; but raw products, such as coal and potter's clay, were taking a place of growing importance. Ship owners who had brought raw materials to England and had as a return freight manufactures of less bulk were glad to take those products at a low rate, but their export meant to the British manufacturer the sharing of his advantages with a competitor. Among the industries those which had grown up so rapidly during the Industrial Revolution were still the leaders, contributing two-thirds of the exports of wares partly or wholly manufactured, in the following proportions (percentages for the whole period, 1880 to 1910):

Manufacture of cotton	34.1%
Manufacture of iron and steel	12.7
Manufacture of wool	11.6
Machinery	7.9
Total	66.3%

Changes in rank

The fortunes of these industries will be the subject of discussion through the remainder of the chapter. For reasons which must be

considered they were not maintaining the victorious progress which marked their development in the earlier part of the century, and their failure to advance was the main reason for the check to British trade. Minor industries which did increase their contributions to exports in this period were of a sort not welcome, because they employed cheap unskilled labor, and reflected little credit on the organization; such were the industries producing ready-made clothes, preserves, soap, furniture, cordage, etc. England appeared to be undergoing a transformation in which the industries on which the country had prided itself and by which it had won the markets of the world were losing ground to industries of a lower sort, serving the consumer with manual labor. An analysis of occupations, comparing 1881 and 1901, and comparing the number actually engaged in an occupation in 1901 with the number which would have been predicted to accord with the growth of population, gave the following results. (Figures represent thousands. The table is to be read as follows: *If* the same proportionate distribution in occupations had obtained in 1901 as held in 1881, there would have been 511,000 more in agriculture, 169,000 less in coal mining, etc.)

Declining Occupations		*Growing Occupations*	
Agriculture	511	Coal mining	169
Cotton industry	107	Building trades	88
Woolen industries	64	Tailoring	58
Silk industry	42	Printing and bookbinding	40
Iron and steel industry	35	Furniture industry	17

Of the occupations on the left of the table, those which were not keeping pace with the growth of population, agriculture was the most marked; England was becoming ever more dependent on food supplies from abroad. The branches of manufacture whose growth had been checked were the very ones on which England had relied in the past for the purchase of its food. The occupations on the other side of the table, growing more rapidly, were not those which the country would have liked to foster. Coal mining was an industry, carried on mainly by manual labor, which put into the hands of competitors a precious source of energy for transportation and manufacture. The building trades, serving the local consumer, were protected by their nature from foreign competition, and again were manual in character; their disproportionate growth was certainly no evidence of strength. The three

manufactures listed were obviously not of a kind to be welcomed in a country which had won its place by the mechanical production of wares for the world market. Conditions in English industry were unusually depressed in the year 1901, and a comparison closing in 1911 would make a more favorable showing, but still not one which would satisfy anyone anxious for proof that England was maintaining its position of industrial leadership.

Cotton

The cotton industry, in which the possibilities of the Industrial Revolution had first demonstrated themselves, had become and still remained the mainstay of the English economic organization. The number employed in it was double that engaged in any other branch of manufacture, and the industry had a peculiar importance in that it produced mainly for the foreign market and so afforded means to buy food and raw materials from abroad. Of the total output eight- or nine-tenths (as measured by value or by bulk) were sold to foreigners. Cotton in the form of yarn or of finished goods contributed about one-quarter of the total exports. Measuring by millions of yards, the exports of piece goods in 1870 exceeded 3,000, and after 1900 were over 6,000; England provided every year over 3 yards of cotton cloth for every inhabitant of the globe. English spindles supplied nearly half (in value) of the cotton yarn which entered into international trade, and English looms much more than half of the cotton cloth.

Organization

The condition was all the more extraordinary in that the English cotton industry, the greatest national export industry of the world, was concentrated in an area only 25 or 30 miles square in southern Lancashire, an area roughly comparable to that of the state of Rhode Island. This region offered the advantages of cheap coal, ready access to ocean shipping, and a damp climate. When cotton is spun in dry air the fibers tend to fly apart instead of clinging together, the strength of the yarn is reduced, and it is apt to break under the strain of drawing and twisting. For the spinning of fine yarns dampness is essential, and the artificial humidifiers used in some countries to overcome the difficulty are an unsatisfactory substitute for the conditions provided by nature in Lancashire. Even more important were the assets derived from the long estab-

lishment of the industry there. For generations the people had done nothing but work cotton, talk cotton, breathe cotton; it was in the air. The result was a store of experience and a provision of skill and equipment for every branch of the industry. The combination of the world-wide market and the sharp local concentration of producers had stimulated an extraordinary specialization of function not matched in any other industry. Special classes of merchants devoted themselves to the purchase of the raw material and to the marketing of the finished or semi-finished goods. Not only was spinning an industry in itself, separate from other branches; different towns specialized in the production of different counts of yarn.* Bolton and Manchester produced the finer yarns, such as were needed for the manufacture of sewing thread, making counts from 60's to 300's; Oldham, a single town containing more spindles than in all of Germany or all of France, produced low and medium counts for weaving ordinary piece goods. Inside a town there would be still further specialization; a single large mill in Bolton or Oldham would confine itself to one or at most a few counts. In the next great branch of the industry, weaving, for which the yarn was raw material, there was a similar localization, although of course specialization could not proceed so far except in the case of some recognized staples. The combination of the two processes, spinning and weaving, in one factory was exceptional, and again it was exceptional for a manufacturer to attend himself to the finishing of the cloth and its sale in foreign markets. The manufacturer would commonly sell the cloth to a shipping merchant, who was intimately acquainted with the market in some particular part of the world (Africa, India, Far East, South America, etc.), who would have the cloth finished (bleached, dyed, printed) to meet the needs of his customers, in establishments devoting themselves to this branch of the business; this shipping merchant relieved the manufacturer of the credit risks involved and of the problems of packing and shipping.

Competition

This bare sketch of the organization of the English cotton industry omits countless details, but will indicate its elaborate complexity, and may suggest why the industry functioned so efficiently

* The count of yarn indicates the number of hanks, 840 yards long, to a pound; a count of 300 indicates about 140 *miles* of yarn to a pound.

before the World War, and why the dislocation of the world's trade which then ensued affected it so severely. Even before 1914 the English had begun to feel the competition of other countries. In spinning fine yarns they were still supreme. These yarns must be spun on the mule, which makes separate operations of spinning and winding, so losing time and reducing output, but which yields a product more fine, even, and soft than other methods. The mule is tended commonly by male labor and requires adept service; it is said that only a boy who has grown up in a mill can become a good mule spinner. Coarser yarns were produced more rapidly on the ring spindle, which could be tended by women of a lower grade of skill. It was characteristic that in England (1909) $\frac{5}{6}$ of the spindles were mule spindles, in the United States $\frac{5}{6}$ were ring spindles; the old country tended to specialize in quality, the new country in quantity. The same contrast appeared in the manufacture of cloth from the yarn; the United States could manufacture drills and sheetings and could export them to a neutral market, such as China, in competition with England, but in spite of a protective tariff it had still to import the finer fabrics from the old country. The power loom had been greatly improved since its original application, particularly in devices to stop the machine if a thread broke and threatened to spoil the work, and later in devices to avoid stoppages. In the Northrop loom, invented in England but taken up, developed, and introduced in manufacture in the United States, automatic devices provided for many needs, including threading the shuttle and replenishing it with yarn, instead of stopping the loom every few minutes to perform this operation. This represented not only a saving in time and in wear and tear, and an advantage in the maintenance of the proper adjustment; its great economy lay in the fact that it enabled the weaver to oversee many more looms. In England a weaver seldom tended over 4 plain looms; in the United States he might tend 20 or even 30 automatics. The Northrop loom made slow progress in England, partly because it was not so well suited to mule-spun yarn, partly because it was not adapted to the finer grades of work, and offered no great advantage when applied to the production of a variety of small orders, partly because the English weavers were strongly opposed to its introduction. Brief attention must be given later to the labor question in the English cotton industry.

Markets

As countries like the United States and Germany grew to industrial maturity they tended to protect their markets in favor of home products, and the English cotton industry was forced to seek outlets elsewhere. Its strength in the spinning branch enabled it to sell still a large proportion of its yarns in Europe, but it found the great markets for its finished cloth, piece goods, in British India and the Far East. Of 6 milliards (thousand millions) of yards exported, on the average of the years 1905–09, British India took 2.4 and China, Japan, Java, etc., took 1, in round numbers. It was therefore with great concern that the English observed the development in those countries of a native manufacture, equipped with English machinery and often financed with English capital. The natives were incomparably inferior to the English as factory workers. In Japan, for example, four-fifths of the operatives were girls between the ages of 13 and 20, many from the country districts with no familiarity with machinery and no sense of organization; they needed at least 3 months' training to acquire average proficiency, and commonly left the factory to be married at the end of a year or two. They worked long hours for low wages; in Japanese spinning mills the average daily wage in 1904 was $0.17 for males, $0.10 for females. At this date in England spinners got about 6*s*., say, $1.50, a day. The difference seems tremendous. Yet in the past England had faced a spread in wages approximately as great, and yet had undersold Eastern rivals in their own markets. The Manchester Chamber of Commerce had found, 1888, that Lancashire could pay operatives 5 to 10 or even 15 times the wage received by the Oriental for a much shorter working day and still could produce yarn at a lower labor cost. The number of operatives required to manage a given amount of machinery was 5 to 8 times that needed in England, and even this larger number could not turn out as much good work as the English. This was, for the Asiatic factories, the awkward period of infancy. Little by little they closed the gap between them and their English models. In 1904 the best of them needed only 3 times the working force of the English. Up to the World War, as shown by the figures of exports quoted above, England still had an immensely important market for its piece goods in the East. But it had seen its exports of yarns to India decline, and exports to the Far East dwindle to almost nothing, as spindles in the eastern countries

were put in operation; and it was faced by a growth in the number of looms in the East which menaced it with a similar result in its trade in finished cloth.

Inflexibility

In the cotton industry, as in others to be considered, England had to pay the penalties, as it had long enjoyed the advantages, of leadership. The period of its industrial supremacy had, almost inevitably, established certain patterns of behavior, fixed certain habits and institutions, which served well in their time, but which became very resistant to change. When other countries had learned all that the English could teach, and, with the flexibility of youth, had experimented and improved upon the models of their teachers, the English found it very hard to adopt the innovations. They were not stupid; to a large extent their hands were tied. The matter can be illustrated by the history of labor in the cotton industry. In that industry was first developed the ideal type of modern factory labor, adept, ambitious, efficient. Laborers of this class developed the modern trade union, an extraordinary achievement. The unions in the cotton industry were unusually well led and progressive; they appeared sometimes more insistent on efficiency than were the manufacturers themselves. They promised to give the industry that stability of economic relations so much needed in a period of competition, and so hard to attain. But they approached this end by developing elaborate rate agreements, "standard lists," which became something like a written constitution for the industry, and with their stipulations regarding the piece wage for different kinds of work they mixed other restrictions, designed to protect the members of their class from exploitation. Good or bad, the standard lists and the other regulations became rigid; if they prevented evils, they certainly hampered progress. An English student of the industry, traveling in America, found the mill labor in Fall River inefficient and overpaid compared with that in Lancashire, working no harder but actually turning out more product because of the organization and equipment provided by the management. Another English student noted that in Lowell one man would tend 6 warping machines, with the assistance of 3 girls, unskilled labor, for the less difficult parts of the process; "an American mill man," he wrote, "untrammeled by standard lists, finds it hard to believe that the Eng-

lish warper runs only one machine." He thought it would be interesting to try in England the American system of reserving the skilled hands for skilled work, "if standard lists could be adjusted and unions would not block the way." In 1903 a group of English cotton manufacturers made a tour of the United States to learn what they could of possible improvements, and after their return they made efforts to apply American methods in their mills. An attempt in one mill to restrict weavers to their special work, supplying helpers to perform the less important duties, was met by a strike; the weavers asserted that they got a restful change by stopping their work to clean and oil the looms, or to carry finished goods to the warehouse. Down to 1914 the trade unions still opposed the introduction of the Northrop loom.

Wool manufacture

It will be convenient to consider next the fortunes of another textile industry, manufacturing wool, although in its contribution to the export trade it was now outranked not only by cotton but also by iron and steel. In contrast to the cotton fiber, the hair of sheep and of other animals often combined with it in manufacture presents great variations, not only in dimensions but also in other qualities, such as elasticity and tendency to curl. Furthermore, wool being provided with little scales or serrations has the peculiar property of felting; the scales of the hairs interlock when they are pressed together. A single fleece may provide ten different qualities of wool, and the fleece is very different according as it is taken from a pure-bred merino, from an English breed, or from a cross-breed combining some of the characteristics of each.

These individual characteristics of the wool fiber resist so purely mechanical a treatment in manufacture as that to which the cotton fiber submits. They lead to a division of the industry into two distinct parts, making respectively woolens, in which the yarn contains many short wavy fibers, and worsteds, in which the fibers are kept as closely parallel as possible. It is not practicable here to follow this distinction, and the woolen industries will be treated as one. But the characteristics of wool play a part in affecting the geographical distribution of the industry and international competition in its products which must be noted here. The raw material is not localized but is as widespread as the sheep. The manufac-

ture up to a certain degree of efficiency is easier to establish just because it is less suited to elaborate mechanization. On the other hand, the highest efficiency in manufacture can be attained only when the best mechanical equipment is combined with an intimate knowledge of the qualities of the innumerable varieties of wool, and of the details of processes suited to make the best of them.

Advantages of England

England had had the experience of centuries in the woolen industries even before the Industrial Revolution. They were regarded as the mainstay of the country's prosperity, furnishing the larger part of the exports and representing the largest manufacture for export of any country in the world of the time. The introduction of power-driven machinery came much later than in cotton, partly because of the technical difficulties indicated above, partly because the woolen industries were so firmly established in traditional lines. But at least this change antedated that in other countries; throughout the nineteenth century England was supreme in the mechanical equipment of its woolen industries, and made most of the machinery which was set up in other countries as modern methods of manufacture spread to them. The expansion of trade about the middle of the century offered a broad market to English products, and the flow of trade to England from all parts of the world built up there a wool market in which all known varieties of the raw material could be obtained. Freedom of restrictions on imports, such as some other countries maintained to protect the sheep-breeding industry, gave the manufacturer full advantage of the opportunity to combine his materials in just the proportions which offered the best results. An American observer was shown in an English factory a blend of 14 distinct varieties of wool, from which a simple woolen fabric was to be made; an American manufacturer, hampered by the tariff of the time, would have restricted himself to 2 or 3. For certain purposes and within certain limits the use of re-worked wool (shoddy or mungo) is legitimate, and from the standpoint of price desirable. It is characteristic that another American observer, on the northwest frontier of India near the Khyber Pass, found second-hand clothes from London being sold to the native Afghans, to be shipped back later as rags to feed the English shoddy manufacture.

Development based on home market

The numbers occupied in the woolen industries in England varied little from 1851 to 1911. This does not prove, however, that the industries were stagnant. At the earlier date many workers were still employed in domestic work, particularly as hand loom weavers; in the course of time these or their successors were absorbed in factories where their work was much more effective. Between those same dates the number of spindles and of looms in factories increased about threefold, and the consumption of wool grew at a corresponding rate. Most of the increased product, however, was taken by purchasers in the home market. As regards exports, there were shifts in the amounts of particular classes of goods sent abroad, but the total volume remained stationary or declined. With the growth of other branches of trade the importance of the industry in the export trade diminished, and on the average of the 5 years preceding 1914 it contributed but 9 or 10% to the total of manufactures exported. If the English industry in this period did not expand its foreign market, it had, in this instance at least, the satisfaction of knowing that its chief rivals were faring no better. The exports of wool textiles from Germany likewise continued nearly stationary, those from France showed a marked decline; exports from the United States were always inconsiderable. The world's demand for the products of the woolen industries increased with the growth of population, but was met in the main by production in the separate countries, as in the United States, under the protection of a tariff. The consumers of woolens and worsted, unlike many of the consumers of cottons, lived in temperate countries, in which industrial civilization had so far advanced that the establishment of an independent manufacture, generally with English machinery, was practicable.

Organization and efficiency

The products of the woolen industries could not be standardized like some cotton products, and although the worsted manufacture approached the cotton manufacture in elaborateness of organization, it was common in the woolen branch for a single firm to carry on all the processes from the preparation of the raw material to the weaving and frequently the dyeing and finishing of the cloth. The characteristics both of the raw material and of the finished goods, which varied greatly in weight, weave, and pattern and were

subject to all the changes of fashion, as they were used largely for outer wear, put a premium on the personal element in manufacture, and made the ideals of scientific management hard to realize. If it is not true, as has been said, that the manufacture of wool "requires more brains than other industries" it seems certain that it is more of an art than most of them. Though machinery has been developed for most of the processes of manufacture, it is not by itself alone a substitute for the skilled operative whose personal touch under competent direction gives results which a mere machine cannot attain. American woolen manufacturers, using English machinery and even English operatives, could not give their products, it is said, the finish and feel of Bradford woolens; they did not observe the nice details which were necessary for the finest work.

Labor

The English woolen industries had in their working force, trained for generations in the business, an asset which gave them an assured position so long as other countries would receive their products on equal terms, and which kept a market open to their finest products in spite of any tariff. Like other representatives of the English labor class the workers in the wool industries were not versatile, not readily amenable to change. "One of the greatest difficulties we have to contend with," wrote an English manufacturer, "is that the old-fashioned workman has not had the benefit of a really improved education, so that whilst he is an excellent workman as long as he has to do exactly what he has always had to do, the moment you ask him to do something new, he is perfectly helpless; he cannot understand that the demand has changed, and that other things have changed, and that which was perfectly right ten years ago may not be right now." This complaint, as will be shown, was by no means confined to the wool industries. England was an old country in manufacture, and could not hope to retain the flexibility of youth. In the wool industries, at any rate, this defect of labor was more than offset by very real merits, and was not intensified to any serious extent by restrictions of trade unions.

Iron and steel

Iron, which furnished, in Jevon's phrase, the fulcrum and the lever of modern mechanical civilization, had been made by the Industrial Revolution an indispensable factor in progress. The

iron production of the world, less than 1 million tons in 1800, had grown to nearly 2 in 1830, to nearly 5 in 1850, to nearly 12 in 1870. In this increase England, using the new methods applied in the Industrial Revolution and the abundant domestic supplies of coal and ore, had taken a leading part; it was really without a rival, producing at the last date as much as all the other countries of the world together. Its leadership seemed to be confirmed by Bessemer's discovery, patented in 1855, of a process which reduced many-fold the cost of converting iron into steel. The superiority of steel to cast iron in tensile strength and toughness opened an ever-widening field to its use, and as improved processes were perfected steel took more and more the place formerly taken by iron. The course of development at the close of the century can be traced in the figures of the accompanying table, giving annual average figures of production for the world as a whole and for the leading countries. Two facts stand out prominently: the ever-increasing demand for iron and steel by the world at large, the ever-shrinking proportion of the supply contributed by England.

PRODUCTION OF PIG IRON AND STEEL
(Millions of Tons)

PERIOD	IRON				STEEL			
	United Kingdom	Germany	United States	World	United Kingdom	Germany	United States	World
1870–74	6	2	2	13	0.5	0.2	0.1	1
1880–84	8	3	4	20	1.8	1.0	1.6	5
1890–94	7	4	8	26	3	3	4	13
1900–04	9	8	16	43	5	7	13	33
1910–13	10	15	28	69	7	15	28	66

Relative decline of exports

Obviously other countries were ceasing to rely upon England as their source of supply of iron and steel, and were themselves developing the production of those metals; England fell to the second and then to the third place, measured by aggregate output. Far more serious was the fact that other countries not only were supplying their own needs, but furthermore were learning such efficiency that they could export to neutral markets in competition with the English and were threatening a branch of English export industry which was second in importance only to the cotton manu-

facture. About 1880 England sold abroad nearly twice as much iron and steel (measured by value) as France, Germany, and the United States combined. Comparing conditions in 1880 and in 1900, English exports were subject to fluctuations and in some lines to setbacks which restricted their growth to small dimensions, while German exports doubled and exports from the United States grew tenfold. In 1900 England was still leading, but with an export trade equal to that of the other three countries, not double it. In 1912–13 Germany took the lead, and the exports of iron and steel from the United States were growing so rapidly that this country threatened to reduce England to third place.

The development of the iron and steel industries in other countries had been furthered by protective tariffs, and testified in that fact to the superiority of the English industry. Even the export trade of those countries had in some measure obtained advantage from protection; assured of the home market the German or American manufacturer could afford on occasion to dump his surplus product abroad at a price which the English manufacturer could not meet. The grievance was a real one, and fostered in England from about 1900 a growing demand for a tariff to be used for protection and reprisal. The protectionist movement, however, made little headway among the mass of the people, who had become prosperous in a period of free trade and held to that policy as obstinately as, for a similar reason, many people in the United States held to a policy of protection.

Ore supplies

An apparent disadvantage of the English in this later period of international competition was the fact that the ore supplies at home, which had formerly provided abundant raw material, were deficient in quantity or in quality for use in some of the new processes of production, and the country was forced after 1900 to import a third or more of the ore which it consumed. Actually, however, the cost of transportation from Spain or Sweden was not far from that of transporting ore from Lake Superior to Pittsburgh, and the English industry was not in this respect at such a disadvantage as it was in the somewhat higher cost of coal, compared with American prices. English coal mines were in general deeper than the American and in some other physical features were not adapted to the most economical methods of production.

Organization set in old forms

Both political and physical factors played a part, unquestionably, in restricting the development of the English export of iron and steel, in competition with the products of other countries. At one time or another, with regard to one ware or another, these factors were felt to be serious handicaps. But all the time an economic factor was at work, which was of far greater importance. The English were being surpassed by other peoples in efficiency of production. They were paying again the penalty of success. Their industry had grown great in the period of their leadership, but it had also grown old, and had become more or less set in traditional lines. The rapid growth of the industry in Germany and the United States was not necessarily a proof of the superiority of these countries, for it was furthered by protection, but the rapid growth in itself contributed to superiority. It required new machinery, it encouraged new methods, it made possible forward-looking plans which could be executed as a whole, not piecemeal over a period of years. The English were conservative because they had so much to conserve; the others were radical because their roots had not yet struck deep.

Wastes

The English industry had grown up in a period when relatively small and scattered establishments were the rule. Coal was coked at the mine, to save costs of transportation, in beehive ovens which allowed the gases to escape. Blast furnaces, steel plants, and rolling mills had been established without much relation to the source of coke or to each other. There was a serious waste of by-products and of energy. The best modern practice required the use of by-product ovens for making the coke, and the use of the gas from these ovens to make steel on the open hearth. The coke, in smelting the ore into pig for making steel, gives off surplus gases which can be recovered and used in an internal-combustion engine for power to roll the steel. Finally, from the time the liquid iron is smelted from the ore until it is rolled out in finished steel shapes, the metal should not be allowed to cool; heat is precious and must not be wasted. Obviously the local combination of all these elements in the process must be most carefully studied to obtain the maximum efficiency, and this was done when the great steel mills were built in Germany and in the United States. But at that

time the capital invested in the English industry had already taken definite shape, and any approach to the new ideals could be only partial and gradual.

Equipment

Not only were the works scattered in England, they were equipped with furnaces, converters, and machinery of an old model, often too small in capacity for the most efficient operation. Lady Bell, wife of a prominent English ironmaster, wrote (1907): "Part of the absorbing interest of watching the manufacture of iron is that, in this country at any rate, it is all done by human hands and not by machinery. From the moment when the ironstone [ore] is lifted off the trucks, then dropped into the kilns, afterwards taken to the furnace, and then drawn out of it, it has not been handled by any other means than the arms of powerful men, whose strength and vigilance are constantly strained almost to breaking-point." When a furnace was to be tapped, three or four men with a great iron bar and with sledge hammers broke through the plug of clay in the vent, while a crowd of men stood about to help in casting the pigs. When sufficient iron had run off and the vent was to be closed again, a man hurled balls of clay at the opening, "the throw being instantly followed by a mighty thrust from a huge bar of iron, wielded by five men, who stand ready as each lump is thrown in to push it home. . . . Sometimes the closing of the aperture is effected in three minutes; sometimes, not often, it has taken nearly as long as an hour." Years before the time when this was written a steam gun had been introduced in America to accomplish the result more surely and at lower cost. An English trade unionist, representing the iron and steel workers, who visited the United States in 1902 found the output of American steel mills almost incredible; all English visitors were impressed by the extensive use of machinery and the relatively small force of labor. A mill would roll 3,000 tons of rails a day with less than a dozen men on the floor. At the Homestead Mills 3 men with special electrical apparatus charged 20 furnaces, a task which previously would have required the labor of over 200. The charging machine had become practically universal in open hearth furnaces of the United States about 1900. It would pick up a box containing the ingredients of the steel, thrust it into the furnaces, empty it and withdraw it, at a great saving of time and of heat as well as of labor. An

English manufacturer thought of introducing these machines for his furnaces, and sounded his workers on the proposal. "They would not allow any work-people to be knocked off, and they insisted that they were to get the same as before. No doubt, if we had put them in it would have been a question of time, and we should have been able to knock off some of the under hands, but the smelters we might have a difficulty with. They are a union, and one of the strongest in this country, and very difficult to attack." The manufacturer abandoned the plan and continued in the old way.

Comparison with American industry

A comparison of statistics (1907–09) showed that in the United States the output of pig iron per worker was more than double the English (84.5 tons against 39), the output of steel was triple (77 against 25). The American iron manufacture produced a ton of pig from less raw material (1.96 tons of ore and limestone against 2.48; 1.74 tons of coal against 2.09). On the other hand, the Americans were lavish in the use of mechanical energy; the horse power per worker in the steel industry was $10\frac{3}{4}$ against the English figure of $5\frac{1}{4}$. About 1900 the Americans were actually invading the English home market, selling rails, fish plates, plates and angles for ship building below the English prices, and winning contracts for bridges and other structural work against English competition in British dependencies (Egypt, Uganda, Burmah) and in the neutral markets of South America. Their superiority showed itself not only in a lower price but also in more prompt deliveries and in more advanced methods of construction which enabled them sometimes to get a higher price per ton for their steel while the consumer paid less in the aggregate, because a smaller tonnage gave the service demanded. The English in this period began to consider "Americanizing" their industry, sent representatives to the United States to study new methods, and imported American foremen and technical experts.

Machinery

Of the major export items listed in the early part of this chapter and comprising all together nearly two-thirds of the total, 1880–1910, the fourth and last, machinery, is still to be considered. Obviously this item has a significance, in an age of mechanism, beyond the measure of money value; it is in some sense an index

of the aptitude of a people for leadership. Particular importance, therefore, attaches to the figures of the accompanying table, which give the value (annual averages in millions of pounds sterling) of the machinery exported from England and from other countries in the period before the World War.

Period	*United Kingdom*	*France*	*Germany*	*United States*
1880–84	12	1	3	3
1890–94	15	2	3	4
1900–04	20	2	10	15
1909–13	32	4	29	28

The figures show a general tendency similar to that which has been considered in the industry producing iron and steel in crude forms, but not quite so marked in some respects. About 1880 England was practically without a rival in the manufacture of machinery. It continued to advance, and down to the end of the period still held the lead over any single country. Its rate of advance, however, was much less than that of some other countries. Germany and the United States had become formidable competitors in the world's markets, and obviously threatened to reduce England in rank as they had done in the export of iron and steel. The matter was of importance because the English industry looked to the export trade for the sale of about half of its output.

The figures include a great variety of wares: cutlery and guns, tools and machine tools, engines, automobiles, electrical and textile machinery, and so forth. Different wares met the new conditions of competition with various degrees of success, and it is not possible here to do more than to suggest some of the reasons why England lost ground, at least relatively, in some of the branches of industry concerned.

Small industries

In some industries the manufacture was still in a backward stage of organization, depending mainly on manual labor and skill, often conducted in small shops with primitive mechanical equipment. This was notably true of cutlery, which was still largely in the stage of the handicraft or of the merchant employer. The average number of adults working in a shop (1901) was 6. The cutlers of Sheffield still drilled by hand (1913) with a primitive boring stick or bow and piercer. One of these cutlers working with a fourteen-year-old son made 56 dozen pocket knives in a week, working fully 70 hours, sometimes 16 hours a day; the two cleared 18*s*. 4*d*.

(about $4.50) for a week's work. Americans with a much higher wage-scale could not possibly compete with this labor in making articles by hand. But when they could not develop machinery to produce the ware, they could sometimes modify the ware to suit the machine, so making table knives of one forging, electroplated, instead of assembling them from parts, and producing in the safety razor an implement which required practically no hand forging or grinding. The manufacture of fire arms was another trade in which the English still depended largely on manual skill. An English sporting piece was a work of art, without question the best of its kind, but it was expensive. The Americans and later the Belgians introduced automatic machinery for the manufacture of fire arms in large quantities, and robbed England of the market which it had formerly had in other countries. The manufacture of locks is another example of an industry which was still carried on in small shops, and which could not compete with more advanced methods of production. The file cutters of Sheffield objected to the introduction of American machines for doing work which they had been used to do by hand, even though their wages were raised as a result; they said "it was not right to turn the stuff out so fast." Machines were gradually introduced, but even in 1928 some of the work was still being done by home workers.

Equipment

Far more extensive and far more significant were the industries which had reached the factory stage of production, but found themselves in this period of competition surpassed by younger rivals. The English industries again found themselves handicapped by their long and gradual development; they carried much of the past into their present. "Old works have been added to, fresh machinery has been introduced from time to time to balance up old machinery. There has been generally an absence of totally new works with an economic lay-out. Whilst the country can point to many works of the highest class, with the most modern equipment worked at the highest efficiency, there can be no doubt that many of our older works are manufacturing at costs which could be greatly reduced if their works as a whole were on a larger scale, well-planned and equipped with plant, and therefore capable of being worked in the most efficient and economical manner." *

* Report of the Board of Trade Engineering Trades Committee of 1916–17.

An American engineer found in 1914 a factory shut down because of a failure in the power plant. The engine was over 50 years old, and the superintendent said it was hard to keep it in repair. Another American, writing in 1912, said that " some few years ago " he had seen in England a single cylinder walking beam engine being built alongside triple expansion engines of modern type; he was told that the owner of an Oldham cotton mill, by whom it had been ordered, wanted an engine like his father's. One can scarcely believe the statement in an American engineering journal that a walking beam engine with the original oak beam served a Birmingham factory for 135 years, down to 1902; the date ascribed to its erection, 1767, was before Watt's patent of 1769. But Watt's biographer is authority for the statement that an engine built by Boulton and Watt in 1776 for a pumping station of the Birmingham Canal Navigation Company was still in regular operation down to 1893.

Trade unions

" The tender and pathetic attachment of the old-fashioned manufacturer to his equally old-fashioned machinery," as an English author described it, was based on something besides sentiment. Trade unions were strong in the machine industry, " the engineering trades " as they are termed in England. They held in general to the theory of the " lump of labor," that there was a certain amount of work to be done and that the interests of the workers were hurt by the introduction of labor-saving machinery. At a time when automatic machinery was being developed in other countries, particularly in the United States, to the point of enabling one worker to tend 2, 3, 4, even a dozen or more machines, the English workmen held covertly if not openly to the principle " one man, one machine," and were determined that at least if a machine was introduced to do the work of a skilled man it should be tended by a man of equal skill and pay. Nothing impressed English visitors to American machine shops so much as the relatively small amount of manual work which was done. The hand hammering, the filing and fitting, which were a normal part of the process at home, were conspicuous by their absence. The American manufacturer would not tolerate machine tools and workmen which would not turn out parts that could be rapidly assembled by workers of a modest degree of skill. Gradually and against opposition,

machinery of a modern type made its way into the English industry, but the very threat of a conflict with labor greatly delayed its progress. Complaints of manufacturers, set forth in detail in the Report of the (Chamberlain) Tariff Commission, 1909, must always be regarded with some scepticism, but in this matter they are amply confirmed by other evidence. The English metal-working and machine-building industry was hampered in its competition with Germany and the United States by the attitude of labor.

Leadership

Nevertheless the manufacturers must bear a considerable part of the responsibility for failure to keep pace with competitors. Like their workmen they too were bound by traditions of the past, and were timid in adapting themselves to new conditions. Their attitude is illustrated by the statement of one of them before the Tariff Commission (1904): "With a protected market we should equip our factories and bring them up to date. We want some definite security that the outlay will be remunerative." Every business man yearns for this "definite security." In an era of competition none attains it. If one man does not make progress, he knows that another will. The best that he can do is to study all possible improvements, choose the most promising, and then take the risks to which he is committed. The process is never ending. Respects in which manufacturers were deficient will be further considered in the next chapter.

QUESTIONS

Compare the amount and rate of growth of English trade in fifty-year periods, 1700–1750–1800–1850–1900.

What does the chart suggest as to the relations of the revolutions in industry and in commerce?

What were the major exports of England about 1800?

What were the major imports?

What was the course of commercial policy?

Explain the peculiar importance to England of the export trade.

What were the 6 important credit items in the international balance, 1910?

What were the 4 important debit items?

What were the indications of change after 1870 with respect to competitors, and with respect to markets?

What were the explanations of the change?

What were the major export industries?

What changes were indicated in the relative rank of industries?

Illustrate the importance of the cotton manufacture.

Why was the manufacture so sharply localized? What were peculiarities of its organization?

Distinguish the lines of manufacture in spinning and weaving in which England was and was not superior. Why was not the automatic loom more generally used?

What were the most important markets for yarn and cloth? What were the conditions of manufacture in Asiatic factories?

Illustrate and explain the inflexibility of the English cotton manufacture. Compare American conditions.

Contrast the fibers of cotton and of wool, and the conditions of manufacture resulting.

What advantages did the English enjoy in the manufacture of wool?

What was the course of the woolen industries in this period?

Illustrate the importance of the personal element in the woolen industries.

What was the course of the iron and steel industry? What was the course of the export trade?

What political and what physical factors obstructed development?

How was the English industry injured by its age?

Illustrate wastes, in comparison with competitors.

Illustrate backwardness of equipment.

Illustrate the technical superiority of the American industry.

What was the course of the industries supplying machinery and kindred products?

Illustrate the persistence of small-scale manufacture.

Illustrate the backwardness in equipment.

What was the attitude of labor in the machine industries?

READING

Development of industry and trade. (Knight, chap. 8, pp. 498–511, 520–524.)

Commerce and policy since 1846. (Ogg, chap. 12, pp. 256–266.)

International competition. (Slater, chap. 20, pp. 239–255.)

International relations. (Slater, chap. 22, pp. 270–280.)

Organization of labor. (Ogg, chap. 19, pp. 412–428; Slater, chap. 21, pp. 256–269.)

Labor legislation. (Ogg, chap. 17, pp. 368–377.)

The Irish problem. (Slater, chap. 19, pp. 228–238.)

Strains and stresses. (Slater, chap. 23, pp. 281–297.)

CHAPTER V

ENGLISH MANUFACTURE SINCE THE WAR

Need of mobility in organization

"The vitality of modern industry, like that of an organism, is measured by its power of response to external stimulus and of self-adaptation to modified environment. 'Mobility' (in this sense of the term) does not imply incessant or purposeless movement or change, and may be consistent with a high degree of stability and complexity of structure. But it does imply the power of spontaneous reaction to changes in economic conditions, and of internal modification and rearrangement to meet such changes. This is true both of the material and the human factors, of methods of business organisation and of relations among classes, as well as of the personal skill, enterprise and leadership which individuals bring into the common stock. . . .

"It is, therefore, a matter of supreme necessity in this period of rapid and insistent flux and transformation to maintain unimpaired the qualities of initiative and flexibility of temperament, the power of readjustment and adaptation, and the capacity for free and willing coöperation among all the partners in production and distribution. Any waning of these powers could only mean an increasing rigidity and ossification of economic structure, and a progressive enfeeblement of its vitality, for which no measures of external support or defensive organisation could compensate."

These words were written in December, 1926, in the report of a committee appointed "to inquire into the conditions and prospects of British industry and commerce, with special reference to the export trade," and were regarded as of such significance that they were repeated in the final report of the committee, January, 1929.

Their truth will be recognized by all. Their application is obvious, in a period in which a war of unprecedented magnitude dislocated all parts of the old economic organization, and left a set of new and strange conditions. The process of adjustment and

readjustment will be the subject of this chapter. But in connection with the passage reproduced, and in anticipation of subjects to be discussed, the words of an acute and not unsympathetic critic, written of England in 1931, may be quoted. "The entire economic structure is frozen. No other community to-day is suffering to such an extent from this paralysis," "this hardening of the arteries," as he terms it in another place.

Shifts in occupation

The war produced in a few years shifts in occupations which in ordinary times would have taken decades. Comparing the census of 1921 with that of 1911, and stating results in round numbers, the building trade and agriculture lost each over 100,000 workers, domestic service nearly 300,000, the cotton trade over 30,000. On the other hand, the number employed in metal working, ship building, and the iron and steel industry grew by 320,000, in mining by 160,000, in the chemical trades by 65,000, in the service of the central government by 230,000. The imperative needs of war broke down old boundaries and restrictions, thrust some industries aside, created entirely new ones. The years 1914–1918 called into being a new organization, aimed solely at the prosecution of war. The year 1918 began a time in which this organization must be transformed to meet the needs of a new world, not that of the war period, not even that of the pre-war period, but of a period differing from either by all the distortions and distress which it had inherited from the conflict.

Importance of export trade

In one respect of outstanding importance the conditions of a recovery to a healthy state remained as before. The committee instructed to examine the means by which "to ensure sufficient and continuous employment and a satisfactory standard of living" agreed that this end could be reached only by the maintenance of a flow of exports to overseas markets (including services done for foreigners), which would pay for the raw materials and the food stuffs on which the country depended for its life. In 1927 the imports of food and raw materials amounted in value to nearly £800 million (say $4,000 million). About four-fifths of the supply of wheat and flour, and three-fifths of the supply of meat were obtained from abroad. Coal was the only important raw

material in which the country was self-sufficient. All of the cotton, nine-tenths of the wool and timber, and more than a third of the iron ore needed were imported from overseas. "During the past century there has been a steady growth in our dependence on overseas supplies for the essential means of existence, and there is not the slightest reason to expect that the tendency will be arrested or reversed in the near future."

Course of trade

An analysis of the facts of English trade after the war is complicated by changes in the purchasing power of money. So far as possible this variable has been eliminated from the accompanying table, which aims to give the volume (value corrected for changes of price) of imports and exports in the years immediately succeeding the war, in percentages of the trade of 1913, the year in which the figures of English trade reached their peak.

Year	*Net Imports*	*British Exports*
1913	100	100
1919	90	55
1920	88	71
1921	74	50
1922	87	69
1923	95	75
1924	106	76

These figures can pretend to be only a partial statement of a complex situation; it will be necessary later to attend to other elements, particularly to the balance of trade when the items are expressed in absolute values. As they stand, however, the figures show a decline of English commerce, natural enough in a war-shocked world, but a decline of exports extending much further than that of imports. The country was, apparently, consuming almost or quite as much as before of commodities brought from overseas, but was selling in payment therefor only half or three-quarters as much of its domestic products. Even when account was taken of the so-called "invisible" exports there was a widening gap between the debits and credits of the country. It was small consolation that other countries also were faring badly in their export trade. A setback which to them meant a check to prosperity might, if continued, mean disaster to a country in England's peculiar position.

Causes of decline of exports

The situation naturally engaged the serious attention of English statesmen, and I shall follow here the analysis made by the special committee set to study it. A decline in exports to some particular market might be due to one of three main groups of causes:

1. Decline of purchasing power of the local population
2. Growth of local manufacture
3. Displacement of British imports by imports from some other source.

Obviously these causes might work in combination, and it would not usually be possible to determine the share of influence of each. But in the case of cotton goods exported to British India, which declined by 57% in volume between 1913 and 1923, figures were available which showed that of the total decline about three-fifths were due to diminished consumption, about a quarter to increased local production, and about one-seventh to increased foreign competition. In different countries different causes might be at work. The export of pig iron to France, Italy, and Japan showed a decline, over the same years, of 63, 38, and 87% respectively; in France the predominant cause was increase of local production (owing to the recovery of Alsace-Lorraine); in Italy decline of local consumption, and in Japan competition of imports from China and India.

The decline of purchasing power in markets to which England had formerly exported was particularly marked in the years immediately following the war. The loss in men and capital goods, the derangements of currency and finance and of the mechanism of credit, affected different countries in different measure, but were felt all over the world. Their effect on British exports was most serious in central and eastern Europe, and in the great markets of India and China. In these Asiatic countries and later in South America the English exporter found his market narrowed by the inability of the natives to sell their own products abroad, and by persistent political agitation, breaking out spasmodically in revolution and war.

Rise of manufacture elsewhere

The interruption to commerce which attended the World War led to the establishment in many countries of manufactures, of

which the products had formerly been imported. This was true not only of Europe but also of other continents, not only of foreign countries but also of British dependencies. The number of cotton spindles in Japan, China, India, and Brazil rose from 10 millions to nearly 18; the number of cotton power looms in India and Japan rose from 120,000 to 200,000; the annual production of steel in Japan, China, India, and Australia rose from 360,000 tons to 858,000. A list of industries established or extended in this period would include most of the simpler machine products, and a large proportion of the countries of the world. The war fostered a desire for self-sufficiency, and stimulated patriotic ambitions to round out the national economy by combining manufacture with the production of raw materials. Protective tariffs increased rapidly in number and in the amount of protection. In 1925 the Committee on Industry and Trade estimated that the increase in tariffs had merely kept pace with the rise of prices, but even then the Committee found the tariffs and the various restrictions which attended them, a serious obstruction to English trade, a view which it repeated in its final report in 1929. With the fall of prices, which came about that time, tariffs were actually raised instead of being lowered and became in many instances practically prohibitory.

Comparison with others

England was not the only country to feel the burden of these conditions. The accompanying table shows how different countries fared, giving their trade in 1923 expressed in percentages of that which they had had in 1913.

VOLUME OF TRADE, 1923, COMPARED WITH 1913
(100 Base)

Countries	*Total Exports*	*Exports of Manufacture*
United Kingdom	75	73
France	106	117
Germany	53	67
Belgium	63	90
United States	119	148

The depression of one of England's former rivals, Germany, is readily intelligible, and the better showing made by France should be discounted to allow for the increase of territory, with the strong industries of Alsace-Lorraine. Other countries were faring much better in adapting themselves to post-war conditions, and continued

to surpass England in the years immediately following. 'A comparison of 8 industrial countries, 1923–25, showed that in increase of exports Czecho-Slovakia headed the list with a gain in those years of 53%, while England was last with a gain of but 2%.'

Effects of the war on manufacture

Many factors combined to hamper the English in their search for markets overseas. We must consider here not merely the external obstacles, the impoverishment of purchasers, and the rise of more or less protected industries in markets formerly controlled. If English manufactures had been sufficiently strong, they could have overcome some of this "sales resistance," and certainly would not have yielded neutral markets to rivals. Returning, therefore, to an analysis of conditions of manufacture in England, we must recognize that in some respects the war contributed to an improvement in efficiency. Under the pressure of war demands, often by direct intervention of the government, the separatism and traditionalism of the old-fashioned manufacturer were, for the moment, broken down. New machinery and new methods were introduced; some industries appeared to be transformed. Some of this gain was permanent; reference will be made later to advances achieved in various lines. But not even war or government could effect a lasting change in English character. Both manufacturers and laborers, the leaders and the rank and file, clung still to the habits of the past.

Management

As regards the responsible managers let us attend to the final report (1929) of the Committee on Industry and Trade. "In dealing with such important factors in industrial efficiency as the rationalisation of workshop practice, the standardisation of products and processes, the higher training of managers and heads of business enterprises, the development and utilisation of industrial research or commercial intelligence, and generally all forms of associated and combined action for the purpose of more efficient production or distribution, we have repeatedly been led to the conclusion that at present one of the most serious obstacles to progress is defective sympathy on the part of persons holding responsible positions in industrial and trading enterprises with new ideas and propositions which involve a radical change of customary

practice, or a new orientation of outlook." The Committee found in the industrial ruling class such imperfect mobility, "power of reacting promptly and energetically to external stimulus," as was the fundamental source of mischief in the inefficiency of the laboring class, but found that "the evil in the case of those occupying high and responsible positions in industry and commerce is more prejudicial to British competitive power, because its effects are more far-reaching, and in some ways more difficult to remedy." This view was confirmed by evidence from many sources. A delegation was appointed to study industrial conditions in America, which in its report criticized sharply the old type of owner-manager, and the managers who owed their places to their personal or financial relations to the owners. The delegation urged that management had become a profession distinct in itself, and that appointments and promotions in the industrial staff should be made with reference solely to the experience, training, and ability of the individuals. It found the results of specialized expert management to be an increase of efficiency and avoidance of waste, obtained not only by improved technique in production and distribution, but also by a recognition of the need to secure the coöperation of labor.

The movement to reform, which had to battle against the stubborn individualism of the old-fashioned manufacturer, was hastened by the insecure financial position of the export industries. Forced to borrow heavily, they became subject to the influence of bankers who insisted on more effective management and on broader cooperation. A step in this process was the establishment in 1930 of the Securities Management Trust which, under the guidance of economic experts, was designed to further industrial reorganization.

Equipment

Progress was made in the modernization of plants, although owners who had postponed improvements in the period of prosperity found them much more difficult of accomplishment in this period of adversity, particularly under the burden of heavy taxation. Reform was hampered by the condition already mentioned, the long-established location of the different enterprises, which made a thoroughgoing reconstruction almost impossible. English manufacturers faced another difficulty in the mechanization of industry. Lacking a broad home market, and selling the larger part of their product to customers in many different countries, they were forced

to a varied output. They maintained their trade by their willingness to accept small orders, and by their ability to produce goods of a special quality. Automatic machinery lost much of its efficiency when attempt was made to apply it to a miscellaneous business of this kind.

Standardization

These conditions explain in part the slowness of the English manufacturers to standardize their products. The Committee on Industry and Trade cited as an example of the difficulty which they faced the case of an engine-building firm which made locomotives of 24 different gauges, between 18 in. and 5 ft. 6 in., varying in weight from 6 to 60 tons. A manufacturer of insulated wire complained to the Chamberlain Tariff Commission (1909), "Until quite recently every engineer has had his own ideas and insisted upon having them carried out. We had some thousands of different patterns of one class of cable, varying sometimes by thousandths of an inch. They were unnecessary and useless, but had to be complied with or the cable was rejected." As suggested in this quotation, the diversification of product, which was a necessity in the export trade, was demanded also in the home trade. Even the locomotives built for British railways had to conform to such a variety of specifications that at best they could be turned out in very small lots.

Standardization, the determination of a limited number of types and sizes of product and the refusal of all others, is a factor in economy and efficiency which reaches far. It concentrates the brains of a business on the difficult problems and turns over to machinery and to common labor the parts of the process which they are competent to perform; it saves capital, saves time, saves material. In it is involved a large part of what is termed "rationalization" or "scientific management." If England lacked the broad market of the United States to stimulate the movement toward standardization, the older country had allowed or required a diversification of product which was altogether unnecessary. Technical experts realized this fact and organized a Standards Committee in 1901, incorporated as the British Engineering Standards Association in 1918, which had great influence. Its specifications reduced the sections rolled from iron and steel from many hundreds first to 175, later to 113, with a saving estimated at

a million pounds sterling a year; 75 sections of street car rails were reduced to 4. Outside the metal trades the movement toward standardization was marked in the electrical industry, and was furthered by the government control of industry during the war. Much was left still to be accomplished, however, for example in shipbuilding and in mining. One firm making wheels for the carriage of the products of mines reported that it had over 3,000 patterns in stock, differing in many cases by a mere fraction of an inch, though some 50 would amply meet the needs of the country. Thoughtful English leaders were much interested in the movement toward simplification in the United States, begun during the war and continued under the influence of Mr. Hoover, but found it extraordinarily difficult to obtain such agreement among the manufacturers of their own country as was necessary to realize its economies.

Research

Some years before the World War the English had become convinced that one reason, at least, why they were being passed by Germany and the United States in industrial efficiency was the neglect at home of advanced technical training and of scientific industrial research. Early in the course of the war the government established a permanent official organization for the promotion of scientific and industrial research, placed at its disposal a fund of a million pounds sterling, and arranged that it should contribute (usually half and half) to the expense of investigations carried on by private trade associations. Some 26 of these associations were formed during the next ten years, embracing most of the important industries, but not shipbuilding, railways, steel manufacture, and parts of the chemical industry, which sought to provide for their needs in other ways. Some of these associations were formed for such special trades as laundering, flour milling, and for the cocoa, chocolate, confectionery, and jam industry. The fruits of such research are apt to be slow in coming although they may then be cumulative in amount. The English were far behind the Germans in the date of beginning, far behind the Americans in the sums of money provided. The movement was at least significant in the change of attitude which it marked, and offered promise for the future.

Preceding pages have discussed the industrial organization with

particular reference to its leaders, their deficiencies and the attempts which were made to remedy them. We must attend now to the laborers, and seek to appraise, however imperfectly, the part which they played in post-war development.

Condition of labor

'The position of the wage earner had greatly improved in the course of the nineteenth century.' 'Sir Josiah Stamp, a competent statistician, estimated that the average laborer could buy four times as much in goods — food, clothing, house rent, etc. — as could his predecessor of a hundred years before.' 'Measured by that standard the laborer's position seemed highly satisfactory. Measured by an ideal standard it was still deficient. 'One-third of the families of the working class were estimated, just before the war, to be living on 25*s*. (say $6.25) a week, barely enough to maintain efficiency. One-fourth of the persons employed in manufacture were in industries yielding under 30*s*. ($7.50), to cover not only wages but also interest, profits, and miscellaneous expense. The annual average net product of manufactures taken all together was only about £100 (say $500) per person employed. The immediate result of the war was to raise somewhat the level of real wages, particularly of those of unskilled laborers, who obtained an increase in purchasing power of 10% or more. 'An investigation of sample districts, comparing the periods 1912–14 and 1923–24, showed a rise in the standard of living. Taking as a minimum standard that below which " a family could not with the utmost economy be adequately fed, clothed, and housed " the percentage of families living above this standard was found to have risen from 88 to 95 if full-time wages were assumed at the latter date, or to 92 if account were taken of broken employment, while the proportion of families living definitely below the minimum fell by one-half even after allowing for unemployment. Further, these improvements were accompanied by a considerable reduction in the hours of work per week, which fell from between 53 and 54 to 48 and even 47 in the principal industries.'

Attitude of labor

In some industries the improved conditions of employment were accompanied by such an increase of efficiency as kept the wage costs to the manufacturer at or below the former level. In others,

and in some of the more important trades (cotton and metal working), this was not the case. The trade unions, which during the war had consented to the suspension of their rules, and had permitted the " dilution " of labor by women and unskilled workers, resumed their former attitude with the conclusion of peace. An Industrial Inquiry, organized by the Liberal party and enlisting the support of distinguished economists, reported (1928) that " the organised workers in many industries have adhered to certain practices which involve restriction of output, thus discouraging men from putting forth the maximum effort of which they are capable without undue strain, have put obstacles in the way of the adoption of labour-saving devices and of method of payment calculated to stimulate energy, and in some cases have done everything in their power to limit the entry of new workers even into trades in which there is a great demand for them. In general, the workers, whether as organised bodies or as individuals, have not felt any responsibility for the increase of efficiency in production in their industries." Attempts made during the war to bring capitalist and labor into closer coöperation by the organization of Whitley Councils (shop committees) proved fruitless in the long run, and the post-war period was one of industrial strife with strikes more serious than they had ever been before. The accompanying table of labor disputes in three periods of equal length gives the facts.

Period	Number of Disputes	Workers Involved	Average per Annum	Number of Days Lost	Average per Annum
1898–1905	4,371	1,345,000	168,000	34,500,000	4,300,000
1906–1913	5,561	4,546,000	568,000	89,300,000	11,100,000
1919–1926	6,553	11,084,000	1,385,000	357,000,000	44,300,000

The year 1926 was marked by an attempt at a general strike, as a political measure to force the hands of the government. Initiated by the miners and transport workers, it spread to other occupations, but broke down before the determined attitude of the government and the public.

Coal

The problems in post-war England can be illustrated by a survey of the conditions in some of the export industries. We may take first coal, not that it ranked as high as some others in importance,

although it did give employment to one in ten of all men engaged in industry, but because of the peculiar difficulties of the situation. Nearly two-thirds (62%) of days lost by industrial disputes in the post-war period of the table were lost in mining and quarrying, almost all in coal mining. England had long been the great coal-exporting country. The coal fields were near seaports, and the coal could be carried at a low rate of freight in vessels of which the most valuable part of the cargo was manufactures of slight bulk. Before the war England exported about a third of the total output. In millions of tons the export in 1913 was 98. In 1920 it dropped to 44, in 1921 to 38. There was a sharp recovery when the French invaded the coal region of the Ruhr; in 1923 the figure rose to 103, only to drop again to 82, 69, etc. In spite of economies in the use of coal, and the substitution for it of fuel oil and hydro-electric power, the demand for it in the world at large and even in Europe was as great as ever; but new sources of supply had been developed which undersold the English. They had skimmed the cream of their resources in the long period preceding. Coal reached the surface from deep down, sometimes after a horizontal run of 2 or 3 miles. Mechanical equipment to cut and carry the coal had been introduced to only a slight extent. Owners protested that they were operating at a loss, and demanded a cut in wages; miners asserted that the capitalistic structure of the industry made for inefficiency, that the management both of production and distribution was incompetent, and demanded that the industry be nationalized, taken over by the government. Readers familiar with conditions in the United States will recognize many features of a problem of persistent over-supply and uneconomical competition which was not peculiar to England. In England, however, the evil was intensified by the loss of the foreign market. The miners would not and could not transfer to some other occupation; nearly one-quarter of them were wholly or partly unemployed.

Cotton

If conditions in the cotton industry, the mainstay of the export trade, were not so bad, they still gave ground for serious concern. A specialist of the industry (Professor S. J. Chapman) writing in 1905, thought that " the worst that we need immediately fear, it would seem, is a considerable retardation of the rate of growth of our industry, gradually administered, which might bring the

Lancashire industry to the stationary state." In the early '80's England had operated over half of the cotton spindles of the world. In 1914 the proportion had fallen below 40%, in 1927 it was little over one-third. While the number of spindles and looms increased in other countries, it remained stationary or declined in England. In 1926 England still led all other countries. It had over one-third of the spindles of the world, one-quarter of the looms, it accounted for about half in value of yarns and piece goods exported. But comparing the volume of exports of 1910–13 with post-war years, there had been a very considerable decline both in yarn (from 100,000 to 80,000 tons) and in piece goods (from 6.6 to about 4 milliard yards). English yarns were of fine quality, and formed actually a larger proportion (measured by value) of the shrunken trade of the world after the war. English piece goods, likewise, held their ground in fabrics of high quality. In coarser products the English trade declined in countries (notably India) where a native industry had developed, and in markets in Asia, Africa, and America where the competition of new rivals (Japan, Italy, etc.) was felt.

The Lancashire operatives had held the doctrine " Wages determine prices." Such a doctrine could be advanced in a period in which England, by its superior efficiency, could be said to control the markets of the world. It became an empty phrase in the period after the war. English manufacturers, paying relatively high wages for a 48-hour week, found it impossible to market their coarser goods over tariff barriers or in competition with rivals paying lower wages for longer hours, often with a system of double shifts which reduced the indirect costs. The percentage of unemployed in the cotton industry approached and then exceeded the figures in coal mining. Manufacturers associated in the Lancashire Cotton Corporation sought to enhance the efficiency of the industry by financial coöperation and by measures of reorganization. They had to struggle against the traditions deep rooted in the minds both of manufacturers and of operatives. Efforts to extend the hours of work, and to save labor, for example to have a weaver tend 8 looms instead of 4, met with obstinate resistance.

Iron and steel

In the iron and steel industries there had been a sharp expansion in the course of the war to meet the demand for munitions. So far as the urgency of the situation allowed, the new steel plants, which

increased productive capacity by about a half, were built adjacent to blast furnaces, so as to get the advantage of receiving liquid iron for conversion instead of wasting heat by melting the cold pig. In 1913 less than 28% of the pig iron used for making steel was received in a molten condition, while in 1924 the corresponding percentage was 45. New blast furnaces were built, larger and more efficient than the old, and some of them were provided with mechanical charging devices. In place of the old beehive ovens, which had been in the majority before the war, modern by-product ovens were built to manufacture coke, saving both heat and the gases and other by-products which previously had been wasted. By these and other changes the efficiency of the English industry was greatly enhanced. That it reached the standard of the best practice on the continent of Europe and in the United States cannot be asserted. The English industry was too firmly set in old lines to be suddenly and entirely recast. Many old and relatively inefficient features persisted; some of the improvements were surpassed in other countries almost as soon as they had been introduced in England. Burdened with a heavy capital charge by reason of extension effected at war prices, the industry could not afford such radical changes as would have been needed to bring it entirely up to date.

The international status of the industry at this time can be measured by reference to exports and imports. Exports of pig iron exceeded imports, 1910–13, in the proportion 6:1. In the post-war years exports declined and imports advanced. The proportion, 1924–25, was under 2:1; in 1927, an exceptional year in which the industry suffered from the coal strike of 1926, the relation was reversed, and exports stood to imports less than 1:2. In the simpler forms of steel, such as billets and bars, lending themselves to mass production, exports were small and imports were heavy, larger than before the war. In the more highly finished articles there was, in general, a considerable excess of exports. Taking iron and steel and their products all together, there was normally an excess of exports over imports in tonnage, and a large excess in value. But there was not, at home or abroad, a market sufficient to provide employment to all those engaged in the industry. The percentage of unemployment in the iron and steel trades was about 20 in every year of the 7 years 1924–30, rising to over 40 in 1931.

Machinery

In the machine trades, before the outbreak of the war, as shown in the previous chapter, England still led all other countries in exports, but already saw its position menaced by the rapid advances made in Germany and in the United States. During and after the war the United States increased its product with extraordinary rapidity, and took the lead in export to the world market. England remained in production about on the pre-war level, and in its sales abroad lost ground. Among the different factors contributing to this result the attitude of the labor engaged in the industry must be counted as of serious importance. The " dilution " of labor, in the course of the war, by the introduction of women and of untrained men, some of them of the clerical and professional class, led actually to an increase in output. Girls at work on the turning and boring of shells doubled the product of trained trade unionist mechanics, working the same machines under the same conditions. The construction of the *Queen Elizabeth*, in a period of war when fighting ships were a vital national need, was held up by a dispute between machinists and boilermakers as to who should put the bolts in the turrets. Even during the war the men employed in shipbuilding would not give up old habits of drink which caused losses up to a quarter of their working time. In the period of demobilization the old working force returned to its former position, with a tendency to " nurse the job " and with covert opposition to the introduction of improved machinery. An American engineer (1921) found the shop spirit in the English metal-working industries the worst which he encountered anywhere in Europe; it was marked by suspicion and malingering. The working week was reduced in 1918 from 53 to 54 hours to 47, with a corresponding increase in the hourly rates of pay, and on the undertaking of the trade unions to maintain the greatest possible output. In some lines the output declined in correspondence with the shortening of the time worked; in some lines employers asserted that the fall in output was proportionately greater than the shortening of the time, that actually less was produced in an hour. The post-war period was, of course, marked by exceptional conditions: the reaction from the strain of the war, disarrangement of the normal course of supply of raw materials and demand for finished products, and other disturbing factors. On the whole, however, it seems certain that workers in the machine trades failed to readjust their

habits and standards in an era in which the country had to maintain the highest standard of efficiency to keep the place in world trade which it needed for its subsistence.

QUESTIONS

Why did the English committee stress the importance of "mobility" in organization? What elements are comprised in it?

What important shifts in occupations did the war cause?

Why was the export trade still so important?

What was the course of imports and exports after the war?

What external causes of the decline in exports can be distinguished? Illustrate.

Illustrate and explain the development of manufactures elsewhere.

How was the trade of other important countries affected?

What beneficial effects did the war have on English manufacture?

In what respect was management still deficient?

Explain persistent deficiency in equipment?

What is meant by standardization? What advantages does it offer? Illustrate English deficiencies, and what was done to overcome them.

What was done to further scientific industrial research?

What was the condition of labor about 1900 compared with that in 1800, compared with an ideal standard?

What was the effect of the war on the condition of labor?

What was the attitude of labor, as regards efficiency in production?

What were the particular difficulties of the coal industry, as regards market, condition of production, capital and labor?

What was the course of the cotton industry?

What improvements were effected in the iron and steel industry?

What was the course of that industry?

What was the course of the machine industries? Illustrate the attitude of labor.

READING

On the subjects of this and the following chapter the best book for collateral reading is André Siegfried, *Post-War Britain*, London, 1924. The Report of the Liberal Industrial Inquiry entitled *Britain's Industrial Future*, London, 1928 (republished in the U. S.), and the Report of the (Balfour) Committee on Industry and Trade, in 5 volumes, provide indispensable material, but are not light reading. References to periodicals below suggest but a few of the many available in that field, and can be extended by the use of the guides to periodical literature.

The costs of the war to the world. (Ogg, chap. 26, pp. 615–656.)

Effects of the war on European industry and shipping. (Ogg, chap. 27, pp. 657–678.)

The post-war crisis. (Siegfried, pp. 44–60.)

Causes of the crisis. (Siegfried, pp. 61–87.)

Foreign trade. (Siegfried, pp. 88–111.)

Industrial organization and empire. (G. Makgill in *Nineteenth Century*, 1917, 82 : 108–116.)

England's prospects as viewed in war time. (J. E. Barker, "Britain's Coming Industrial Supremacy," in *Nineteenth Century*, 1916, 80: 675–700; J. A. Hobson, "Shall We Be Poorer after the War?" *Contemporary Review*, 1917, 111 : 43–53.)

Industrial reconstruction. (C. E. Fayle in *Quarterly Review*, 1916, 226: 295–317; April, 1918, 229: 414–438; Oct., 1918, 230: 319–341; O. Tead in *Political Science Quarterly*, 1918, 33 : 56–76; C. D. Burns in *Annals of the American Academy of Social and Political Science*, 1919, 82 : 52–82.)

CHAPTER VI

ENGLAND: POST-WAR PROBLEMS

Demobilization

The preceding chapter began with a discussion of the need of mobility in economic organization, borrowed from an English report, and with a statement of the shifts in occupation during the war, when England mobilized not alone its army but also its industrial population. The problem of demobilization involved not merely the return of soldiers to civil life, but also a change in the internal organization, reducing numbers in the war industries. At best this problem was hard to solve without suffering and loss. But it was made far more difficult by the fact that not England alone but the rest of the world as well had changed during the war. A return to the old pre-war organization no longer met the conditions. England had a new and far more difficult problem to face. It must mobilize again, to face the changes of a new world. As it had shifted its troops in time of war, to make the most of every unit of man power, so it must now adapt its economic organization so that every able-bodied worker could contribute the most of which he was capable to the national income.

The gravity of the problem was not immediately apparent. In England as in the United States there was a post-war boom, with a deceptive appearance of prosperity. Construction and development work and the renovation of equipment, postponed during the war, were now carried out. Factories worked full time to replenish exhausted stocks of goods. Profits were high. Factories were enlarged, new securities were lavishly marketed, all on the assumption that prosperity had returned at last, and had come to stay. Only gradually did people realize that all these phenomena were but the aftermath of the war, and that peace held very different conditions in store for them.

Shifts in occupation

The survey of the important export industries, in preceding pages, gives the picture of an unhappy struggle to meet the new

conditions. Such shifts in occupations as occurred were of a disheartening character. The occupations which declined in relative number were just those on which England had counted in the past to provide means of payment for the necessities which it must import. There were substantial declines in mining, the metal trades, in some branches of the textiles. On the other hand, the occupations which grew in relative importance were sterile, from the viewpoint of foreign trade; they were occupations in which one Englishman had to be supported by another. Such were building, public works, government service (employees of the central government declined in number while those in local government grew), above all the distributing trades, which rose from 10.9 to 14.7% of the total.

Unemployment

More serious even than this shift in occupation was the prevalence of unemployment. After December, 1920, there were always (except for one brief period) over 1 million capable of working but idle; in parts of 1921 and 1922 the number exceeded 2 million. Over the whole decade 1921–30 the number averaged nearly 1.5 million, above 12% of the total of which a record was kept. In 1931 the percentage rose steadily, to reach 20 before the end of the year. A certain amount of unemployment is inevitable in any industrial country, and may be considerable in an industrial depression. In England, in the ten years before the war, the percentage of unemployed is estimated to have been 3 in the best

PERCENTAGE OF WORKERS UNEMPLOYED

YEAR	COAL	IRON AND STEEL	MACHINE TRADES	SHIPBUILDING	COTTON	WOOLEN
1924	3	18	18	28	16	7
1925	10	23	13	29	6	13
1926	10	21	12	34	9	11
1927	16	18	13	30	9	11
1928	18	20	10	18	9	8
1929	16	19	10	24	12	13
1930	14	23	13	22	24	21
1931	23	44	26	50	41	30

year, 8 in the worst. Such a persistence of unemployment on such a large scale was, however, without precedent, and indicated a

problem of an entirely new order. The distribution of unemployment in some of the most important industries is presented in the table on page 116, which gives the average percentage (round numbers) of registered workers unemployed in Great Britain in the first quarter of the year. Workers on strike do not appear in the figures.

Causes of unemployment

A laborer, able and willing to work, will lack employment when the capitalist who might advance his wages calculates that he cannot, taking all costs into account, sell the product at a profit in any market open to him. This short sentence is a summary, obviously, of the elements of economic theory, and in its practical application to the English situation would require a review of all the facts that have been presented in preceding pages, to illustrate on one side the decline in the demand for English products, and, on the side of supply, the relatively high cost of production which prevented sales in competition with more efficient rivals.

If laborers were unable to get work in their customary occupations, why did they not seek and find employment in some other line of work? In a brief period of depression one would scarcely expect an operative trained in a particular trade to desert it for some other in which he would start at a disadvantage. One would suppose, however, that long years of short time or of entire lack of employment would force men from a depressed trade to some other, or even to some other country where conditions were more favorable. If they could not find work in their former occupation and at their former rate of wages, why did they not offer to work for less, so reducing costs and enabling employers to market the goods which they produced?

Immobility of labor

Answers to these questions must be attempted here, although it will be possible to indicate only briefly some factors in a very complex problem. In the first place it must be noted that, as stated above, there was to some extent a shift in occupations. Even if it had been more extensive it would have offered no permanent solution of England's problem, for in general it reduced the man power in the export industries, and sent people into the "sheltered" trades, producing for the local market but in the long run

dependent for their food on what the export industries could buy for them. Actually, as the last table shows, it left still in export industries, as well as in others, a great surplus of unemployed.

This immobility of labor can be explained in part by a recognized characteristic of the English people, a dogged persistence in traditional ways of work and life which fitted the people ill to face a transformed world. To some extent, just how far it is hard to say, the immobility was established and even furthered by positive action of the government.

Rise of labor in politics

The English government had in the nineteenth century been slow to grant the demands of labor, whether for a better status of trade unions or for public contributions to social welfare. A change in its attitude was forced by the increase in political influence of the mass of the people. Extensions of the suffrage in 1867 and 1885 changed England from an aristocracy to a democracy. The working class was slow to make active use of its new power. It was content, in general, to allow itself to be represented in parliament still by members of the upper class. Two members of the House of Commons were elected in 1874 to represent the miners, but down to the end of the century there was never more than a small group, a dozen or so, of labor members. There was now, however, at least a menace in the background, to force the legislature to attend to the demands of labor. The decision in the Taff Vale case, 1901, making a trade union liable to a suit for damages and so threatening its independence of action, was set aside by an act of Parliament in 1906, which legalized peaceful picketing and protected the funds of a union from attack. It was significant that in that same year more than 50 members had been returned to Parliament by the labor vote, which had become a political factor to be seriously considered. An Old Age Pension Act, passed in 1908, was one of several measures designed to improve the conditions of life of the working class. The Osborne case, 1909, which would have prevented trade unions from using their funds for political purposes, lost some of its effect by the establishment of modest salaries (£400) for members of the House of Commons, and was abrogated in its most important features by the Trade Union Act of 1913. With the extension of the suffrage to women the labor vote rose after the war from a few hundred thousand to over 2

million, and the number of representatives to slightly above 50. In the hard times, 1922–24, the labor vote grew to over 4 million, and the number of members to 150, more or less, in a total membership of the House of Commons slightly over 600. In 1924 for the first time a labor ministry took office under Ramsay MacDonald, and though it lacked a majority governed for the larger part of the year. When the Conservative government which succeeded it appealed to the country in 1929, on the issue of protection, labor polled a vote of over 8 million and elected nearly 300 members, returning MacDonald again to office.

National insurance against unemployment

This sketch of the growth in political power of the working class will help to explain the policy followed by the government after the war in regard to unemployment. A National Insurance Act had been passed by the Liberal government of Lloyd George in 1911, which included provisions for insurance both against illness and against unemployment. With respect to unemployment the act was restricted in scope. It applied to only a few industries, particularly to those engaged in construction work; it made but a small contribution from the public purse; it limited the benefits to a small sum (7*s*. a week), to be paid for not more than 15 weeks. The act was extended in 1916 to include the war industries, and in 1920 to include all employees except those in domestic service and in agriculture, so embracing about two-thirds of the total workers, and raising the number subject to its provisions from 4 to 12 million. The tendency from that time on was to relax the restrictions and to extend the benefits of the act. It applied in 1920 to those who could not find work of any kind at the rate of pay which they had been receiving; that is, a man was required to accept work to which he had not been trained but only under conditions as favorable as those to which he had been accustomed. In 1927 this was altered so as to justify a worker in refusing employment if it was not in his usual occupation as well as at his usual rate of pay. In 1930, under the second MacDonald administration, he was relieved of the need of seeking work himself and was assured benefits unless he had " refused without good cause suitable employment offered him by a Labour Exchange." The time limit on the payment of benefits was abandoned in 1924 under the labor government in office at the time and the amount of the bene-

fits was raised by various amendments from the original 7*s.* to 17*s.*, with the addition of 9*s.* for a wife and 2*s.* for each child; the sum could be added to by local authorities and was increased in purchasing power by a general fall in prices. The original theory of proper "insurance" had to be abandoned. If stoppages had been scattered and infrequent, the people affected by them, employers and employees, could have accumulated a reserve in periods of activity to tide them over bad times; this would have approached real insurance. When unemployment was so general and so persistent the reserves vanished; the benefits to those out of work could not be met by premiums paid by employers and employees who were still engaged in production; a constantly increasing part of the burden had to be assumed by the government.

Burden of taxes

Even before the war the people of England were paying in taxes to the central and local governments over one-tenth of their income (1913–14, 11.2%; cf. U. S., 6.4; France 13.3). The war left a load of debt which could be carried only by great exertion. The people of England were more heavily taxed than those of any other great country (1923–24, 23.2%; cf. U. S., 11.5; France 16.6). A wealthy man had to pay the greater part of his income in income tax, and if he desired to leave his property unimpaired to his heirs would find that the whole remainder of his income would not suffice to pay the life insurance required to offset the inheritance tax. The government had to depend more and more on the savings of the propertied classes to pay the expenses of those who were contributing nothing to the national product. As the country approached the crisis of 1931, a commission reported (June, 1931) that the policy followed to that time could not possibly be continued, if the government were to balance its budget. The insurance fund, already in debt to the government for over £80 million (say $400 million), was continuing to draw on it for almost a million pounds a week. The commission proposed that unemployment benefits be reduced (for an adult, for example, to 15*s.* a week), that contributions be increased from employer and employee as well as from the government, and, most important of all, that the payment of benefits to a person out of work terminate after 26 weeks. Leaders of the labor party, such as Ramsay MacDonald and Snow-

den, agreed to the necessity of some such action, and on appeal to the country in a general election were confirmed by a sweeping majority.

Effect of unemployment relief

There is difference of opinion as to whether the effect of the policy of unemployment relief was a demoralization of the working class. No one is qualified to speak dogmatically on such a subject, particularly when he is called upon to appraise subtle changes in character over a relatively brief period of time. No one can assert with any confidence just what would have happened if the government had followed more sternly the principle of Malthus, that "no person has any claim of *right* on society for subsistence if his labour will not purchase it"; perhaps such a course would have led to a social revolution without remedying the economic difficulties. But, on the other hand, no one can contest certain obvious results of the policy. Whether or not it undermined the will to work, it certainly reduced the incentive to work. Laborers who were paid to remain idle indefinitely had less reason to seek work in other places, to seek work in other employments, to seek work at lower wages than those which they had been used to receive. The level of wages, not only nominal but real, was actually above that prevailing before the war. The Minister of Labor (July, 1931) estimated that weekly full time nominal wages had risen 70% and hourly wages 90 to 95%, comparing 1914 and 1931; that the cost of living of the working class had risen only 45%; consequently that the level of real wages had risen 17%, measured by the week, 30 to 35% measured by the hour. These figures took no account of short time or of unemployment. They did not mean that the working class, taken as a whole, was better off than before the war. But they certainly meant one thing, that the employer who did not find the increased wage balanced by an increased output had to count on increased costs.

Costs

At the very time when he found his market restricted in other countries he found his capacity to compete hampered at home. No one would dream of asserting that, measured by ideals, the wage of the English worker was too high. It was considerably above that of most European countries, and double that of many

of them, but it was considerably less than that paid in the United States or in Canada. Every sensible person would have wished to see a further increase of the wage in England — if the worker could earn it. Any friend of the working class, however, could not but feel disquiet to see maintained a level of wages which so many could not earn. An economist does not need to be a misanthrope to be inclined to believe that those who were at work could have contributed more effectively to production if the threat of dismissal had not lost its sting, and that many of those who were not at work would have found some way to contribute to production, to their advantage rather than to their injury, if the pressure on them had not been so much relaxed. Friends of the working class opposed the unemployment policy because they believed it ruinous to the workers themselves. In the long run means must be found to buy from abroad the necessary food for the people. Exports must be maintained to buy imports. The real employers of the workers in English export industries were the people abroad who bought their products. These people were outside the range of English legislation. What they were willing to give for an English product must, in the long run, determine the price which the English manufacturer could get, the wages which he could pay, the taxes which he could bear.

Critical conditions

The strain of these conditions brought English finance and currency to the breaking point in the summer of 1931. Even in 1929 it was estimated that the annual cost of social insurance, poor law relief, old age pensions, and workmen's compensation was about £180 millions (say $900 millions) of which about half was raised by taxation. It became constantly more difficult to devise taxes which would bring to the treasury the sum necessary to cover expenditures. Manufacturers in the exporting industries complained that the charges on them were so heavy that they were crippled in their efforts to find a foreign market. To their high wage bill they had to add a supplement, say 7 to 10% (2 to 3% of total cost) to cover local taxes and social charges. Not alone on this account, be it noted, but as a result of all the conditions together, both at home and abroad, exports declined in quantity and increased but little in value. Meanwhile imports continued at a high figure, greatly exceeding the exports in value. England

still had the means to pay for the excess, but only by drawing on other resources, and by resigning the position of a great creditor country which it had formerly occupied.

International balance

The major items of England's international income and outgo are presented in the accompanying table for the year before and most of the years succeeding the war. The figures, necessarily based in most items on estimates, are given net; for example, the earnings of shipping give the freights due from foreigners after the subtraction of charges by foreigners for the carriage of goods on English account. Short term interest represents the profit of English bankers on commercial loans; commissions were paid for the services of brokers, insurance companies, and various agents; " other items " include tourist expenditures, personal remittances, and in later years payments on government account.

INTERNATIONAL BALANCE SHEET OF ENGLAND

(Figures in Millions of Pounds, Sterling)

YEAR	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1913	94	210	25	10	339	158	181
1920	340	200	40	15	595	343	252
1922	110	175	30	10	325	171	154
1923	115	150	30	10	305	203	102
1924	130	185	40	15	370	341	29
1925	124	250	60	4	438	384	54
1926	120	270	60	18	468	475	− 7
1927	140	270	63	15	488	392	96
1928	130	270	65	30	495	358	137
1929	130	250	65	39	484	396	88
1930	105	220	55	34	414	381	33
1931	80	165	30	26	301	446	− 145

(a) Earnings of shipping.
(b) Dividends and interest on investments.
(c) Short term interest, commissions.
(d) Other items.
(e) Total, (a) to (d).
(f) Excess of imports over exports, merchandise and bullion.
(g) Balance.

The most significant column of the table is, of course, the last one, giving the excess of the credit items over the single great debit item, the excess of merchandise imports. England before the

war had been used to expect a large surplus which it reinvested in foreign countries. Post-war figures show a marked change. (The large figures of the boom year, 1920, and years immediately following must be discounted, for they were expressed in a depreciated currency.) The country was no longer in the enviable position of having an assured large surplus. The amount of the balance was subject to great fluctuations, and in some years sank uncomfortably low. In normal times there would have been no cause for immediate concern, even in a year like 1926, marked by a deficit. Credits could be arranged to carry that. The real cause for concern lay in the distant prospect. But even the credit rating of the country was injured by the condition of its trade and of its finances; it was vulnerable. We must attend now to another related topic, the currency, in which difficulties culminated in the summer of 1931.

Return to gold standard in 1925

England, like other countries engaged in the war, with the exception of the United States, had abandoned the gold standard. The government had stimulated the issue of paper money and the increase of bank deposits until the currency of the country, measured in units of the pound, had become greatly inflated. Prices rose, and the pound, quoted in a gold unit, fell from the normal exchange value of $4.86 to $3.18 (Feb. 1920), fluctuating later between those limits. Fluctuations of this sort were a serious disturbance in foreign trade, and menaced the position of London as the money market of the world; no one could tell what a pound would be worth a month or three months hence. The English were determined to return to the gold standard, making the pound exchangeable for a fixed weight of gold, and the only question was whether they should strive to return to the old par, £1 = $4.86, or should accept conditions as they were and resume exchange of paper for gold at a lower rate, say £1 = $4. Obviously the latter course would have lightened the immense burden of the national debt; the government would have paid to domestic bondholders (not to those in the United States, who held obligations payable in dollars) units which had shrunk in value. Considerations urging the other course, the return to the old par, were, above all, pride in the national reputation for fulfilling contracts, and then the fact that foreign assets held by the English were mostly pay-

able in sterling, while the chief foreign liability, war debts to the United States, was payable in dollars. By determined action the government was able to bring sterling back to par in 1925, and resume the free exchange of gold for paper at the old rate. The reader should note carefully the reactions of this policy, because they reappeared, in reverse direction, when the country again abandoned the gold standard in 1931. Every increase in the gold value of the pound increased the difficulties of the English export merchant.

Results

An American importer, offered a lot of textiles for £1,000, might be very glad to take them if he could buy the necessary foreign exchange for $4,000, might hesitate at $4,250, might refuse at $4,500. The English exporter could have lowered his price in sterling so as to keep his market, if his costs had declined proportionately. It was a critical feature of the situation that they did not. The major item in his costs was wages, and wages, which had risen in nominal amount with inflation, persisted at their former levels during deflation. Not only the disinclination of the individual to accept an apparently lower rate of pay, but also the insistence of labor organizations, the policy of unemployment relief, and all the political factors involved, made it impossible to bring wages into line with the prices which were fixed in the world market.

Crisis of 1931

Summarizing the situation presented in the summer of 1931, we find a country faced with a deficit in its relations abroad, and a government which was threatened with a serious deficit in its own finances. The failure of Austria's largest commercial bank (May, 1931) caused general alarm, " froze " the large amount of English credit extended in central Europe, and caused bankers to call home from England the funds which they had there. Gold left the country in large quantities. The Bank of England sought to meet this " flight from sterling " by large credits obtained in France and in the United States. The Labor ministry fell, and was replaced by a coalition ministry, still under MacDonald, which took the necessary measures to balance the budget. In spite of all efforts, after more than £200 million in gold and deposits had been withdrawn, the government found it necessary to announce (Sept. 20) that the

Bank would no longer exchange freely gold for notes. In December sterling exchange reached a low of $3.24\frac{1}{2}$.

Election of 1931

The people were invited to pass upon the acts of their ministers in a general election held in October, 1931. The result was a sweeping defeat of the Labor party. Although they cast still some 7 million votes they were able to return only some 50 members to the House of Commons. The national coalition, including not only Conservatives and Liberals but also some former adherents of the Labor party, had 554 seats, and of these the Conservatives alone held 471. This distribution of party strength promised to bring up for reconsideration the question of commercial policy, in which some elements in the Conservative party had been deeply interested for years.

Growth of customs duties

England had never followed a policy of perfect free trade, if by that is meant the entire absence of custom restrictions. Such duties as were imposed before the World War, however, were designed to bring in revenue to the government, and afforded no protection to home industries. The exigencies of the war and the abnormal conditions of the post-war period led to departures from previous policy. At different times and for different reasons duties were imposed on a number of articles, but no general tariff was established. The "McKenna duties" were imposed early in the war (1915) on motor vehicles, musical instruments, and clocks and watches, to maintain the rate of foreign exchange by discouraging the importation of foreign luxuries. Duties on silk were also designed to afford revenue by taxing a luxury. Another set of duties was developed to establish and maintain "key industries." The country experienced great difficulty after the outbreak of the war, from the lack of essential goods which it had formerly imported: synthetic dyestuffs and drugs, gauges, scientific glassware, hosiery needles, to give examples from a long list. The importation of these products was restricted, at first by prohibition, later by heavy duties ($33\frac{1}{3}$ to 50%). Still another set of duties could be applied under the Safeguarding of Industries Act, of 1921, when it could be shown that an English industry was suffering from the importation of competing products from a country in which a

depreciated currency acted as an export bounty, or when the goods were being sold (" dumped ") at a price below the cost of production.

As a result of all these enactments, the English tariff in 1931 was a mixture of elements which suited neither the adherents of free trade nor those of protection. It has been described by saying that it was not a tariff wall, but a set of scattered and high spiked railings. The duties were high, but affected relatively few commodities; less than 3% of the imports were subject to protection. The list was greatly extended as a result of the currency crisis of 1931; the government was given power to levy duties, practically prohibitory, for a limited period, to reduce imports and so maintain the exchange rate for sterling. Even convinced free traders acquiesced in this measure, which was deemed necessary to national security. The condition, however, may be described as one of unstable equilibrium, likely to change in one direction or the other, according to the play of economic and political forces.

Problem of protection

The policy of protection, which had been vigorously urged by a considerable group in the Conservative party ever since the time of Joseph Chamberlain, about 1900, was faced by a difficulty in the English situation which may not be immediately apparent to an American reader. The country could not possibly adapt itself to a condition of self-sufficiency. It had to import from abroad most of the food and raw materials that it required. It must pay for its imports by the services of banks and shipping, by drawing on dividends and interest due from abroad, or by the export of commodities. Of these three means of payment the first two were inadequate, and the third could be furthered only under special conditions by a protective policy. If the manufacturers who contributed most of the exports were not strong enough to market their products abroad, England's case was hopeless. A sale in the home market provided no means to buy the food which was needed for the subsistence of the people.

Imperial preference

The qualifying phrase in the previous paragraph, " under special conditions," must now be explained. Protection, to be effective, must be extended outside the home market to other parts of the

world. If the countries making up the British Empire could agree to make their union not merely political but also economic, and could give the mother country such protection in their markets as would assure it an outlet for its exports, the problem would be solved. The self-governing British dominions (Australia, Canada, etc.) had, in framing their tariffs, given a preference to the exports of the mother country amounting on the average to about 9% ad valorem. After the war England allowed a corresponding reduction from the new import duties to many products of the Empire. A system of imperial preference was thus established. Under its operation, however, England still had to seek in foreign countries the market for most (about 60%) of its exports, still had to obtain from foreign countries most (over 70%) of its imports. So far as it had been carried the system of imperial preference promised no solution of England's problem.

Difficulty of the problem

An extension of the system was beset with grave difficulty. England could not exercise political pressure on members of the Empire to make them grant more substantial advantages; the time when that could be done had long since passed. It could not offer an economic *quid pro quo* to obtain increased preference. This it could do only by offering to restrict the importation from foreign countries of food and raw materials. The slight advance which it had made in this direction, granting preferential treatment to products of the Empire had given substantial results only in the case of wares already subject to taxation (sugar, tea, coffee, wine, tobacco, etc.); the Treasury lost some money by the remission of duties, but the consumer paid no more for the product. If the British dependencies were to be assured the market of the mother country for a broader range of products this could be done only by taking from the free list the important raw materials and food stuffs, and levying on them duties which would raise considerably the price to the consumer. At the higher price level the British colonial producer, free of duty, could compete with the foreigner; below that level obviously he could not compete or he would already have won the English market. This higher price level, however, meant an added obstacle to the efforts of the English manufacturer to sell his products abroad; he had now to pay a tax on raw materials from which foreign competitors were free

To the people at large it meant a considerable increase in the cost of living.

QUESTIONS

What did the problem of demobilization involve?

Why was its gravity not immediately apparent?

In what regard were shifts in occupation unsatisfactory?

What was the course of unemployment, compared with previous experience?

In what industries and what period was unemployment worst?

What different causes could be offered to explain unemployment?

What different courses were open to a worker who lacked employment in his usual occupation?

What general considerations would you suggest to explain the immobility of labor? What special considerations applied to England at that time?

What turning points, in the history of labor in politics, were marked by the dates 1874, 1906, 1913, 1924, 1929?

What were the elements of the Insurance Act, 1911, affecting unemployment; in what respects were its provisions extended later?

Illustrate the burden of taxes.

What were the conditions, and how were they met, in 1931?

Can one say, downright, that the English policy was good or bad?

What was the level of wages, judged from the viewpoints of the worker and of the employer?

How could friends of the worker criticize the system?

How did the conditions affect England's international balance?

What were the most important "invisible" items offsetting the "unfavorable" excess of imports over exports? What surplus did they provide in post-war years?

What was the lowest dollar value of the paper pound? What considerations were urged for and against a return to the gold standard at the former par, £1 = $4.86?

How did the return to the old par affect the export trades?

What was the course of the currency crisis of 1931?

What was the result of the general election of 1931?

Distinguish different kinds of customs duties imposed during and after the war.

Explain the difficulty of applying the principle of protection in England.

How could the difficulty be met by applying protection to the British Empire as a whole?

Explain the practical difficulty of extending imperial preference.

READING

Most of the references below have been restricted to the single book which best covers the ground, André Siegfried, *Post-War Britain*, London, 1924. The periodicals offer abundant material on most of the topics covered.

European recovery after the war. (Ogg, chap. 28, pp. 679–709.)

European agriculture after the war. (Ogg, chap. 26, pp. 629–653.)

English agriculture after the war. (Siegfried, pp. 148–163.)
European labor conditions and policy. (Ogg, chap. 29, pp. 713–751.)
European labor movements. (Ogg, chap. 30, pp. 755–774.)
Social insurance. (Birnie, chap. 14, pp. 236–260; Ogg, chap. 25, pp. 574–594.)
Recent political tendencies. (Siegfried, pp. 223–249.)
The Conservative and Liberal parties. (Siegfried, pp. 250–268.)
The Labor party. (Siegfried, pp. 268–287.)
The election of 1923. (Siegfried, pp. 287–305.)
The election of 1931. (See references to periodicals in *Reader's Guide*.)
England as the world's financial and commercial center. (Siegfried, pp. 135–148.)
The currency. (Siegfried, pp. 29–43, 168–177.)
The course of recent commercial policy. (Siegfried, pp. 9–29.)
Problems of commercial policy. (Siegfried, pp. 111–135, 163–168.)
The surplus population. (Siegfried, pp. 178–195.)

CHAPTER VII

FRANCE TO 1789

Anyone who would understand contemporary France must carry his study of the country back at least as far as the eighteenth century. " Our peasants and artisans both come from the Middle Ages, and deep heart searching reveals that every essential of our character already existed at the time of the Revolution of 1789." This is the judgment of André Siegfried, a Frenchman who knows his own country the better by reason of careful studies which he has made of other countries.

In the eighteenth century England made its start in the new path of industrialism in which it was to remain so long the leader. In that same century France was set in a mould of a different shape, of which, indeed, the outlines have slowly changed, but in which features have persisted down even to the present day.

Primacy of France before 1800

In the eighteenth century France counted not only as the most powerful but also as the richest country of Europe. Of its military power the position of Louis XIV at the beginning of the century, of Napoleon at its close, was significant. In area it did not match the young state of Russia, but its fertile soil, its favorable climate, and its advantageous geographical position made it the envy of other countries, and in the size of its population it was supreme. Even in 1700 France had a population of over 20 million, not only exceeding that of any other country, but amounting to nearly two-fifths (38%) of the estimated total of the " great powers " in Europe at the time. Even in 1789 the French population counted one-quarter of the total of the six great powers, one-sixth of the total estimated population of Europe, and not until after that date did France cease to be, in number of people, the leading state of the Western World.

In a period when international rivalry was sharp and wars were frequent the wealth as well as the power of countries was commonly

measured in totals, and by that measure France stood at the head. If we make our standard not the aggregate but the average, the result is very different. France as a whole led the world, but the ordinary Frenchman had reason to envy the inhabitants of many other countries. Not only was the aggregate wealth or income divided among more people, but, as will appear, it was so distributed as to leave to most of the people very little on which to live.

Inferior to England in political organization

France was weak not in its resources, physical and human, but in its organization, in the institutions which determined people's activities. It was particularly weak in its political organization. A comparison with England will best illustrate the situation. England was a country so small in area that the problem of developing efficient government, reasonably good legislation and administration, had been much simplified. The island of Britain was definitely limited by nature; it was not only protected by the sea from invasion, it was also (a matter of equal importance) protected by the sea from the temptation to territorial expansion. The energies of the English could be applied without interruption to the working out of their domestic political problems. Their political development had been intensive, resulting in improvement of the quality of their institutions rather than in their spread over greater area. Their development had been consecutive, with but slight interruption from war or revolution. What they gained from political experience they kept; progress was relatively steady if at times it seemed slow.

Political faults

When modern France took shape, at the close of the Middle Ages, it offered so large an area and so many diversities that the problem of government was much more serious. The representative system, which had been steadily maintained in England and which led finally to parliamentary government, broke down in France. The Estates General met for the last time in 1613 — for the last time until their convocation in 1789, ushering in the French Revolution. The absolute monarchy was an evasion rather than a solution of the problem. The theory that a single man was fitted by the grace of God to rule a great country was accepted by a people which did not think, but it could not justify itself by its results. The single

man was rarely wise and able. Rarely did a foolish king choose wise ministers. The fortunes of the state were guided largely by individuals whose claim to power was that they pleased the sovereign rather than that they understood and could meet the needs of the people.

France was too large to be governed effectively with the simple means available at the time. It was not large enough to suit the ambitions of its rulers. They coveted the territory of neighbors across a vague frontier, and engaged the country in wars which were fruitless whether they were won or lost. These things, of course, are matters of political history, and for details the reader must be referred to other books. There is not space here even to describe the institutions of government, and to show their faults. Reference will be made to them from time to time, but at this point only one aspect of the French political system will be treated, its finance. The main cause of the low standard of life of the average Frenchman was a fiscal system which drained the resources of the class of economic producers, and gave them to a class, economically sterile, to be wasted. In this survey of the French finances features appear which will be found again much later in another country in about the same state of political development, Russia.

Fiscal system

Economists are now agreed that capacity to pay taxes does not vary directly with a man's income, but that the rich can afford to pay a higher proportion than the poor. In accordance with this principle of progressive taxation the poor man is exempted from any direct tax, paying only a moderate amount in indirect taxes on the luxuries which he consumes, while the wealthy man may pay one-quarter, one-half, or more of his income. In contrast to this principle the ruling classes in France had so arranged that the taxes were sharply regressive: the poor paid in taxes a much higher proportion of their income than did the well-to-do. The situation will be illustrated by a description of two taxes, the gabelle and the taille.

The gabelle

The gabelle was a salt tax. The government monopolized the sale of a necessity of life, and thereby forced all the people, even the poorest, to contribute to its support. Everyone needs a certain amount of salt to maintain health; no one cares to consume much

more than that. In effect, therefore, the salt tax is a poll tax, imposing on people of all classes an equal burden. It is sometimes necessary, under primitive political conditions (as in recent times in British India), but it is always oppressive and bitterly unpopular. In France the tax was heavy; an Englishman estimated that the salt for his family cost 28 times as much in France as in England. It was unequal; in different parts of France half a dozen different rates were levied. These differences led to an immense amount of smuggling; every year there were thousands of searches and seizures, and hundreds of people were sent to the galleys. It was inconvenient; people had to buy their supply at warehouses open only twice a week, and had to buy a year's supply at one time, even if that forced them into debt. The government exempted favored classes from the tax, but forced the common people to buy a certain amount per head, forbade them to use salt water from the sea or from springs, and would not even let them without express permission use an excess above the needs of the kitchen for curing pork. The yield was large, and the government could not dispense with the tax, but it had to support such an army of officials to prevent and punish evasion that it spent 20 millions to collect 60 millions.

The taille

The taille (from the Latin *tallagium*) had been established as a royal tax in the fifteenth century, to be paid by the common people for the support of the army. The upper classes in this period were still bound to military service, so it was fair that they should be exempt, but in the course of time they were relieved of duties while they maintained their privileges, and the working class continued to pay the tax. In the larger part of France the government fixed each year a sum which it hoped to be able to collect, arbitrarily apportioned this sum among provinces and then among villages, and left the village to raise its quota as best it could. Many features of the system resembled that current in Russia before the World War. The village tax collectors were allowed a percentage on receipts, but undertook a difficult and even dangerous office. "The post of collector often drives its incumbent to despair, and nearly always ruins him," said Turgot. The best men shunned the office, even paying for dispensation to be relieved of it; it fell to the ignorant and inexperienced, with little to lose, who often

sought their profit by corrupt bargains. If one villager did not pay, the others had to make up the deficit, but there was no fixed standard, in land or income; everyone hung back, paid as little as he must, evaded payment if he could, delayed it as long as possible in any event. Not only were the nobles and clergy exempt for the most part from this tax; the system was riddled with privilege and favor, and many of those theoretically subject escaped from their obligations.

Tax farming

The burden of taxation was immensely increased by the method of collection. The government lacked an administration whose honesty and efficiency it could trust. Instead of collecting taxes through its own agents it entered into contracts with private financiers, tax farmers as they were called, who undertook to collect the tax on terms which promised them a profit. Commonly they bought the right to collect a certain tax for a lump sum which they advanced, and kept the surplus above this amount for themselves; sometimes they shared with the government the excess above a stipulated total. They relieved the government of the expense and odium of collecting the tax, but made the people pay dearly. Adam Smith asserted that taxes were being collected in England at a cost under 5% while in France when the people paid 24 millions not over 12 reached the public treasury. This estimate has been accepted by later investigators, and serves at least to indicate the waste of the system. In individual cases the gains were scandalous; Laffemas (about 1600) asserted that tax farmers leased the customs duties for 100,000 crowns and levied a million. Tax farmers became multi-millionaires. Some distinguished people belonged to this group (Helvétius and Lavoisier, for example), and one of the major faults of the system was the attraction it exercised for able men, who under different conditions might have made their fortunes by serving the public instead of by exploiting it. Even though this system of collection was not applied to all the taxes, it increased seriously the burden which the people had to carry.

Burden of taxes

The weight of that burden can be indicated, if not precisely measured, by Taine's estimate of the payments imposed upon a

peasant in the eighteenth century. He would have us believe that for every 100 francs of income the peasant had to pay 53 to the collector of the direct tax, 14 to the noble landlord, 14 to the church for tithes, and still had to pay indirect taxes from the residue of 19. Frankly, a condition as bad as that, applying to the great mass of the people, is incredible. More conservative estimates would make the taxes absorb a third or a half of the peasant's income. All that can be said with certainty is this: that the taxes took so much as to leave only a bare living for many of the people, and in some periods not even that. Between 1700 and 1789 the population grew from 21 to 26 million, evidence that people could not only live but grow under conditions as they existed. Yet there were periods of famine in which the population of the whole country or of considerable districts declined, and throughout the century the standard of living remained desperately low. In later chapters the condition of the Russian peasants in the nineteenth century will be described in some detail, and the reader will realize how sorry is the lot of a neglected agricultural population under an inefficient and burdensome government. Most of the significant facts detailed there can be matched in France of the eighteenth century. In France, however, the uglier facts represent rather the extreme, the limits to which misery might go, than conditions typical of the mass of the people.

Agricultural classes

When Arthur Young traveled in France, just before the Revolution, he was struck by the predominance of the small holding in the agriculture of the country. This was a period in which, in England, the large estate and the large farm were growing up at the expense of the class of small freeholders; in contrast to English conditions France appeared to Young to be a land of peasant proprietors. Many of these small cultivators, however, did not own the land they worked. In the mixture of rights which resulted in France from the decay of the old manorial institutions it is sometimes difficult to determine who should be regarded as the real proprietor, the lord or the cultivator; members of each class had certain rights and were subject to certain restrictions.

Relatively few of the country people were in the position of the English agricultural laborer of the later period, lacking altogether a right to land, however small a bit it might be. Many of them had

to spend part of their time working for others, but a considerable proportion had rights of some sort to land sufficient for their support. A large part, in some regions the larger part, of the land was in the hands of petty cultivators who can be regarded as practical proprietors, true peasants, although they had to recognize the over-rights of some lord.

Land tenures

The land tenures of France in this period may be characterized by saying that they were much more old-fashioned than those of England. Many more remnants of an earlier period persisted. Even the small proprietors who came closest to the condition of the English freeholders, who could transfer their holdings freely and will them to heirs, were bound commonly by some obligations to the lord of the neighborhood. At the other end of the scale were the country people still subject to *mainmorte*, the rule of the dead hand. They could not will the land they held even to their own children, unless these lived with the parents, and they had to submit to a right of the lord to a part of the estate. In eastern France, where they were most numerous, they constituted a lower class, not eligible to public office and unable to testify in cases in which their lord was concerned unless there were no other witnesses. The lord had in theory even a " right of pursuit " if they left the land, but this became purely formal, and was abolished before the Revolution.

The very fact that a relatively small proportion of the country people lacked altogether the possession of land prevented the development of large farms such as grew up in England in the eighteenth century. They were exceptional in France, because the farmer could not rely on a rural proletariat to supply the labor. There was another reason, also, which hindered the development of farming on a large scale. The landed estates of the nobility were composed of fragments, often widely scattered; the process of consolidation of fragments did not go so far in France as in England. The large estates were often put in the hands of middlemen, who sublet them in pieces to petty cultivators, and undoubtedly Arthur Young often mistook these small leaseholders for peasants, owning the land on which they worked.

Alongside the lease was another form of tenure which played no part in the later history of English agriculture, but which was common in France and in some parts, especially in the South,

was predominant. This was share-cropping, called metayage in France because the crop was usually equally divided. There will later be a discussion of this tenure, which persisted into the nineteenth century. In general it may be said that it was a tenure based on custom, indicating usually poverty of capital, and marking backwardness in the European development. Neither landlord nor tenant had the incentive to the investment of capital, the improvement of methods, or the introduction of new crops which a contractual arrangement would have afforded.

Backward implements and methods

In the latter part of the eighteenth century improvements were effected, particularly in the North; artificial grasses were introduced, and the yield of the land was increased. But Arthur Young, traveling in France just before the Revolution, was shocked to find backward methods of agriculture so widespread as to characterize the country as a whole. He described methods and implements as those of the early Middle Ages. Wooden plows, like Virgil's, merely scratching the soil, were common. Hay was mowed with scythes, grain with sickles, of a shape sanctified by centuries of tradition. Carts were small and clumsy, constructed with the minimum of iron. In considerable districts the land was cultivated by methods still more primitive and less efficient than those of the regular three-field system. In some regions a two-field system was common; in some only one-third or less of the land was sowed with crops, and this land was then given not one year but several years in fallow, to recover its fertility. Large tracts of land had been so far exhausted by the crude methods of cropping that they had been abandoned, to grow up in weeds and brush. Leaving aside the most northern provinces, where the agriculture was really good, the yield of cereals was at most 7 to 1, in the center and south only 4 or 5 to 1. In general the yield was estimated to be less than half the English, measured with respect to seed, not much more than half measured by the crop per acre. The characteristic fault of primitive field systems, the lack of fodder for farm animals with a resulting lack of manure, showed itself in an aggravated form, particularly as the nobles coveted the common pasture, and restricted its use by the people. The raising of cattle and sheep declined so that there was a dearth of meat, milk, leather, and wool. These were the conditions resulting from persistence in outworn

methods. A reform was difficult not only because of the ignorance of the people and a lack of effective leadership, but also because the needed capital was absorbed and wasted by a bad government, and the incentive to progress was damped by the fear of the tax-gatherer.

The nobles

In the eighteenth century, says Tocqueville, " in England the only exemptions from taxes were enjoyed by the poor, in France by the rich. There the aristocracy had assumed all the burdens in order to enjoy the power of governing; here they steadily refused to pay taxes, as their only consolation for the loss of political power." The nobles had been in France a serious menace to the authority of the crown, but in the seventeenth century their power had been broken, and the leaders were reduced to the position of courtiers, wasting their time amid the splendors of Versailles while others attended to the work of government. They kept their privileges after they had abandoned their duties, and became a dead-weight on the society which carried them. Some of them enjoyed princely revenues, not so much from the land they owned as from the salaries and pensions drawn from the public purse. Most of them were poor, and found it difficult to maintain the position even of simple gentry. In Brittany " there is a crowd of gentlemen cellar-rats on the farms," one family, living on black bread, " attests its nobility only by the dove-cote "; in Burgundy a gentleman might dress like a peasant, but would carry a rusty sword under his arm, and would die of hunger rather than work. A French author of the time described the farms owned by these poor nobles as worked on shares, badly cultivated, lacking stock, rendering poor harvests for which a creditor always was waiting, and described the noble family as living in a château so tumble-down as to be a menace to life, without education, united only by regret for their condition.

Burdens on the cultivator

The medieval rights of the landlords had declined constantly in money value, but persisted in many cases, to the injury of tenants and of the whole society; the people lost far more than the lord gained from them. The lord's monopoly of baking, for example, required the people to come to his oven for their bread, imposing

on them the difficulties of distance and delays in time, and exposing them to innumerable petty exactions. Hunting had been at one time free to all, and in some places had been a service expected of the lord, a duty rather than a pleasure, demanded by the tenants for the protection of their crops. As game became scarce the condition was reversed. Nobles monopolized the right to hunt, and used the people's crops to feed the game; the people could not weed or cultivate at the proper time, could not keep dogs, could not kill pests. The noble monopoly of the dove-cote, whose pigeons fed on the peasants' crops, was a similar abuse. A good illustration of the relative profit and loss of these customary rights is furnished by the case of the champart, the right of the lord to part of the crop, exercised under various forms in different regions. In one place it amounted to one-twelfth of the crop, but the lords demanded of people who would be free from it a sum amounting to one-third of the value of the land. The former proportion measured the gain to the lord, the latter the loss to the people. The lord could keep the crop standing in the field until his agent came to check his share, and could require that to be carried to his barn first, while the rest might spoil. The noble class sought in general to give as little and to get as much as it could, to exploit every privilege to gain a money return. Even their limited right of jurisdiction, almost the only political power which they exercised in local affairs, was exploited as a source of profit; it was farmed out to contractors, or was exercised by underpaid deputies while the lord kept the fees. Seigniorial justice was notoriously lax, arbitrary, and corrupt.

Condition of labor

Over against the privileged class in the country districts stood the mass of the people, the workers who actually cultivated the soil. Their condition, as said above, has been compared to that of the Russian peasants about 1900. Arthur Young thought them considerably worse off than the same class in England. He was struck by the fact that the country people wore neither shoes nor stockings. They had to sell the best of their grain to pay their dues and taxes, and ate inferior grades of rye or oats and barley. Many of them lived in mud huts, lacking stove and chimney, separated only by a few planks from their pigs and chickens. Even those who were better off rarely had glass window panes. Conditions

varied in different times and in different places. The ebb and flow of population furnishes really the only simple index by which the economic efficiency of France as a whole can be measured. Tested by that measure France lacked in some periods enough food to go around, in other periods had a surplus which permitted a growth in the number of consumers. To a large extent the country was at the mercy of the seasons. A succession of good years enabled more babies to be brought to the age at which they could contribute to production; a series of bad harvests cut off the weaker fringe of the population. Next in importance to this great variable was the fluctuation of royal finance, which left to the people for their subsistence a larger or smaller share of what they had produced. Of any general and considerable improvement in the standard of living there is no evidence. The condition of the working class accorded pretty well with the economic theory of the time, that they got a bare living and no more.

Condition of manufacture

Of manufacture, as of agriculture, it may be said that the French organization was much more old-fashioned than the English in the earlier part of the eighteenth century, and lacked almost entirely the sweeping changes which revolutionized the English organization in the latter part of the century.

In technique, the knowledge of processes, the French were regarded as distinctly superior. Their nearness to Italy, a contact which was made more effective by political and military connections, gave them a distinct advantage. Manufactures of a finer sort had first developed in the communes of northern Italy, and spread from there to countries north of the Alps. Nor were the French inferior to other peoples in their capacity to learn and ability to improve. In the description of the English conditions reference has already been made to the technical competence of the French, and the topic will be again discussed later.

France was at least the equal of other countries, and was superior to most, in its endowment of raw materials for manufacture, in the period before coal became the most important item. In its supply of wool and of some metals of minor importance (tin and lead) it was behind England, but in its stock of other materials of manufacture it was counted among the richest states of Europe. Even as regards a market for its manufactured products France had

some advantages. The mass of the people, it is true, were desperately poor, and the broad market on which machine industry was later to be built up did not yet exist. Yet this was true also of other countries while the very vices of the French fiscal system provided in the upper level of society an affluent and extravagant class of purchasers, eager to have the best and willing to pay high for it.

France did not lack resources, either physical or human, but it did lack an organization, a system of coöperation, which could develop these resources effectively. Bad politics and bad policy wasted the resources which were available.

Division of home market

The French government was too busy with foreign affairs to set domestic affairs in order. It did not even provide for an effective use of its natural resources by establishing freedom of trade within its borders. Not only did regular customs frontiers persist within the national boundary, separating one group of provinces from another, but even the local tolls, established in the Middle Ages on rivers and highways, continued to hamper exchange; these obstacles to freedom of internal trade were not swept away until the Revolution. Iron manufacturers complained not only of the dues which they had to pay for the right to transport on the rivers, but also of the resulting delays, which sometimes kept them past the time of high water and left their vessels stranded.

Gilds

Gilds, established in the Middle Ages, when manufacture and trade were necessarily local affairs, and in that period natural and wholesome institutions, were allowed to persist into the modern period, when they had outlived their usefulness and represented only obstacles to progress. Not only did the government permit them, it actually fostered and increased them. Here again we see the result of bad politics. The government wanted money, it was not able to develop an effective tax administration of its own, it used the gilds of tax gatherers and granted them monopoly privileges in return for their fiscal services. So in the very period when England was being prepared for the new era of free competition and large-scale manufacture France was being more tightly tied to the antiquated institutions of local privileged industry, conducted

on a small scale. Even so great a statesman as Colbert was forced by the need of money for the wars of Louis XIV to further the gild organization as a means of collecting taxes. The number of trades incorporated in Paris was doubled. He formed a corporation of "lemonaders" (*limonadiers*), and when no one appeared to buy the mastership he announced that membership was compulsory.

The gild was the common but not the universal form under which industry in France was regulated before the Revolution. Some provinces (as Lorraine and Champagne) escaped in large part from gild regulations, some towns (as Limoges) were known as free communes, in which anybody might exercise any trade. Even in Paris there were islands of freedom, for example the cloister of the parvis Notre Dame, under the shadow of the great cathedral. While the government sold the right of monopoly to some, it sold or gave to others dispensation from this monopoly, as will appear. Yet in general the gild was the characteristic institution determining the form and spirit of French industry in the eighteenth century.

Gild policy

The very soul of the gild was the maintenance of a traditional standard. In technique there must be no departure from time-honored processes. In making and marketing there must be no opportunity for one man to rise above the others, so menacing the traditional equality of the masters of the gild. If this principle had been carried out completely, French industry would evidently have been bound to the handicraft system, and the largest unit would have been a little shop with a few journeymen and apprentices working under the eyes of the master. Even the system of the merchant employer would have been impossible. Actually there were many departures from the strict code of the gild, but they were opposed to the spirit of the time, and were achieved commonly only by the exercise of some political influence. A serge manufacturer at Lille got from the central government the privilege of working 20 looms, that he might try certain experiments in making the goods, but the magistrates of the town protested vigorously, asserting that the industry would be ruined if a few powerful manufacturers could thus expand their operations. Limitations on the number of machines and number of laborers under one master were a natural and logical part of the gild system; the rule at Lille limited the serge-maker to 6 looms, at Lyons the silk-maker

was limited to 4. Shops did tend to grow in size in the course of the eighteenth century, and before its close examples could be found of master manufacturers employing 20 to 100 workers, but these large shops were relatively rare.

While the gild system was, on the whole, effective in repressing the development of larger and more effective industrial units, and so was an economic hindrance, the social ideals which it represented were very far from being realized. The system was riddled with favor. Promotion from the lower ranks of apprentice and journeyman to that of the masters depended not on personal merit but on family relationship or money. The mass of the industrial workers were destined to remain wage laborers, earning a bare pittance throughout their lives. To defend their interests they organized unions, *compagnonnages*, secret societies with an elaborate ritual, which fought the gilds, the employers, and even each other.

Influence of the gilds

A French student of the subject asserts that only two classes suffered much from the rule of the gilds: workmen in a trade which was capable of development by the investment of capital, and persons who had saved capital which they would have liked to invest in a trade reserved to the members of some corporation. A believer in the power of capitalism as an agent in industrial progress might well ask if this judgment is not sweeping enough to condemn the French gilds of the eighteenth century. To particularize in this way, however, seems to underrate the broad influence of the gild spirit in the society of the time. It was opposed not merely to the capitalist, it was opposed to the individual, in whatever rank of society he might find himself. It put the idea of the corporation above that of the individual; it regarded as perfect the society of the time, in which each man had a place which he must keep. French society of the time was very far from perfect. A man's place was fixed far too much by the accident of birth, far too much by political favor, far too little by his personal merits, by the contribution which he might make to the general welfare. French society needed the dissolvent of an active, stimulated individualism. It got that, in political affairs, in the French Revolution. It has never had it in social and economic affairs, down to the present day, in such measure as England and Germany and the United States have had it.

Resistance to progress

In a society sorely needing reform the gilds were an organized force opposing any change: that is the general indictment against them. They fought against efficiency embodied in production on a large scale. They fought against improvements in products and processes. The manufacture of lacquered metal could not be started because it cut into the territory of several established gilds; colored paper was manufactured against the opposition of the gilds of the engravers, of the printers, of the upholsterers; pianos were hunted down by the makers of musical instruments previously current. It would be easy to add many more such examples of the gilds' blight on progress.

Gild quarrels

When the gilds were not fighting innovators they were commonly fighting each other, contesting the monopoly of different parts of the field of industry. In this regard France suffered much from the multiplication of gilds by the government for fiscal reasons. There were 6 different gilds of upholsterers. At Amiens there were 9 distinct corporations engaged in the manufacture of different woolen products. Seamstresses were given the monopoly of women's underclothes, tailors of their outer garments. Milliners were separated from cap makers and feather workers. At Amiens barbers had a monopoly of surgical operation, but were not competent to undertake such a serious operation as lithotomy, which was performed by specialists who paid 5 cents to the barbers' gild on each occasion. The manufacture of buttons belonged to one gild or another according to the material of which they were made, horn, metal, cloth, and so forth. Tailors began to make them, to suit the button to the garment, but the other gilds protested, and had men arrested on the street if they were wearing outlawed buttons.

Attempts at reform

From time to time, in the eighteenth century, the government endeavored to restrict or to suppress the gilds. Turgot, one of the earliest of modern economists, used his power as minister in 1776 to issue an edict abolishing all the trade corporations except those of the barbers, druggists, goldsmiths, and printers. The edict was refused validity by the Parlement (a court) on the ground that

it would overthrow society by abolishing the necessary distinctions and gradations, in which each man found his place. Some of the old gilds were abolished but new ones rose to take their place. The gilds were too characteristic a part of the old régime in France to be thus easily done away with. Like the government itself they were in financial difficulties, partly from the burdens laid on them as agents in taxation, partly from the costs of the constant litigation in which they were engaged. Most of them were burdened with debt and many became bankrupt. Like the government they strove desperately to maintain the position of privilege which they enjoyed. Not until the convulsion of the French Revolution were they finally swept away.

National regulation

While the restrictions on manufacture imposed by the gilds were a very serious obstacle to industrial progress in France in the eighteenth century, they were not the only one. The central government, as well as local bodies, assumed the responsibility of telling the people what they might make and how they might make it. In this period there was a faith in the power of the state which seems almost childish in view of the actual weakness of the public administration. Not in France alone but also in England, Germany, and in fact everywhere in Europe the governments were attempting to direct the course of enterprise. France, however, suffered more than other countries in that the industrial regulations were less intelligent than the German, were more extensive, and were maintained much longer than the English. Colbert, the minister of Louis XIV, published a great code of regulations, which attempted, particularly in the matter of the textiles, to lay down rigid instructions for manufacture throughout the kingdom. Successors less wise than he extended the restrictions until they became a net from which escape would have been impossible if the government had been able to enforce them or had not itself provided means of evading them. From 1720 to 1760 more than 300 edicts were issued, regulating in minute detail the course of industry, fixing raw materials, processes, and products. The government attempted to do for a great kingdom in the eighteenth century what the gilds had done for little towns in the Middle Ages. It attempted, as they had done, to keep things just as they were. So, for example, it resisted the introduction of machinery in the

knitting trade, forbidding the making by frame-work knitters of stockings resembling those knit by hand, and for a considerable period restricting the making, the transportation, and the sale of knitting machines.

National administration

All these regulations were tainted with the curse of the period, the attempt of the government to make a profit out of its operations. Manufacturers had not only to submit to inspection, but also to pay for it. The inspectors, of different grades, were seldom experts in their field; some of them frankly accepted an official post because they had failed in trade. The regulations became so complicated and confused that their administration, even by a force of experts, would have been impossible. The evil done by them was tempered by the inefficiency and corruption of officials, but the laws remained nominally in force, always a threat to any manufacturer original and bold enough to attempt an innovation. Persons of influence would evade the restrictions, and would see that weaker competitors were kept subject to them. Even the government lost faith in its policy, and in the latter part of the eighteenth century made only half-hearted attempts to maintain the laws. Breaches in the system, allowing paper makers the free use of machinery, permitting textile manufacturers to make stuffs of such dimensions and quality as they chose, marked a gradual transition to freedom of manufacture which was not, however, achieved until the end of the century.

Privileged manufactures

One avenue of escape from these restrictions was afforded in a fashion characteristic of the country and the time: the government made laws and then gave or sold to favored individuals the right of exemption from them. Royal manufactures, so-called, included not only state enterprises, such as the arsenals and the Gobelins tapestry manufacture, but also private enterprises enjoying the royal favor and put above the ordinary law. In England as in France the kings had sought to use their power to grant favors of this kind. Their right to do so was one of the burning questions involved in the Puritan Revolution and in England was settled early in the seventeenth century by the solemn decision which became the basis of the law of patents, namely, that a right of monopoly could be granted only for a restricted period, and then

only for such public service as a new invention. From then on in England the field of industry was open to free competition, without favor. In France, down to the Revolution of 1789, competition of a manufacturer subject to local and national restrictions with a manufacturer privileged by royal favor was hopeless.

Royal manufactories

The development of the system of royal manufactories can be best briefly set forth by statistics. Before Colbert they numbered altogether 68, and under him 113 were established. In the first half of the eighteenth century 243 new grants were made, and from then to the Revolution 158. The total of these figures is 582, but it would be wide of the facts to assume that a number approaching that total was ever in existence. These enterprises were forced, not natural growths, with the feeble vitality characteristic of their origin; many of them were short-lived. Yet in every period there were some of the sufficiently prominent to emphasize the fact that success depended on favor, and that political influence was more important than private initiative. Among the many features of the old régime in France obstructing industrial development, few had more serious effects than this system of royal privileged manufacture. At the time when in England the new class of captains of industry was rising, to transform the organization in the Industrial Revolution, the development of such a class in France was made practically impossible by restrictions imposed in the field of economic affairs, while favors were reserved for those who followed the path of political preferment.

The privileges conferred on a royal manufactory commonly included freedom from such public charges as taxes and the quartering of soldiers, immunity from inspection, the right to sell the product anywhere, sometimes the right of eminent domain or special privileges in recruiting labor, often a subvention in money and the grant of some social distinction.

Conditions in privileged manufacture

Some of these privileged manufactories were large enterprises, employing hundreds of workmen, even more than a thousand, with a capital correspondingly large. Some of them included real factories in a modern sense, with considerable groups of employees, approaching or exceeding a hundred, working under oversight in a

single building. Often, however, even when the workers were concentrated in one enclosure, not dispersed in the surrounding country, they had separate cottages in which they worked independently. They were subject to strict discipline and sharp restriction of their freedom of movement; in some cases there were strikes which resembled revolts rather than modern industrial conflicts. Records of the pay received by industrial laborers in this period show a disconcerting variety in different times and places. Some workers in a royal manufacture are described as faring well; some appear to have received less than a living wage. Van Robais, a Dutchman who conducted an important textile manufacture under royal privilege, had the reputation of paying the lowest wages; he would not raise them when the price of his product rose, and would give out work enough to keep his employees busy only half of the time. Holker, an Englishman who conducted a royal manufacture of cotton at Rouen, boasted of the low wages he paid, compared with the English standard. The average wage of the industrial worker in the provinces about 1700 is given as 12 to 15 sous a day, perhaps twice as many cents in modern purchasing power; skilled workers in the cities might get 30 or 40 sous, while in the country districts females in such ordinary employments as spinning might earn only 5 to 10.

Spirit of monopoly

The grant of the privileges of royal manufacture was employed in its earlier history to establish new industries in the country, and nominally continued to be a reward for enterprise and invention. Actually it was a favor to be won by solicitation and intrigue. The Company of French Point obtained the monopoly of manufacture of that variety of lace, and required lace makers who had formerly worked at home to come to their factory, sometimes from a considerable distance, to work for them at very small wages. The spirit of monopoly spread from the royal manufacturer to include other industrial undertakers, who organized rings to control the market and to raise prices in the sale of wool, cloth, mineral products, and so forth.

Dispersion of manufacture

The reputation of France as a source of supply of fine wares, particularly silks, and as a country with a great variety of manu-

facturing industries, should not be allowed to obscure the fact that agriculture remained still in the eighteenth century the mainstay of the organization. It is estimated that manufacture occupied only one-eighth or one-ninth of the total population. Furthermore, the large establishment was still very exceptional. Most of the people engaged in manufacture worked at home or in little shops, with few apprentices or helpers. The inspector of manufactures in one of the French provinces (Poitou, 1747) wrote that there were 500 factories under his jurisdiction, but most of the manufacturers were themselves workmen, and not over 50 employers had all their work done by hired help. Manufacture was spread far and wide in the country districts, in the form of cottage industry. The gilds and the government fought a dispersion which made regulation impracticable, but the cheap labor offered by the agricultural population attracted inevitably a class of merchant employers, who gave out materials to be worked up at home. The silk industry, of which the raw material was too costly to be given out in this way, was exceptional in that the work continued to be done under the eyes of a petty employer.

This tendency to dispersion in the country districts must be borne in mind when enterprises are described as employing hundreds or even thousands of workers. Commonly there would be in such enterprises one or more warehouses to store raw material and finished goods and to furnish a place for offices, and sometimes there would be a shop or factory for finishing processes; but most of the workers would be scattered through the villages of the surrounding country. The project of a manufacture of linens at Troyes assumed 20 weavers in the factory proper, while the preparatory processes were all performed in the rural districts. In the cotton industry which grew up in Alsace in the eighteenth century the weaving as well as the spinning was done in the country cottages. Under these conditions work must still be done by hand with such simple implements as had long been in use. When power was needed, as in mills and forges, it was commonly obtained from water, sometimes from wheels turned by horses or men. The first cylinder printing machine in the cotton industry of Alsace was operated by ox power. One establishment relied on 9 oxen for its power, and many continued to use horses until well into the nineteenth century. Steam engines were introduced before 1800 but were still few in number at that time.

Technical competence

While factories, in the modern sense, grew up in France in the eighteenth century, the growth was sluggish, helped along by special privileges in the case of royal manufactures, obstructed by the multitude of restrictions imposed upon the manufacturer who enjoyed no special favors. France continued still to hold a high place in the contributions of individuals to technical progress. The improvement of the loom by Vaucanson, of the iron manufacture by Buffon, the introduction of the slide rest in metal working, are illustrations of ingenuity worthy to rank with those of any other country of the time. The Academy of Sciences was an active center of experiment and invention; in scientific research the French were second to none. The government assisted in recruiting foreign workmen who could bring with them the knowledge of improved processes, and induced many to immigrate from Germany, Holland, Italy, and other countries. This incoming flow of artisans was balanced and probably exceeded by a movement outward of French workmen, whose technical experience was valued so highly that every country endeavored to attract them.

Labor

France, thereforth, was not kept from industrial progress by technical incompetence. Nor did the country lack cheap labor. There was nothing in French history, it is true, like the agrarian revolution in England, which drove a landless proletariat to the towns and supplied the developing manufactures with a working force which had to submit to factory discipline because that was the only alternative to starvation. Holker complained that he could not manufacture cotton goods so cheaply in Rouen as he had done in England, in spite of lower wages, a government subvention, and other privileges; though he paid the workers little he got little work from them, as they wasted time in talking, flirting, and so on. If the French were in this respect at a disadvantage compared with the English, the difference was only one of degree and was not decisive. There is, unhappily, evidence of an ample proletariat in the French towns to feed factories if other conditions had been favorable to their establishment and growth.

Lack of leaders

The major reasons why the factory system made such a feeble beginning in France in this period were, first, the prevalence

everywhere of restrictions, and second, the lack of a class of business leaders, willing and able to break through these restrictions and build up industry on a competitive basis.

Here again France suffered from no lack of men with original ideas. On the contrary, the class known now as "promoters" was more numerous and more active in France than in any other country. Members of this class were known as *donneurs d'avis;* they were specialists in ideas, expert consultants. Unhappily the conditions of the time diverted them from any contribution in the field of economic production. They would, it is true, advise a client speculating in stocks, but in general their field of operation was political, not economic. Their major function was to advise the tax farmers how they might make the most money, whether by squeezing more from the people or by yielding less to the treasury. The great prizes of the time were offered not to those who served society but to those who served a government which lived to exploit society. The government of the old régime drained from the country both the capital and the men needed for industrial progress.

QUESTIONS

In what respects did France of the eighteenth century rank high; in what respects low?

Explain the superiority of English political institutions.

In what respect was France too large; in what respect too small?

What is meant by calling the French tax system regressive?

Illustrate the oppressive character of the salt tax.

What were the origin and faults of the taille?

Why did the government farm the taxes, and with what results?

Illustrate the burden of taxes.

What contrast did Arthur Young find in land holding in England and in France?

Illustrate the old-fashioned character of French tenures.

Explain the relative infrequency of large farms.

What were the characteristics of metayage?

Illustrate backwardness in implements and methods.

What was the condition of the nobles?

Illustrate burdens resulting from landlords' superior rights.

Illustrate living conditions of the cultivators.

In what respects was France qualified for success in manufacture?

What hindrances persisted in internal trade?

Explain the persistence of the gilds.

What were the principles of gild policy?

What were the economic and social effects?

Contrast the spirit of the gilds with that of later times.

Illustrate the obstructiveness of the gilds, their quarrelsomeness.
What was the later course of the gilds?
How was manufacture affected by the national regulation of industry?
How effective was the administration?
Contrast France and England as regards privileged manufactures.
How did they affect private enterprise?
What privileges did they enjoy?
What were their organization, and the conditions of labor?
What was the relative importance of manufacture in the French organization?
Explain and illustrate the dispersion of industry.
Was French manufacture prevented from developing by technical incompetence? by lack of labor?
Explain the major reasons for the backward development.

READING

The little book by Henri Sée, *Economic and Social Conditions in France during the Eighteenth Century*, N. Y., Knopf, 1927, provides in most compact form reading parallel to the subjects of this chapter. The reader will find also much of interest in Edward J. Lowell, *The Eve of the French Revolution*, Boston, 1897; Hippolyte Taine, *The Ancient Régime*, N. Y., 1876; and in Alexis de Toqueville, *The Old Régime and the Revolution*, N. Y., 1856.

Classes and their demands, 1789. (Sée, chaps. 1, 13, pp. 2–12, 222–228.)
Agriculture and the peasants. (Sée, chap. 2, pp. 14–56.)
The French peasant before the Revolution. (Mme. Mary Duclaux in *Contemporary Review*, Sept., 1903, 84: 349–364.)
The clergy. (Sée, chap. 3, pp. 60–81.)
The nobility. (Sée, chaps. 4, 5, pp. 83–119.)
Trades and gilds. (Sée, chap. 6, pp. 121–135.)
Commerce. (Sée, chap. 7, pp. 137–154.)
Industrial development. (Sée, chap. 8, pp. 156–173.)
Conditions of life. (Sée, chap. 9, pp. 175–189.)
The middle classes. (Sée, chaps. 10, 11, pp. 191–210.)
Poverty and its relief. (Sée, chap. 12, pp. 211–221.)

CHAPTER VIII

FRANCE: AGRICULTURE

The preceding chapter was introduced by a statement of a contemporary Frenchman that the characteristics of his countrymen even after 1900 were much like those which had marked them even before 1800. In this and in the next chapter, covering the economic development of France in the nineteenth century, there will be an opportunity to test and to illustrate the truth of this remark. In anticipation of the details of the history it may be profitable here to point out some general features of pre-war France which marked the country as more old-fashioned than other countries with which it would naturally be compared.

France about 1900

Figures of about 1910 showed the proportion of peoples engaged in agriculture and in manufacture and mining as follows:

Countries	*Per Cent in Agriculture*	*Per Cent in Manufacture*
France	41	33
England and Wales	8	48
Germany	35	40
United States	33	30

More than any of these other peoples the French still clung to the occupation of agriculture, which from the time when Adam delved down to the Industrial Revolution had been man's main employment, but which was now being replaced by manufacture in the leading countries. A census taken ten years later would show even the United States joined to the industrial group, and of the four countries France alone in the preponderance of agriculture.

Of equal, perhaps of greater, significance was a fact, which will be illustrated later by other figures, that the French, both in agriculture and in manufacture, engaged in production on a smaller scale than that common in other leading countries. The peasant with a small farm was still the leading figure in agriculture; the

individual artisan and the small shop still bulked large in the statistics of those engaged in manufacture.

International comparisons

In trade a tendency to self-sufficiency inherited from the past marked still the family, the district, and the country as a whole. France supplied still by far the largest part of its need for food; the proportion of foods among its imports was less even than that of the United States. The proportion of manufactures among its imports was below that of any of the other three countries. France imported mainly raw materials (58% of merchandise imports), and except in the case of silk goods manufactured mainly for the home market.

The figures of coal consumed, a good index of advancement in transportation and manufacture, were as follows for the three European countries (in millions of tons):

Year	*France*	*Germany*	*United Kingdom*
1865	18	25	90
1885	29	67	138
1908	54	206	199

The railway freight traffic (tons times distance in kilometers, in thousand millions) was in 1913:

France . . . 29 Germany . . . 67 United States . . . 421

The density of traffic (figures above compared with length of line) was in Germany and in the United States nearly double what it was in France.

France had in 1912 little over one-third of the mileage of telephone lines in Germany, and sent less than one-seventh of telephone messages.

The scattered facts used above to indicate the contrast between France and some of the other leading countries may serve to direct the reader's attention to the problem of the reasons for the difference; this and later chapters will present material for further consideration of the problem, if not for its solution. In closing this introduction, however, it may be well to indicate the existence of a problem still larger, still more important and more difficult, which must remain in the background. Siegfried discusses facts like those above, illustrating the self-sufficiency of the French, but he summarizes his account in a formula which transcends any

economic terms: "The best description that one can give of pre-war France is that it was a happy country."

The French Revolution, 1789

The old régime in France, described in the previous chapter, ended abruptly with the French Revolution of 1789. No people had ever made so determined an effort as did the French of that time to dig a gulf between themselves and their past; not until the Russian revolution of the World War was there a parallel in history. The French of the revolutionary period had been preceded by philosophers and theorists who gave them the ideals of an entirely new world, and these they now attempted to realize. It is not possible in this book to decribe the Revolution or even to discuss in detail its effects. As the years went by, more and more of the new ideas were discarded, the people reverted more and more to the habits and institutions which had directed their activities in the past. The Revolution did a great service in its work of destruction, sweeping away the antiquated remnants of a political and a social system long outgrown. The new growths, however, which came up and endured, were grafted on the old; they were not the offspring of fresh seed sown by the philosophers. Under Napoleon and under the kings of the restored monarchy who succeeded him the political and social life of the country was really a continuation of the old régime shorn of its more serious abuses. In economic affairs, as will be seen, the Revolution made a distinct mark, but it drew no sharp dividing line between past and future. Here again it served progress by its efficiency in destruction rather than in creation. In agriculture and in manufactures it freed people from trammels inherited from a distant past, but it left almost undisturbed the great underlying economic institutions of property and of production.

The nineteenth century

Following the Revolution came almost 20 years of war. The period is often compared to that of the World War in the next century. Here again, however, it is probable that we are inclined to exaggerate the effects. France was still on such a low stage of economic development that it was relatively insensible to shocks which, repeated for that length of time, would ruin a more modern civilization. France emerged from the long wars, in 1815, certainly not unscathed, but on the other hand not gravely crippled.

There followed then such a period of peace as the world has not known since modern states arose. The Franco-Prussian war, 1870–71, the most serious conflict in which France was engaged, was a blow which checked the economic development of the country for a time, but which was not, perhaps, so decisive an influence as is sometimes represented. The loss in territory was offset by gains made in other continents; the loss in men was small compared with that which came from the declining birth rate; the loss in capital was repaired with amazing ease. It is convenient for some purposes to divide the recent economic history of France into two parts, before and after 1870. That date is chosen, however, not only because it marks the Franco-Prussian war, or the third republic in France. It is about the time when steam navigation and railroad transportation first brought the other continents so close to Europe that economic problems of an entirely new kind arose.

Effect of the Revolution on agriculture

Soon after the outbreak of the French Revolution of 1789 the country people began to storm the castles of their lords as the people of Paris had stormed the Bastille. The old régime was at an end. A decree of 1793 sought to abolish, root and branch, the intricate system of custom and regulation which marked the superiority of the noble landlord to the common man who worked the fields. All men were to be equal before the law. One man might still become dependent on another by free contract, but such dependence as rested on the custom of the past was abolished; the former manorial tenant became a full proprietor. All proprietors were to cultivate what crops they pleased, freed from the vexatious restrictions of the former government. In agriculture as in other spheres of interest the Revolution sought to introduce a new era of liberty, equality, fraternity.

The Revolution was a turning point in its abolition of privilege. Its effect on the distribution of property was less than might be supposed. Even before 1789, as said in the previous chapter, there were in France a great number of petty cultivators, who differed from proprietors only in the annoying incidents of their tenure. Counting these among proprietors, the total number holding land before 1789 has been variously estimated at from 4 to 5 million. The Revolution put on the market a great amount of land previously held by the state, by the clergy, and by the

emigrant nobles. Some of this land went to increase the holdings of the petty cultivators. The number of proprietors grew, perhaps by half a million. But much of the new land was kept as undivided property by the communes; much passed into the possession of the rising middle class, who had a fund of capital to invest. The new government needed money, and followed a fiscal rather than a social policy in disposing of the free land. If France of the nineteenth century was characteristically a country of peasant proprietors, this was not a result of the French Revolution. The Revolution facilitated the development of such a class, but did not create it.

Land tenure in 1814

A series of reports made to the government, published under the title "Agricultural Statistics of 1814," show great variety in the size of holdings in different parts of France. There were some districts (as in Brittany) where the largest farm did not extend above 50 acres of arable, and holdings ranged in size down to 10 or 12 acres or even less. "Properties are in general so subdivided that he who cultivates his little patrimony or the field of another is often obliged to borrow the plow of his neighbor." Further south, but still in the grain-growing country (department of Deux Sèvres), a farm of 10 acres was said to be large enough to keep a man busy through the year; such farms were better cultivated and gave a better wheat crop than the larger farms on which several plows were kept. From these miniatures the size of the holding ranged up through all possible gradations to the large enterprise of hundreds of acres. It is interesting to note that in one region (Valence, department of Drôme) many large proprietors had begun since the Revolution to cultivate their own properties, and were credited with a very beneficial influence on agricultural methods by the experiments which they tried.

Leases

A considerable part of the agricultural area was still let out by the proprietor to a farmer or cultivator who paid a money rent or a share of the crop. In some districts of the north the land was leased in large farms, and was well cultivated by a class of capitalist farmers. Commonly the lease ran for 9 years, and contained regulations by which the fertility of the land was to be maintained.

More often the land was let in small holdings, sometimes for a rent to be paid in grain, not in cash. Leases for 3 years or for 6 years were not uncommon. These leases would ordinarily contain a provision that the farmer must follow the usual course of cropping in the district, but if this restriction prevented some abuses it certainly discouraged progress, and in connection with the short term and small size of the holding contributed to make agriculture inefficient.

Metayage

Metayage, share cropping, which Arthur Young described as the predominant tenure in France before the Revolution, still persisted to a large extent, but was now on the defensive and was declining. Commonly the proprietor provided land, house, live stock, implements, and seed for the first year; after the harvest, seed for the next year was reserved and the rest of the crop was divided, half and half. Taxes and repairs were shared in various ways. This arrangement grew up in Europe, as has been said, when custom rather than contract ruled society, when the working class was wretchedly poor and ignorant, and when proprietors assumed quite naturally a patriarchal attitude toward their dependents. The old conditions still lasted in some regions, as described in Segré, 1815 (department Maine-et-Loire). "The proprietor directs all the work, sells the cattle; nothing is done without his participation. The way of farming cannot enrich but cannot impoverish the farmer. It is an absolutely paternal administration. The master and the metayer do nothing without consulting each other." In Brive (Corrèze), "The agreements between proprietors and metayers hold usually for a year; but they continue by tacit renewal, without any other act, as long as the master is satisfied with the metayer, or the metayer with the proprietor . . . ; it is not unusual to see families remain on the same estate for 30 and 40 years and even indefinitely without renewing the agreements." But, as has been suggested, when the idea of individual contract began to sap the force of custom, both parties to this arrangement would see the advantage of a money rent, the proprietor because he would be assured a definite return without so many personal demands upon him, the metayer because he could keep not a part but all of the return above the rent fixed. So we read (Dreux, Eure-et-Loire) that metayage was much more

common before 1789, and that proprietors were abandoning it all the time for a money rent which would give them a return both more certain and more nearly corresponding to the value of their property. The official who reported on conditions in Cosne (Nièvre) criticized the leasing system, but thought that metayage was as bad. "The method of cultivating by metayers paralyzes the progress of agriculture at least as much as leases for short terms; it condemns the metayer to ignorance and misery, and demoralizes him by forcing him constantly to choose between his conscience and his interest" (in dividing the product).

Backward methods

Almost all the reports of 1814 describe an agriculture which adhered to the traditions of the past. Normandy was certainly not one of the more backward parts of the country, but these reports from that province are characteristic: "Rural economy had made no progress, the method of cultivation is always the same"; "The cultivator, accustomed to follow his routine, never takes the chance of making experiments." The open field system, with its accompaniment of *vaine pâture*, the right to pasture stock on the stubble, forced all cultivators to follow the same routine of cultivation, since all the crops of any field had to be harvested by a certain date when the animals were let in; it was less common in the south, but persisted in some parts far into the nineteenth century. Its bad effects were apparent. "There is not a good cultivator who does not vote for the abolition of this right, which is as harmful to changes in cultivation and to doing away with fallow as it is to the welfare of sheep," who were raced about by shepherds in competition for a scanty pasture (Rambouillet, Seine-et-Oise). From the same department (Corbeil) it was reported that this right caused damage to the crops and the woods, to the ditches which served for boundaries and for drainage, and to the animals themselves by spreading epidemic diseases.

Crops and yields

The reports of 1814, and similar reports compiled by English consuls and published in 1836, show a great variety of field systems. The old three-field course (winter grain, summer grain, fallow) was the most common, but was far from universal. In a progressive district, such as that about Calais, where the farms were

commonly 100 to 200 acres in size, and ran up to 250 acres, the land was kept almost constantly under crops, a field might lie fallow only once in 8 or 9 years. Good land yielded about 30 bushels of wheat an acre, fair land 22, inferior land 11. Reports from other districts gave 20 to 30 bushels as the yield from the best land, and for the inferior land noted yields as low as 8 or even 6, a medieval standard. Taking the country as a whole the level was very low; official statistics for the years after the close of the Napoleonic wars gave an average yield per acre of only 11 bushels. In many districts systems of cropping were practiced which were even less efficient than the old three-field course. So on the lower Loire, "On the best lands, adapted for wheat, that grain only is sown, and they are left fallow for the next year. On others buckwheat follows wheat, and on some rye; and these lands, after two harvests, are left fallow for five or seven years. This is the general and wretched husbandry of this department." Even worse were the conditions in a backward region like La Vendée. "The farmers are without capital, are badly provided with implements, have not half the number of labourers required for the land, do not lay on a sufficient quantity of manure, and will use but very little lime, although they find their wheat suffer by the smut for want of it; the fields are always full of weeds, for the roots are left entire by the miserable ploughs in use, and from the want of hands to pluck them out."

Plows

In gathering the statistics of 1814, officials from local districts all over France were asked to describe the plow in use. The significant feature of their answers is, first, the general statement that the plow was of the form used from time immemorial in that vicinity, and, second, the indication that each locality had its own favorite form, established by usage. The character of the soil and of the crop of course played a part in this variety, but mere tradition was certainly one of the reasons for the difference. All of the plows were made of a combination of wood and iron. Some of them were of the simplest character, resembling a narrow hoe tearing up the earth; some of them were rigged on an axle between two cumbrous wood wheels. The coulter, to cut the sod, was described in some forms as resembling a broad-bladed knife, over 30 inches long, and it is interesting to note that in one district, at

least (Chartres), the government required it to be removed from the plow at night, because it offered "a murderous instrument, which has often served in the commission of crimes."

An index of the efficiency of these implements is furnished by statements of the animals required and the ground covered. Horses were the usual draft animal in the north, oxen (even cows) in the south. In one region (Côte d'Or) oxen had formerly been in use because they could be maintained by browsing in the woods, but the government had restricted this practice to preserve the forests, and horses were introduced. Horses were sometimes hitched in front of the oxen (Maine-et-Loire), not so much to help pull as to hurry the pace. In Aveyron 1 yoke of oxen plowed 15 to 20 acres in a season. In Haute-Marne a plow team of 4 to 6 horses covered 30 acres or less in a season. In Eure-et-Loire (Chartres, a great grain-growing region), 1 man with 2 or 3 horses plowed $1\frac{1}{4}$ acres a day; plows were drawn also in different localities by 2 oxen and 1 horse, and by 2 oxen and 2 or 3 horses. In Maine-et-Loire the plow team consisted of 6 oxen alone, or of 4 to 6 oxen plus 1 or 2 horses. Teams of this size needed, of course, a driver as well as a plowman. In Nièvre plows were drawn by 6, 8, and even 10 oxen, yet the plow never went deeper than 5 or 6 inches, even in the lightest soil. In this last locality wheat was grown on the old three-course system, and yielded an average of a little less than 9 bushels per acre, of which nearly 2 had to be reserved for seed! These figures would be incredible if one did not take into account, first, the wretched condition of ill-bred and ill-fed live stock, second, the character of the plow, third, the fact that the cultivator tried to make up for ineffective plowing by repeating it several times. Land was plowed 3 or even 4 times before wheat was sowed.

Labor

Even more serious, almost startling, are the figures which indicate the amount of human labor working on the land, in proportion to its area. A Frenchman, Dupin, writing in 1827 and using, it is true, rather shaky estimates, figured an average of 13.5 human labor units per 100 acres in France, an average of 2.5 in England. An Englishman (Earl Lovelace, writing in 1848 but using earlier figures) estimated 9.5 labor units to 100 acres in France, 3 in England. No one believes these figures to be exact; no one can

contest the general truth of the contrast which they indicate. In the vineyards of the south, where spade work was the rule, one is not surprised to find (1836) a holding of 16 acres worked by 2 men, their wives, and children. The figures above, however, apply to France as a whole, in which arable agriculture employed by far the largest part of the population.

Use of land

From the English author last mentioned the accompanying table has been constructed, as the best summary presentation of the nature and the results of French agriculture in this period, say about 1840. As the figures, although official, are necessarily inexact, I have given the equivalent in round dollars.

Use of Land	Area (Millions of Acres)	Return per Acre (s.	d.)	(Dollars)
Ordinary tillage (cereals)	34.3	54	7	$13
Special crops	6.8	87	4	21
Fallow	16.7	4	7	1
Artificial grasses	3.9	43	4	9
Meadows	10.4	37	2	10
Pasture and waste	22.7	3		1
Vineyards	4.9	71	8	17

By far the largest part of the land regularly cultivated was planted with cereals, of which wheat, oats, and rye were most important but which included buckwheat and cheaper grain. The relative proportion of tilled land and fallow is what we should expect in a country in which the three-field system was still so common. The immense expanse of this fallow, merely growing weeds and affording but scanty food for animals, was then and long remained the weak point in French agriculture.

Forage crops

The lack of fodder for stock, which was one of the great weaknesses of the three-field system, caused the people to prize highly the natural meadows and explains the growth in the cultivation of such crops as clover, saintfoin, etc. They had been introduced before the Revolution; the statistics of 1814 report that they had already in some places reduced the price of hay, and had lowered

the rent of meadow and pasture land by one-fifth or one-quarter. Corbeil (Seine-et-Oise) reported that they had been introduced 50 or 60 years before, had become general in the last 25 years; "to-day there is not a single farm which does not devote a part of its land to these products"; "cultivators have found in artificial hay fields the real reason for their comfortable position." Their great benefit, of course, was that without exhausting the soil they furnished fodder for a greatly increased number of farm animals, who in turn furnished manure for the grain fields.

Special crops

The root crops, which played such a prominent part in the reform of English agriculture, were known in France but were not nearly so important there. The "special crops" indicated in the table included the potato, beet for sugar, rape for oil, flax and hemp for fiber, tobacco, and woad for dyeing. These crops were cultivated at a disadvantage until the artificial grasses made inroads on the old three-field course and provided additional supplies of manure. The potato, in 1814, was often cultivated in gardens, and sometimes in the field, but had become an important article of food only in certain districts. In Parthenay (Deux Sèvres), it was a field crop on almost all the farms; "it is commonly used for the food of animals, and even of men in periods of scarcity of grain." Through the first half of the century the potato grew constantly in importance as a crop and as a food. In 1862 it ranked in importance next to wheat and oats, and ahead of other field crops in value.

Yield of wheat

Arthur Young, who traveled through France about 1790, had no official statistics on which to base averages, but was an alert observer. He estimated the yield of wheat at 16 bushels per acre, and the average return on agricultural land at 35 shillings (a little less than $9) per acre. If we accepted his estimates we should reach the conclusion that in half a century French agriculture stood still or went backward. In only a single year from 1815 to 1840 did the wheat yield reach the level of 16 bushels per acre. Writers about 1840 estimated the gross return on agricultural land at 30, 32, 34 to 35 shillings (say $8 to $9) an acre. Young probably exaggerated the average return as much as he did the yield of

wheat. When official statistics became available, in 1815, they showed the following results, giving the wheat yield in bushels per acre in a rough annual average over the period indicated.

Period	*Bushels per Acre*
1815–20	11
1821–30	13
1831–40	14
1841–50	15

A rate of gain such as that would, under some circumstances, seem extraordinarily high. In France it meant merely that the agriculture was emerging from a medieval condition. Progress was rapid because there was so much ground to make up, and even this rapid gain left the country far behind efficient contemporaries. The really important conclusion which emerges from a study of such estimates as have been quoted and also from a study of more concrete and reliable accounts is that the level of production, measured either by the acre or by the man employed, remained very low.

Small holdings

Among the reasons for the low returns of agriculture is one already indicated but which deserves emphasis, and which can be made the occasion for reviewing other related factors. France was already a country of peasant farms, so small in size that many were real dwarfs, much below the level of economic efficiency. Small holdings, common before the Revolution, grew steadily in number. It is not possible to give reliable statistics to illustrate the subject. Such figures as are available do not lend themselves to analysis: they combine different kinds of land (forest, arable, and vineyard, for example); they fail to combine the property holdings of a man in different localities; figures of properties lead to no certain conclusions regarding holdings, the real economic units, in the *possession* of one man but the *property* of another. With this introduction some estimates of the period may be quoted, but with the warning which applies even to much more recent statistics, that they can be accepted only as very rough (and possibly misleading) indications.

For example, let us take a report to the British government on the ownership of land in France, dated 1869.

Property is generally divided into three classes: —

1. Properties averaging 600 acres, numbering about 50,000
2. Properties of 60 acres, numbering about 2,500,000
3. Properties of 6 acres, numbering about 5,000,000

If a reader with a critical bent finds the figures above quoted suspiciously neat, he can discover good basis for his scepticism by calculating total areas involved. The figures give a total of 210 million acres; the actual total area of the country was not much more than half that! The figures greatly exaggerate the extent of the medium-sized estates.

Another calculation of the time, designated "official" by the English author who quotes it, classified families according to the rental value, net income, of their properties. There were estimated to be, in round numbers, 5.4 million families owning land.

2.6 million held land of an annual income under £2, say $10
0.9 million held land of an annual income under £4, say $20
0.8 million held land of an annual income under £8, say $40

These made up a total (allowing for decimals rounded) of 4.2 million, leaving only 1.2 million owning each enough land to afford an annual income above £8 or $40, after taxes and the necessary costs of cultivation were deducted.

Agricultural classes

Another set of figures, more detailed and somewhat more reliable, classified the agricultural population not by area of land or amount of income, but by their relations to each other. The table is given here, again in millions and rounded decimals, that the reader may not have his attention distracted by insignificant figures.

	In Millions
1. Proprietors managing their own estates	0.06
2. Proprietors cultivating their own land	1.8
3. Proprietors cultivating their own land and also working on the land of another	2.0
4. Farmers (lessees) of land, also owning land of their own	0.6
5. Metayers also owning land of their own	0.3
6. Day laborers also owning land of their own	1.1
7. Farmers of land not owning land of their own	0.4
8. Metayers not owning land of their own	0.2
9. Day laborers not owning land of their own	0.9
Total	7.3

This table comes near enough important facts to deserve serious attention. The most impressive feature is the showing that nearly

three-quarters (72%) of the agricultural population owned some land, even if it was only a scrap of garden. However much the members of classes 1 to 6 might differ in the amount of land held, the difference was of degree, not in kind; they all had such an interest in the security of property as ownership of land involves. Class 2 represents the true peasants, each owning enough land to absorb his whole time, but not enough to enable him to live without work upon it. Class 3, largest of all in the table, comprised nascent peasants, working their way up to complete independence. These two groups made up, together, more than half of the agricultural population; both economically and socially they set the tone of the industry. Farmers and metayers were not half so important, and of them, again, much more than half owned some land of their own. Of over 7 million total there were only 2 million who sought their livelihood in work of which all the profit went to others, and of these again much more than half owned some bit of land.

Summary

Reliable figures of the distribution of landed property or of the division of land among actual farmers cannot be had. It can be stated with certainty, however, that small holdings greatly exceeded in number the medium-sized and large farms. Socially, the petty cultivator represented the largest class in the agricultural community. Economically, measured by total area in holdings of different size, the small holdings were less important. They were individually so small that the aggregate area embraced in them certainly covered less than a half, probably less than a third of the cultivated surface.

It is instructive to compare the figures of agricultural classes, in the table above, with the statistics of agricultural land. If we drop from the table classes 6 and 9, the laborers, we have left over 5 million (5,329,575) persons who may be termed heads of agricultural enterprise, "farmers," even if some were of a most modest kind. In the same year (1862) the areas of different sorts of agricultural land were enumerated as follows.

Land	*Million Acres*
Arable	66
Vineyards	6
Meadows	12
Pastures	16
Total	100

It would certainly be wide of the fact to assume from a comparison of these figures that there was such a thing as an "average" French farm of 20 acres, including 13 acres of arable, and so on. Rather, we must picture a great many fragments of farms, of but an acre or two, occupying only part of a man's time; a large number of farms of perhaps 10 to 20 acres; a smaller number but a large extent of farms running from 20 acres up to several times that size; and relatively few very large farms.

Agricultural implements

Some of these figures may be compared with detailed statistics of agricultural implements and machinery, available for 1862; there is, again, no pretense that the results are more than rough indications. The figures in column (*a*) give the number of implements, in column (*b*) the number of acres of arable (including fallow) to each implement. For example, there were 16 acres of arable to a plow (the larger figures are rounded). Column (*c*) gives the percentage (rounded) of heads of agricultural enterprise who owned the implement in question: 18.8% of 5,329,575 heads owned harrows.

	(*a*)	(*b*)	(*c*)
Plows	3,206,521	20	60
Harrows	1,002,302	70	20
Cultivators	25,846	2,500	0.5
Threshing machines	97,884	700	2
Sowing machines	10,853	7,000	0.2
Mowing machines	9,442	7,000	0.2
Reaping machines	8,907	7,000	0.2

Summarizing these figures, we find that except for hand implements the plow was the only general instrument of agriculture in France. Even the plow was far from universal, for spade work persisted in the vineyards and outside, but there were enough plows to provide one for an average arable area of 20 acres. Less common was the harrow, still of the old type, with a wooden frame and wooden teeth projecting. Cultivators, "horse hoes," were rare; only 5 in 1,000 of the farmers had them. Threshing machines were displacing the flail or the still more primitive method of treading out the grain by driving animals over it; this is just the period in which they were being widely adopted, the number of them had nearly doubled in the past 6 years. But such modern

instruments as sowing, mowing, and reaping machines were still rare; there were not enough of them to provide one for each even of the large estates.

Fragmentation of farms

Still another element of the situation must be introduced here, to explain why French labor was ineffective and why agricultural machinery was so tardily introduced. The units of agricultural enterprise were commonly small in area, as has been shown, but, to make the matter worse, these little farms although they were under one head were not commonly of one piece. They were often, probably much more often than not, composed of separate fragments. Reliable statistics again are lacking. All that can be said is that separate properties (including urban) assessed for taxation were composed each of about 11 parcels, on the average. Such a scattering of landed properties was, of course, normal in the old open-field system, and undoubtedly was to a considerable extent the result of that system. The evil had certainly been intensified, however, by the division of estates among heirs. Each of the heirs would demand in the division his share of each kind of land, arable, meadow, and pasture; some even insisted on a portion of the barn and of the house. Carried on for generations the process resulted in a scattering of fragments which offended all principles of efficient cultivation.

Local self-sufficiency

The former separation of the provinces of France by customs barriers disappeared in the Revolution, but the practice of local self-sufficiency continued until the railroads gradually broke it down. The wine of the south was of course transported north, generally by water, and some other specialities had established themselves. Even in 1814 Roquefort cheese to the amount of over 400 tons was produced from sheep fed on the limestone plateau of Aveyron, was ripened in the caves of the region, and was marketed as far as Bordeaux and Paris. In general every district, even in the south, attempted to raise its own food, and bought the minimum from outside. In the country districts this self-sufficiency extended even to the family. Of the women tending the cows along the lower Loire we read (1836): "They take with them their distaff or their knitting, and thus prepare a considerable

quantity of the clothing used by the family from the flax raised upon the premises." The reader will note the reference to the distaff, the ancient instrument which preceded the spinning wheel, and which was of course better fitted to outdoor work, but at this same period we are told that further south (Gironde) the women working indoors scarcely used the spinning wheel, " the distaff is the only method they know." Again we see the tradition of centuries holding firm against change.

Condition of labor

The result of all these conditions was of course a low product and a low income per capita. Taking for illustration common labor, as relatively reliable statistics are available for this class, we find the pay per day was about 2 francs in 1858, while the price of wheat was about 8 francs a bushel; a man had to work four days to earn a bushel of wheat. It is interesting to see the official estimates of a family budget of this class, all members of the family working for such time as they were commonly employed. Very rough equivalents in dollars are given.

Expenses	*Francs*	*Dollars*	*Income*	*Francs*	*Dollars*
Food (incl. bread 235)	378.50	75	Wages, 1 man . .	350	70
Lodging	42.50	8	Wages, 1 woman .	102	20
Clothing	91	18	Wages, 3 children	151.50	30
Other	70	14	Total	603.50	120
Total	582	115	Surplus . .	21	4

The figures present an impressive contrast with similar statistics for laborers of the present day: in the totals, in the high proportion demanded by food, in the low proportion available for " other " expenses. This last item would include such necessaries as light and heat, of which the family enjoyed little which it could not obtain free; if a surplus for " amusements and luxuries " existed it must have been pitifully small.

Food

Bread was then as later the mainstay of the French diet, but bread made entirely of wheat was still a luxury to the lower classes. Great quantities of buckwheat were raised, and in some districts formed the main food of the people; in 1836 potatoes were taking the place of buckwheat pancakes on the lower Loire. In the highlands of the Tarn (south central France) even in 1814

potatoes were extensively used; the people there were described as living exclusively on potatoes and chestnuts for 6 months of the year. The report of a British consul at Boulogne (1836) gives a sample dietary in a progressive region. "The ordinary food of the labourers in agriculture consists, in the morning, from four to six o'clock, of milk thickened with flour, which they eat with bread composed of an equal proportion of wheat and rye. At half-past eight o'clock the same sort of bread and butter, with water or thick milk. At noon, a soup made with lard and cabbage, and on particular occasions, soup made with pickled pork and vegetables, haricots (a species of French bean), peas, etc., with bread; beverage, small cider* or water; but never any butcher's meat."

Housing

In the laborer's budget the only item which had about the same relative importance then as now was clothing, which was made often from wool and flax spun at home, and which always included wooden shoes for wear on every day except Sunday. The sum apportioned to housing is ominously low. Some definite information on this subject is afforded by fiscal statistics, for a tax on the doors and windows of a house has been a regular part of the French system. Of 7 million dwellings (1846), nearly half had at most 3 openings (*i.e.*, 1 door, 2 windows); nearly 2 million had but 2 openings, a third of a million had but 1 opening — no window at all. These last were survivals of the eighteenth century, when they seem to have been general in the country districts. They may fairly be described as dens: a single room with a dirt floor, sunk low in the ground, entered by a low door which alone gave access to light and air. In the nineteenth century conditions improved. A family would at least live above ground, and would often have 2 rooms and sometimes a garret or loft in addition. Provision was generally made for the live stock outside, but even in 1836 the farmers of the lower Loire were described as "miserably lodged in most instances, frequently sleeping in the same apartment with their cattle."

From conditions described above, the change was gradual in the second half of the nineteenth century, until near its close.

* "Small" cider was made, presumably, by adding water to the pomace after the juice of the apples had been squeezed out, and pressing it again, so resembling the English small beer, and the *piquette* of the wine countries, which was a common beverage for those who could not afford the wine made from pure grape juice.

A more rapid movement then was intensified by the conditions growing out of the World War, and will be treated in a later chapter.

Agriculture after 1870

More than half (51%) of the French people were still occupied in agriculture in 1872. The proportion gradually declined, but even in 1911, just before the war, amounted to 41%; France remained still a country predominantly agricultural. The old crops persisted. In 1899, the year of a banner wheat crop, France ranked next to the United States and actually exceeded Russia in the production of wheat. For a few years about that time the country came near to complete self-sufficiency in its supply of wheat. Improvements in transportation by land and sea threw on the European market the cheap grain of other countries and France was exposed to the effects of these changes. The country, true to its traditions, protected itself by a tariff which was raised from time to time until, in 1894, it amounted to about $0.50 a bushel on wheat. French agricultural producers were being maintained at the expense of the consumer. Against an enemy of another important crop, the product of the vine, similar measures were of no avail. About 1865 a minute plant louse, the phylloxera, was found to be infesting the vines; by 1882 four-fifths of the vineyards in the department (Herault) leading in wine production had been destroyed. The pest was gradually overcome by the introduction of American root-stocks, which showed superior power of resistance, and by washes with water and chemicals, but the market did not keep pace with the increased production, prices fell, and about 1900 the industry was passing through a severe crisis.

Improvement

An indication of progress in methods in the most important branch of French agriculture is furnished by figures of wheat yield, which are given below in rough approximations of the annual yield in bushels per acre.

Period	*Bushels per Acre*
1851–60	15.5
1861–70	15.8
1871–80	15.8
1881–90	17.3
1891–1900	17.9
1901–1910	19.4

A glance at the figures, covering two generations in time, shows that from 1850 to 1880 conditions remained nearly stationary, but that there was distinct progress after 1880, even though, as will later be shown, this was not sufficient to bring France to the level of its contemporaries. Better use was made of the land. A more modern system of cropping reduced the area of unproductive fallow and at the same time increased the yield on the large part still cultivated with cereals. Modern agricultural machinery spread through the country districts. Comparing the statistics for 1892 with those already given for 1862, the number of plows increased only a little, but the cultivators increased nearly tenfold, and the other examples of specialized machinery listed in the table grew to 2-3-4-5-fold of the previous number. Chemical fertilizers were used to supplement the farm manure; the importation of this new aid to agriculture rose from 99,000 tons in 1890 to 232,000 in 1910. The tendency to local self-sufficiency diminished, and territorial specialization in different crops developed with the improvement of the railroad system.

International comparison

Nevertheless, at the close of the period, France still remained behind other countries in the efficiency of its agriculture. A measure is given in the accompanying table which gives in bushels per acre the yield of different crops in four European countries and in the United States, taking the average of the 10 years 1903–12. In the last line the rank of France among European countries is given, if other countries not included in the table but for which statistics are available are counted.

Country	*Wheat*	*Rye*	*Barley*	*Oats*	*Maize*	*Potatoes*
France	20	17	25	35	19	129
Germany	30	27	36	52	—	197
Great Britain	32	29	35	48	—	228
Russia	10	13	15	21	16	105
United States	14	16	25	30	27	96
Rank of France	9th	11th	10th	9th	5th	11th

The ranking in the last line is somewhat unfair because the list from which it was made up included some countries in which the crop was grown under special conditions and in very small quantities. Yet it is certainly significant that France appears always so far down on the list, and in the table always so far below Germany

and Great Britain, superior only to Russia. As regards the United States it should be noted that cultivation here was extensive, in the economic sense, and the labor power which in Europe (even in Russia) would be concentrated on a small plot was spread over a large farm; the yield per unit of area was small but the yield per person employed was many-fold that which would be shown by any of the countries in the table. If the table were extended to include other products, France would still make a poor showing. In the product of sugar beets and in the amount of sugar obtained it was again 8th or 9th. The product of milk per cow was estimated to be about half that obtained in England or Germany, about a third of that obtained in Denmark or Switzerland. Only in the culture of the vine did France stand high among European countries.

Reasons of inferiority

The reason for this inferiority was certainly not any disadvantage of soil or climate. It must be sought in the human element. Looking at the matter in one aspect it may be said that the French got less from their agriculture because they put less into it. Their cows gave less milk because they had less to eat of such concentrated foods as bran, oil-cake, and various residues. Their sugar product was below the German because their seed (two-thirds of it bought from Germany!) was not so good, because the beets were not so well cultivated and handled, and because, again, they did not have so much fertilizer on which to feed. Of chemical fertilizers France used in its agriculture at this time about two-thirds as much phosphates per acre cultivated as did Germany, one-third as much nitrates, less than one-twentieth as much potash salts. In spite of all the progress which French farmers had made in the nineteenth century they were still behind those of other leading countries in their application of capital, whether it took the form of fertilizer or machinery, and in their knowledge of methods.

Holdings about 1900

To explain these facts we must return to a study of the organization of French agriculture. Statistics of the holdings, "farms" managed as independent units whether owned or not by the possessor, are given in round numbers for the year 1908 in an accompanying table.

Farms	*Number*	*Per Cent of Area*
Very small (under 2.5 acres) . .	2,000,000	3
Small (2.5 to 25 acres)	2,500,000	26
Medium (25 to 100 acres) . . .	700,000	34
Large (over 100 acres)	150,000	37

The distribution of land, as sketched in the statistics above, appears to approach closely the ideal presented by agricultural economists, in which a combination of large, medium, and small holdings intermixed offers the peculiar advantages associated with each type, and a corrective for the characteristic deficiencies of the other types. But French agriculture was very far from ideal; the comparative figures of yield prove that definitely. The most plausible explanation appears to be that the French, in agriculture as in manufacture and business enterprise in general, did not possess the qualities which enabled them to make the most of organization on a large scale.

Comparison of small and large holdings

The government in 1908–09 investigated the condition of agriculture in the country with regard particularly to the small holdings, and asked a specific answer from each department to the question: "Is the small holding inferior, equal, or superior to the large?" A categorical answer to the question was of course not easy, and some answers were so qualified that they have to be left out of account. Even so there were enough specific answers, supported by concrete facts, to make the results very significant and they are reproduced here. The table is to be read in this fashion: In — departments (omitting Corsica) the small holding was — to the large.

	Equal	*Superior*	*Inferior*	*Not Classed*
In implements and methods .	14	27	29	14
In economic results	8	47	16	13

The small holding was so nearly equal to the large in equipment and methods, so far superior in results obtained, that one of two conclusions is inevitable: either the small holding was relatively efficient or the large holding was relatively inefficient. The latter solution, already indicated by comparative figures of crop yields, is confirmed by the judgment of competent authorities. A writer of the period (1912) thought that of the large estates which were not let out in pieces a few but not many were examples of the

model large holding, with progressive methods and generous outlay of capital. Many of the wealthy middle class, manufacturers and business men, who attempted to manage their estates did badly. He found the medium-sized holdings inferior to the large in equipment, inferior to the small in the quality of their labor; some prospered in the hands of efficient farmers, but a large proportion of them were ill organized, lacking competent direction or adequate capital.

Importance of peasant class

Even in economic efficiency, therefore, the proprietors of large and medium-sized estates were at least not so far superior to the small landholder as to deserve detailed consideration, and the small landholders were so incomparably more important in the social and political aspect that the remainder of this chapter will be devoted to them. An American writer (Perkins) called attention to the current conception of the French national characteristics — wit, frivolity, fickleness, a readiness for political change — and the contrast of this idea, based on the traveler's view of the Paris boulevards, with the real France. The French peasant, the most important figure in the most important occupation, presented the complete antithesis of those characteristics. An eminent Frenchman declared his people to be the most *sérieux* (almost, not quite, the English " serious ") nation in the world, in contrast to the English, the keynote of whose character he found to be frivolity!

Industry

The outstanding economic merit of the French peasant was his unfailing industry. " An instinct for work dominates the peasant, an instinct irresistible as a natural law which binds him to the soil by a tie amounting almost to devotion." In the cultivation of those products which require only patient toil and unfailing personal attention the French peasant was supreme; he needed to fear no competitor in raising poultry and eggs, in growing flowers or vegetables for the market which the towns opened to him. But his field was limited, both in the physical and the metaphorical sense. He could follow tradition, but unassisted he was unable to keep pace with the advance of scientific agriculture, and unable or unwilling to invest sufficient capital to get the best returns. The application of modern farm machinery was hindered not only by

the small size of his holding, but also by the fact that it was still often composed of separate fragments. Humorous stories were told of fragments so small that in the process of division they finally vanished, of a father who rewarded his son every time he headed his class by buying him a bit of land, because it was cheaper than to take him to the circus. A farm of moderate size might consist of many scattered pieces. The consolidation of these fragments, as it had been accomplished in other countries, would have greatly enhanced the value of the land, but was relatively rare in France because each peasant feared lest he might lose by the transaction.

Thrift

The indomitable persistence of the French peasant showed itself not only in his devotion to work but also in his passion for saving. Small as might be the return from a little farm, the family expenditure would be kept still smaller. If often, as unquestionably was the case, this was at the sacrifice of economic efficiency, yet time and again the thrift of the people has been the salvation of the nation. The saving often took the form of hoarding. A notary in the '80's received from a peasant in payment for a piece of land gold pieces of the coinage of every government from that of Louis XVI; some of these must have been hoarded for 90 years. To a surprising extent, considering his cautious nature, the French peasant invested in bonds and stocks, as these securities became more common. But the one investment which above all others appealed to him, which in many cases actually enthralled him, was land. Many peasants lived to save, and saved to buy land. All through the nineteenth century they were extending their holdings, nibbling bits off the medium and large estates. Balzac called the peasant " that indefatigable mole, that rodent which undermines and disintegrates the soil, parcels it out and divides an acre into a hundred fragments. . . . This essentially unsocial element, created by the Revolution, will some day absorb the middle classes, just as the middle classes have destroyed the nobility. Lifted above the law by its own insignificance this Robespierre with one head and twenty million arms is at work perpetually." Balzac's book, *Les Paysans*, translated under the title " Sons of the Soil," was the account of the proprietor of a large estate whose land was coveted by the peasants, and whose

life was made so difficult by them that he had finally to surrender; the book is fiction but was based on established facts.

Narrowness

Balzac disliked the peasant because, as said, he was unsocial, because he was inevitably narrow, because he was usually ignorant. He did not share in the development of civilization, its books and newspapers and all its finer products. With his eye on the ground he had no interest in or understanding of the larger problems of the day, economic, social, or political. Devoted to Napoleon, with whom he associated his rights to land, and oblivious to the passage of time, he hailed Napoleon III a half-century later as "the Little One" come back, with a lusty *Vive Marie Louise* for his wife! Even in the twentieth century the examination of recruits to the army showed a considerable percentage of illiterates, and profound ignorance of French institutions and French history. One recruit described Austerlitz as one of Napoleon's ambassadors; another held the Maid of Orleans to be a French queen who was burnt by the Prussians in 1871; a third described Victor Hugo as a lawyer and composer who had discovered vaccination. If, as has been said, the peasants made universal suffrage possible by their conservatism, they made it inefficient by their ignorance and lack of interest. They were a ready prey to the professional politician, in matters both of domestic and foreign policy. If they had been consulted, the war of 1870 would never have taken place. Bismarck said that the French soldiers with whom he talked had only one great desire, to return to their fields: "If one only listened to the French peasant there would never be any war."

QUESTIONS

In what two important respects did the French organization about 1910 appear less advanced than that of other leading countries?

What are other indications of a less progressive organization?

Does economic activity or material welfare supply any index of happiness?

What were the aims and results of the French Revolution?

Sketch the course of France in the nineteenth century.

What was the effect of the French Revolution on agriculture?

What was the distribution of land holdings after the Revolution?

What were the nature and effects of the usual leases?

What were the terms of metayage, its good and bad sides?

Illustrate the backwardness of agriculture. Explain the low yield.

Characterize the plow and the plow team, and explain their inefficiency.

How did expenditure of labor compare with that in England?

What was the gross yield per acre of land used in different ways? (See U. S. Census for comparative contemporary figures.)

What was the advantage of artificial grasses over fallow or pasture?

What do the statistics of wheat yield show as regards rate of progress, and absolute level attained?

What evidence of the prevalence of small holdings is supplied by estimates (*a*) of landed properties, (*b*) of net incomes, (*c*) of agricultural classes?

Summarize the evidence as regards number of holders of different classes and size of farms.

Distinguish 3 classes of agricultural implements: (*a*) relatively common, (*b*) not infrequent, (*c*) rare.

Explain why the individual farm was commonly composed of scattered pieces.

Illustrate local self-sufficiency. Indicate exceptions.

Compare the condition of labor with that of later times.

Illustrate the characteristic diet of laborers.

Illustrate their housing.

To what difficulties was French agriculture exposed after 1870?

Indicate the course of improvement, and reasons for it.

How did French agriculture compare with that of other countries just before the World War?

What reasons can be given for its inferiority?

What was the distribution of land holdings, 1908?

What was the relative efficiency of large and small holdings?

Contrast Parisian and French qualities.

Illustrate economic merits and defects of the French peasant.

Illustrate his thrift.

Illustrate his political merits and defects.

READING

The student will find, in addition to references below, good descriptions of French agriculture in Agnes Duclaux, *The Fields of France*, London, 1902, and Rowland E. Prothero (Lord Ernle), *The Pleasant Land of France*, N. Y., 1908. French fiction supplies admirable collateral reading; for suggestions see "Peasant Studies in French Fiction," *Edinburgh Review*, 1902, 205 : 299–325.

The French character. (André Siegfried, *France, a Study in Nationality*, New Haven, 1930, chap. 1, pp. 1–23; or in *Atlantic Monthly*, Dec., 1929, 144 : 744–754.)

Development of European agriculture. (Birnie, chap. 2, pp. 14–33.)

Nature and effects of the French Revolution. (Ogg, chap. 5, pp. 88–98, with bibliography.)

The French peasant after the Revolution. (Mme Mary Duclaux, *Contemporary Review*, Oct., 1903, 84 : 498–510.)

French agriculture after the Revolution. (Ogg, chap. 9, pp. 180–192; Knight, chap. 7, pp. 480–496.)

French agriculture to 1848. (Clapham, chap. 1, pp. 6–28.)
Metayage. (Lord Ernle, "Farming Partnerships in France," *Nineteenth Century*, 1920, 87 : 439–454.)
French agriculture, 1848–1914. (Clapham, chap. 8, pp. 158–194.)
Village life in France. (*Contemporary Review*, 1892, 61 : 65–72; 1894, 65 : 376–391; 1897, 71 : 424–431.)

CHAPTER IX

FRANCE: MANUFACTURE

Facts were presented at the beginning of the last chapter to illustrate the tardy progress of France in economic organization, as compared with England or Germany. Professor Clapham raises the question whether France may properly be said to have experienced at all an industrial revolution, so gradual and long-drawn-out was the development, and he shows that the period of most active change did not follow closely after the period of the great inventions but was deferred to the very end of the nineteenth century.

Conditions in 1851

A census taken in the middle of the century, 1851, gives a means of appraising progress up to that point. Most of the people (57%) were still engaged in agriculture. Just a quarter (25%) were returned as occupied in manufacture. But most of these, roughly 3 out of 4, were on the handicraft stage, providing food, clothing, and building for the local market of the village or the town. They differed little in the technique which they employed, in the simplicity of their organization, in the breadth of their market, from their prototypes of the Middle Ages. On the average, in most trades, a " master " employer had 2 employees working for him; the typical concern was obviously a little shop. Only in the clothing trade did the number of employees rise to 4 times the number of masters.

The census distinguished from this petty industry another class which was denominated *la grande industrie et les manufactures*, comprising about a quarter of the total. The French words suggest " big business," but the fact was far removed from that modern concept. These so-called manufactures differed from the petty industry in that they produced for a broader market than the immediate locality, but their scale of operations was very little larger. Using the same measure as before, the number of work-

men compared with that of employers, most of these manufactures had an average of 4 or 5 workers to a master. This was true of the workers in iron and other metals, and even of the workers in mines and quarries. Only in the industries which produced the raw metals did the number of workmen per master rise to 6 and 7.

Textiles

One group of industries there was, and only one, the textiles, which had risen to a higher stage of organization. In this group the number of workmen per master rose to 15. Numerically the group was very large, including over one-sixth of the total engaged in manufacture (both small and large), and therefore, both as regards quantity and quality, deserves consideration. Its characteristics are illustrated by another set of figures, which omit scattered workers and restrict attention to the establishments in which some degree of concentration had been attained.

Textiles	*Number of Estab'ts*	*Number of Workers*	*Workers per Estab't*	*Value Added per Estab't*	*Value Added per Worker*
Hemp, flax .	5,576	56,167	10	$1,000	$140
Cotton . . .	2,394	244,819	102	13,000	130
Wool . . .	2,424	144,146	60	11,000	190
Silk	1,459	165,000	113	24,000	210
Mixed . . .	1,005	85,121	84	15,000	170
Total . .	12,858	695,253	54	$9,000	$160

The vague term "establishment," a verbal translation of the original French, has been retained in the text, since it is clear that the figures refer rather to business firms than to factories, and included a mixture of merchant employers and of factories proper. This dilution of the factory statistics was probably least in the cotton manufacture, in which most of the processes were carried on under the roof of the employer, and probably greatest in the wool and silk industries, in which production was still largely in the hands of out-workers. Making allowance for this imperfection of the material, which forbids rigid conclusions, it is nevertheless apparent that the scale of business operations in this most advanced branch of French industry was still very small.

Small scale of operation

In the manufacture of flax and hemp the typical establishment seems to have been a little mill dependent on water power if it supplied any power to its handful of workers. In the cotton manu-

facture there were already large establishments, employing each several hundred workers, but in that and in other branches of the textiles the typical factory seems to have been one with 50 to 100 workers, at most. The value added by manufacture (value of the product for the year, less cost of raw materials) gives another measure of the modest standard of French industrial enterprises of the period, whether they were conducted by merchant employers or by manufacturers proper. The value added per worker, out of which must be paid not only wages but also other expenses and profits, seems at first incredibly small. The reader must realize however that the official statistics of the time set the average wage in the textile industries at 2 francs a day ($120 a year); a skilled male worker got more than that, but the women, who were in the majority, got less, and the children much less.

Steam power

The figures giving the percentages of establishments employing steam power seem at first glance impossibly small. The total number of steam engines credited to textile establishments was 1,004; the total number of stationary engines in France at that time was 5,672. It is possible that some engines in the textile mills were omitted from the enumeration, yet in 1878, the first year in which it is possible to compare steam horse power in the textiles and in the total, the proportion was not very different (in thousands of horse power, not number of engines, 91 : 484). Even when the dilution of the statistics by the inclusion of merchant employers is taken into account the figures remain significant, and will furnish occasion for comment hereafter.

Petty industry

This survey of the condition of industry at the middle of the century leaves us now to review the history up to that point. Of the petty industry, the larger part of the whole, it may be said with a considerable measure of truth that it had no history. The butcher, the baker, and the candlestick maker pursued their trades in the old fashion, as their predecessors for many generations had done before them. The shoemakers of the town or of the village still worked singly, turning out each a pair of shoes a day for the people of his vicinity; the first shoe factory is said to have been established at Liancourt in 1844. The sabots, wooden shoes,

were made not only in town or village, but actually in the forests themselves; one merchant employer in Paris had 1,000 persons working for him in central France (Cantal), turning out 600,000 pairs a year. The French Revolution had swept away in industry as it had in agriculture many of the hampering restrictions of the old régime. The gilds were gone, but their narrowness of spirit still persisted. Workers in some industries (paper, hat, some of the metal and textile trades) endeavored to restrict admission to their sons, charging them a very small fee and others a very high fee for acceptance as apprentices. Time and again the reëstablishment of the gilds was proposed. It was argued that there were too many artisans and merchants, that there was an oversupply of manufactured products, that destructive competition forced down prices; the whole argument was medieval in character, aiming to maintain the status of the workman, without regard to the consumer and without regard to progress. The government did not agree to these proposals, and did not interfere so seriously with the conduct of manufacture as the old monarchy had done, but it still tended to superintend closely the course of affairs. It still maintained the assize of bread and the old regulations of the town market, and on occasion it regulated in detail the conduct of an industry.

Slow development

The long period of war after 1789, in which France was partially blockaded, led to the establishment of the beet-sugar industry, and stimulated the growth of the cotton and metal industries. Prohibitive tariffs endeavored to maintain in the following period the development of manufactures. Their growth was at best sluggish. Taking as an index of progress in advanced methods the use of steam, we find the total horse power of stationary engines in France, including those used both in mining and in manufacture, in 1850 was 67,000. At that same date a single industry in England, the cotton manufacture, employed nearly as much steam horse power, 62,940. France did not lack inventors. Papin was the first to apply steam to the movement of a piston in a cylinder. Cugnot constructed a locomotive in 1770. Frenchmen were applying steam to navigation at the very time when Americans and English were carrying on their experiments; Frenchmen were the first to suggest the use of the screw propeller. Yet in the practical devel-

opment and application of steam power the French lagged far behind the English. They lacked an organization in which the spirit of business enterprise would adopt an idea and make it a practical reality. The first steam engines introduced in France in the eighteenth century (1726 and following), were made and set up by Englishmen. Native Frenchmen, it is true, the brothers Perier, took up the inventions of Watt, and established the first factory for building steam engines in France; before 1815 a considerable number of steam engines had been built and applied to manufacture. Yet a well-informed Frenchman testified in 1824 that in most parts of France the principal manufactures employed water power, and if the official statistics of 1851 are to be trusted the proportion of textile establishments employing steam power was still small even then. In Alsace, as said above, some of the early textile mills were run by oxen, and many were run by horses even in the second quarter of the nineteenth century.

It is not practicable here to review the course of the many different manufactures, but we may note some features in the development of those which were of the greatest interest in the period of the Industrial Revolution.

Cotton

The cotton manufacture lagged far behind the English. Its output in 1835 was estimated at only one-quarter of the English, and the reasons for its backwardness, as seen by an English writer of the time, are significant. (1) French factory labor lacked perseverance and regularity. "The weavers, and even many of the spinners, cannot be induced to work the year round at their looms or mules, but in the months of summer and vintage turn to agricultural pursuits for relaxation." France kept long its rural character; even in 1851 only 1 in 10 of the people lived in a town of 20,000 inhabitants or more. The people were not cut off from the land, as they had been in England, and loved to return to it after separation for a time. The factory workers as a class were less effectively trained. Their wages were considerably less than in England, but the labor cost was fully as high. (2) The raw materials cost more in France, particularly when they were transported far into the interior. Cotton bought in New Orleans could be landed in Liverpool for considerably less than in Le Havre, taking freight and duties into account, and the Lancashire industry was

closer to the sea. Coal, particularly, cost more in France than in England, often 3 or 4 times as much at the factory, partly again because of higher customs duties and local dues, but mainly by reason of the need of transporting it further from the mine. (3) The capital charges were heavier in France than in England. A steam engine of 30 horse power costing $7,000 in England would cost $11,000 in France; the equipment with spinning machinery to be run by an engine of that size would cost $54,000 in England, $85,000 in France. Power looms were not introduced until long after they had been used in England, partly because they cost so much more, partly because hand labor was so much cheaper. (4) The French factories were smaller than the English, and scattered through the country instead of being concentrated as they were in Lancashire. The French could not attain the advantages of specializing in standard lines, as the English in their spinning industry had done relatively early. The English were already producing for a world market, and exported as much in a fortnight as the French did in a year. (5) The policy of high protection, even prohibition, did not keep out smuggled goods to compete with the French product, while it increased the costs of manufacture, and narrowed the market. Political instability discouraged investment, and raised interest charges.

Iron and steel

Another industry by which to test the industrial progress of France is that of iron and steel. At the middle of the century its output, measured in tons of pig iron, was under one-quarter that of the English industry. It started the century with an organization and technique which had remained substantially unchanged for hundreds of years. The iron was smelted in little charcoal furnaces, scattered through the country near readily accessible ore deposits. In the region of the Pyrenees the old Catalan furnace was still in use, producing wrought iron or steel directly from the ore. These old methods consumed an extravagant amount of fuel, and made the product too expensive for general use. The use of coke was introduced before 1800, but spread very gradually; even near the middle of the century (1846) less than 1 in 4 of the furnaces used coke for fuel. At that date the price of a ton of pig iron was, in round figures, $18 in Glasgow, $30 in France. Such a difference in price could be maintained, of course, only by

a very high protective tariff, and English authors calculated that the French lost a million pounds sterling a year by the extra cost of the iron used in their plows alone!

The development of the industry can best be illustrated by the figures of the accompanying table.

Year	Pig Iron		Wrought Iron		Steel
	000 Tons	% Charcoal	000 Tons	% Charcoal	000 Tons
1819	110	98	70	99	
1825	200	98	140	71	5
1830	260	92	150	69	
1835	290	84	210	52	6
1840	350	78	240	43	7
1845	440	60	340	32	12
1850	420	55	360	23	9

Antiquated methods

The figures show, obviously, a considerable growth through the period, a growth much more rapid than that of population. On the other hand, as said above, France at the end of the period had an output less than a quarter of the English, and when comparison is made with the figures of production about 1900, evidently the country had made but a bare beginning. The most significant figures are those which show the persistence of charcoal as a fuel. Protected from competition by the tariff and less favored by its supply of mineral fuel France clung to antiquated methods long after England had abandoned them. The railroads, with their superior efficiency in the transportation of bulky raw materials and with their demand for metal, really introduced France to the "iron age" just about the date at which the table above closes. Statistics showing the organization of the separate branches in metal production and metal manufacture in 1851 list a total of 2,308 establishments still employing 1,918 water motors and only 411 steam engines. In a dozen different branches of the industry only one, that engaged in the manufacture of machinery, employed more steam engines than water wheels.

Machinery

The manufacture of machinery is that branch of industry by which the mechanical progress of a people can best be rated, and

the means of comparing English and French in this regard is furnished by the evidence before an English parliamentary committee in 1824. The French manufacture was prejudiced, in the first place, by the higher cost of iron, reckoned roughly at double the price in England. The coal needed for iron working cost several times as much in France as in England. The equipment of the shops was inferior. The French, to emphasize the fact by repetition, did not lack inventive capacity. In their suggestions for improvement of the tools for metal working they were pioneers. Taking for illustration the three fundamental machine tools, the lathe, the planer, and the miller, all three of these were developed on lines which the French had suggested in the eighteenth century. Even the idea of the system of manufacture with interchangeable parts was French in origin. Thomas Jefferson, when minister to France in 1785, described the plan of a French inventor for manufacturing the locks of muskets on this system, and Jefferson himself assembled several locks from the parts. Yet none of these ideas reached the stage of practical application in the country of its origin, and the French had later to import from other countries the machines or the methods which they had been the first to propose.

Labor

French labor in the machine trades was inferior to the English. Given enough time, a French artisan could turn out as good a piece of work as an Englishman. But a French business man testified that if he had to place an order for spinning machinery he would expect to get the product from an English shop in one-quarter or less of the time which a French shop employing the same number of workmen would require. "This speed should be attributed in part to the superior skill of the workmen, and still more to the great variety of tools in use in the English shops." An English engineer testified that it paid better to employ an English smith at 10 or 11 francs a day than a French smith at 4 francs; the difference between them lay not merely in the quality of their work, but in the quantity which either could turn out in a given time. Actually the manufacture of engines and machinery in France at this time was largely in the hands of English employers and English workmen, and the labor cost was 25 to 30% higher than in England because the English workers had to be tempted

by high wages to leave home. Manby & Wilson, manufacturing steam engines at Charenton, employed about 200 Englishmen, and used French workers only for common labor. The same Frenchman whose testimony has been noted above estimated that in the 2 years preceding, some 16,000 workmen had emigrated from England to France. The manufacture of engines and machinery could be conducted in France only under the protection of a high tariff, and at prices which imposed a serious burden on the manufacturer who was purchasing equipment for a factory.

Condition of labor

The condition of industrial labor in this period still corresponded pretty closely to the theories of classical economists and later socialists, that the laborer received just about enough to maintain life and to bring up a family. An adult factory worker might receive 2 or 3 francs a day, say $120 to $180 a year. The family budget of such a worker would resemble the budget of the agricultural laborer given in the preceding chapter, with most of the expenditures distributed to cover the primary necessities. Bread alone absorbed a third to a half of all that the laborer had to spend. The price of wheat varied, of course, in different times and places, but fluctuated in general about the level of $1.50 a bushel. If we accept the estimate of a German economist that a people living mainly on bread requires about 400 pounds of grain a year per head, and make the necessary calculations, we find that even the worst paid laborer had more than enough to support a family. The growth of population in the period is of course evidence of the fact. The complaint of drunken riots in the labor class is further evidence that workmen spent money on non-essentials, whether they could afford to or not. The industrial worker of the early nineteenth century was unquestionably better off than his predecessor of the eighteenth. The improvement in that period was, however, vastly less than that which was reserved for the succeeding time.

Hours

The normal day in the textile factories was assumed to be 12 hours of actual work, to which must be added the time allowed for meals. This standard was, however, not infrequently exceeded, and even the journeyman artisans, working outside the factories, were used to a longer day. They would begin at 5 and keep at

work until 8 in the evening, taking out an hour each for breakfast and for dinner. These long hours may help to explain the slow pace of the workmen, and the complaint of Sunday drinking. The government as yet did little to protect the working class. It forbade any effective combination on their part to raise wages or to improve the conditions of work, and gave employers a favored position in any dispute over wages.

Description in preceding pages of conditions in France down to about 1850 shows a country which had been as yet little affected by changes arising from the Industrial Revolution. Cut off from international trade and competition by a tariff so high as often to be prohibitive, the industrial organization was still in the main like that of centuries preceding. The new factory industry engaged but a small part of the people, made little use of the new source of power, trailed slowly after the leader, England, in the improvement of processes and machinery.

In the period from 1850 to 1914 the process of change was more rapid, and was most rapid at its close. It will be convenient, for the purpose of a preliminary survey, to break the period into three parts, and to note the general influences which characterized each.

Development after 1850

Between 1850 and 1870 the mileage of railroads grew from little over 2,000 to nearly 10,000, almost fivefold, and, what is still more significant, railroad freight service (ton-mileage) increased over tenfold. Industries which had grown up in France at a considerable distance from coal mines and from the sea were only now in a position to share the advantages which England had enjoyed even before the railroad was introduced. The development of ocean transportation in this same period made another contribution to the opportunities for the supply of raw materials and for the growth of manufactures depending upon them. Finally, a reform of the policy of high protection made it possible for the first time to take full advantage of the opportunities for commercial intercourse. Napoleon III desired to abolish prohibitions and to reduce duties both on raw materials and finished goods, but found the legislature obstinately opposed to his projects.

The Cobden treaty

If he could not make laws he had absolute power to make treaties, and the Cobden treaty of 1860 (so-called because it was the work of

Richard Cobden, acting for England, and of Michel Chevalier acting for France) was a sweeping measure of reform. It was the first of a series of treaties with other states, in which the "most favored nation" clause granted to all the same advantage which had been conceded to one. French manufacturers had foreseen nothing but disaster as a result of the reduction of the tariff. Some interests, indeed, did suffer, but French industry in general maintained itself and gradually developed on a higher level of efficiency.

War of 1870

The next period, 1870–1890, began with a war which cost France heavily in men and in money, and which cut from the country two provinces, Alsace and Lorraine, in which flourishing manufactures had developed. The German Empire which rose from this war showed in its rapid industrial development the psychological stimulus of military and political success, and it is not unreasonable to explain the relatively slow advance of France in part by the burdens resulting from the war and the psychological influence of defeat. As indicated on an earlier page, however, war losses were not crushing, and other factors played a part in retarding progress. Hard times were general in the period of falling prices which followed the great commercial crisis of 1873, and France was not the only European country in which the manufacturers complained that business was bad.

More rapid development after 1890

In contrast with the slow and gradual development of earlier decades the last period, from 1890 to 1914, was marked by an advance so rapid as to do much to close the gap between France and the leading industrial countries. An index of this acceleration of progress is furnished by statistics of the steam power employed in manufacture and mining. (Figures, in millions of horse power, give averages for five-year periods centering about the date noted.)

1875	0.4	1895	1.2
1880	0.6	1900	1.8
1885	0.7	1905	2.3
1890	0.9	1910	3.0

Some reasons can be given for the quickened pace of the industrial development in this last period, although it is difficult to determine their relative importance. In the first place, as

appeared in the course of English history, the hard times which followed the crisis of 1873 were succeeded, at the close of the century, by a period of rising prices and active business all over the world. France, which had learned some lessons of industrial efficiency in a period of relatively free trade, now applied its experience behind the shelter of a tariff wall. There was a gradual return to protection after the late '70's, culminating in the high duties of the Meline tariff of 1892; the manufactures which developed after that date were devoted largely to the supply of the home market. Progressive leadership, which had been notably lacking in French industry in the earlier periods, developed latent possibilities. Siegfried, writing in 1931, dates from a period beginning over 30 years before a movement into industry and "big business" of some of the ablest members of the middle class who previously had sought to satisfy their ambitions in military or administrative careers. The decline in prestige of the army involved in the Dreyfus case may have played a part in this movement.

Decline in birth rate

Important as is this evidence of the rise of a new spirit of business enterprise, the reader should be warned not to exaggerate its scope. Taking the French people as a whole, industrial as well as agricultural, they remained extraordinarily constant to the traditions of the past. Reference must be made to an element in French life too big and complex to be treated here in detail but too significant to be omitted entirely from consideration. This is the decline in the birth rate, which resulted toward the end of the century in an almost stationary population. The reason for this decline, long a matter of dispute, was indicated by a Finnish statistician, who compared the proportion of births in different regions with the proportion of those who took out insurance against fire and hail. In departments in which such insurance was usual, he found a low birth rate; in departments in which the majority had not protected themselves by insurance, the birth rate was much higher. Similarly, he found an inverse correspondence between the proportion of people with accounts in savings banks and the number of births: the more general was the practice of saving, the less children were born. Long since, of course, the decline of the birth rate in France has been accepted as the result of conscious and voluntary restriction. Instances are mentioned of marriage

contracts specifying the number of children to be reared, and of divorces arranged because too many children were born. A French author cites as characteristic a newspaper romance ending, " They were happy . . . and they didn't have any children."

Birth rate in different classes

When the statistics were analyzed more carefully, it was found that the birth rate varied greatly in different economic and social classes. In cities with a large factory population it was relatively high. The proletariat (the word, by derivation, means " breeders ") had nothing to lose, and took little thought of limiting their families. In country districts, where the peasants were poor and their farms very small, the attitude of the people was the same. When, however, the peasant held more land and attached more importance to his social position, he was inclined to limit his family to prevent the dissipation of his little estate. " He loves his land more than his family," " His dream is to have a sole heir marry an heiress," " He is quite willing to let his name disappear if his only child is a daughter ": in such terms the peasant of this class was characterized. Likewise the population of those cities which had been little affected by the development of manufacture, where the people still made their living in the old fashion, as artisans, shopkeepers, in the professions or in office, showed very low birth rates. These were the home of the true *bourgeois*, the type which was not confined to them but which marked and still marks a large proportion of the French people. Siegfried suggests as a definition of the term " a man with some accumulated savings," and expands it by a statement of the bourgeois ideal: " To acquire a little property, a little house, a little business, a little income from investments, is the dream of millions of French people."

French bourgeois

What is there peculiarly French in this ideal? In fairness to M. Siegfried (who, in fact, had no idea of presenting a formal and complete definition), the characteristics of the type must be analyzed in some detail. One element in the type is certainly prudence, caution, the determination to " play safe." It shows itself in all the relations of property and family, in the custom of the *dot*, dowry, in marriages, in the determination to preserve what property the family has, to add a little to it if possible. An

author in the *Revue de deux mondes* said: "We live to save in France, not save to live." Other countries have a greater aggregate wealth, some have more wealth per capita, few if any have such a general distribution of wealth among the lower middle class.

A second element, closely connected with the first, is the prudent limitation of ambition. Let us run over again M. Siegfried's statement of the bourgeois ideal, to note the importance of the word so often repeated: "To acquire a little property, a little house, a little business, a little income from investments." Young people of the middle class are not so much encouraged to become rich as exhorted not to die poor. The German economist, Sombart, thinks that in economic history two distinct motives to economic activity have shown themselves, in the earlier period, say that of the Middle Ages, the desire to make a living, in the later period, that of capitalism, the desire to become rich. It may be, as has been suggested, that France is happy beyond other countries, and it may be that this is the result of a modest restriction of ambition. Certainly no one could ask more of life than "a good living." At any rate, this is the aim of a large part of the French people.

However much this aim may conduce to happiness, it does not urge a people to economic progress. It is a sure sign that the society is still ruled by tradition, by standards of the past which disregard the possibilities of a future. Adherence to tradition is certainly a third element in the make-up of the French middle class. The economic problem, as it presents itself to them, may be sketched as follows: how to make a living, in the place in which one was born, in some established occupation. Emigration from France is and has long been notably small. Internal migration was of slight dimensions. A servant girl who took a place in another department (there were 87 departments in France) lost her character. The census of 1896 showed that three-quarters of those employed in manufacture, the occupation most likely to stimulate a change of residence, were working in the department in which they were born.

Tendency to individual activity

We must be prepared, then, to find France, even at the end of the nineteenth century, a country still old-fashioned in its organization. The people were strongly individualistic, not so much

in a positive, assertive sense as in their distrust of economic relations which would tie their fortunes up with those of others. The French statistics supply an interesting indication of this bent. They classified the whole population gainfully occupied according as they were working alone, or in " establishments " as heads or underlings. An establishment was defined as consisting of at least two persons working together. It might, for example, consist of a man and his wife, if they both worked; they would be rated as two heads if they had no employees. Figures are presented here for two dates at the turn of the century, and for a date after the war, in a period which will be considered later; they are given in percentages, for convenience of comparison.

	1896	*1901*	*1921*
Working alone . .	23.6	21.7	15.9
In establishments			
Heads	23.5	25.5	30.3
Employees . . .	51.4	51.2	51.2
Out of work . . .	1.5	1.6	2.6

Simplicity of organization

These figures, it may be well to repeat, cover the whole working population, those in agriculture, trade, and other occupations, as well as those in manufacture. Taken altogether, they picture an extraordinarily simple organization. Nearly a quarter of the people worked entirely by themselves, with no one above to direct them, and no subordinates to be directed. Another quarter was composed of people who were their own masters, whether or not they shared their independence or had others under them. Just over half worked for others, receiving wages or salaries. The average " business firm " in France, if we strained the statistics to interpret them in this way, consisted of one head and two subordinates, a unit of three persons. Actually, of course, the mixture of occupations makes such an interpretation improper. Nearly half of the establishments in agriculture, about a quarter of those in trade, had no employees; they consisted of the characteristic French unit, a married couple sharing the labor of an enterprise.

Size of manufacturing establishments

Another set of statistics, restricted to manufacture proper, affords the means of judging the size of industrial establishments, and permits a comparison with American conditions.

Number of Employees	Number of Establishments		Percentage	
	France	United States	France	United States
Working alone	1,505,853			
No employees	37,413	110,510		
1 to 5 employees	501,668	232,726	88	58
6 to 20 employees	49,173	112,138	9	28
21 to 50 employees	10,904	32,408	2	8
51 to 100	3,709	11,663	.6	3
101 to 500 employees	2,997	11,303	.5	3
501 to 1,000 employees	258	1,063	.05	.26
Over 1,000	94	443		
Total	568,803	401,744		

The figures refer, in France, to the year 1896, in the United States to 1899, so that the difference in time is almost negligible. This is the most recent date for which a comparison of the two countries is possible; after 1899 the American census of manufactures abandoned the attempt to include the hand trades, and even in that year omitted so many scattered individuals that the figures for people working without employees are valueless. The figures for establishments in which labor was employed are fairly reliable, and are significant. In both countries the little shop with 5 employees or less outnumbered establishments of larger size. In France, however, this petty unit absorbed so much of the total that the larger establishments appear relatively unimportant. The small factory, employing 6 to 20 workers, was relatively 3 times, the larger factory with 21 to 50 was 4 times, factories still larger were 5 times as numerous in the United States as in France.

Financial organization

Relatively few of the industrial establishments in France were organized in the form of the joint stock company, which lends itself to unlimited expansion. They were in large part family enterprises, passed on from one generation to another, with a jealous exclusion of participation by outsiders. A family which prospered in manufacture would invest its capital often not by the expansion of the original factory, but by buying or building other factories, sometimes in the same industry, sometimes in a related and sometimes in quite a distinct industry. Economists long ago

recognized that France suffered less than some other countries from commercial crises, and did not need to seek long for the reason; the organization was less complex and delicate, and operated under a lower pressure. When the people did invest in securities, not in real estate, they preferred government bonds, after them high-grade railroad bonds, and still later in order of preference seasoned stocks. The banks were largely investment institutions, with very conservative commitments in financing trade, and with little inclination to promote new enterprises.

Contrast with England

We must not expect to find, therefore, in the France of this period, manufactures developed along the line of " big business," marketing great quantities of standard goods at the low prices resulting from an extensive mechanical equipment and an elaborate organization. A comparison of the exports of England and of France just before the war shows a marked contrast. The bulk of the English exports, as has been seen, was the product of a few great industries. French exports were scattered over a wide field; the largest items in the list, manufactures of silk and of cotton, did not in either case amount to 6% of the total exports. In almost every class the French did export something. The individual skill and taste of their workmen enabled them to offer products of a quality which removed them from the competition of pure machine work. In some lines, such as clothing, millinery, fancy goods, they were notably strong. The characteristics of their work can be illustrated by a survey of some of the important industries.

Silk

The outstanding French manufacture was that of silk. About 1880 France produced more silk goods than all the rest of Europe together. These goods were in large part the product of hand work. In the region of Lyons and St. Étienne silk working was an hereditary employment, passed on from generation to generation. The workers felt a love and pride in their trade, and were celebrated all over the world for their skill and taste. The typical weaver would own 1 to 3 hand looms, with journeymen working under his supervision. In the last quarter of the century power looms gradually displaced the hand looms, with the substitution of the factory for the family shop. Yet even at the end of the

century the number of hand looms was nearly double that of those power driven, and the proportion of hand to power was higher than in other European countries. Machinery was introduced in the preliminary process of throwing before it was in weaving, but even in this branch of the trade factories developed on only a small scale. At the turn of the century French manufacturers were complaining of the competition from Germany, Switzerland, and Italy, and asked for protection against the cheap machine-made products of those countries.

Cotton

If cotton ranked alongside silk in the French export trade, it must not be assumed that the industry was equally strong. French silks were marketed all over the world. French cottons could be sold only in small quantities outside the protected market of the colonies. Here again the French by reason of the special quality of their work could hold their own in particular lines. Even so far back as 1824 an English cotton manufacturer had testified that in the production of some specialities the French were unexcelled. So in 1913 the French could market some of their lace, embroidery, passementerie, and tulles even against the resistance of the high tariff of the United States. In staple goods they had to rely upon the protection of the home market. They were still behindhand in attaining the advantages of the large, highly organized, and thoroughly mechanized units of production. Even in 1885, over one-third of the cotton looms were hand looms. Even after 1900 one-fifth of the knit goods were made in the homes of the workers, by that class of " frame-work knitters " which had died a lingering death in England long before. Even in the factories reliance was placed on labor rather than on machinery, when comparison was made with the English or American practice. Most of the factories were owned by individuals or by private associations; they were smaller than English factories of their class; they lacked the economies of standardization, and had no such efficient merchandising organization as English manufacturers enjoyed.

Wool

The manufacture of woolen products does not, as has been seen, lend itself so readily to mechanization as the manufacture of cottons. When the Cobden treaty of 1860 opened the market to the competition of the English, weaving was still almost altogether a

hand process in France. Some branches of the industry were forced to improve their methods and lower their prices to maintain themselves. On the other hand, in the manufacture of short wool (as flannels) France was actually superior to England, and the quality of some worsted products was so high that they were sure of a market anywhere; the English recognized their superiority in beauty of texture and of color. In the later history of the industry these conditions continued; some branches of the industry manufactured for the home market, under the protection of a tariff, while others built up a large export trade. The French were recognized leaders in the manufacture of women's dress goods, in which art and finish and draping qualities were of the first importance; they actually exported half or more of their product to England. Some of the best of these fine fabrics were still being woven on hand looms down to the World War; hand-loom weaving was still the major occupation of some villages in the region of Cambrai and St. Quentin, in the heart of the war zone. Factories found it hard to compete with the product of individual workers who turned out ever-varying patterns in small quantities, and who managed to give a personal touch to the work which the machine could not imitate.

Iron and steel

In the production of iron and steel the peculiar merits of French individualism had an unfavorable field. Even in 1850 the metallurgical industry had developed to a state in which mass production in units of considerable size was essential to efficiency, and the inventions of Bessemer and his successors in the manufacture of mild steel intensified the advantages of " big business." The relative freedom of trade following the Cobden treaty of 1860 forced the abandonment of the antiquated charcoal furnace, but did not stimulate such improvement as would enable the French to supply entirely their needs for the metals. In spite of a tariff which was felt as a serious burden by the consumer (rising to 50% and above), the country still imported iron and steel and their products. In the last quarter of the century progress in production still was slow, to be followed in the first decade of the next century by a remarkable burst of development. Figures giving the product in millions of tons, for five-year averages centering on the date noted, are as follows:

Year	*Cast Iron*	*Wrought Iron and Steel*
1875	1.4	1.0
1900	2.5	1.9
1910	4.3	3.1

The rapid development in the last decade before the war resulted from the adoption of advanced methods of production, in which the large plant with all functions integrated took a leading part.

Machinery

The relatively high price of iron and steel was, of course, a hindrance to the development of the metal-working trades. Another obstacle, not so obvious but of at least equal importance, was the deep-rooted sense of craftsmanship in the people, which caused them to rely more on manual skill and less on the automatic action of a machine. The work was actually better done, but it was done more slowly and at greater cost. The Pennsylvania Railroad imported for trial a French locomotive which was pronounced by American experts to be a work of art, superior to anything produced in the United States; but the beautiful finish of the bearing surfaces and other mechanical details was attained by treating each part as an individual problem to be worked out by hand. An American motor mechanic who had taken down many French automobile engines said that they were in better condition after 10 or 15 years of service than were American engines 6 months out of the factory. The French mechanic filed and scraped each bearing to an individual fit. In the automobile industry, it is true, some firms adopted American methods, and could compete not only in quality but also in quantity production at moderate prices. In 1913 the value of automobiles exported was higher than that of either wines or woolen products. In general, however, the French machine industry remained in development behind the American, the German, even the Belgian. Manufacturers of machine tools asserted that they were forced to offer a great variety of designs, because it did not pay to specialize in producing for the restricted home market, and asked further protection against the product of foreign competitors who could offer more prompt deliveries and better prices because they followed the more effective methods bound up with specialization and standardization.

Productivity of industry

The census of 1851 gave a very low figure ($160) for the value added per worker by the processes of manufacture in the textile industry. Even after 1900 the productivity of French industry, measured in this way, was still low. Figures for 1906, including all branches of industry and including not only wage earners but all actively occupied, gave an average per head for the value added of 1,780 francs (say $356, using the rough equivalent 5 francs = $1). In the chemical industry the figure rose to $800; in the clothing trades it sank to $250. This figure for "value added," total value of the product less cost of raw materials, cannot be accepted as stating the facts exactly at any time, and it is still less reliable as a measure of comparison between different times, particularly when there is a change, as in the figures above, in the basis of the figures. Yet the one broad fact, that the productivity of French industry increased considerably in the second half of the nineteenth century but still remained low at its close, is certain, even if productivity cannot be so exactly measured as the figures suggest. A comparison of the figures of different countries is still more hazardous, but is interesting and permissible if caution be exercised. The census of 1900 in the United States followed a plan roughly comparable to the French, including in the enumeration the hand trades and the petty craftsmen, and gave an average of about $870 value added for each person actively occupied. The census of 1910, restricted to factory industry, gave an average over $1,100.

As the value which manufacture adds to the raw materials must bear the charge of rent, interest, and profits, as well as wages, obviously the wage earner in French industry could hope to receive only a modest compensation. Wages had risen but little in the first half of the century. In the second half, stating the matter in a general way, they doubled. The cost of living, notably as affected by the fall in the price of wheat, had gone down, so that the worker was distinctly better off. Characteristic wage rates in the region of Paris, where the highest wages were paid, were given as follows in 1893, reckoned for the day of 10 hours:

Workers	*Wages in Francs*	*Equivalent in Dollars*
Skilled male	7 to 10	about $1.50 to $2
Unskilled male	4.50 to 6.50	about $0.90 to $1.30
Women	2.50 to 3.50	about $0.50 to $0.70
Children and young persons	1 to 3.50	about $0.20 to $0.70

An English report of 1909 estimated the weekly money wage paid in the building trades and some branches of manufacture at three-quarters of the English standard, and, as the French worked longer hours, the hourly wage at less than two-thirds of the English. The cost of living was estimated to be somewhat higher in France than in the country of free trade.

Protection of labor

France, following England after a long interval in the introduction of machinery and power, naturally was much later in recognizing the need of protecting factory labor. In the middle of the century, when England was limiting the hours of work to 10 in the textile mills, with efficient officials to enforce the law, France set a limit of 12 hours for all factory work, but did not organize an administration to make the rule effective. Not until 1874 was such an administration provided, and even the provisions then adopted, aiming to limit the labor of children over 12 years (in spinning mills children over 10 were still admitted), were not strictly carried out. At last the government, about 1900, introduced the 10-hour day and the 60-hour week for women and young persons, and prohibited the system of shifts or relays by which men in the textile industry had been still compelled to work 12 hours.

Influence of labor

These relatively recent reforms were due to an awakened public sentiment, and to the increased political influence of the working class. The right of workers to organize in trade unions was not formally granted until 1884. Before that date unions had been tolerated in fact, but an organized strike was a penal offense. Even afterward unions did not develop anything like the numerical importance or effective organization of the English unions. The interest of the working class was diverted in large measure to revolutionary socialism, and showed itself in political rather than in industrial relations. Representatives of labor became an important fraction in the Chamber of Deputies. They won a number of reforms in factory regulation and in social legislation. In spite of their radical principles, however, as Professor Clapham points out, they touched the traditional rights of property to but a very slight extent. The regard for property of the French *bourgeois* was indomitable.

QUESTIONS

What was the relative importance of manufacture about 1850? What was the proportion of petty industry in the total?

What was the average size of establishments in the textile industry, measured by the number of workers or by the value added?

To what extent was steam power employed?

Illustrate the persistence of medieval conditions and ideas in petty industry.

Illustrate and explain the slow development in the use of steam engines.

What reasons were given to explain the backwardness of the cotton industry?

What was the course of the iron and steel industry? Illustrate the persistence of antiquated methods.

What conditions hampered the development of the machine industry? Compare French and English labor in this industry.

What was the condition of industrial labor in this period?

What were the normal hours of work?

What elements favored development, 1850–70?

Explain the slow progress, 1870–90; the more rapid development after 1890.

How was the decline of the birth rate proved to be voluntary?

Distinguish tendencies of the birth rate in different classes.

What are some of the elements in the French *bourgeois* type? Illustrate.

Illustrate the tendency to individual rather than group activity.

Illustrate the tendency to small-scale operation in manufacture; compare the United States.

Illustrate the less progressive financial organization.

Contrast English and French manufactures.

What were the importance and characteristics of the silk industry?

What were the characteristics of the cotton industry?

Explain why the woolen industry could export largely to England.

What was the course of the iron and steel industry?

In what respects were the French strong in machine construction; in what respects weak?

Explain the term "value added in manufacture." What do the figures show regarding productivity of manufacture?

What were, in general, changes in wages and hours of work?

Contrast French and English aims in the labor movement.

READING

European foreign trade and policy. (Ogg, chap. 13, pp. 369–282; Knight chap. 11, pp. 610–641; Birnie, chap. 4, pp. 51–64.)

Money, banking, investment, 1815–1848. (Clapham, chap. 6, pp. 121–139.)

Money, banking, investment, since 1848. (Clapham, chap. 13, pp. 376–401.)

Communications and commerce since 1848. (Clapham, chap. 12, pp. 339–375.)

French manufacture to 1848. (Clapham, chap. 3, pp. 53–81.)
French manufacture since 1848. (Clapham, chap. 10, pp. 232–265.)
French industry in nineteenth century. (Knight, chap. 10, pp. 572–608; Ogg, chap. 10, pp. 204–210.)
The small industries of France. (Givskov in *Contemporary Review*, Sept., 1904, 86: 333–349.)
The labor movement. (Clapham, chap. 10, pp. 265–277.)
Labor legislation. (Ogg, chap. 18, pp. 380–389.)
Labor organization. (Ogg, chap. 20, pp. 438–450.)
French socialism. (Ogg, chap. 23, pp. 512–522.)

CHAPTER X

POST-WAR FRANCE

Loss in men

In the course of the war France mobilized 7,935,000 men, one-fifth of the total population, over three-fourths of the males of working age. Of these, at the time of the armistice, 1,282,000 had been reported killed or missing; of the remainder nearly 1,500,000 needed a pension to compensate impaired productive capacity, and of these last nearly half were permanently crippled. Comparing the figures of population in the same area, excluding territory gained in the war, there was a decline in total population of over 2 million between 1911 and 1921, and the loss was heaviest in the class of males between 15 and 50. To fill the gap thus formed in the working population France had to enlist the service of foreigners. Spaniards, Italians, and Poles helped to fill the ranks of the agricultural laborers; and Italians, Poles, Belgians, and Spaniards to the number of nearly a million took service in French industry.

Loss in capital

The loss in capital seemed likewise overwhelming. Before the war France was a creditor country, with investments abroad of 45 milliard francs (roughly $9,000 million), and a net credit in its favor of 38 milliard, after deducting investments by foreigners in France. The country lost a quarter of the whole in the Russian collapse, sold part of the remainder, and incurred new debts abroad, so that it emerged from the war with a net debit in international relations of nearly 7 milliard pre-war francs (say $1,400 million). Immensely greater was the internal debt, representing in the main capital diverted from productive to unproductive uses. The national debt even in 1914 was heavy, amounting to about 12% of the total national wealth, but in the ten years following it had grown to crushing proportions, and is estimated to have reached 37%. The government struggled in vain to balance the budget,

and had to meet the calls upon it by the issue of paper money, with resulting depreciation of the franc.

Inflation

An attempt under Poincaré (1923) to force Germany to pay the reparations imposed, by military occupation of the Ruhr district, increased expenditure and gave no promise of financial return. There was a "flight from the franc." Faced by the prospect of unlimited depreciation, owners of capital sought to transfer it to other countries where the currency was more stable, and by selling francs depressed still more their gold value. The franc fell to a level of two cents in gold. At last, again under Poincaré (1926), the government took vigorous measures to set its finances in order, and turned the tide. With the return of confidence in 1926–27 capital flowed back to the country, depreciation ceased, the government was able to build up a large stock of gold and to establish the franc again on the gold standard (1928). It followed the only practicable course in abandoning any attempt to return to the former par (1 franc = $0.193), and stabilized the franc at about one-fifth of its former value (1 franc = $0.03918); in the text hereafter conversion will be made at the rough rate of (1 franc = $0.04). The government could not in this way reduce the burden of debts owed abroad and payable in foreign currency, but it did reduce the interest on the internal debt to manageable proportions. It paid bond-holders the stipulated number of francs, but the franc was easier to acquire by taxation, and was worth less for purchases than it had been before the war. Obviously such sweeping changes in the value of the unit of currency had far-reaching effects, both economic and social. The experience of Germany, where the depreciation was still more drastic, will afford an opportunity to discuss the general aspects of the process. The particulars of the history of inflation in France are too complicated to be treated here.

Reconstruction

The main reason why the government was unable, for so many years after the war, to attain settled order in its finances, was the demand upon it for the restoration of regions devastated by the armies. The damage to property in the war zone was estimated at various sums ranging from 10 milliard pre-war francs ($2,000

million) up to fantastic figures. At any rate the government had spent in the work of reconstruction some 60 milliard francs before 1925, and though this sum may have been inflated by extravagance, as it certainly was by the depreciation of the franc in which it was paid, it gives some measure of the loss.

Occupied territory

The parts of France occupied by the enemy were the most advanced and richest of the whole country. The area actually controlled by the Germans after the battle of the Marne was relatively small, only 6% of the whole, but included 14% of the total workers engaged in mining and manufacture. The 10 departments immediately affected by the invasion, with 11.5% of the total area, included 21% of the wage earners and 41% of the steam horse power employed in manufacture; they included, evidently, not only a disproportionate share of the manufactures but also the most advanced manufactures. If we include not only the parts occupied and those under fire, but also those parts so near the front as to be disorganized, we find them, all together, to have played the major part in some of the most important industries. Measuring by percentage of the total product which they supplied before the war, the figures are as follows: coal 74, coke 76, pig iron 81, steel 63, copper 94, zinc 76, woolen yarn 81, linen yarn 93, glass 80, sugar 76, alcohol 59, and so forth, for a long list. Some of these products were of vital importance for the support of the armies, and France suffered a serious military disadvantage from the necessity of supplying them from other sources.

Alsace and Lorraine

Against these tremendous losses the war brought to France one immediate and considerable gain, the provinces of Alsace and Lorraine, which had been ceded to Germany in 1871. They added to the area of France about 3%, to the population over 4%. They included the richest deposits of iron ore in Europe, beds of potash important as agricultural fertilizer, and a little petroleum; Lorraine had some coal and France was given a conditional right to the coal in the important mines of the Saar valley. The two provinces were far above the average of France in their industrial development. Lorraine was strong in metallurgy, Alsace in the textiles (cotton, woolen, artificial silk); together they made material

contributions to French capacity in a score of different industries. They promised, therefore, a distinct addition to the industrial equipment of the country, although they also set some difficult problems, for the territorial transfer cut the lines of the commercial relations which they had established when they were part of Germany.

For the moment, at the close of the war, France seemed prostrate. Figures of production for the two years 1913 and 1919 give an impressive realization of the way in which war had drained the economic vitality of the country.

	1913	*1919*
Coal (million tons)	36	16
Pig iron (million tons)	5.2	2.4
Steel (million tons)	4.7	2.1
Freight (daily average of loaded cars, thousands)	60	30
Grain (million metric quintals)	97	50
Potatoes (million metric quintals)	136	77
Sugar beets (million metric quintals)	59	11

From the depth of economic depression which followed the war the country, still bearing the scars of the conflict, rose again. It will be the object of this chapter to discuss the changes in the organization of production which distinguish post-war France from France of the nineteenth century.

Agriculture

In agriculture, still the most important branch of production with reference to the number of persons engaged, a convenient measure by which to trace the recovery is an index number giving the physical volume of the important crops compared with the average of the years 1909–13 as a base, 100. (Figures for Alsace-Lorraine are included for the pre-war years, so that territorial changes do not affect the index.)

1919	70	1923	86
1920	71	1924	96
1921	76	1925	100
1922	87	1926	82

A very small part of the decline was due to direct devastation. The government estimated the cultivated area affected by the war at about 11,000 square miles, but of this total most was but slightly damaged. The area in which destruction was practically complete formed less than 4% of the total (say, to visualize the

extent, a block 20 miles square); the zone of trenches and heavy bombardment was under 30% (a block 50 to 60 miles square). Compared with the whole cultivated area of France these figures obviously are almost negligible as an explanation of the decline in production. Far more important were the shrinkage of the area under the plow and increase of the unproductive area in parts of France entirely removed from military operations.

Lack of labor

French agriculture suffered not so much from damage to land, or even from dearth of capital, as from loss of men. Of those who had left the farm to enter the army over half a million had died in service, and about half a million were more or less incapacitated. Still another group, approaching half a million in number, men and women, left the farm for work in other occupations. Even with the addition of Alsace-Lorraine, France had fewer persons occupied in agriculture in 1926 than it had, on a smaller area, in 1906. Even in the area of pre-war France agriculture was losing ground to industry. In 1926 France was still agricultural rather than industrial, rural rather than urban. But it is significant that the urban population, which had formed a quarter of the whole in 1846, and about a third in 1876, had risen to nearly half in 1926 (49.1% in communes with a concentrated group of 2,000 or more).

Migration to town

The movement from the countryside to the town had shown acceleration before the war, and had already roused serious concern. Later and more slowly than some other countries France also was abandoning agriculture for the factory and the town. If the economic attraction was less effective than in some other countries, because so large a proportion of the country dwellers were land owners, the social advantages made perhaps a stronger appeal. Village festivals, simple at best, are said to have declined in number and appeal in the generation before the war; postal service was slow; telephones were known only by name. Opportunities to make a desirable marriage, a matter taken more seriously perhaps by the French than by some other people, appeared better in the town. The social attractions of town life are so general that they need only be suggested, and were often enough to draw the children even of peasants away from the farm. They were rein-

forced, in their appeal to the class of agricultural laborers owning little or no land, by strong economic inducements. Farm wages had risen considerably in the period before the war, but offered a man often less than he could earn as a common laborer in the town, and much less than he could earn if he learned a trade.

Condition of labor

The average daily pay of the farm hand in 1914 is stated at about 3.5 francs ($0.70), but was much less in some districts; in the Dordogne, for example, it was about 2 francs ($0.40), a little more in summer, a little less in winter. The scarcity of labor after the war raised wages, but even in 1930 the annual earnings of an agricultural laborer in most parts of France were about 6,000 francs ($240). All these figures include anything in the nature of board or lodging received. The living afforded by such a sum must evidently be meager, even if, when a family was concerned, it was supplemented by the earnings of others. The dwelling often consisted, even in the twentieth century, of a single room, lighted by a single window, and with an earthen floor. In this room the whole family lived, ate, and slept, sometimes 3 or 4 in a bed. This description, we are assured by a person intimately acquainted with the facts, applied not only to many of the laborers but also to many of the petty proprietors, although of course it must not be assumed as applying to all. The food showed more improvement over previous conditions. Bread, still the mainstay of the diet, was now almost always white bread of pure wheat; a man would eat of it from 2 pounds up even to 4 pounds a day. Meat was no longer a special delicacy, reserved for festivals. It was commonly eaten at least once a day; after the war farm servants expected it at two meals. Everywhere, too, the agricultural workers now expected for drink either cider, beer, or wine.

Effects of agriculture

The scarcity of agricultural labor after the war had important social and economic effects. It drew into the country, as indicated above, a great number of foreigners, even from distant Galicia, to work on the soil. It caused millions of acres of arable to be taken from under the plow, to be turned into permanent meadow or pasture. It encouraged the introduction of machinery to take the place, so far as possible, of manual labor. The prevalence of

the small holding was still an obstacle to this process, although apparently the very small holdings were being absorbed, perhaps abandoned by agricultural laborers who sold out on leaving for the town. Even in the twentieth century, after the war, the scattering of a farm in separate fragments added to the difficulty of effective cultivation. Even a small holding might consist of 10 or 20 fragments or more, sometimes miles apart, some of them no larger than a quarter of an acre.

Consolidation

Consolidation of these fragments by purchase and sale and exchange was slow to correct the evil, and there was need of more general and effective action under government control, such as had taken place in parts of Lorraine. The destruction of landmarks in the districts devastated by war seemed to offer a peculiarly favorable opportunity to effect consolidation, and a law of 1919 offered to inhabitants of the liberated regions the opportunity, if they so desired, to have the rearrangement administered by public officials. Most of the villages voted against any change; the people in some cases chased the engineers away with stones. Only in the region of the Somme did some 150 villages, comprising about half the area of the district, consent to the process. As a result the fragments there were reduced to a fifth of their former number, with an increase in average size from 0.8 acre to 4 acres.

Implements

Better evidence of the need of a reform could hardly be offered; even after the reform elaborate agricultural machinery could not be effectively employed. The report of an American trade commissioner (1920) on the market for farm implements in France shows that the most active demand was still for the plow and the harrow; that cultivators and mowers had come into general use; but that the demand for more specialized machinery (binders, seeders, etc.) was still restricted. The report said that the village blacksmith of almost every locality was still a plow manufacturer in a small way, and referred to one place in northern France where, 75 years before, a plow with two wheels and a heavy beam had been established in favor; the farmers of that place still demanded the identical model with the same color of paint. With this evidence of the limitations of the petty cultivator should go some testimony

to his merits, in the same report. "The French peasant, steady-going, thrifty and frugal, and far more inclined to do without than to buy beyond his means, almost without exception pays his debts reliably and promptly. . . . The manager of the branch of one American company, whose business for the year amounted to more than $1,000,000, told me that at the close of the war the uncollected overdue debts amounted to less than $8."

Change in the peasant

The peasant stock of France was rooted too deeply and was too strong a growth to be suddenly transformed. Without question, however, it was gradually undergoing change. The influence of the town reached out into the country districts, undermining old standards and customs. The disappearance of the provincial costumes in many parts of France, and the imitation of city fashions, were an external mark of change, not in themselves important but very significant as an index of the altered attitude of the peasant. His interests now extended far beyond the horizon of the village church tower. He bought and sold in a market which was national or international in extent; his prosperity depended on price changes which were little affected by conditions over which he had any control. He was beginning to regard agriculture not as a career but as a business, not as an end in itself but as a means to an end. He still clung to his land and coveted more land, but competent observers agree that his love for the land had diminished, and that he desired money not merely that it might be hoarded or saved, but also that it might be spent. The school, and then the army life in barracks, stimulated new ambitions and new wants. More money was spent on clothing, tobacco, and drink. The process of change was intensified in the regions restored after the ravages of the war. Means were lacking to erect the model villages which had been planned, but great improvements were effected, particularly in the installation of arrangements for the supply of electricity and of water. In Picardy, after the war, a peasant of the upper class, holding 75 acres or more, might, if he belonged to the younger generation, have an automobile and a telephone, maybe even a wireless set. Such a standard of living was very far from representative of rural France as a whole. Some districts seemed almost untouched by the new ideas. But between these two extremes it is safe to say that the greater part

of the country was affected, and was in a process of gradual change.

Was the peasant a profiteer?

It has been the current opinion in France that the peasants, excluding of course those directly suffering from ravages, actually benefited by the war, enjoyed what was for them a "Golden Age." The rise in food prices assured them a most favorable market, and it is alleged that they avoided paying their share of taxes and actually accumulated surplus funds with which they could liquidate debts and buy more land. The townspeople regarded them as profiteers. Such a feeling would be inevitable, but a more careful examination of the facts appears to show that it was unjust. Against the rise in the price of food stuffs must be offset the rise in the costs of production, and the rise in the price of manufactured goods which the peasant must purchase. A peasant, told that he was lucky to get such a high price as the government guaranteed for his wheat, replied that he did not see what difference it made, he had formerly sold a sack of wheat to buy a pair of shoes, and he still had to do the same. If his statement was correct, he was actually a loser, for most of his costs had risen. To draw a balance for all the peasants over the whole period would be a hopeless task. An estimate of the income and outgo of French agriculture in 1923, by a competent authority, would make the net return available for payment on capital invested less than 1%. The same author, comparing the years 1914 and 1928, shows that the prices of farm products (measured in the depreciated franc) had risen about 6-fold, that agricultural wages had risen 6-8-10-fold, and that the price of the requisites of farm life had risen 8-10-fold. Protective duties on farm products were raised as the franc declined, but they were not raised so much as were the duties on manufactured goods.

Increased yield

The efficiency of French agriculture, measured by relation of the product to the area cultivated or to the people employed, was higher after the war than before. The wheat crop for the average of 5 years before 1930 was nearly equal to the average pre-war crop although the area cultivated had diminished by over 3 million acres. Some of this land which passed from under

the plow was not really suited to the cultivation of cereals, and was more effectively employed for grazing or forage. On the land which remained under cultivation the yield increased some 2.5 bushels an acre, partly because only the better land was used, partly because it was better cultivated. Other cereal crops showed similar results. Far more artificial fertilizer was used than in the period before the war. This was true of the phosphates and nitrates, and was especially noteworthy in the case of potash, now to be procured from the beds of Alsace; the amount of potash consumed in 1925 was 7-fold the amount of 1913. It profited the farmer little, however, to improve his methods and increase his output so long as farm costs and living expenses kept pace with or exceeded the money returns which he obtained.

Industry

An index of industrial production, based on mining and the more important branches of manufacture, and giving the volume of products compared with the base year, 1913, as 100, provides a measure by which to trace the course of industry in the years immediately following the war.

1919	57	1925	108
1920	62	1926	126
1921	55	1927	110
1922	78	1928	127
1923	88	1929	139
1924	109	1930	140

The process of mobilization at the outbreak of the war was a shock of almost incredible intensity to the orderly process of manufacture. Of 100 workers employed in July, 1914, only 34 remained at their work in August. The demand for munitions and military supplies forced a readjustment, and by 1917 the number of employees was actually equal to the pre-war number. Prisoners of war were set to work in the mines and factories, as they were in agriculture and transportation. The demand for men at the front in the military crisis of 1918 diminished the number of workers again, and the cessation of military needs after the armistice left the highly developed war industries without a vent for their products. The index of production shows for some years after the war a depression more serious than that which marked the course of agriculture. Mines and factories furnished products less essential

than the foodstuffs of the fields, and their complicated organization suffered more from the brutal shocks of the war and of the post-war period. By 1924, however, French industry had reached and passed the standard of pre-war years, and in the following period it developed in capacity with astonishing speed. Although the index of agricultural production has not been computed to cover these later years, it is safe to say that at best it remained at about the pre-war level, while mining and manufacture rose to an entirely new height.

Industrialization

France resumed in the post-war period the process of industrialization which was noticeable even before 1900, and which now proceeded at an accelerated pace. We have noted above the tendency of workers to desert agriculture for industrial employments. The foreign trade of the country gives another indication of the shift in relative importance of the two major occupations, although it must be confessed that commercial relations in this post-war period were so disordered that inferences from them must be accepted with reserve. France had been used to import an amount of manufactured goods which was in value much less than the export of manufactures; the proportion had been about 40% in the generation preceding the war. For the first few years after the war France had to rely largely on other countries for manufactured products, but then reduced rapidly its purchases, and after 1923 the proportion fell to 20% or below; the country was selling, in manufactures, 5 times the value of what it was buying.

Coal and power

Another indication of industrialization is furnished by the rapid increase in the application of power to the processes of mining and manufacture. The steam horse power in 1913 was 3.5 million; the figure had risen in 1927 to 6.9 million, almost double. Before the war France had felt its disadvantage in the lack of adequate supplies of coal. It produced about 40 million tons a year, but had to import 20 million tons of coal and 4 million tons of coke to maintain its industries. Its difficulties during the war were intensified by the invasion which put mines yielding three-quarters of the supply under the control or within cannon range of the enemy. The French recovered their mines at the end of the war to find

them wrecked and flooded, the machinery destroyed and the workers' dwellings damaged or destroyed. At the same time the return to France of Lorraine, with its great iron and steel industry, increased the demand for coal and particularly for metallurgical coke. The cession to France of the mines of the Saar, in compensation for the damages done in the north, went but a little way to solve the problem, for their coal was not fit for coking. Germany was further required as part of the provisions for reparation to supply 7 million tons of coal or a corresponding quantity of coke every year for 10 years, plus some additional amount to make up for the reduced output of French mines; the figures are merely of historical interest for the actual deliveries were far below the amounts contemplated. For the first few years after the war the French were in serious straits for lack of this prime essential of modern industry. The mines of the war zone were restored to operation sooner than had been thought possible, with modernized equipment which enhanced production; other mines which had been opened to take their place during the war continued to contribute to the supply; the national output soon reached pre-war level (1924) and considerably exceeded it. The consumption of coal rose to nearly 2 tons per capita, placing France little below Germay in this index of industrialization, although still far below the leaders (U. S., 4.4; England and Belgium, 3.9). France was able to supply from its own mines about two-thirds of its needs, but had to rely upon imports to make up the remainder.

Water power

The deficiency of coal brought prominently to attention a resource which the country had hitherto neglected, its latent water power. France is estimated to have available from this source 5 to 10 million horse power; in this respect it stands high among the countries of Europe, and not very far below the United States and Canada. The most important source is in the Alps, where the flow is large and is fairly regular because it is fed in summer from the snow, and where broad valleys provide the access for means of transportation. Before the war hydro-electric plants of a capacity about 1.5 million horse power had been installed, and additions raised the figure to about 2.7 in 1927. Part of the energy thus gained was applied to the service of public utilities (electric light, railroads); part was used in manufacture. It was used

particularly for the reduction of bauxite, the ore of aluminum, for the production of chemicals, for electric furnaces making iron alloys, for power in the manufacture of paper, and so forth.

Size of industrial unit

Still another evidence that France was following the path of industrialization was the growth in importance of the larger units of production. Figures below include both mining and industrial establishments, classified according to the number of employees.

Number of Employees	Percentage of Establishments		Percentage of Employees	
	1901	1921	1901	1921
1 to 10	93	90	32	22
11 to 100	6	9	28	21
Over 100	1	1	40	57

Obviously the small establishment, although it was still everywhere to be found, was becoming always less important in its contribution to the national product. The large units were growing both in number and in size. Surveying the proportion of employees in establishments of different size, one might describe the three groups in 1901 as fairly nearly equal, but certainly would not think of so describing them in 1921. Industries providing clothing and food, the building and the wood-working trades lingered on a lower stage or organization; industries making iron and steel, and working on the metals, mining, the cotton and the glass industries were concentrating in large establishments.

Size of factory

Figures of the table above include both mining and manufacture. Below are given statistics of the distribution in establishments of different size of manufactures proper, " industries of transformation " as they are termed in French. To enable comparison with American statistics of manufacture, which in this more recent period omit small shops from the enumeration, establishments with lesss than 6 employees are excluded. The figures of the census of 1896, quoted in the last chapter, are recast so as to permit comparison on this basis; unfortunately that census gave only the number of establishments, not the number of employees, in works of different size.

Number of Employees	Percentage of Establishments				Percentage of Increase	
	France		U. S.			
	1896	*1921*	*1899*	*1919*	France	U. S.
6 to 20 employees . .	73.3	67.1	66.3	50.9	− 8	− 23
21 to 50 employees . .	16.2	19.1	19.2	23.0	18	20
51 to 100 employees .	5.5	7.1	6.9	11.2	30	63
101 to 500 employees .	4.5	5.9	6.7	12.4	31	86
Over 500 employees .	0.5	0.8	0.9	2.5	49	182

Of course in the development of industry the small factory has come first; in some branches it has proved to be the most economical form; and in most branches it has found a secure place for itself even when the large undertaking has overshadowed it. When the market is limited by the nature of the product (artists' materials, bricks), or the dispersion of the raw material (cheese, cider), when the product is not standardized but must express the personality of the customer or of the workman, the small unit is the most efficient. Henry Ford asserts, "As a general rule, a large plant is not economical," and buys a large proportion of the parts in his cars from others instead of making them in his own works. The apparent advantages, technical and economic, in large-scale operation are offset by difficulties in organization and management which require the highest grade of ability if they are to be overcome.

Comparison with United States

So it is not surprising to find, both in France and in the United States, and at both dates given, that the small factory was the preponderant type. In France, in 1896, 9 factories out of 10 employed 50 workers or less, and the proportion had not changed greatly in 1921. The tendency in France evidently was toward an increase in the size of the plant, but movement in that direction was spread fairly broadly over the different classes, and was not at all revolutionary in its speed. The contrast between France and the United States is best brought out in the columns on the right of the table, which compare in percentage form the changes in the proportions of factories of different size. In both countries the very small factory declined in relative importance, but much

more sharply in the United States than in France. The small factory grew gradually, in its share of the total, in both countries. The contrast is most striking in the change in relative importance of the larger units, and particularly in the group including the largest factories. Just as the very small factories were declining very much more slowly in France, so the very large factories were rising much less rapidly in relative importance.

Scientific method

With the growth in size of the French industrial unit went a more complex organization and increased efficiency; the big factories grew in importance just because they were more efficient. Only in the large plant was it possible to realize that specialization of function which gave to the scientist and the trained manager the opportunity to make his peculiar contribution to the process of production. The movement toward a closer union of science and industry which appeared in all advanced countries at this time found the French prepared and sympathetic. They had furnished their full share of great scientists, and they now increased their number of industrial laboratories, public and private, chemical and physical. As noted in a previous chapter, they had, before other peoples, initiated the process of manufacture with interchangeable parts. Time studies, instruction cards, methods of rate setting, and other features of "scientific management" as the system was developed in the United States by Taylor and his successors, had long been known to the French. A commission of the American Manufacturers' Export Association which visited France in 1916 reported that: "The new war plants are well located and admirable of their kind; they elicited our profound admiration as models for the industries of France; nothing better can be found in the United States or elsewhere . . . certain of their shell plants are perfect to the minutest detail. In these plants not only are great quantities of a single article turned out, but the different processes are gone through in orderly sequence with a minimum of waste motion and a perfect automatic checking system that prevents slacking in any part of the operation." The munitions industry offered, of course, an ideal field for the application of the new methods of manufacture. The destruction of mines and factories in the war zone also gave a favorable opportunity for the renovation of equipment, and the more effective utiliza-

tion of resources. When the damaged coal mine had been opened and pumped dry, it would be provided with new pneumatic and electric machinery for drilling, cutting, and hoisting; around the mine would be grouped a central station for generating electricity, batteries of coke ovens supplying gas, a factory for making briquettes from the slack, and works supplying a great variety of chemicals.

Obstacles to efficiency

Many industries showed in the post-war period an increased efficiency due to the superior organization of the large units. Illustrations will be given, however, of certain obstacles offered by French conditions to the application of the new ideas. The workman, we are told by those competent to judge, was still the craftsman, delighting in the individual touch and apt to become indifferent if he lost personal interest; mass production, by constant and automatic repetition, did not appeal to him. Nor did the customer take so kindly to standardized products. The breadth of the French market has been limited not only by the policy of protection, with its reaction on the export trade, but also by the insistence of the French themselves on variety in the products offered them. These two factors, labor and market, inevitably affect the organization of manufacture in any country. Still another set of factors, purely physical, affect the productivity of extractive industry, and react upon manufacture. Before the war (1911) the French miner averaged an annual product of 300 tons of coal, to be compared with 371 in England, 381 in Prussia, and 819 in the United States. In 1929, when the annual average in the United States had risen to 930, the French miner was producing less than a ton a day; shorter working hours had offset the advantage of improved equipment. Yet it would be quite improper to condemn either laborer or operator on the basis of these comparisons, without taking into account depth of mines, thickness and slope of seams, and a number of other physical factors which are often of decisive importance.

Business organization

The movement in France toward production on a larger scale was attended by the intensification of business activity which marks the industrialized state. In the 20 years from 1906 to 1926 the proportion of the people engaged in commercial under-

takings grew rapidly; the personnel of insurance companies doubled, of banks tripled. Combinations in business took on a new form. France had known nothing so highly developed as the German cartel or the American trust. The steel industry had had in its different branches a number of *comptoirs*, selling agencies, which sought to maintain a uniform price level by the distribution of orders among members, but which did not touch production; and France was represented in a number of international combinations. The movement toward the concentration of control proceeded during the war, stimulated by the government for military reasons, and marked in many cases by the absorption of ownership in larger undertakings. The period of reconstruction after the war offered an opportunity for a new lay-out of plants, and emphasized the need of combination to avoid ruinous competition at home, and to obtain a market for surplus products abroad. The joint stock form of organization increased greatly in importance, as was evidenced by the issue of large amounts of industrial securities on the stock exchange. The movement toward business concentration affected many of the most important French industries, metallurgical, mechanical, chemical, and so forth. In place of the selling agencies of the former period combinations were developed designed to exercise a more effective control of the home market, and France still continued to be represented in a number of important international cartels.

Textiles

Surveying the different branches of industry in the period under consideration, the most striking change was a shift in importance from textiles to metals. Comparing the same territory (excluding Alsace-Lorraine), textiles and clothing comprised 39% of workers in industry in the broader sense, including mining, in 1906, and only 28% in 1926, while the group including mining, metallurgy, and metal working rose from 18 to 27% of the total. The French textile industry lagged in the development of larger units, more efficient in mass production. In cotton the factories remained relatively small. Spinners were required to produce a great variety of yarns, of all sorts of staple, sometimes in small quantities. The weaving factories had short runs of goods, with frequent changes of design; the French weaver repeatedly refused to tend more than 2 looms, and actually averaged less than 1, if

the statistics are to be credited. In silk weaving the tendency was actually toward a decline in the size of the factory. Before the war large factories had been built, including 500 looms or more, with dormitories for the women workers and with a bus service to take them to their homes in the country over week-ends. The war drew women back to work in the fields, and stimulated discontent with life under strict rule. After the war a new type of factory, including only 10 to 25 looms, was built out in the country, offering an 8-hour day to the women of the vicinity, and thus making the conditions of life far more agreeable; and more and more looms were established in separate houses, 2 or 3 in each, run by electric motors. Quite aside from this interesting example of reversion, the conditions in the textile and clothing industry as a whole seem to bear out Siegfried's prophecy that it will find its future not in mass production but in supplying individualized products, which will appeal always to consumers of cultivated tastes, and which can be produced only in an atmosphere in which the personal touch is respected and encouraged.

Iron and steel

In contrast with the textiles were the metal industries which had now risen to the first place in the national economy. Scattered establishments along the coast smelted iron ore imported from Spain and Africa with English coal, but most of the French works were grouped about the coal fields in the north, which became part of the war zone, in the center, where steel of the higher grade was produced for automobiles and tools, and in the east, the region of the Lorraine minette, the richest iron deposit in Europe. The Lorraine ore had a considerable proportion of phosphorus, which spoiled it for conversion by the method which Bessemer had discovered. The invention, however, by another Englishman, Thomas, of the basic method, in which the converter was lined with a material which would extract the phosphorus and which would render not only a good steel but also a good agricultural fertilizer, made the working of the Lorraine ores practicable. A great steel industry had grown up in the eastern region, supplying about half of the total French product, mainly in the primary forms of rails, bars, rods, and sheets. France produced a surplus for export of these primary products, importing some finished products such as machines and tools.

Problems of steel industry

The German invasion, sterilizing a large proportion of the coal and iron mines, and of the iron and steel works, put France during the war under a heavy strain. The treaty of peace reversed conditions, returning to France in the part of Lorraine which the Germans had taken in 1871 not only additional ore supplies but also a highly developed steel industry. The Germans had constructed here great basic steel works of a model character, combining the processes of smelting and conversion, and utilizing for power the blast furnace gas. The French now faced a double problem. On the one side they had to obtain from abroad enough metallurgical coke to feed the Lorraine furnaces. Even before the war they had been forced to import about half of the coke (or coking coal) consumed: the addition of German Lorraine, which had depended on coke from the Ruhr, increased their needs. They sought to solve this problem by requiring Germany to deliver coal and coke as part of the terms of reparation. The other problem was that of a market for the increased product due to the added capacity of the Lorraine works. The treaty of Versailles kept the German market open, at least for a time, but in competition with the steel makers of other countries, England, Belgium, etc., it appeared necessary to enter into the international agreements to which reference has been made above. A measure of the change in the metallurgical position of France is afforded by figures of production before and after the war. Of crude iron the output in 1910 was 4 million tons, in 1929 it was 10 million (10,450,000 tons, of which 9,670,000 were converted into steel).

Standardization

A weakness in the French metallurgical industry, as it appeared to American observers, was the diversification of product, and failure to specialize in the production of standard types. This held true even of the largest works, such as that of Schneider at Le Creusot in central France. "The range of manufacture now [1916] covered at Le Creusot and St. Chaumond would be startling to most American manufacturers. It includes almost all the processes from the ore to the highest grade of finished product of great variety. Such varied production demands the highest grade of supervision and makes it almost impossible to apply details of efficiency which would be used by the manufacturer who can con-

centrate his attention on one line." The lack of labor-saving devices and the reliance on manual labor even in the rolling mills were characterized by an American critic as "intolerable."

Metal working

Following the metal industries through the later stages, much the same conditions are found as appear in this survey of the primary processes of metallurgy. There was a marked expansion measured with respect both to persons and product. Within the frontiers of pre-war France there was a slight decline in total population, 1906–26, while the number employed in working on the common metals grew from 803,000 to 1,372,000, a gain of more than half. The production of industrial machinery grew 3 or 4 times in gold value, 1913–26. There was a distinct improvement in technical efficiency, particularly in some of the larger plants which now grew up. Yet along with this advance there persisted remnants of a more primitive and less efficient organization, and even the larger works struggled against difficulties which seem characteristic of French conditions.

Mechanization

There is general testimony to the good qualities of the individual machinist, whose work was described as accurate and competent but somewhat slow, as was natural under a system in which piece wages were exceptional. Again, however, Americans noted a tendency to rely upon the individual activity of the worker rather than upon automatic or semi-automatic machinery. The reasons are significant. In the first place, as intimated above, the French workman was better than most others when he was engaged on his own job, was not so good as some when he was set at a task of repetition in which the machine was superior to the person. He found difficulties when given a machine tool not provided with adjustments based on the metric system; the matter is mentioned but does not seem to have been very important. Most important appears the fact that most French manufacturers had not attained to production in such quantity of standardized products as would make the automatic machine really economical. There was no advantage in having it turn out parts with such rapidity that it would be left idle much of the time. An illustration is given of a highly specialized machine turning out 160 parts a day, which a

French manufacturer refused when it was offered to him at $7,000; he was glad to take it at $3,200, stripped of some of its automatic mechanism and turning out only 40 parts a day, for he wanted only 200 parts a week.

Automobiles

Of different branches of mechanical industry only two developed to the point of using a considerable amount of special automatic machinery, those producing automobiles and electric motors and generators. The annual product of the French automobile industry came to exceed that of the silk industry, and nearly equaled that of crude iron and steel; producing over 200,000 cars a year France accounted for a third of the total European output, and was exceeded only by the United States and England. In the automobile industry there developed a marked concentration in large establishments. Citroen, Renault, and Peugeot accounted for three-quarters of the total product, turning out each 200 cars a day, more or less. Seven producers, under 10% of the total number, manufactured 89% of the total product. Along with them persisted many manufacturers in a small way, turning out 10 cars a day, more or less. A dealer in machinery, well acquainted with the industry, described conditions which present an interesting survival from the old-fashioned methods of manufacture. "A number of French cars are assembly jobs. Many of the parts of these cars are made by small foundries and machine shops scattered throughout the country. These shops are often 'family affairs'; that is, two or three brothers with perhaps a cousin or two, make up the working personnel. There is very little overhead expense, and by working 14 hours a day instead of 8, they turn out a large amount of work at a low-production cost. Builders of assembled cars are often in this way able to have their parts made cheaper than could be done in their own plant with modern machinery."

Comparison with United States

The great manufacturers adopted American automatic machinery, developed the policy of progressive machining, standardized gauging, and chain assembly. Yet the results remained considerably below the standard attained in America. Citroen calculated that in the United States about 850,000 workers (including those employed in the supply of coal, iron and steel, textiles) produced

12,000 cars a day, while in France 210,000 workers were required for a daily output of 700 cars. He drew the conclusion from his estimate that 70 labor-hours would produce a car in the United States, while France required 300, or if the Citroen plants were excluded from the comparison, 500 labor-hours to a car. The contrast was due, of course, to the difference in the scale of operations in the two countries, and to the persistence in France of the many small manufacturers. And this difference, again, was due to the contrast in the market. In the United States, with three times the population of France, a working man could buy a car with 60 days' wages, while in France he would have to pay 300 to 400, the income of a whole year.

Mass manufacture of automobiles did not attain in France either the economy or the quality of the American product. The best French engines remained without a superior in any country, and some of the engines produced " in series," to use the French term for progressive assembling, were perfectly good. Many, however, of those turned out in quantity production gave trouble during the first few months of their service, and had to be brought gradually to adjustment. The explanation given by the French author who states the fact is that here again France suffered from diversification, in this case of the raw material. French steel makers were called upon from so many sources, for so many different kinds of steel, that they could not attain, in their supply to a given manufacturer, such complete adherence to specifications and such absolute uniformity as was needed for perfect parts. A machine tool will behave differently when applied to different grades of metal, and will turn out parts of different dimensions if there is any variation in the raw material.

Conditions of labor

Under conditions as they have been described in this chapter France inevitably was restricted to a modest scale of living. An estimate applying to the year 1926 made the total national income about 200 milliard francs, which would give a per capita income of about $200. The distribution of this income among classes was affected by the war, to the disadvantage of the lower middle class living on salaries and the income from small investments, in favor of the capitalist and the wage earner. An investigation in 1930 covering the common trades exercised in the towns throughout

France showed that wages had risen faster than the cost of living since 1911; in rough gold equivalents the day's wage of a man had risen from less than $1 to $1.35, of a woman from $0.50 to $0.75. In the automobile factories unskilled laborers got about $1.50 a day, skilled workers $2.00 more or less; workers in the textile mills received in general less than $1 a day.* Aside from the rise in wages conditions had improved. A law passed in 1913, just before the war, which limited the day's work of an adult man in a factory to 10 hours, was succeeded just after the war (1919) by a law establishing an 8-hour day (or a 48-hour week) as the normal period of working time; this was not applied to all branches of industry, but affected a large proportion of industrial laborers. Other measures of social reform contributed to the well-being of the working class. The labor movement, which before the war had been revolutionary in character, stressing class war and direct action, became much more moderate in tone, and inclined toward coöperation.

QUESTIONS

What was the loss of France in men? in capital?

What was the course of inflation and recovery? On what basis did France return to the gold standard, and with what result?

Illustrate the losses suffered from devastation and from occupation of territory.

What was gained by the recovery of Alsace-Lorraine?

Illustrate decline in production, comparing 1913 and 1919.

What was the course of agricultural production after the war?

What were the causes of decline?

Explain the drift to the town.

What was the condition of agricultural labor?

What were the results of the lack of labor?

To what extent was modern agricultural machinery introduced? Why was it not employed more extensively?

Illustrate and explain changes in character of the peasant.

Was the peasant a profiteer?

Illustrate and explain increase in yield of agriculture.

What was the course of industrial production after the war?

What different facts testify to a process of industrialization?

What problem was presented by coal, and how was it met?

What was the development in water power?

What was the tendency in size of industrial establishments?

* In Paris, October, 1930, the wage of an apprentice in the trade making undergarments was $2 to 3.50 a *week*, in the dress-making trade $8 to $10 a *month*. From this level employees worked up to 2 or 3 times the wage quoted, and the best hands got 4 times that. *Bulletin de la statistique générale de la France*, March, 1931, 20: 219.

What was the tendency in size of factories? Why will small units always persist? Compare the tendency in the U. S. during the same period.

What conditions favored the application of science to industry? Illustrate results.

What obstacles were offered by conditions in France?

Illustrate the development of the organization of business.

What was the course of the textile industry? What were characteristic features of the manufacture of cotton? of silk?

What was the course of the iron and steel industry? What particular problems did it offer? How was it criticized by American observers?

What was the course of the metal-working industries? Explain backwardness in the introduction of automatic machinery.

Illustrate the importance and the characteristics of the automobile manufacture.

Compare American manufacture, and explain the contrast in quantity, price, and quality.

What was the condition of the worker as regards wages and hours?

READING

The book by William F. Ogburn and William Jaffé, *The Economic Development of Post-War France*, N. Y., 1929, gives a comprehensive survey of the subject; the second part of it, treating of different industries, affords the opportunity to follow their development into a recent period. Periodical literature, made available by the *Reader's Guide* and *Social Science Abstracts*, permits an expansion of the collateral reading to almost any extent.

Economic survey of pre-war France. (Ogburn, chap. 1, pp. 3–19.)
Economic changes resulting from the war. (Ogburn, chaps. 1, 2, pp. 19–47.)
The currency. (Ogburn, chap. 4, pp. 48–68.)
Capital and investment. (Ogburn, chap. 4, pp. 69–92.)
Course of production after the war. (Ogburn, chap. 5, pp. 93–120.)
Effects of inflation on trade. (Ogburn, chap. 6, pp. 121–155.)
Effects of inflation on production. (Ogburn, chap. 6, pp. 156–181.)
Industrialization. (Ogburn, chap. 8, pp. 182–215.)
Study of a particular industry. (Ogburn, Part II, contains 10 chapters on special industries and some general topics.)
Labor in post-war France. (Ogg, chap. 30, pp. 774–784.)

CHAPTER XI

GERMANY

Political conditions

About 1800, when England was already well advanced in the Industrial Revolution leading to the present organization, when France had passed through the political revolution by which it hoped to modernize itself, Germany was still in a condition approaching the medieval. This country had promised, in one period of the Middle Ages, to take the lead in Europe. Its kings, however, had lost their power at home by seeking abroad the leadership of a phantom state, the Holy Roman Empire. Germany, as a single state, ceased to exist; it dissolved into independent fragments, of which more than 300 divided among themselves the German people. Next to Bismarck, Napoleon may be said to have contributed most to the unification of Germany; as a result of military victories culminating in the battle of Jena (1806) he swept away the power of most of the German princelets, and re-formed the country into about 40 states.

Even after 1806 there was still no Germany. The Germans lacked a common currency, common taxes, even a common law. The roads of one little state did not connect with those of its neighbors; the rivers were cut into sections by political frontiers. Some of the states were made up of disconnected pieces; the duchy of Saxe-Coburg-Gotha was composed of 10, Brunswick of 8. Each state had its own customs tariff, and some had internal tariffs and transit duties in addition; Prussia, the largest of the states, had over 60 distinct tariffs. To reach the center of the country from the outside the merchant had to cross from a dozen to a score of these tariff boundaries, and had to struggle against other obstacles, such as the variety of currency and of laws. There were still in Germany, much later (1844), 56 different laws regulating bills of exchange.

Occupations

This political fragmentation, essentially medieval, entailed necessarily an organization of production resembling much more that of

the Middle Ages than that of the present day. Nearly three-quarters of the population of Prussia were rural, restricted to extractive industry, and if the people of the little towns who practiced agriculture be added, the proportion of the population occupied in agriculture may have been 80% or above. Prussia counted over 1,000 places with town rights, but it would be a great mistake to confuse these with modern cities. Only 17 of them had a population over 10,000 — a smaller number than that which could show an excess over 100,000 in 1900. Most of these places had less than 3,000 inhabitants, and a very large proportion had less even than 1,000.

Primitive organization

Applying Adam Smith's principle that "the division of labor is limited by the extent of the market," we find, as would be expected, an extraordinarily primitive system of production, with little territorial specialization, and with the unit of production reduced to the simplest terms, often the individual worker. An American reader will find a better parallel in the colonial conditions of the eighteenth century than he will find in northwestern Europe. The country dwellers, making up most of the population, supplied most of their own needs, not only of food but of clothing and housing. The peasant farmer was in his own person or as represented by a member of the family a butcher, baker, mason, carpenter, cabinetmaker, spinner, weaver, fuller, dyer, tailor, soapmaker, brewer. He would have to go to the town artisan for his shoes, his harness, his metal work, and such specialized products as the casks of the cooper. The town artisan was still the simple craftsman, working in a little shop, perhaps with the help of journeymen and apprentices, but still with methods and implements which had been sanctified by centuries of tradition. In the country and in the town Germany retained not only the characteristic organization of the Middle Ages but also two of their most characteristic institutions, serfdom and the gild.

Serfdom

In a country made up of so many parts, subject to a great variety of historical influences, a brief statement cannot apply equally to Germany as a whole. Conditions varied. It may be said of Germany in general, however, that it still maintained in law and

in fact the institution of serfdom, by which the people of one class were kept in hereditary dependence, lacking freedom of movement, freedom to marry, freedom in the choice of occupation. In western Germany the proportion of the servile class was not so large, and the conditions of servitude were not so burdensome as in the districts east of the Elbe, where the land was owned in estates of considerable size, organized like the medieval manor. Here the lords (Junkers) not only owned the land but relied upon the forced services of their servile tenants for its cultivation, and exercised the right of jurisdiction over them.

Condition of serfs

Illustrating by conditions where they were worst (Pomerania, Kurmark, Upper Silesia), we find in nineteenth-century Germany the characteristic evils from which more advanced countries had escaped centuries before. Since there was no freedom of contract but labor was forced, the dependents gave their services unwillingly and felt no interest in the result; if a storm threatened in haying, they would not hurry and were pleased rather than otherwise if it came. Opposition and friction were constant in the efforts of the lord to get work done, and held him to a routine of cultivation in which the problem of administration was simplified. The gain to the lord, measured by results, was small; the loss to the serf, measured by time, was large. In Pomerania, where there was no limit by custom on the labor which the lord could exact, the common people had sometimes to plow their own fields by moonlight with exhausted horses, after the day's work for the lord. In Silesia fishing services were not uncommon. In October or November, often when there was a film of ice on the ponds, the lord would drive his dependents into them, to catch the carp with nets or with their bare hands; when a man was frozen stiff he would be taken out to a fire, his mouth pried open, and warm beer and pepper poured down it. In the Polish districts of Upper Silesia the dependents were treated like slaves, much worse than the live stock. Some were forced to give all their time to the lord for 6, 8, or 10 years together; they were given barely enough food to keep them alive (porridge, peas, occasionally meat from an animal dead of disease), and pay insufficient to buy their clothing. Threatened with prison, they could truthfully say that they would rather spend 2 years there than 10 working for the lord.

Most of the lower class in this region went without stockings the year around; in summer the men wore shirt and trousers, the women a jacket and skirt without even a shirt.

Effects

In districts where these conditions prevailed, the character of the people was degraded. They became careless, lazy, thievish. They grew cunning in the evasion of work, and had to be driven to it with the whip. They had no respect for property, and abused the farm animals as they did the buildings which were turned over to their use. Prussia prided itself on a general system of elementary education, established well in advance of neighboring countries, but in some of these manorial districts there were whole villages where few could read or write. The village school might be held by a tailor or weaver who would let his wife do the teaching, and the appointment was often in the hands of the lord, who would put in a superannuated servant or some one who had done him a discreditable service.

Emancipation

Conditions like these obviously barred progress. Modern society has developed its economic efficiency by stimulating its members to make the most of themselves and of their property. It has given them, to this end, personal freedom so that everyone can choose the work for which he believes himself best fitted to succeed, and has substituted contract for custom or status, improving the opportunity for the individual and at the same time enhancing his responsibility. A society permeated with the spirit of serfdom was doomed to stagnation, and could not hold its place in competition with more progressive societies. In Prussia, as later in Russia, military events forced the rulers to decisive action. After the overwhelming defeat at Jena (1806), the Prussian kings initiated a series of reforms, extending over the whole first half of the century, by which the institutions of the country districts were gradually transformed from those of the manorial system to those of the modern order. Personal freedom was, at the start, established for all members of society. No one could be held to labor except by his consent. As regards the distribution of the property right in land the legislation was less generous. Where land was given to the common people the increase in their zeal was note-

worthy; they got double the product from a given area. But only the upper class or workers, those who had previously held enough land to support a full plow team, were at first given a property right in the land which they had been working, and then in only part of it. The lords resented the rise of a new class of proprietors beside them, by which " they had always to be walking on other people's land," which " spoiled the pleasure of living in the country," and " made their estates a hell for them." These lords, of the Junker class which furnished the best officers of the Prussian army, had too much influence to be disregarded, and managed as a result and sometimes in spite of laws to obtain for themselves most of the agricultural land in the regions east of the Elbe. The mass of the people became agricultural laborers, making their living by working for the landlord. In western and in southern Germany where hereditary dependence had assumed a milder form, and where manorial estates were much less important, emancipation resulted in the establishment of a large class of peasant proprietors.

Agriculture

As might be expected from the persistence of serfdom, the field arrangements and systems were in large part still medieval. The open-field system with its intermixture of scattered strips was general. A holding large enough only to support a good-sized family might be composed of 200 or 300 separate fragments; in the region of the Rhine the meadow owned by an individual might be the size of a bedspread. Coupled with the open-field system was the old three-field system — winter grain, summer grain, fallow — with its characteristic weaknesses. The lack of fodder for stock restricted the number of farm animals which could be kept for draft and for food, and reduced the amount of manure available. After constant cropping with cereals for centuries the land returned a yield only a third or a fourth of that which it gave later under improved systems. A yield of 9 or 10 bushels an acre was considered very respectable. The clumsy and ineffective plows of the time stirred the soil only to the depth of some 4 inches. Cattle, kept through the winter on an insufficient supply of straw for fodder, were often so weak in the spring that they could not stand, much less walk; they were dragged by the tail upon a sledge (hence the name *Schwanzvieh* given to them), and were hauled out to pasture. Prussian kings and

other leaders had tried to stimulate the introduction of such new crops as the potato and clover, and Thaer, whose name stands out prominently in the history of German agriculture, spread by his writings acquaintance with the more advanced methods practiced in England. The resistance of ignorance and tradition to these efforts at improvement can be measured by the fact that one writer sought to defend the three-field system by reference to the Holy Trinity.

Manufacture

In manufacture as in agriculture the organization about 1800 was still essentially medieval. An artisan was prohibited by law from plying his trade in the country districts. He must enter the trade as an apprentice in one of the town gilds, must submit to such conditions as the gild imposed to attain to the independent position of a master craftsman, and was then still subject to the rules of the gild. Some of the worst abuses of the gild system had been remedied, but its narrowness and pettiness remained still the order of the day. The law of the time left, however, some opportunity for a more advanced organization to develop. Mining, in which the Germans had been recognized leaders for centuries, was carried on in the mountains, and little iron furnaces were established in or near the forests, smelting the ore with charcoal. Under the leadership of merchant employers an immense amount of spinning and weaving was done in the cottages of the countryside. Much of this was practiced as a by-industry, occupying the spare time of agricultural workers, but there were regions in which whole villages supported themselves by textile work, producing with the simplest implements wares which were sold by the merchants in the town markets, and which even were exported in considerable quantities to foreign countries. Factories had begun to appear, but they were still exceptional; their development will be described later.

Standard of life

A country which was not endowed with a fertile soil or favorable climate, in which four-fifths of the people sought their living in agriculture by methods which were ineffective and wasteful, could not support its population on a high standard of life. A German statistician estimated the average income of a Prussian subject in 1802 at 27 thaler, say $20. This is only half the income

ascribed to the English by Gregory King more than a century earlier. No sensible person would believe that we may conclude, offhand, that the standard of life in Germany in 1800 was only half as high as in England before 1700. The important thing is the conviction forced upon us, not merely by shaky estimates but also by all the other evidence, that in either case the standard was so far below that of the present day as to strain our comprehension. Pauperism was infrequent in Germany, but poverty was almost universal. A modern writer (Sombart) thinks that, aside from the landed nobility, not 1,000 persons in all Germany in 1800 had incomes exceeding 10,000 marks, say $2,500. By chance we have for England at the same time (1801) tax statistics showing 1,020 persons returning incomes over £5,000 (say $25,000 with an average income in the class of nearly $50,000); but of course these figures include members of the landed aristocracy along with representatives of the new order. To indicate the simplicity of life even of the upper classes German writers remind us of Goethe's bedroom at Weimar, dimensioned about 8 by 11 feet, and provided with the simplest furniture. Another measure is furnished by statistics of consumption in Prussia about 1800, including all classes, the relatively well-to-do along with the common people. Estimates would give to each inhabitant per year an average of $\frac{1}{2}$ yard woolen cloth, $\frac{3}{4}$ yard cotton, 4 yards linen, $1\frac{1}{2}$ pounds tobacco, 1 to $1\frac{1}{2}$ pounds sugar, $\frac{2}{3}$ pound coffee, and so forth.

A suitable introduction to the course of development from this point is provided by estimates of the increase in consumption. The average inhabitant of Prussia spent on 16 commodities grouped together, to compose an index, sums as follows:

Year	*Thaler*	*Dollars*
1806	11.5	8.20
1831	21.2	15.20
1842	22.1	15.80
1849	26.7	19.10

The Zollverein

The most momentous change in this period was the establishment of a customs union, the Zollverein, which wiped away a number of the tariff frontiers, and first made possible the extension of trade and the development of a more advanced organization. Prussia, the largest German state, had reformed its tariffs in 1818, and in

1834 induced other states to join with it in a union which comprised about two-thirds of the area and population of Germany. Internal tariffs were abolished, and the common tariff on the external frontier was remarkably liberal for a European state of the time. Lines of wagons gathered on the roads at the old internal boundaries, we are told, and at the stroke of midnight crossed them amid cheers. Some interests suffered, as must often be the case when protection is removed. Small undertakings were unable to compete with the larger units of production, which could show their efficiency in the broader market afforded. The industrial development, which will later be described, could not have taken place except as this new field for it was provided. The introduction of the railroad, at almost the same time, multiplied the efficiency of the reform, and hastened the process of modernization. The union was extended to include all the German states except Austria, and liberal commercial treaties were made with other European states. The effect on internal trade can be measured by comparing grain prices in the same year in different provinces of Prussia; improved trade facilities reduced the spread between high and low prices in 1855 to one-quarter of what it had been in 1817. Along with the extension of the commercial area went a process of unification of commercial institutions. The states of the customs union were pledged to coöperate in the establishment of a common standard of weights and measures, and a common currency, which were finally attained just before and after 1870. A common law regulating bills of exchange was adopted in the different states about 1850, and a common law regulating other commercial interests somewhat later; a common postal service under public control was established for most of the states in 1868.

Development of trade

The most important effect of all these reforms was undoubtedly in the field of internal trade. We have no statistical measure of its increase, but can trace its effects in all parts of the organization. Less important in this period, but still of significance, was the development of foreign commerce. Figures below give in rough equivalents the value of the commerce of the Zollverein at different periods.

Small as these figures seem, measured against those about 1900, they gave Germany an important position in the commerce of the

time, leading all countries except France and England, and not far below France. The growth in the value of foreign trade, measured with respect to population, is particularly significant.

Year	Million Dollars		Dollars per Head of Population	
	Imports	Exports	Imports	Exports
1834	76	103	3.20	4.40
1854	192	239	5.90	7.40
1860	261	333	7.80	9.90

Imports and exports

The nature of the foreign trade of the Zollverein can be illustrated by another table, giving the percentage of total value contributed by wares of the more important classes, in 1864.

	Imports	*Exports*
Articles of consumption	27	23
Raw materials	38	15
Partly manufactured and materials for manufacture	23	9
Manufactures	9	52

Among articles for consumption Germany necessarily depended on the outer world for tropical and semi-tropical products, such as coffee, tea, spices; sugar and tobacco also took an important place in the list of imports, although the country supplied at home a part of the amount consumed. The major item of export under this head was cereals and flour; the country was still so largely agricultural that it looked to the farming class to provide part of its purchasing power abroad even though this involved for some classes a stinting of the food ration at home. Its natural resources were not so rich as to provide large exports of raw materials; the surplus of forest products and raw wool was not sufficient to pay for such textile fibers as cotton and silk, which could not be produced at home. The trade, import and export, in industrial products is the most interesting and significant part of the table. In products of a developed factory system, such as yarn, or of advanced metallurgical technique, such as crude iron, the Germans were still distinctly inferior, and made heavy purchases abroad, particularly in England. The manufactures which furnished the major part of

their exports were in general the product of hand work, in which low wages were still the determining factor in winning a market: cloth of cotton, linen, woolen, and silk woven on hand looms, metal articles cast or wrought, pottery, a great range of minor specialties. In the account, which will come later, of the rise of modern forms of industrial undertakings the reader must realize that in the background was the great mass of industrial producers, working at home or in small shops and working still with implements of a bygone age.

Handicrafts

Most numerous were the artisans in the handicrafts, settled in the little towns and supplying the simple needs of the townsfolk and of the farming population of the vicinity. Down even into the nineteenth century they remained the most important part of the industrial organization. The regularity of the old order is beautifully illustrated by figures which show the proportion of representatives of the common trades to total population in Prussia at dates a generation apart.

	1795–1803	*1831*
There was one shoemaker to . . .	206	197
There was one tailor to	242	241
There was one smith to	361	429
There was one baker to	628	614
There was one butcher to	839	848

and so forth, with fluctuations increasing according to the specialization of the trade.

Industrial organization: Baden

Serving a broader market were the cottage workers engaged in the cloth industry, and, finally, the factory workers. The relative importance of these different classes can be illustrated from the statistics of one of the German states, Baden, so late as 1861. Baden was industrially less developed than some other German states, yet the statistics ascribed (1851) 37% of the families to manufacture and mining. This surprisingly high proportion, almost as large as that of Germany after 1900, would doubtless be reduced if modern census methods of counting were employed, yet would still be high. Only when we analyze the figures in detail can we realize that a country showing a large proportion of the workers engaged in industry can still be far removed from our idea

of an industrial country. Of the total of about 160,000 persons, 92,000 were petty craftsmen of the sort indicated in the table above; the two crafts of the shoemaker and the tailor made up over a quarter of the number. Some 19,000 were home workers, weaving on hand looms in their own cottages. The statistics show some 50,000 workers employed in " factories and industrial establishments producing mainly for the wholesale trade," but the reader who scans the list finds it distended by such items as the following: 1 shawl factory with 8 workers, 1 carpet factory with 8 workers, 2 copper works with 4 workers, 649 sawmills with 682 workers, 1,922 grist mills with 2,378 workers, 859 breweries with 1,502 workers, and so forth and so forth. A rough analysis, excluding establishments employing on the average less than 20 workers, would reduce their number from nearly 7,000 to about 600, and the number of workers employed to less than 30,000. There would remain some good-sized establishments. The two beet-sugar refineries with over 2,000 workers may have counted out-workers in the fields, but some of the spinning mills were undoubtedly like modern factories, and were of considerable size. The reader will perhaps realize best the distance by which the industry of that period was removed from the present organization from the fact that (excluding mining and saw and grist mills) only 167 steam engines were employed in manufacture, with a total horse power of 2,434, an average under 15, considerably less than that of a small automobile.

Encouragement of industry

Even before 1800 some individual undertakings of considerable size had been established. Mines required a somewhat elaborate equipment, particularly when they were combined with metal works. A mine in Upper Silesia is described as having (at about 1800) 6 water wheels furnishing power not only for the operation of the mine but also for the blast furnace, a battery of hammers and a rolling and slitting mill. The various governments were eager to extend industrial activity, both to occupy their people and to provide wares which could either be exported themselves or could take the place of imports. In either event, according to mercantilist doctrine, the industry saved money by bringing it from abroad or by keeping it at home. So lavish encouragement was given, in Germany as in France, to the founding of industries.

Such contrast as appeared between the two countries lay in the greater thrift and more effective administration of the German governments, and their relative freedom from the personal influences which corrupted the French system. In neither country did these protected establishments attain a really vigorous growth or a position of national importance. Forced growths, likewise, with feeble vitality, were the factories which were established during the Napoleonic wars, when the continental blockade shut out foreign manufactures and encouraged home industry.

Cotton

Most of the cotton-spinning factories which had grown up in this period were killed by English competition after 1815. Here and there a manufacturer would survive, if he had ability and energy, if he would work hard and could get cheap labor. Strengthened by experience he would extend his operations, and get the advantage, very considerable in cotton spinning, of production on a larger scale. In this way, little by little, an independent industry grew up in Germany. It did not reach the level of English efficiency. Germany continued to import large quantities of English yarn, as indeed it continued to do in the later history. But favored by proximity to customers and by some tariff protection, German spinners could at least hold their own in some parts of the field.

Wool

In the spinning of woolen yarn the superiority of the large establishment did not show itself so early. German cloth-makers spun their own yarn at home; they would have 1 or 2 machines, each with 40 spindles, operated by members of the family and workers in the household. In Prussia in 1840 the average number of spindles to an establishment was still little over 100. In the 20 years following, the number of establishments declined to less than $\frac{1}{3}$, while the number of spindles increased so much that each establishment averaged nearly 600. The description of the woolen industry in Aix la Chapelle by an English traveler (Banfield, in 1848) gives a picture of the earlier conditions; 23 mills were engaged in spinning wool; they employed 1,048 hands but had an average of only 92 spindles apiece, and only 2 of the 23 had steam engines, with an aggregate of 12 horse power. Only 24 of the 488 establishments engaged in different branches of the woolen industry

in that region employed steam, with an aggregate of 385 horse power. Not long afterward the average of spindles to a mill had increased to about 1,000 and doubtless the use of steam had greatly extended.

Power

For the operation of any but the simplest machinery the need of some external power was felt, and was supplied usually by water, sometimes by animals driven around an axle which they made to revolve, a horse gin or winding engine. The interruption to water power during the frosts of winter and the droughts of summer prevented continuity of operation, and induced manufacturers to introduce steam in spite of the added expense of the engine and its fuel. Steam horse power in Prussian industry grew from 7,500 in 1837 to nearly 62,000 in 1855, and over 600,000 in 1875. The reader may be reminded that in all France in 1850 the horse power of stationary engines amounted to but 67,000; and Prussia formed only about half of the German states.

Iron

The iron industry in the early part of the century was still in the stage of the little charcoal furnace, and Germany had to import a large amount of its crude iron from England. Even in 1847 only 32 out of 247 Prussian blast furnaces used coke instead of charcoal. Between that date and 1870 progress was rapid. The furnaces were doubled in height and increased in section, the hot blast was introduced, coke displaced charcoal. The annual product per worker grew from 26 tons in 1860 to 43 in 1865 and to nearly 70 in 1870. Germany passed Belgium and France in iron production.

Krupp

The firm of Krupp had already attained a position of leadership, not only in Germany but in the whole world. The founder, Friedrich, died in 1826, leaving to the son, Alfred, a shop employing four workmen. The Krupp speciality was cast crucible steel, a metal of fine quality superior for many purposes to any other, but requiring painstaking care in its manufacture. The growth of the business can be measured by the number of employees: in 1835 (when the first steam engine was introduced in the works), 67; in 1846, 122; in 1851, 704; in 1861, 2,000; in 1873, 16,000. To anyone conversant with military history there is an obvious

connection between these stages of growth and the wars in which European powers were engaged; Krupp steel was unexcelled for small arms and artillery. In this growth of the Krupp business two elements at least are noteworthy. One is the contribution of German labor. To make a product such as Krupp exhibited at the Paris Exposition of 1867, a block of homogeneous cast steel weighing 80,000 pounds, required almost perfect discipline and organization. The steel must be melted in separate crucibles in 240 different furnaces, and must be poured continuously into the mold at the right temperature; an eye-witness describes the work as done with astonishing precision by a brigade of 800 men, drilled to perform every movement so accurately that the whole group worked as one. Another feature was the elaborate equipment with which the works were endowed, including not only the complete plant for casting and working the metal, but reaching out also into the primary processes, including iron mining and smelting. This process of integration was not original with Krupp or confined to his works. Some years earlier Banfield described the engine-building shop of Haniel at Ruhrort on the Rhine: "The order, quiet, and business-like arrangements were quite English; but it was not very English to hear that nearly every pound of iron used had been raised at their own mines, smelted, rolled, and finished at some of their own works."

Conditions 1850–1870

The rapid industrial development of Germany after 1870, so rapid that it almost strains the understanding, would be wholly unintelligible if it had not been preceded by a period of preparation in which sound foundations were laid for the advance. This preparatory period may roughly be described as covering the years 1850–1870. Before 1850 the German people were in the period of industrial apprenticeship. They had to go to their western neighbors, particularly England and Belgium, for a knowledge of processes, for acquaintance with machines, and for an understanding of the organization of machine processes in the factory. They borrowed capital as well as ideas. Many industrial undertakings were set up only to fail. They were learning their lessons in a school of bitter experience. About the middle of the century the fruits of this period of trial began to appear. Sifted out by a process of natural selection, leaders gifted with the rare combination

of qualities needed by the captain of industry founded establishments which were destined to reach the first class in efficiency and extent. Many of these men came from the ranks; starting without means or influence they rose to the top by sheer ability. Richard Hartmann came to Chemnitz in the '30's as a journeyman machinist with less than $2 in his pocket; in 20 years he was employing over 2,000 workmen. Another machine works, that of Borsig, employed 50 workmen in 1837 and 1,600 in 1866; it was accounted the largest locomotive factory in the world. It is significant that in this machine age individual Germans were succeeding not only in manufacture by machinery but also in the manufacture of machinery itself. German writers can give an extended list of leaders who in the decades before 1870 founded industrial firms which became celebrated in later history. Some industrial establishments had already taken on the form of the joint-stock company, although the spread in manufacture of this agent of capitalist expansion was reserved for the period after 1870, when new regulations facilitated its creation. Already, however, Germany had left the Middle Ages so far behind that it was subject to the shocks of the new order; it celebrated its capitalist adolescence by a sharp commercial crisis in 1857. The banks, which in the early part of the century had followed the conservative lines of business marked out by tradition, were now ready to lend their aid in the promotion of new enterprises, and shared in the active speculation which led to the reaction.

Labor

The contribution of German labor to the successful establishment of modern forms of manufacture in the country can best be discussed later when the reasons for the rapid development after 1870 are considered. An extract from an English writer who visited the Haniel foundry in the Ruhr about 1850 will illustrate the advantages which the German employer enjoyed. Asked if there was any danger of a strike such as had recently threatened among Lancashire molders, "We were told no interruption on the score of wages was anticipated, although only leading men in the works, chiefly puddlers and roll-masters, were paid as high as is common in England. The habits of the people are averse to such attempts — the laws enact severe penalties; but the chief ground was of course to be sought in the excess of supply over the demand for

labour. A country only rising from a very bad organization of labour, by which a disproportionate number of the inhabitants are tied to agriculture, finds it easy to recruit the manufacturer's demand where the people, being all well-trained at school, are versatile and easily taught." The strength of the manufacturer's position implied, of course, corresponding weakness on the side of the factory worker. All the evils and abuses which showed themselves in the early English factories were reproduced in Germany: the exploitation of children and women, the long hours, the unwholesome surroundings. They did not last so long, however, and they were not so severe. The period of the factory was later in Germany than in England by some fifty years. The unhappy experience of the English was not lost on the Germans. Not only had private and public opinion changed in the interval, but also governments had learned how to administer more effectively the regulations designed to protect the worker.

Cottage spinners

Real as were the hardships endured by labor in the early factories, they appear almost negligible in comparison with the sufferings of hand workers in the textile trades. The common fabric used by the Germans for underclothes and for some of the outer garments was linen; statistics of consumption, quoted on an earlier page, indicate its importance. The preparation of yarn from the flax and of cloth from the yarn was effected with the simplest implements, and was a common household occupation. Many of the laboring class, provided perhaps with a small plot of land but with neither land nor agricultural wages sufficient to support a family, made both ends meet by selling yarn spun at home. In some districts whole villages were devoted to this occupation. The individual spinner could earn only about 2 to $2\frac{1}{2}$ groschen (say 5 or 6 cents) a day, but the price of food was low and wants were simple. The opening of the continent to the cotton yarn and cloth of the English factories in 1815, at the close of the Napoleonic wars, wrote the death sentence of the old linen industry, which could not hope to compete with the constantly cheapening product of machinery. In desperation the spinners increased their output at the expense of its quality, and lost their export market. Earnings declined until, about 1840, a whole family, man, wife, and children, working day and night at the spinning wheel, could not earn over 5 cents a

day. The unequal contest lasted for more than a generation. Its close is pictured in figures full of meaning; the state of Prussia in 1855 still counted 75,000 hand spinners of linen, in 1861 less than 15,000.

Hand-loom weavers

Cotton spinning was never of importance as a cottage industry in Germany, and in working wool the contest was between shops or factories of different size and did not lead to such widespread popular distress. In weaving, the hand loom remained still, and even after 1870, the common instrument of production, and cloth was produced for merchant employers in the home of the worker. The flying shuttle had come into general use after 1820, and a good loom could be bought for about $11. The fortunes of the hand-loom weavers varied according to the branch of the textile trade in which they worked. They fared worst in linen, in which they were subject to the competition of other textiles as well as of the machine product. As early as the '40's the linen weavers of Silesia, where the industry had been established by Prussian kings in the preceding century, were reduced to destitution. A weaver had to work 16 hours to earn 2½ to 3 groschen (say 6 to 8 cents). Hundreds were swept away by famine and typhus, and there were violent outbreaks against the merchant employers. The people lived on porridge and potatoes, the children went naked, and the adults were barefoot even in winter. It is significant of the lingering death of cottage industry that much later (1891) some 50,000 persons were still engaged in Silesia in textile home work, still working 15 or 16 hours a day, and earning little over $1.50 a week. Of 100 textile laborers included in the statistics 5 were under 15 years of age, 7 were over 70; how many of the very young and old were working in cottages and were not reported it is impossible to say.

Development of agriculture: enclosure

From this survey of industrial development we return to a consideration of the branch of production which still engaged most of the people, agriculture. The greatest step in the modernization of that occupation, the emancipation of the serfs, has already been noted. The process of emancipation was slow, and still more slow was the untangling of the intermixed property rights involved in the open-field system. A regulation of 1821 gave Prussian land-

holders the opportunity to escape from the old network by a process which included the exchange of strips and the laying out of new roads to serve the blocks of land thus consolidated. The reader must not underrate the difficulty of this process. Carried out by the superior power of the landlord, as in England, it could be forced through rapidly, but if the rights of all concerned were to be carefully weighed, and the engineering questions set by roads and water supply were seriously studied, the problem became very complex. In the twentieth century 5 or 6 years are allowed to complete the process in a village. Even in 1930 a considerable part of the arable area of Germany still lay in unenclosed open fields. The process of consolidation had gone furthest east of the Elbe, where the prevalence of large estates facilitated it. In the western provinces of Prussia more than two-fifths of the area still awaited consolidation and enclosure, and in southern Germany the proportion of unenclosed arable was probably as high or higher.

Improvement of systems

In recent times the gain by enclosure in Germany has been estimated at a reduction of the cost of cultivation by one-fourth, and an increase in production of one-third. In an earlier period the gain may have been even greater. Even without enclosure improvement was possible where roads through the fields permitted the different strips to be treated individually, or where the cultivators could agree on a change of method. The old three-field system was subject to many changes in the second quarter of the century. Clover, potatoes, sugar beets, and legumes took the place of fallow. In western Germany the rotation of crops was introduced, and in the eastern parts at least a larger proportion of leaf crops was cultivated. All these changes made it possible to keep a considerably larger number of stock, and production on the arable was enhanced by the more abundant manure. Between 1800 and 1870 the yield per acre of rye, barley, and oats is estimated to have doubled, that of wheat to have increased by a half. The productive area grew by the reduction of fallow, and taking into account both factors, the increase of area and the increased yield per unit of area, it is estimated that the product of German agriculture doubled and possibly tripled in the course of the nineteenth century.

Crisis after 1870

The more recent period, beginning in 1870, which for the manufactures to be described in the next chapter marked an extraordinary development, was for agriculture a period of stress and strain. The world crisis of 1873 initiated a fall in the price of agricultural products which was particularly marked in western Europe, where the cheap grain and meat of new countries were now marketed in profusion. We shall have to note social and political effects of the crisis: a great increase of the debt on farm land, and an attempt by a protective tariff on foodstuffs to relieve the pressure at the expense of the consumer. The economic effect was a stimulus to efficiency. If the reader will refer to the table comparing crop yields in different countries after 1900 (p. 173), he will find Germany near the head of the countries listed.

Fertilizers

There was an extraordinary increase in the amount of artificial fertilizer applied to the land. Comparing figures for 1890 and for 1913, the increase in the amount of potash salts was 14-fold, superphosphates 4-fold, phosphates from steel slag over 5-fold, Chile nitrates over 2-fold, sulphate of ammonia nearly 7-fold. The source of some of these fertilizers deserves a word of comment. Germany had at Stassfurt the richest supply of potash salts of any country of the world; it was one of the few items in which it stood very high in the list of natural resources. It won a valuable phosphate as a by-product of its steel industry. The combined phosphorus, which spoiled the quality of the iron of the Lorraine ores when they were reduced by the primitive Bessemer process, could be extracted by the basic process invented by the Englishman Thomas, and the slag when pulverized formed an effective fertilizer. The German chemical industry was already developing processes by which nitrates (as in sulphate of ammonia) could be synthesized without need of dependence on such natural deposits as the guano beds of Chile.

Agricultural machinery

The use of agricultural machinery grew in corresponding measure. The number of farms (German *Betriebe*) did not change greatly. The total number, including the very small holdings, was something over 5 million, the number with an area of 12.5 acres or more

was not much over 1 million (in 1882, 1,233,106; in 1895, 1,305,632; in 1907, 1,351,296). The number of farms reporting agricultural machinery of the kind indicated was as follows at different dates (figures in thousands, rounded).

	1882	*1895*	*1907*
Steam threshing machines	76	259	489
Other threshing machines	298	597	947
Sowing machines	64	169	290
Mowing machines	20	35	301
Steam plows	1	2	3
Cream separators	—	88	337

The Germans, favored neither in soil nor in climate, have made up their deficiencies by hard work and by that application of scientific method which is characteristic of the people. Liebig, the leader in agricultural chemistry in the nineteenth century, has had worthy successors in the field of theory; the government has disseminated the teachings of experts and the people have adopted them. The cultivation of the sugar beet is an example of a highly developed art encouraged by the coöperation of German chemists. In 1840 the manufacturer got about 5½% of raw sugar from the beets crushed, in 1860 8%, about 1900 13%, in 1910 over 16%.

Size of farms

In the distribution of ownership of the land there has been relatively slight change since 1800. The table below gives the holdings of different size in 1907, with reference to farm operation, not to ownership; but investigation has proved that the divergence of ownership statistics from these figures is not considerable.

Size	*Number (Rounded)*	*Per Cent of Agricultural Area*
Under 5 acres	3,000,000	5
5 to 12.5 acres	1,000,000	10
12.5 to 50 acres	1,000,000	33
50 to 250 acres	250,000	29
Over 250 acres	25,000	22

Comparison with France

Conditions in Germany, as represented by these statistics, resemble the French rather than the English agrarian organization. The resemblance to the French is actually less than the figures would suggest. Too close a comparison of the distribution of land in holdings of different size would be misleading; the products and

methods of the two countries were so different that figures of size do not represent the same facts. In both countries there was a numerous peasant class, cultivating small farms with their own labor. The characteristic peasant of France, however, worked on a smaller scale than his German neighbor; east of the Rhine a larger part of the area was held in peasant farms of considerable size, of 100 acres and over. Of the very small holdings France had a larger proportion which represented either independent agriculturists, or persons on their way to becoming such. Even in Germany, particularly in the southwestern part, a farm of 5 acres on which grapes, fruit, tobacco, or hops were grown, would support an independent cultivator, but in Germany a considerable proportion of these small parcels of land was held by people who had some other occupation, such as inn keeper, smith, etc., and who practiced agriculture only as a by-industry. The contrast is most marked at the other end of the scale, in the large holdings. Not only did Germany have a much greater part of the whole area in really large estates of 250 acres and above, but also in Germany these estates were concentrated locally, in the region east of the Elbe, and were not scattered about among the medium and small holdings. France had no class to show like the German Junkers, successors to the manorial lords who had kept the land when their serfs were freed after 1800.

Large estates

These large landlords found themselves in a particularly difficult position during the agricultural crisis after 1870. Devoted largely to the production of cereals they suffered from the fall of prices in the world market, while their costs were increasing. They had, so far as they were able, kept the common people from getting land at emancipation, thinking that they would be forced to labor, as before, on the lord's estate. They had thus, however, deprived the people of any permanent interest in the region where they lived. Emigration to America and movement westward in Germany to districts where manufactures were developing drained the eastern districts of their labor supply, raised agricultural wages, and compelled the landlords even to import labor from neighboring Poland. Debts incurred in a period of stringency became more burdensome as prices continued to fall, and mounted up to an ominous total. With great political influence, by reason of their social and mili-

tary position and their local concentration, the Junkers became leaders of an agrarian party which obtained protective duties on cereals and other foodstuffs, first established in 1879 and raised considerably in later years.

Agrarian protection

By 1900 Germany had become an industrial state in the sense that home-grown supplies of food no longer sufficed to support the population, and the country must look to the export of manufactures to buy the needed supplies from abroad. The food tax weighed heavily on the industrial laborer, reducing his real wages by the increase in the price of the bread and meat which he consumed. The large landlords were those who received most of the benefit; the holders of medium and small farms, engaged in raising a variety of products, were not deeply interested. The government defended its course by pointing to the military situation of the country, asserting that it must be as far as possible self-sufficient, and must rely upon the agricultural class to furnish the best material for the army.

QUESTIONS

What was the political constitution of Germany before and after 1806? What important elements of unity did the Germans lack?

What was the nature of the economic organization, as evidenced by occupations and urban groups?

Compare conditions with those in the American colonies.

What liberties did the serf lack? Where was serfdom most prevalent?

Illustrate the condition of the serfs east of the Elbe.

What effects of serfdom could be traced?

What were the reasons and occasion of emancipation?

What were the terms of emancipation?

What was the yield of agriculture? Why was it so low?

What was the industrial organization? (Distinguish handicraft, merchant employer, factory.)

Illustrate the standard of life, as indicated by different measures. What evidence is there of improvement, 1806–1849?

Sketch the establishment and growth of the Zollverein. What changes in transportation and in law accompanied it?

What was the course of trade following the establishment of the Zollverein? What was the nature of imports and exports? Contrast imports and exports of industrial products.

(In contrast with the figures in the text, the student may be interested to determine roughly from the U. S. Census of Occupations how many people are now served by a tailor, a baker, etc.)

Illustrate the industrial organization of a German state about 1860, distinguishing different classes of workers.

Explain the establishment and survival of factories.

Illustrate the development with reference to cotton, wool, application of steam power, iron, and steel.

What were significant features in the development of the Krupp steel works?

Contrast industrial periods before and after 1850.

What advantage did an Englishman find in the employment of German labor?

Illustrate the decline and destitution of cottage workers in spinning, in weaving.

Sketch the progress and results of enclosure (consolidation).

Illustrate the improvement in cropping systems, and the results.

What were the cause and results of the agricultural crisis after 1870?

Illustrate the increase and the source of artificial fertilizers applied.

Illustrate the increase in the use of agricultural machinery.

Compare the distribution of land holdings with that of France.

Why did the Junkers suffer particularly from the agricultural crisis after 1870?

What did they do to improve their position?

READING

Students who find the suggestions below inadequate may turn to the bibliographies in Ogg and Knight for additional references. The field is less satisfactorily covered than most others in English works.

Reforms of the Napoleonic period. (Ogg, chap. 5, pp. 98–107.)

Reasons for contrast of English and German agrarian history. (W. J. Ashley, in *Economic Journal*, June, 1913, 23 : 165–181.)

Agriculture to 1848. (Clapham, chap. 2, pp. 29–52.)

Agriculture since 1848. (Clapham, chap. 9, pp. 195–231.)

Agriculture in the nineteenth century. (Knight, chap. 6, pp. 458–466; Ogg, chap. 9, pp. 192–201.)

Industry to 1848. (Clapham, chap. 4, pp. 82–103.)

Communications and commerce to 1848. (Clapham, chap. 5, pp. 104–120.)

Early railroad and telegraph. (Clapham, chap. 7, pp. 140–157.)

CHAPTER XII

GERMAN MANUFACTURE, 1871–1914

Results of the war, 1870–71

The year 1871 marks an abrupt turning point in German history, both political and economic. In that year the German people at last established for themselves a single state, comprising most of their number, and added to it the province of Alsace and Lorraine, rich in agricultural, mineral, and industrial resources. They exacted from the French, moreover, at the close of the Franco-Prussian war, an indemnity of 5 milliard francs, roughly $1,000 million, which was rendered with surprising promptness. The first fruits of the victory, however, turned bitter to those who sought to enjoy them. An unexampled period of reckless speculation, in which the number of stock companies was tripled by the activity of promoters, led up to the crisis of 1873, and to a period of depression lasting through the decade.

Industrial development

If the dreams of the speculators were not immediately realized, yet the progress of the country in the succeeding generation surpassed anything that sober judges at home or abroad would have imagined possible. Inside the framework of the new state a new economic organization developed with a rapidity which was matched only in a country with the virgin resources of the United States. Germany was in 1860 still a country predominantly agricultural; about 60% of the people got their living from the soil. After that date the number employed in agriculture remained almost the same, while every year additional hundreds of thousands of a rapidly growing population joined the ranks of those engaged in industry and trade. Before the World War Germany had become the greatest industrial country of the world, measured by the absolute number of those engaged. The advance in the more complex and advanced forms of organization is pictured also in the

rapid growth of urban centers. In 1840 there were only 2 cities counting over 100,000 inhabitants; in 1910 there were 48. The percentage of the people living in cities of that size was in 1871 under 5; in 1910 it was over 21. In the decade before 1900 Berlin was growing more rapidly than Chicago.

Coal and iron

The progress of Germany in this period can be measured by the speed with which it developed its resources of coal and iron, two products particularly characteristic of industrial advancement. Figures in the accompanying table are given in round millions of tons, with another figure which indicates roughly how many-fold the product of each country in the table increased in the course of the period.

Resources	*Germany*	*England*	*France*
Coal			
1875	28	99	11
1913	273	287	40
Increase	× 10	× 3	× 4
Pig iron and steel			
1875	2	6	1
1913	14	8	2
Increase	× 7	× 1	× 2
Steel ingots and castings			
1875	0.2	0.7	0.2
1913	14	7	2
Increase	× 70	× 10	× 10

Horse power

Another index of industrial progress is afforded by the figures of steam horse power applied to industry in the state of Prussia. In 1837 the country had made a bare beginning, with 400 little engines producing altogether only 7,000 horse power. In 1855 the figure had risen to 62,000 horse power; in Germany as a whole the amount of industrial horse power must already have exceeded the French figures. The most rapid development, however, was reserved for the succeeding period. In Prussia alone, in 1879, the horse power approached 1 million, in 1901 was nearly 4 million, in 1911 it exceeded 6 million. Assuming that 1 horse power provides the energy which would be supplied by 12 to 24 men, the figures

suggest the extent to which human endeavor had been supplemented in this period of mechanization.

Size of enterprise

Still another and in some respects a still more significant index of industrial growth is afforded by the statistics which group the industrial population (both mining and manufacture) according to the size of the enterprise. For present purposes it seems necessary to distinguish only 3 classes, groups of 10 or less constituting what may be termed a small shop, 11 to 50 making a small factory, groups over 50 making a large factory. It is convenient to include in the table the post-war figures, and reference will be made later to the growth of the very large enterprises in which more than 1,000 persons were engaged. Figures give the percentages of the whole number of industrial workers engaged in enterprises of different size at the time of each census.

	1882	*1895*	*1907*	*1925*
Up to 10 persons	61	47	36	29
11 to 50 persons	13	17	18	16
Over 50 persons	26	36	46	55

Handicraft

The first line of the table comprises petty industry, craftsmen, and workers for a merchant employer. The absolute number of those engaged in industry on this small scale remained about the same; the proportion to the whole diminished greatly. The workers who remained without the help afforded by machinery and power, and who could get little advantage from the division of labor, had to content themselves with a bare living. When Lavollée wrote (1884) the earnings of the craftsman, working in summer from 5 in the morning to 7 at night, in winter from 6 to 8 or 9, were estimated to be about $4 or $5 a week; in bad times they sank to $2 or $3. The family rarely ate meat, and had to content itself with the simplest lodging. Craftsmen established in the little towns, serving the country people, fared better than those who endeavored to maintain themselves in the cities. Earnings barely kept pace with the rise in the cost of living. In the city of Hanover, just before the World War, the average income of the craftsman was about $375 for the year. Bakers and butchers were the aristocracy of the class, earning up to $600; tailors and shoemakers earned but $300 a year, or even less.

Merchant employers

The home workers producing for a merchant employer were still worse off. Reference was made in the previous chapter to the condition of the hand-loom weavers in Silesia about 1890. Nowhere else was destitution so extreme, but other members of the class, weaving goods of cotton, wool, or silk in a hopeless competition with machine-made products, were engaged in a losing fight. In this later period merchant employers found their outworkers not so much in the cottages of the country-side as in the crowded districts of the cities, and gave out work to be done particularly in the needle trades: the making of clothes and underclothes, embroidery, lace, gloves, and so forth. The census of 1907 showed still over 400,000 of these out-workers in industry. The employers found such advantage in the low rates of pay accepted by the workers, in the small amount of capital required and in the consequent ability to stop operations without serious loss when the market was bad, that they could continue this form of business even in the modern industrial environment. Apparently a minimum wage law, extremely difficult to administer, would be the only means to rescue this submerged group.

Factories after 1870

The major part of Germany's industrial population was still of the kinds described above, when the Empire was founded in 1871. Factories were relatively rare, and the factory organization was in general inefficient. An Englishman said in 1871 that the working hours in German factories were from 5 : 30 A.M to 8 : 30 P.M. for 6 days in the week, yet the product was no more than would be turned out in England in a 60-hour week. Professor Reuleaux, an expert judge who represented Germany at the Philadelphia Centennial in 1876, reported, " In the industrial field we have received a defeat equal to two Sedans." Krupp guns were the only products to be proud of. The exhibits of German industry were in general *schlecht und billig*, " cheap and nasty." An Englishman, writing in 1878, said, " Of course, as a manufacturing nation, Germany is at present very far behind us, being immeasurably poorer, more heavily burdened in ways that tell on the efficiency of labor, and far from thoroughly organized." An American, visiting Reuleaux in 1887, thought that his verdict on the German industry of 1876 still held true.

From such beginnings German factory industry, in the course of a generation, swept upward to a commanding position in the European world. The reasons for this sudden display of vigor, for this rapid transition from a simple and inefficient organization to a highly complex and very efficient organization, form one of the most interesting problems in economic history.

Sombart's analysis

The subject may be introduced by a rough summary of the analysis of German characteristics explaining the people's specific talent for capitalism, as presented by Werner Sombart. He finds in the Germans a lack of the aesthetic qualifications of the Romance peoples, but in compensation a strong ethical disposition, a sense of duty. The Germans further (still following Sombart) have a talent for coöperation, a readiness to sink the individual personality to become a specialized part of a group. German history, embracing so much military drill, has disciplined the people beyond others, and so fitted them to act each his particular part in " big business." The mixture of races, with an infusion of Jews, is an element which Sombart always stresses. The lack of a modern state before 1871 developed certain useful characteristics; it inculcated modesty in foreign trade relations, it enforced patience and painstaking care. Germany was very far from being spoiled by success. On the other hand the imposing success of the Empire after 1871 engendered other more positive qualities, while the exclusive tendency of the Hohenzollern monarchy did not tempt into the service of government men who had the qualifications to become great captains of industry.

Discipline

Without attempting to discuss in detail all of Sombart's suggestions, it will be profitable to review some factors of incontestable importance in German industrial success. " There is truth in the saying that Prussia became great by hunger," said August Bebel, one of the leaders in the history of German socialism. The simple life had been imposed for many generations on a people who managed still to hold fast to ideals of home and family which kept them from being degraded. The rapid increase of population in the very period of success maintained an unremitting pressure; pressure forced progress. Germany in 1850 was almost as densely popu-

lated as was France in 1900, but between those dates there was an increase of over 20 millions, for which a place had to be found somewhere. The people were bred up in submission. The schools, which all must attend, were subject to strict discipline. Their directors exercised a qualified right of arrest and imprisonment to subdue unruly pupils. From school youths passed to the army where for 2 or 3 years they were again drilled in the elements of order, obedience, care of the person and belongings. If Germany lacked in this period an established class of factory laborers like the English, in whom factory work was a tradition inbred for generations, there were compensations. It had at least raw material admirably qualified for initiation, and the reader may be reminded that Henry Ford prefers such labor to individuals set in ways which may not suit the factory organization.

Education

"Ten years' residence and study in Germany has led me to the belief that this Empire's greatest capital is its intelligence." So wrote a commercial agent of the United States at Eibenstock, in 1903. Are the Germans naturally more intelligent than other peoples? Doubtless an "intelligence test" could be framed to prove the case, but a sceptic could be pardoned for doubting its significance. Yet it does seem true that the Germans have succeeded better than any other people in discovering intelligence where it does exist, in developing it so far as training can do that, certainly in inculcating a respect for it and giving it a higher place in the direction of social activities. It has often been said that it was the primary school teacher who won for the Prussians the victories at Königgrätz and Sedan. Illiterates are almost unknown in northern Germany; "they are as dead as gypsies, three-field agriculture, tilt carts, and wolves." Education did not turn the mass of the people into intellectual prodigies. According to the general opinion German workmen are not original or inventive. An Englishman who made inquiries in this matter in many parts of Germany got always the same reply, that no suggestions for improvement of methods were ever made by the workmen. But if the people in the course of their training lost some of their initiative they were well prepared to follow the initiative of others. The results of English education, according to the Bishop of London, were that it made the English schoolboy not only to

dislike learning but to despise it. The German people did not all become learned, but all came, at least, to respect learning in others. One of the ambitions of the small boy, it is said, is to become a professor! The people like to learn, and they like to apply their learning. Any foreigner who has traveled in the country can testify to the eagerness of individuals to display any acquaintance, even of the most modest dimensions, with a foreign language, when an Englishman or an American would stick resolutely to his own. The statement ascribed to a German engineer that a common workman may be seen figuring his wages by application of calculus would illustrate this point, while it would suggest that he could reach the desired end more quickly by some simpler method.

Higher education

The reader must distinguish German education at two levels, the universal education of the common people touched upon above, and the higher education in technical schools and universities for the production of leaders. In both fields Germany has shown the way to other countries. Prussia combined, as Kuno Francke said, the democratic ideal of education for all with the aristocratic ideal of careful training and selection of the best. In was characteristic that the University of Berlin was founded at a time (1809–10) when the country was using every resource to escape from under the power of Napoleon. A rough measure of activity at the higher level is provided by statistics of books published in Germany (including parts of Austria and Switzerland) and in other countries just before the war, during, and after it. (Figures are given in thousands.)

	1913	*1916*	*1920*
Germany	35	22	32
France	11	5	6
England	12	9	11
United States	9	10	8

The quantitative comparison is itself impressive, but is made more so if quality be taken into account. A large part of the output in England and in the United States consisted of fiction, while Germany had a much higher proportion of serious works, educational in character, and many more books designed for the young. The ten most popular authors with the workmen at Krupp's included

Schiller, Lessing, and Goethe, and translations of Dickens and Scott; translations from the classics were in steady demand.

Further, this is to be noted. The fruits of education are of slow growth, cumulative through generations. Respect for learning cannot be effectively taught in the school alone. It must be taught at home, by parents who themselves were educated in the home as well as in the school. Standards which impose themselves upon a people without the need of being preached have an authority beyond any conscious exhortation, but are slow to establish themselves. So it is significant that even in 1801 nearly 4,000 books were published in Germany, roughly 1 to 8,000 population compared with 1 to 2,000 in 1911. And it is significant that even in 1840 an Englishman could report as follows on the Zollverein: "The German people is remarkable for temperance, thrift, industry, and intelligence, and enjoys a system of universal education. Excellent polytechnic schools diffuse technical instruction throughout the entire country."

Moral qualities

This last quotation puts in the first place moral virtues: "temperance, thrift, industry." Is it true, as Sombart thinks, that the Germans have more of an ethical inclination, a stronger sense of duty than other peoples? A discussion of the general question would lead far afield, and would probably lead to no definite conclusion. But this, at least, is certain, that they have shown certain virtues, notably those specified above, in measure beyond other peoples. And it would be idle to deny the immense economic import of those virtues. Treitschke thinks that the domestic institutions of the people were their sole salvation in enabling them to recover from the fearful ravages of the Thirty Years' War. Shadwell, a competent English judge, finds in those same domestic institutions of the home and family the salvation of the people in the throes of industrialization, when the sudden development of the factory system and of the great city subjected society to strains comparable to those resulting from war itself. "The habits of the people!" he exclaims; in them he finds the real reason why the German working classes, with lower wages, longer hours, and higher cost of living than the English, could yet maintain a superior standard of physique.

In closing this survey of the contributions which the common

people have made to the industrial progress of Germany I shall raise a question, without implying agreement with the judgments expressed, and certainly without attempting an answer. Siegfried described pre-war France as "a happy country." An American traveler (Collier, in 1910) observed: "Germany is getting to be a very tired-looking nation. One hears almost as little laughter in Germany as in England." Does industrialization pay?

Organization

No matter how good the common labor of any country may be, it will count for little in the complex organization of modern industry if it is not competently led. There is a fair parallel in military matters. An army in which the common soldiers, as individuals, are of first-rate quality, but which is poorly directed, will be defeated by another in which the rank and file may be of indifferent stuff, but which is so well staffed that every campaign is wisely planned, and every battle is fought under conditions selected by good strategists. The Germans attained their position in modern industry as much or more by the merits of their leaders as by the good qualities of their laborers.

Source of leaders

An English author makes the surprising statement that the class of self-made men is practically unknown in German industry. It is true that in this later period of development the leaders came commonly from the middle class, descended, perhaps, like the Krupps, from ancestors who had fought their way up in the earlier part of the century. With the highly capitalistic tendencies of the most modern time it has been difficult for an upstart to break into the group controlling big business. German social divisions, down to the World War, were sharper than in either France or England. While an education was given to everyone, two parallel systems of education were provided, one for the common people, another at a higher level for the middle and upper classes. It was difficult and it was unusual for members of the laboring class to manage a transfer to the higher level. With or without an education some rose from the bottom to the top. The head of the firm of Schuckert & Co., electrical manufacturers of Nuremberg, was in 1873 working at the bench in a small shop. In 1882 he had 40 workmen under him, in 1900 he had over 8,000. Other examples could be

cited, but it may be conceded that they were relatively less common after 1870 than before that date, less common in Germany than in the United States. Still, the question whether the constitution of German industry in this period was democratic or aristocratic is interesting rather than important. From the purely economic point of view the matter of decisive importance was that Germany had a supply of leaders sufficient in quantity and quality to build up an industrial organization which in some ways was the most efficient of any in the world.

Application of science

One merit the German manufacturers had, incontestably, in measure beyond that of any other people, — a recognition of the importance of science in modern industry and a determination to make the greatest use of its application. In no other country was the importance of the scientific expert recognized so early; in no other country was the proportion of experts in industry so high. The advanced stage of educational efficiency in the German scientific schools and the inclination of the people to study contributed greatly to this result. While the proportion of the staff to the rank and file in industry doubled, the supply of technical experts increased still more rapidly. The competition for places forced down their salaries to an extent which encouraged manufacturers to make the fullest use of their services, though on the other hand it suggested the appearance of a " white-collared proletariat." Inquiries made shortly after 1900 showed that most of the trained technical graduates in municipal service and in the mechanical and electrical industries received salaries of $500 a year or less, that less than a quarter had salaries exceeding $700. To an extent hard to realize in America the dignity of the position, the German *Stand* (status in society), was accepted as compensation for the low income; and in some lines of work great prizes were reserved for those who proved their ability.

Experts

The career of such experts may be illustrated by reference to the chemical industry, the branch of manufacture in which their contributions were recognized by all the world. An English author (Dawson, in 1914) counted 1 university-trained chemist to 40 work people, and found a ratio of science to labor which could

be matched nowhere else; a German author (Elster, in 1929) reckoned 1 expert to 5 workers. The exact statistics are unimportant; the figures are quoted merely as illustrations. University graduates were received in German color works on a 5-year contract, binding themselves not to enter the employ of other works for a period of 2 years after departure or dismissal, but drawing salary meanwhile. The salary was modest, about $500 at the start, but the chemists were members of a select group, a sort of club or faculty, with a keen consciousness of its dignity and responsibility, with regular meetings for professional discussions and with an active social life. The chemists determined in large part their own activities in research; after service in the works some were sent off to travel and study in some particular field, to return then with their contributions. A discovery made by a research man would be patented by the firm, but a share of the profits would be given the discoverer if it proved to be a commercial success, and some of the chemists enjoyed large incomes.

Optical instruments

A practical example of coöperation at a high level, in which pure scientists, practical men, and the government each contributed, is afforded by the history of the manufacture of optical glass, in which the Germans reached such a commanding position before the war that the allies were sorely put to it to supply their deficiencies. Abbe, professor of mathematics and astronomy at Jena and particularly interested in the theory of optical lenses, had some made for him by the manufacturer Zeiss. Difficulties experienced in getting suitable glass led to the inclusion in the group of Dr. Schott, a trained chemist acquainted with the processes of glass manufacture. After 2 years of experiment a grant was made by the Prussian government (1883–84) for the continuance of the investigation, and in the final result a highly successful business was established, supplying over 100 varieties of optical glass and microscope objectives of unmatched quality, containing up to 10 lenses of which some were no larger than a pin head but were exact in curvature to the breadth of a wave of light. The Zeiss works specialized in quality. Leitz of Wetzlar developed production in quantity, introducing standardization and manufacture in series, and supplying a third of the world's product. Many similar instances could be given of the coöperation of university professors;

and the government, which had already established research institutes in a number of lines, made the centenary of Berlin University in 1910 the occasion for the establishment of another school of research with a grant of 10 million marks.

Systematic planning

The German respect for knowledge and disposition to make use of the trained expert showed itself in all parts of their national life, not only in industry but also in trade, where the problems of merchandising were given more serious attention than in any other country, in agriculture and in forestry, and in the public service. The usual report from the German front during the war was that a certain operation had been carried out *planmässig*, " according to plan." Every problem received patient study, was systematically analyzed, and methodically attacked. It is symptomatic that the best guidebooks to most countries of the world were those founded by the German Bädeker generations ago. Shadwell notes as characteristic the fact that in a German town, even of modest size, the traveler can expect to find almost immediately a book store, and in the shop an excellent little guidebook and map of the place and its vicinity. He notes that Germans are rarely seen to hurry, yet have a way of arriving on time. The Germans have a saying that *langsamer Schritt*, slow march, won the war of 1870–71. The creation of synthetic indigo, one of the great achievements of modern chemistry, was the result of 10 to 20 years of patient effort, involving the expenditure of millions of dollars.

Adaptation

Of inventive geniuses of the first class, like Werner Siemens, the Germans have had relatively few. Their habit led them to effect their progress by a number of small steps rather than by one leap brilliantly conceived. No people in the world compared with them, however, in their interest in and knowledge of the progress effected by others. Every exposition was attended by Germans, traveling not for pleasure but studying the exhibits as scientific observers, to get suggestions for the improvement of their own methods. They imported from other countries models of the best machinery, studied and copied them, improved on them if they could. " They copy everything," said a representative of the McCormick Harvester Company, " but copying will never get

more than the dregs of a trade. The country that originates will always be ahead." Proud in that conviction, Americans opened their works wide to German observers. A party of them, being shown through an automobile factory in Detroit and confessing themselves to be professional automobile engineers, were surprised when they were provided with pencils and paper that they might make full notes of everything of interest to them. And in the course of time, as the trade statistics show, they found large parts of the field of industry in which conditions allowed them not only to supply their own needs but also to export in competition with others. Nearly two-thirds in value of German exports, 1913, were composed of manufactured wares. When American machinery did not answer the expectations of the importers they brought in American engineers and foremen to show them how to make the most of it.

Specialization

The rapid development of manufactures in this period enabled the Germans to obtain the economies resulting from specialization. A plant which had offered a great variety of products, anything from a garden hoe to a steam engine, would concentrate its energies in a restricted line, and seek to achieve the highest efficiency in that. Different factories specialized in the production of engines, boilers, turbines, pumps, bicycles, sewing machines, and so forth, and so forth. With the production of a restricted group of products in large quantities the introduction of special machinery became profitable. The Germans did not go so far in this regard as the Americans, because the relatively lower wages of the workmen made it cheaper to turn out by hand some work for which in the United States a special machine would have been devised; but they advanced considerably beyond either English or French in their mechanization of many processes. "In the latest works nothing is touched by the hand that can be done by mechanical means," wrote an observer in 1908. And he instanced an incident which marked a notable departure from earlier European practice. The head of a machine plant showed him a large packing case containing a special machine which had been imported a little while before from the United States. It had been left unopened because in the interval something better had been devised, and it was already out of date. This manufacturer, it was noted, had no fear

of spies in his factory, because his methods were always in process of change.

Merchandising

One other feature of German organization in this period was characteristic and was very important. Unlike the English, whose goods in the period of their industrial success had "sold themselves," the Germans laid great stress on efficiency in marketing. They realized that they got no profit from a product, no matter how good or how cheap it was, if they did not sell it. The real head of a business was commonly a merchant rather than a manufacturer, employing technical experts to direct the processes of production while he attended to marketing and finance. The founders of the great chemical industry, Bayer and Cassella, were business men rather than chemists. The German color works did not rely alone on the quality of their dyes to find them a market; they spent large sums on books of samples printed in many languages and distributed all over the world. German trade journals were printed not only in English, Spanish, and French, but also in Russian, Turkish, Chinese, and Japanese. An American traveler in South America noted meeting a German agent for the sale of cotton textiles who had been prepared for his work by training in a school for spinning and weaving, who was perfectly at home in 5 or 6 languages, and who was given an income commensurate with his ability. Large industrial firms would employ experts with salaries very high according to the European standard, whose business it was to conduct the delicate negotiations involved in large contracts and requiring sometimes months of residence in a foreign capital. "In Germany trade is a passion," wrote a well-informed observer; "it is not an incident in a man's life, a variant on pleasure and sport, but the chief, primary, absorbing concern." Institutions of higher learning taught commerce as other scientific schools taught various branches of engineering.

Lack of space forbids a description of the various branches of industry which developed in Germany in the period under review, but their course can be illustrated by reference to characteristic features selected from the great mass of material.

Coal and iron

Statistics in the early part of this chapter illustrated the rapid development of the resources in coal and iron. The Germans had

always been distinguished for their efficiency in mining, and in this period were still leaders in its development. Some of the Westphalian collieries had advanced even beyond the steam engine, using explosion motors and relying largely on the electric transmission of power. The minette of Lorraine had only half the iron content of the best American ores, but in plants rivaling the American in extent and technical perfection it was made to yield its metal at costs below those of all other European producers. About 1900 the exports of iron and steel products doubled or tripled in the course of a few years. The government gave specially favorable rates on the stretch of railroad, over 150 miles, separating the ore and coke; Duisburg-Ruhrort, the place of transshipment on the Rhine, became the greatest internal port in the world, measured by the tonnage of goods. English observers found an efficiency which they could not match, due more to good plant and management than to lower wages of labor. The rapid development of the industry can be illustrated by the career of August Thyssen. Born in 1842, the son of a small manufacturer, he founded at Mülheim on the Ruhr, in 1871, a metallurgical establishment employing 70 workmen. In 40 years the works at Mülheim had expanded to embrace so many departments of iron and steel manufacture that they employed 7,000 workmen. Thyssen had become a multimillionaire, owning and operating coal and iron mines on a large scale and a fleet of vessels to transport his products.

Machinery

The success of the Germans in reaching a leading position in the manufacture of machinery was similar, though less spectacular. Cobden complained, so far back as 1838, that the Germans were developing the manufacture of machinery under the guidance of English workmen: "In almost every large town there were English mechanics instructing the natives to rival us." The manual worker learned the craft so well that in the later period he became at least the equal of his teachers. In old-fashioned works the individualism of the craftsman was, as in France, an obstacle to progress. A university graduate who essayed the life of a laborer (about 1890) found in a Chemnitz machine shop in which he was employed that the parts of engines and machine tools rarely fitted at first: "There was much to be done over; many a test had to be

made; many a time the whole machine must be taken apart and set up again." Meanwhile, however, progressive manufacturers were adopting other methods. The firm of Ludwig Loewe, which held in the manufacture of small arms much the same position which the firm of Krupp held in making guns of larger bore, devoted 2 years to a careful study of the methods of manufacture in different countries. It then imported a complete outfit of machine tools of all sorts from Connecticut, and introduced the methods of manufacture which were the most advanced of the time. Other manufacturers had already copied and adapted American machine tools. An observer competent to judge by long experience and acquaintance with American as well as European methods found the Düsseldorf Exhibition of 1902 " the finest show of machinery and tools ever seen." In 1907 Germany imported 9,000 complete machine tools, of which the largest part came from the United States, but in the same year it exported 52,000. The country had arrived at mechanical independence. An American engineer visiting it in 1921 found American machine tools used much less than elsewhere in Europe.

Some even of the hand trades were adapted to meet the new conditions. The reader doubtless knows the Sign of the Twins, as a brand of some German cutlery; it was registered at Solingen, nailed upon the church door by Peter Henckels in 1731, and has been borne by the same firm ever since. The work used to be done, as in England, almost entirely in little scattered shops, but the introduction of die forging, by which blanks for scissors and knives could be stamped by machinery in large quantities, saved an immense amount of time and labor, and enabled the Germans to export their product to Sheffield itself.

Textiles

In the manufacture of textiles the Germans developed no such superiority. A government investigation of the cotton industry in 1878 showed features resembling those of the English industry in the '30's. Mills were small and scattered; the effect of the political subdivisions of the past were still apparent. About half of the labor force continued to do their work in their own cottages. Hand looms gave place slowly to machine looms, and persisted down to 1914. Lacking the highly efficient commercial organization of the English industry the manufacturer was at a dis-

advantage in the purchase of raw materials and in the marketing of finished goods. German manufacturers imported a large part of their yarn from England, and in the making of piece goods could not compete with the English in staple lines. They found a market by their readiness to make novelties and specialties. They carried hundreds of patterns and were willing to accept orders for a few hundred yards of fancy goods, on occasion down even to less than 100. It was not unusual for the trade to place an order for a new class of goods in Germany, and if the product proved popular to have it then manufactured in quantity in England. In silk the Germans managed, toward the close of the period, to threaten the supremacy of the French industry by the introduction of a more elaborate mechanical equipment. In the woolen industries, as in cotton, they did not in general attain the efficiency of the English; they found an outlet in the export market only by painstaking study. Makers of dress goods employed highly qualified designers, whose patterns and colors were subjected to the criticism of buyers for the trade before they were adopted. Shadwell was shown in Elberfield some dress goods, manufactured of materials imported from England and then shipped back to England for sale. Asked how he could accomplish this, paying carriage both ways, the manufacturer replied, " It is a nice design; there is brains in it."

Chemicals

The industry which best illustrated German capacity to apply science to manufacture and get commercial profit from the trained expert was that engaged in making chemicals. Germany ranked below the United States before the war in the aggregate value of the output of chemicals, but the American product was composed mainly of heavy industrial chemicals processed by methods which had long been standard, while the Germans excelled in complex organic products synthesized by methods which they had developed, products with " brains " in them. The Germans supplied dyes, colors, drugs, perfumes, flavors, and so forth to all the world. In the past dyes had been obtained directly from natural products, blue from indigo, red from madder and logwood, yellow from saffron, scarlet from cochineal, and so forth. The discovery by an English chemist, Perkin, of an anilin dye made from a coal-tar residue started an almost endless series of developments in which the Germans were the unrivaled leaders. They imported

from England and other countries the waste products of gas works and sent them back in the form of delicate colors and precious drugs. Four-fifths of the world's dyes came from Germany; England itself used German dyes in that proportion.

The Badische Anilin und Soda Fabrik, at Ludwigshafen on the Rhine, was in 1865 an establishment employing 30 workmen. In 1913 it employed nearly 10,000. It had over 200 chemists in the works plus some 60 engaged outside. The plant was regarded as a model in construction and management. Here and elsewhere in the German chemical industry the equipment was of the most advanced order, including giant filters and vacuum pans, with use of superheated steam or of refrigerants to suit the process. The empirical method, reliance on trial and error, had been almost banished from the manufacture; a new process was introduced only after a long series of laboratory researches involving often the application of the most advanced abstract theory. Not only in the production but also in the application of dyes the Germans were recognized to be best; English manufacturers who wanted a particularly nice piece of work done sent it to them.

Electrical industry

Another characteristic industry was that engaged in the manufacture of electrical equipment. Here again pure science and practical ability must be combined to attain the highest efficiency. The industry in Germany traces back to 1847 when Werner Siemens, a born inventor, combined with the mechanic Halske in a firm to manufacture a pointer telegraph which Siemens had devised. Down even to 1882 workers in the industry were too few to be separately enumerated in the industrial census; the telegraph was still the only important commercial application of electricity. In 1913 the industry employed 140,000; it accounted for 35% of the world's output to be compared with the United States, 29%, and England, 16%; and the value of its exports was double that of any other country. Germany had built nine-tenths in mileage of European street railways, and was a leader in electric installations in other continents, particularly South America. The A.E.G. (Allgemeine Elektricitäts Gesellschaft, same meaning as General Electric Company, but not to be confused with the American corporation), founded in 1883, became the greatest manufacturing unit in Europe. The works at Berlin employed over

70,000 employees. Like the great chemical works they were models of efficient equipment. Coal brought from Silesia by rail was unloaded, conveyed, and fed to the furnaces entirely by mechanical means. A Corliss engine, dating from 1897, was the sole remnant of the period of reciprocating engines; most of the power was obtained from steam turbines.

Banking

The growth of German industry in the period after 1870 was attended and greatly assisted by a development of the banking system. The first part of the period was marked by a great increase in the number of joint stock banks, which now no longer required the grant of special charters for their establishment. After 1890 the tendency was rather toward concentration. Under a variety of forms — mergers, stock holdings, understandings not expressed in formal contracts — many of the smaller and the provincial banks were brought within the sphere of influence of four great Berlin banks. Banking methods seemed in some respects behind English and American, particularly in the small use of checks as means of payment, but in the promotion of new enterprises the large German banks were as active and efficient as those of any other country and distinctly more progressive than the English or the French. It was highly characteristic that one of these great banks would finance an undertaking, say the installation of a lighting plant or street railroad system in South America, in large part by the sale of bonds in France or England, using the capital of a rival to extend German enterprise while the bank retained the stock until it had been seasoned by the success of the undertaking and could be marketed at a good figure.

Business combination

Another feature was noteworthy in the industrial development of the period, although the nature and extent of its contribution to progress has always been a matter of dispute. This was the union of separate industrial enterprises, for various purposes but particularly for control of the market. The German cartel or pool developed with the rise of large capitalist enterprise, in the '80's. In the United States a pool designed to maintain prices was illegal, being in restraint of trade; in France or England it was not contrary to the law, but was not enforceable at law if members chose to

disregard the agreement. In Germany the law accepted and upheld it, and the government itself on occasion became a member of a pool. An investigation of 1905 showed the existence of 385 cartels: in the coal trade 19, the iron industry 62, other metal industry 11, the chemical industry 46, the textile trades 31, and so forth. It is not possible here to describe the form and fortunes of these combinations, still less to appraise their results. Obviously they promised in a period of cut-throat capitalist competition to steady the course of industry, but critics have questioned their success in this regard, and have been able to point to the maintenance in operation of inefficient producers, and an added cost to the consumer, as evils attending their existence. At least and at the worst they illustrate that capacity for coöperation which Sombart thought to be characteristically German, and which is certainly in general, in these recent times of group action, a quality indispensable for success.

Wages

From this survey of the upper levels of the German organization we must return to a consideration of the common workman. One important factor in Germany's success in export to foreign markets was, undeniably, the cheap labor which the manufacturer had at command. The reader must not be misled by the phrase "cheap labor." The service of the workman was cheap because it was good; he returned a "good pennyworth" for the money paid him. On the other hand, it was also true that the money wage of the workman was in general lower than the English standard, distinctly lower than the American standard. The English Board of Trade found conditions in 1905 to be as represented in the accompanying table, in which the figures of other countries are expressed in percentages of the English standard.

Country	*Hourly Money Wage*	*Lodging*	*Food*
England	100	100	100
Germany	75	123	108
France	64	98	106
United States	240	207	125

Money wages rose greatly in Germany in the course of the nineteenth century, and continued to rise up to the outbreak of the war. Real wages, measured by what the money could buy, rose also.

Real wages were actually higher in Germany than would appear in a bare comparison of wages and prices because in Germany the state and the municipality provided so much more than other countries in the way of insurance and in the enjoyment of public utilities. Yet at best the standard of living of the German workingman's family was strictly simple. Göhre, the German student who entered a machine shop in Saxony to learn by experience what the German workman's life was like, received the usual pay of a beginner, 20 pfennig (5 cents) an hour, a little over $0.50 a day. Older hands and skilled workmen earned up to $5 or even $10 a week. Assuming average earnings of $5 a week, Göhre said: "There can be no question of want in this class of wage earners. . . . It is, comparatively speaking, one of the most prosperous and most favorably circumstanced of the whole body of working men in Saxony." These statements refer to a period about 1890. Wages rose considerably in the succeeding period, although the benefits were reduced by the agrarian tariff which caused a distinct rise in the price of food. A characteristic day wage shortly before the outbreak of the war would be from $1.25 to $1.50.

Standard of living

Critics of the industrial system were dissatisfied, and properly so, with this level. They found $375 a year insufficient for the support of a small family, $500 not enough for a large one. Yet if prevailing levels did not satisfy the ideal, they were rising and in some respects presented a favorable comparison with other countries. "The habits of the people!" The Germans, inured to a simple life and trained in an admirable domestic economy, made the most of a small income. Figures of average per capita consumption are significant. The average German consumed of wheat and rye, in a period ending in 1890, a little over a pound a day (392 lbs. a year); in a period ending in 1906 the consumption had increased by nearly 40% (to 545 lbs. a year), and exceeded even the French average. The consumption of meat, which was estimated in 1816 at 38 pounds a head in a year and in 1873 at 65, had risen in 1912 to 115, very little below the English figures. The consumption of sugar nearly tripled in the course of a generation; it was only half as high as that of the United States and of England, but exceeded that of France and of other countries. A German in 1892 compared the standard of living of the factory workers of his country with that of

the English in the '30's, but would certainly have modified his comparison if he made it nearer to 1914. The Germans, with less money, actually seemed to get more that was worth having in life. Other English observers agreed with Shadwell that the physique of the working class was on the whole superior to that of the English. As one put it, " In no large German towns is it possible to find such masses of undersized, ill-developed, and sickly looking people as are to be found in the poorer districts of . . . large British towns."

QUESTIONS

What important changes marked the year 1871? Illustrate industrial progress since then.

Compare the development of coal and iron with that of England and France.

Illustrate the development in horse power; in unit size of enterprise.

Sketch the course of handicraft.

What were the characteristics of industry under the merchant employer? Explain its persistence.

What was the condition of factory industry in the '70's?

What were the causes of development as given by Sombart?

Illustrate the discipline of the people.

What results can be ascribed to the German system of elementary education?

Illustrate the importance attached to higher education.

Explain the advantage of long-established educational standards.

What moral qualities can be ascribed to the people?

Illustrate the importance of leadership in an organization.

What was the source of industrial leaders in Germany?

Illustrate and explain the use made of technical experts.

Sketch the career of an expert.

Illustrate German efficiency in the manufacture of optical instruments.

Illustrate the significance of the German word *planmässig*.

Illustrate their ability in adaptation.

Illustrate advanced methods in production.

Illustrate advanced methods in marketing.

Sketch the course of the iron and steel industry; the career of Thyssen.

Illustrate methods in machine manufacture.

Illustrate characteristics of the textile industries: cotton, silk, wool.

Illustrate characteristics of the chemical industry.

Sketch and explain the development of the electrical industry.

What industrial contribution was made by the banks?

What are the facts and the theories of development of German business combinations?

What was the course of money wages and of real wages? How did they compare with those of other countries?

Illustrate the standard of living of the working class. Compare it with that of other countries.

READING

Excellent collateral reading is provided in William H. Dawson, *The Evolution of Modern Germany*, London, 1908, reprinted in a revised form in New York after the war. Other books available are: Earl D. Howard, *The Cause and Extent of the Recent Industrial Progress of Germany*, Boston, 1907 (Hart, Schaffner & Marx prize); W. J. Ashley, *The Progress of the German Working Classes*, London, 1904; Wolf von Schierbrand, *Germany*, N. Y., 1903; J. E. Barker, *Modern Germany*, 5th ed., enlarged, N. Y., 1915.

Recent development of agriculture. (Clapham, chap. 9, pp. 195–231; Knight, chap. 6, pp. 466–479.)
Recent industrial development. (Clapham, chap. 11, pp. 278–322; Knight, chap. 9, pp. 526–564; Ogg, chap. 10, pp. 210–224.)
Industrial and trade associations. (Knight, chap. 12, pp. 643–670.)
Labor and social legislation. (Clapham, chap. 11, pp. 322–338.)
Labor legislation. (Ogg, chap. 18, pp. 388–397.)
Social insurance. (Ogg. chap. 24, pp. 543–571.)
Labor organization. (Ogg, chap. 20, pp. 430–438.)
Socialism. (Ogg, chap. 22, pp. 485–508.)
Foreign trade and commercial policy. (Ogg. chap. 14, pp. 284–300.)

CHAPTER XIII

POST-WAR GERMANY

Political factors

In describing economic development it is possible, usually, to assume a set of political conditions, more or less fixed, and to show how the economic forces worked under those conditions. Changes in either part of the field, economic or political, are usually so gradual that they can be described over considerable periods of time without reference to other interests. In post-war Germany, however, the movement of events was so rapid in both parts of the field, and the interplay of the economic and political factors was so vital, that it is extraordinarily difficult to present a clear picture of the course of development. The reader may be helped to follow the account presented in this chapter by the accompanying summary, which blocks out in rough fashion the chronology of the period, with reference mainly to political factors.

Year	*External*	*Internal*
1918	Armistice	Revolution
1919	Peace of Versailles	Inflation of the currency
1923	Occupation of the Ruhr	Collapse of the currency
1924	Dawes plan	Stabilization; inflow of foreign funds
1929–30	Young plan	Outflow of foreign funds
1931	Moratorium	Credits frozen

Economic conditions

Germany emerged from the war in a condition close to complete economic collapse. For years it had been living on its capital. In agriculture it had been taking crops without restoring the fertility of the soil; in manufacture it had almost entirely used up, except for coal and iron, its stock of raw materials; 1.8 million of its adult men had been killed and over 4 million wounded; the whole population had been underfed for years. By the terms of the Treaty of Versailles and the settlements which ensued, it ceded 13%

of its area in Europe and all its colonies. The ceded territory, including Alsace-Lorraine and Upper Silesia, was above the average in resources, latent and developed, and is estimated to have contained 15% of the country's productive capacity. The country lost the larger part of its iron ore, a considerable part of its coal and of its metallurgical plants; the new frontiers cut vital connections in the established iron and steel industry.

Reparations

In addition, the country in accepting the Treaty of Versailles had, to use the common phrase, signed a blank check. It bound itself not only to pay within the next two years the sum of $5 milliard ($5,000,000,000), but in addition such sums as the Allied Powers might determine as necessary to cover war damages. Into the unhappy course of the reparations settlements it is not necessary to enter here. They belong in the field of purely political history. The governments of France and of England had made to their peoples the extravagant promise that Germany should pay the costs of the war, and found themselves forced to demand the impossible. France particularly was obdurate in demanding payment, feeling that even if the burden laid on Germany was greater than that country could bear there was compensation in having on the eastern frontier a neighbor so crippled that there could be no threat to the security for which the French yearned.

Reparation payments

The amount which Germany actually paid on account of reparations has been the subject of bitter dispute. To the end of 1922 the Reparations Commission conceded the payment of $2 milliard, while some Germans claimed that the country had paid over $10 milliard. The truth undoubtedly lies between those extremes; an impartial American estimate put the sum at over $6 milliard. The larger part of the total involved no cash payment but the transfer of property, the exact value of which it was hard to appraise. Germany made over to the allies a vast amount of fixed property, including railroads in the ceded territory and shipping, and in addition, according to the terms of the treaty, made every year deliveries in kind of great quantities of coal and coke, chemical products, and timber and other supplies for reconstruction in the devastated districts. A very small part of the payment (a little over $300 million) was made in gold which had been held in the

reserve of the Reichsbank. Aside from the transfer of property and deliveries in kind, most of the funds were transferred by bills of exchange payable in foreign currencies, sterling, francs, or dollars, acceptable as means of payment in the allied countries.

Inflation of currency

Germany was at this time, as will be realized from the introductory description, in no condition to get these bills of exchange in the ordinary way, by exporting a surplus of goods. Actually, it was forced all through this period to import much more than it exported. It had to buy food and replenish its stock of raw materials; it had to reorganize its industry on a peace basis; it must import before it could begin to export. To get the bills of exchange needed for reparation payments Germany realized on such foreign investments as were left at the close of the war, sold to foreigners bonds, shares, and real estate, and sold paper marks. This was the period in which the German currency was depreciating. At the gold par a dollar would buy a little over 4 marks. When exchange operations were resumed, after the war (January, 1919), it would buy about 8; in December, 1919, nearly 50. In 1920 the rate, roughly measured, varied between 40 and 90; in 1921 between 60 and 250. Depreciation went on at an accelerated pace in the latter part of 1922 and in 1923 until it reached points at which the American dollar would buy, instead of 4 marks, millions, billions, finally trillions of the paper currency. The depreciation was irregular and uncertain; many people thought that Germany would restore the former standard or would at least resume gold payments on a basis much above the prevailing quotations. To speculators the world over the paper mark offered irresistible attraction. It has been estimated that during the years 1919–22 foreigners bought paper marks up to a maximum of nearly $1,000 million — and a good share of this total was, in fact, composed of American dollars, spent by speculators in the United States. The foreign currencies received in payment for the marks were remitted to the allies, in part payment of reparations, and the paper marks, like the Confederate currency in the United States, are now valued only as a curiosity.

Reasons for inflation

The economic and social effects of the period of inflation, 1919–23, will receive attention later. We are concerned here only

with the public aspects of the process. Why did the German government loose the flood of paper money which caused the depreciation of the mark, and raised the cost of living in December, 1923, to 1,247,000,000,000, compared with the par, 1, of 1913–14? Some people have charged that it was a deliberate conspiracy designed to spite the Allies. Doubtless Germany was desperate in this period, looking forward to an endless future always crushed under debt; and doubtless some of the limited class who gained by depreciation contributed, whether consciously or not, to further its course. But, given conditions as they were, it is hard to imagine any other outcome of the situation. The revolutionary government, however honest in intention, was inexperienced and weak. Imbued with the principles of a doctrinaire socialism, it was indulgent to the people in legislating for their welfare, without counting the cost; when the bills came in it had not the funds to meet them, and lacked resolution to increase the burden of taxes. There were times in which the government strove, as earnestly as it could, to set its house in order. Without the charge of the reparation payments it might have succeeded. With this added to other charges, at a time when the economic organization was still shattered, the case was hopeless. The government could not pay reparations with paper marks, but could meet a deficiency in its domestic budget by the issue of paper money, and constantly did so. Then prices would rise, government expenses would increase, the taxes which had been adjusted to a lower level of prices would be still less adequate to cover expenses, more paper money would be issued to make up the deficit, and so the process would continue in a vicious circle.

Occupation of the Ruhr

In the middle of 1922 the tension was so great that the German government asked for a two-year moratorium in the reparation payments as the only means to avert financial collapse. England would have agreed to this but Poincaré, at the head of the French government, asserted that Germany was deliberately defaulting and must be made to pay by force. Then began (January, 1923) the occupation of the Ruhr, the district named after a small river east of the lower Rhine, in which were situated the most important coal mines and iron and steel works of Germany. The invasion was met by "passive resistance." All reparation deliveries ceased;

the people in the occupied region worked only under compulsion, and were supported by contributions from the rest of Germany. This was the period in which the mark began its headlong fall, ending before the end of the year in its extinction. In its place was substituted a new and stable currency, and with the stabilization of the currency in 1924 a new chapter in German history began.

The occupation of the Ruhr, "costly, vindictive, and short-sighted" as it has been well termed by an American author, brought to the French loss rather than gain, and forced upon them at last a realization that the terms of reparation must be amended if Germany were to remain solvent and be in a condition to pay anything. A committee of experts, under the chairmanship of an American, Dawes, presented a plan which was accepted by all the powers interested, and which, if it did not provide a final solution of the problem, offered at least a breathing-space of some years, in which passions might cool and conditions might approach the normal.

The Dawes plan

In contrast to the previous attitude, the Dawes plan recognized that the internal economic and fiscal conditions of Germany were of vital importance, that the country must be assured a stable currency and sound public finance, and be allowed to recover its economic strength if it was to continue payment of reparations. So for a year payments were altogether remitted, and even a loan was granted the country, that it might set its currency system in order. Payments were to rise gradually to an amount ($625 million a year) much less than any which had previously been considered acceptable, and arrangements were made for the collection of the money in Germany and its transfer to the creditor powers so as not to endanger the stability of the currency or of the government's budget. During the five years of its operation the Dawes plan met admirably the needs of the situation. Reparations were paid punctually and in full. Germany, faced at last with definite demands which it could meet, recovered its economic strength with extraordinary rapidity, as will appear later in the chapter. The period of the plan may be regarded as a new era. Yet, as already intimated, it was not a final settlement. The Dawes committee, while it fixed the annual payments, had no right to determine the period over which they should continue, or the sum to be paid

in the aggregate. The management of the plan involved foreign control of German domestic affairs, in matters of finance, banking, railroads, and so forth, which an independent country could not tolerate indefinitely. The Germans had asserted that the original Reparations Commission exercised in Germany greater rights than the German emperor had ever possessed; the Agent General for Reparation Payments (an American, S. Parker Gilbert) exercised in some ways even more power. Germany had practically been treated like a bankrupt firm, to be administered by a receiver for the benefit of the creditors.

During the five full years of the operation of the Dawes plan, and the fraction of a year following (Sept. 1, 1929, to May 17, 1930), before the succeeding Young plan was substituted for it, Germany paid on reparations account a total of nearly $2 milliard (7,993 million gold marks), of which France received over half, England over a quarter, and Italy, Belgium, and other powers the remainder. The plan, as said above, fulfilled the designs of its promoters in giving Germany at last stable financial conditions and enabling that country to meet the demands upon it promptly and in full. Why then was it found necessary in 1929 to assemble another committee of experts, to study the situation afresh, and to propose an amended plan?

Need of amendment

The answer to that question lies partly in the dependent position imposed on Germany by the Dawes plan. Foreigners established in Berlin managed some of the country's most important interests. Not until Germany assumed full responsibility for raising and remitting the reparation payments in such a way as it thought best, quite free from foreign tutelage, and with some definite prospect of finally ridding itself of debt, could the situation be accepted as according with the position of a sovereign state. There was, however, another element in the situation which indicated the necessity of revision. The payments which Germany had made, prompt and full as they were, had not been made from the country's own resources. Germany could get the means of remitting payments abroad only by obtaining a favorable balance in the international relations of debit and credit, giving it a surplus credit which it could assign to satisfy the demands of the powers to whom reparations were due. The largest debit item consisted of

goods imported and needing to be paid for; the largest credit item consisted of goods exported, for which the foreigner must pay. Leaving aside some smaller factors (service of shipping, etc.), in the long run Germany could pay reparations only by a surplus of exports over imports. The disquieting feature of the situation under the Dawes plan, from this point of view, was the fact that except for brief periods imports continued to exceed exports in value. So far from liquidating its debts Germany was actually running deeper into debt. It was paying reparations with borrowed money.

German borrowings

The Dawes plan had promised to settle the German financial and economic organization on a firm foundation. It had encouraged the Germans to renew their industrial enterprise with confidence in the future. Their crying need was capital. They needed it to reorganize their industries, to provide stocks of raw material, to finance their business in the period of waiting before returns came in. The active demand for capital forced the rate of interest up so that the ordinary borrower must pay 10% or more on a commercial loan. Bonds were offered at a price which made their yield seem extraordinarily attractive to an investor. Foreign capitalists were not insensible to the inducements which Germany now offered them. The amount of foreign capital which flowed into Germany in this period has been estimated at something like three times the amount which Germany sent out in the form of reparation payments. A large part of the capital was employed to finance industrial recovery, and was indeed essential to it. Some of it, borrowed by municipalities for the extension of public undertakings (on occasion the construction of athletic fields and swimming pools), might better have been left unspent, if judged from the strictly economic viewpoint; some tendencies to extravagance resisted all efforts of governing authorities to curb them, but after all were not a large element in the situation. The critical fact was the failure of export industries to find a market abroad which would give the country a surplus credit on which to draw for the payment of reparations, and which would provide employment for the large number of people out of work at home.

The Young plan

Under these conditions the German government asked to have the situation reviewed, and another committee of experts met at

Paris, under the chairmanship of Owen D. Young, who had been a leading member of the first committee. The new plan of reparation payments devised by this committee went into effect in May, 1930, but remained in force for little over a year, when its operation was suspended by a moratorium proposed by President Hoover, to apply to payments on all international public debts growing out of the war. The official recognition by the United States, the chief creditor country, of the disturbing influence on the economic recovery of the world exercised by the international debts, was an indication that the question of reparation payments would sooner or later be reconsidered as part of a larger problem. Of historical interest, at least, are some features of the Young plan which marked it as an advance upon its predecessor. For the first time the sum total of reparations was determined; Germany was to continue payments over a period of 59 years, to 1988, but the annual payment was considerably reduced (by one-fourth at the start and by one-fifth on the average), below the level of the Dawes plan; and provision was made by which Germany was to benefit if the United States reduced its demands on debtor countries. Most of the apparatus of foreign control, which had been so distasteful to the Germans, was abolished, and a Bank for International Settlements was established in Switzerland to administer the operation of the plan. If conditions had remained as they were when the experts met in 1929, or had improved, the Young plan might have worked successfully. The crisis of that year, initiated by the crash on the New York Stock Exchange and spreading all over the world, made failure certain. Creditors who had lent large sums to Germany on short time, practically on demand, hastened to withdraw their funds, but found their credits "frozen." The sharp decline in prices made still more difficult the financing of the German export trade. The Hoover moratorium of 1931 was merely the acceptance of the inevitable, a recognition that under conditions as they were insistence on the payment of the war dues could lead only to disaster.

The foregoing sketch of the history of the reparation problem provides a background for the history of the economic development of the period. Before proceeding, however, to a study of the course of different branches of production it will be profitable to examine with some care the effects of such an inflation of the currency as Germany experienced in the five years, 1919 to 1923.

Effects of inflation

When a currency depreciates, the rise of prices is uneven. Some prices are fixed by contract and do not rise at all. Rentals are commonly determined for a year or more; interest on mortgages or on bonds may run for years, payable in a definite number of units of currency, marks for example, without regard to the purchasing power of the unit. Other prices are slow to change. Retail prices are of this sort, greatly affected by custom; wages also, adjusted to a conventional standard and modified by a bargaining process or by governmental action long-drawn out, always lag in response to a change in the money unit. Even the "price of money," the rate of interest charged on loans, does not keep pace with inflation when the depreciation is at all rapid; it also is affected by custom, and fails to take into account the shrinkage in the value of the capital when the loan is repaid in depreciated currency. Consider now the effect on different classes when the money unit shrinks to half its former value in a year, a condition fairly representative of the depreciation in post-war Germany before the catastrophic decline late in 1922. Wage earners, the largest class in the community, found that their money wages, even if they were increased and considerably increased in terms of marks, brought them in less of the necessaries and comforts of life than they had had before; their real wages had fallen. Salaried employees and recipients of pensions found themselves in a similar or in a worse position. Members of the middle class whose income consisted in the rentals of real estate or in interest on bonds or mortgages were in a hopeless position; they suffered more than during the war itself; many were submerged or reduced to dependence on charity. It is characteristic that when the government intervened in behalf of this class, by a Valorization Act passed in 1925, it offered to an original investor in government bonds a small allowance only when his total income was less than $200.

Gainers by inflation

While most people lost, and some were irretrievably ruined by the inflation, some gained. Debtors saw the amount of the debt and the sums due in interest shrink before their eyes. Speculators who "sold the mark short" made huge sums at the expense of the purchasers. Employers of labor, particularly those in business on

a large scale and getting the benefit of the rise of wholesale prices, which were first to respond to inflation, produced at lower cost (wages, rent, interest) and made great profits. The small class which gained most was that of the speculative investors. Although interest rates rose constantly, and at one time reached 20% a day, 7,300% a year, they never kept pace with the depreciation of the mark. The borrower would find that he could pay the high interest and repay the principal in depreciated marks, and still have a handsome surplus; the banks were paying him for the use of the capital which they provided. This was the period in which bold spirits, keen in the use of credit, built up business combinations of fantastic dimensions.

Losses from inflation

From the bookkeeper's viewpoint losses and gains resulting from the inflation should balance. Actually the losses, both economic and social, vastly exceeded the gains. Anyone with money got rid of it with feverish haste, lest it depreciate on his hands. Some of it was spent lavishly; travelers were struck by the extravagant life of the large cities. More of it was invested unwisely, in the construction of plant and equipment which afterwards had to be scrapped or remodeled. Germany would have suffered in any event from the dearth of liquid capital which made it dependent on advances from foreigners in the succeeding period, but its dependence would not have been so great if it had been able to conserve its own capital more wisely in the period of inflation. More serious than any money losses and scarcely to be measured in money was the demoralization attending conditions in which service and reward stood in no relation to each other, and accepted standards of social and economic justice were flagrantly transgressed.

Agriculture

German agriculture, during the war, felt the strain to which all parts of the economic organization were subjected. The allied blockade cut off former sources of food supply, and forced German farmers to press to the limit their own resources. Products were sold at prices fixed by the government, and the producers, to make both ends meet, were forced to spare costs in every way possible, managing their enterprises in a hand-to-mouth fashion, without

regard to maintenance of the fertility of the soil. The government took horses for military service, and killed cattle as competitors with human beings for food. German agriculture lived on its capital and emerged from the war badly crippled. Its course is pictured in the accompanying table.

Year	Production (Million Tons)			Consumption (Thousand Tons)		
	Cereals	Potatoes	Sugar Beets	Nitrates	Phosphates	Potash
1913	13	40	14	200	630	550
1919	9	21	6	110	137	670

Agriculture during inflation

The period of inflation offered to owners of mortgaged farms the opportunity to rid themselves of their debts by payment in depreciated currency, and to farmers paying a fixed rental the advantage of the rising prices for their products. Peasants with surplus funds in hand hastened to spend them. Travelers were struck by the apparent prosperity of the country people. A Frenchman noted one village in which six pianos had been purchased; one family, it was said, bought two pianos at a time. Peasant families were seen in the towns decked in jewelry and drinking wine. The urge to get rid of money before it depreciated led also to many permanent improvements, and to the purchase of a great amount of farm equipment. For this last purpose it is estimated that half of the available funds were spent, but often unwisely. A peasant would buy a threshing machine which he could use for only a week in the year, a tractor which would be in operation for less than a month of working time.

Stabilization

The stabilization of the currency (1923–24) put an abrupt end to these conditions. The products of other countries, cheaper and often better graded and more attractive to the purchaser, flooded the market. A short harvest (1924) was sold for what it would bring; credit was tight, and the German farmer, like others of his kind, lacked business sense. The farmer got for his products prices which continued low in relation to his costs, in wages and supplies; this was the phenomenon of "the scissors," the spread between agricultural and other prices, to be discussed later as it

showed itself in Russia. He was favored only in the purchase of nitrates and agricultural machinery, of which the production was so efficient that prices remained low. In four years of stable currency German agriculture incurred debts approaching $2 milliard; the amount of debt was mounting toward the pre-war total (11.5 milliard marks, to be compared with 18 on the same area before the war). East Germany was particularly hard hit. Rye, the major crop of that region, had fallen in the estimation of the German consumer, and was meeting sharp competition from Poland. Many farms in the east were mortgaged up to the full value of the land.

Science in agriculture

The Germans met the problems of their post-war agriculture in a characteristic way, by methodical analysis under government control of technical means of improvement. An experiment station established in Saxony studied the application of the Taylor system to agriculture; made time and motion studies of agricultural operations; showed how many more potatoes women could sort if taught a better posture and provided with better implements; calculated the percentage efficiency gained by making fields regular in shape. Following American examples, a considerable approach was made toward a standardization of agricultural machines and their parts. Better methods of grading, packing, and marking were taught. Progress was appreciable but it was bound to be slow in a country where agricultural practice had been fixed by centuries of usage, where different kinds of scythes were used in the north and in the south, where on one side of a river (the Murg in Baden) a people of Allemannic descent turned their hay with a wooden fork, while on the other side, under identical conditions, a Frankish population used a rake. In Germany as in France there was clear evidence that rural life was changing, that the old institutions of land and family were dissolving, but the process was a slow one, operating over decades if not over generations.

The small industry

In industry as in agriculture Germany still retained many representatives of an organization almost medieval in its simplicity. An agent of the American Department of Commerce found (in

1924) in the Saxon Erzgebirge more than 40 little communities, with 50,000 to 60,000 souls, in which the families were devoted to making wooden toys; one little town would make guns, another drums or helmets, another Noah's arks or miniature cottages, and so on. Drawn into the current of the world's affairs by the spread of commerce, such people were helpless in the confusion of the war and the following period. The blockade cut off the supply of Angora goat hair of which dolls' wigs were made. Makers of bisque-head dolls lost their livelihood when, in the distant United States, the tariff on dolls was doubled and a change of fashion brought the unbreakable or the character baby doll into favor. Of such small producers there were still millions in Germany, engaged in handicraft or working for a merchant employer. We must concern ourselves here, however, not with them but with representatives of the new order, who in contrast to them were organized in forms ultra-modern in their extent and in their complexity.

Joint stock enterprise

The conditions of the time led to a great spread of corporate enterprise. The number of corporations proper and of limited liability companies doubled between 1913 and 1926. The fluctuations of the currency and the burden of taxes both contributed, in different ways, to this result. The paper "securities" representing rights in an enterprise developed in a great variety of forms: not only common stock, preferred stock, and bonds of the old kind, but stock of different classes, some with plural votes attached, convertible stock and bonds, various forms of options, warrants, and scrip. Such changes, natural in a period of rampant speculation, facilitated the operations of shrewd financiers who found it possible to obtain the control of enterprises with the expenditure of relatively little of their own capital, and who managed often to conceal a control which was none the less real.

Cartels

Above the separate companies rose various forms of combination. One might have expected that the socialist government which assumed power after the revolution would nationalize industry in accordance with the principles of Karl Marx. Even before the war there had been an approach to nationalization in the coal and potash industries. The new government, however, showed

remarkable timidity or prudence — the judgment on its course will depend on the viewpoint of the observer. It has been likened to the barking dog, very savage when on the chain, who becomes very quiet when he is freed. It let private capitalism work its way with little hindrance. Cartels or pools grew fourfold in number. They had been favored by the war, as the government had found them convenient instruments in the control of industry for military ends. In the succeeding period of inflation they were not so effective. This was a time in which manufacturers sought to protect themselves against the rising prices of their raw materials, while they still enjoyed the higher prices for their products.

Combines

Obviously the most certain way to accomplish this end was to control the sources of supply, and the years 1919–24 were marked by the rapid development of vertical combinations, covering the course of manufacture from raw material to finished goods. The inflation which required correction in this way supplied ready means for the merger of enterprises under unified control. Prices of stocks had not kept pace with the rise of other prices; a German author describes them as *spottbillig*, " dirt cheap." A man who formerly could get 10 suits of clothes made by the sale of 1 share of A.E.G. (German General Electric) would find that 1 suit cost 3 shares. Furthermore, as noted above, bank loans could be got for less than nothing by those who were adept in credit transactions. The merger movement developed with extraordinary speed. Of a sudden it would appear that a firm formerly insignificant had acquired control of a great group of enterprises. Some magnates were intoxicated by success. Hugo Stinnes, already a great capitalist, brought under his control " coal mines, iron and steel works, metal and machinery, electro-technical and automobile factories, shipbuilding plants and shipping lines, paper, printing and publishing plants, lumber and textile mills, sugar factories, petroleum companies, electric power utilities, farms, banks, hotels and insurance companies."

The stabilization of the currency, 1923–24, put an end to the conditions under which consolidations and mergers had sprung up like mushrooms overnight. Some of the monstrous combinations, like that of Stinnes just described, broke in pieces when prices ceased to rise, and when debts must be paid in good money. The

movement to combination did not cease. Cartels came back into favor, and some combines, like the steel trust, grew to unprecedented size. The guiding principle, however, of these years of Germany's recovery after 1924 was no longer speculation but was efficiency in production. After the delirium of inflation the Germans set themselves with painstaking care to study the possibilities of their situation, and to endeavor by scientific method to win back the ground that they had lost. This was the period of the " rationalization " of industry.

Rationalization

Rationalization involved all that which in America was included in the term scientific management: avoidance of waste, whether of human effort, of raw material, or of power; standardization; ordered planning. It meant something more, however, than was commonly included in the American use of the term. It was made to apply not merely to a single factory but to a whole industry and even to the whole society; it spread out to include not merely the making of goods but also their transportation and marketing; it was science applied to economic life in general. The Germans had begun before the war to adopt advanced American methods in manufacture. Their conditions were different and they were sometimes disappointed by the results which they obtained. Labor was cheaper; capital was dearer, especially after the war. They read and talked more about Henry Ford and his system than did any other people, but they found that the method of chain assembly which he had brought into prominence (*Fliessarbeit*, "flowing labor," as they termed it) had its limitations, and offered no sure guarantee of profit. If some brilliant successes were offset by failures, they tried, at least, everywhere to apply the new principles of a rational economy. They accepted them, as a French author has said, with the enthusiasm with which they had accepted Luther's preachings in the sixteenth century; it was the Reformation in the field of economics. The government mobilized public resources to foster the movement; institutes and councils were founded to guide and further it.

Industry during inflation

In industry as in agriculture, inflation had led to the investment of money as rapidly as possible in some fixed form in which it would not depreciate. Enormous sums were spent on the exten-

sion of plants. Much of this investment was wasted. Equipment was uselessly duplicated. Before the war the Germans had 25,000 locomotives and 650,000 cars to provide transportation. After inflation they had 31,000 and 750,000 for their reduced needs, although in the interval, by the terms of the armistice, they had had to surrender 5,000 and 150,000. Inflation had protected the home market from competition, and had reduced wages to a bare minimum, so that the mechanization of industry by labor-saving devices was retarded and investment was made in forms technically antiquated. The idea, often expressed, that Germany benefited greatly by the investments in fixed plant in the inflation period, is mistaken. When the currency was stabilized and manufacturers must produce under conditions like those prevailing in other countries, it was found that much of the new plant must be scrapped, much of it must lie useless, and much of it must be remodeled. Mistakes of the inflation period had later to be repaired under much more difficult conditions of credit and of competition.

Productivity

If Germany did not succeed in the period of stabilization, from 1924 on, in setting industry on its feet so that it could carry its own burden plus the added charge of reparations, the fault lay rather in the disturbed conditions of the outside world than in any lack of energy and intelligence at home. The critical test of success was the development of an active export trade, and, as will appear, that was not attained. The leaders of German industry contributed at least all that could fairly be expected of them to prepare the country for it. Productivity had sunk to a low point in the later years of the war, when in spite of long hours and the urgency of the military situation mere lack of nourishment caused a decline of 30 or 40% in the output of a worker. The introduction of the 8-hour day, one of the first measures passed by the revolutionary government, and the persistence of subnormal living conditions kept the output low during the period of inflation. The reorganization of industry and the maintenance of better standards of life and work raised productivity, in spite of the shorter working day, to or above the pre-war level.

Coal

The daily product of coal per worker in the Ruhr, measured roughly in tons, in 1913 was 0.9. During inflation it sank to 0.6

and below. In 1924 it approached the pre-war level; in 1926 it passed 1.1. Stinnes had asserted that the geological peculiarities of German coal veins forbade the introduction of coal-cutting machinery. By 1927 more than half of the coal in the Ruhr was mined in that way, and the proportion was increasing. The existence of the great industrial combinations made possible something that cannot be accomplished in the United States or in England, the concentration of production in the best mines; and these were elaborately equipped with all sorts of mechanical devices. Rationalization did not stop at the mine. An English commission reported in 1925 that the Germans were getting 10% more effective heat from their coal than they got before the war. The coal combination sent its experts to the industrial plants to teach economy in the use of fuel, convinced that its own interests would thereby benefit in the long run. The period saw an extraordinary development in the use of lignite, " brown coal " as the Germans call it, of which the United States possesses enormous quantities left unused. Most of the lignite beds are near the surface and were exploited by open workings, completely mechanized; " from the time the first hole is dug until the lignite is ready for use in furnaces or briquet factories, no hand touches it." Near the lignite beds were established chemical works and great central power stations, which got their fuel at the equivalent of about $1.50 a ton of real coal, delivered at the furnace. One of these central power plants, consuming 10,000 to 15,000 tons of lignite a day, would have a working staff of only a few mechanics; one man at a switchboard controlled the flow of lignite into 80 furnaces, and the ashes were sent back by pneumatic power to the bed from which they came.

Iron and steel

Similar progress marked the course of the iron and steel industry under rationalization. If the daily output of a worker in the iron industry in 1925 be taken as par, 100, it had risen in 1926 to 120 and in 1927 to 140. In this industry a huge combination, the United Steel Works, came to control about half of the trade, with an output of raw steel almost equal to that of all Great Britain. It was equipped to supply some 30,000 distinct products, and aimed by carefully studied specialization to produce these with the greatest economy. The less efficient mines and plants were closed down, and the production of various classes (structural steel, rails,

plates, tubes, wire, special alloys, and so forth) was distributed among the different plants so as most to economize costs in production and marketing, to enhance quality, and to facilitate effective administration. The industry was judged to be better equipped for efficient production than that of any other European country, and to be not far behind that of the United States. The Krupp works, outside the combination, faced a difficult problem at the close of the war. They had specialized in military supplies, and at one time during the war employed 167,000 workers. The demilitarization of Germany by the Treaty of Versailles deprived them of most of their market. They had to seek new outlets in the manufacture of agricultural implements and machinery, cash registers, locomotives, motor trucks, and so forth. Their working force declined from over 40,000 in 1920 to less than 20,000 in the early part of 1926. Vigorous and extensive measures of rationalization, in which losing ventures were dropped and great economies were achieved, restored their activity and enabled them in 1929 to employ 90,000 workers, more than their pre-war force.

Chemicals

The German chemical industry suffered in the war a serious setback in its position. Other countries which previously had relied upon Germany for the supply of many products learned how to produce for themselves when the German supply was cut off; the patents which had protected German processes were abrogated in the countries at war, and were taken over by their nationals. The Germans applied themselves in characteristic fashion to win back the ground which had been lost. An immense combination was formed, the Community of Interests of the Dye Industry (*Interessen Gemeinschaft Farbenindustrie*), which included the six leading chemical companies and was the most highly capitalized industrial corporation in the country. This concern spread out, by stock ownership and by the formation of working agreements, so as to extend greatly its influence both at home and abroad. In the United States it was represented by the I.G. Chemical Corporation, in which it shared control with the Standard Oil Company of New Jersey and the Ford Motor Company. The superiority of the processes which it controlled for the manufacture of synthetic nitrates, for the hydrogenation of coal to obtain gasoline or lubricating oil, and for the making of other products, gave it a standing

in every country of importance. In Germany the chemical combine applied a policy of rationalization similar to that pursued by United Steel Works. It closed down obsolete plants, standardized products so as to avoid the waste incident to duplication and excessive variety, and distributed its output among units highly specialized and equipped with the most efficient apparatus. An elaborate organization, marked by a territorial division into four distinct areas, was devised to provide for the management of an industry which offered such difficult questions of technique as well as of marketing and finance. The combine could not win back the position which Germany had formerly held in the supply of dyes. The German share of the world's production of aniline dyes, which in 1913 had been 80%, fell to less than half. Loss in that part of the field was made up by progress in other directions. The production of synthetic nitrates, for use mainly as fertilizers, came to be the most important branch of the industry, with a value greater than that of dyes, drugs, and other coal tar products combined. The production of artificial silk and synthetic alcohols developed rapidly. The manufacture of gasoline and oil directly from coal or lignite was a problem persistently attacked, and promising, to judge from previous experience, to be solved in time by German scientific method.

The few industries reviewed above must suffice to illustrate the way in which Germany adapted itself to post-war conditions. The pre-war product had been reached and passed by 1927; the share which industry contributed to the total national income had mounted from 40 to 50%, and was still increasing. It is time now to measure the result of the development, as tested by the country's foreign trade and by the standard of life of the working classes.

Conditions of commerce

Germany was in the position of England, a country which could not produce at home the food necessary for the subsistence of the people, and must import supplies from abroad. Like England it paid for its imported food by manufacturing for other countries. Like England, again, it lacked most of the basic materials of manufacture and had to import them. In 1913 81% of German imports consisted of food and of materials raw or partly manufactured; 66% of the exports consisted of finished manufactures. The export trade in manufactured goods was for Germany as for England a

vital matter; the country had taken on the nature of a factory working on foreign orders.

Before the war Germany, like England, though in smaller measure, was a creditor country, able every year to import a surplus of goods paid for by interest and dividends due from foreigners, and reinvesting abroad every year considerable sums in forms which helped to extend German commerce and industry. It lost practically all of these foreign investments as a result of the war, it lost the considerable credits formerly provided by its shipping, and, on the other side of the account, it had now to remit the large sums due as reparations. Germany must now manage in some way to build up its credit items if it was to meet the situation as the Allies had planned. It could accomplish something by restoring its merchant marine to carry freights and passengers for foreigners, but the earnings of shipping would not nearly suffice to balance the account. In the long run the country could meet the charges against it only by building up an export trade in manufactures so large that it would pay for the necessary imports of food and raw materials, and would supply in addition a surplus of profits sufficient to cover reparations.

Export trade

Through the period of inflation Germany made no approach to an orderly solution of the problem. With the depreciation of the currency there were spurts of activity in the export trade, embarrassing to countries in which cheap products were dumped, but on the whole the country in this period was living on capital of its own people (including the wage earners) and of other peoples. By 1923 the exports had fallen below 20% of the level of 1913.

	1925	*1926*	*1927*	*1928*	*1929*
Exports	9.4	10.6	11.0	12.4	13.5
Imports	11.7	9.7	13.8	13.7	13.4
Balance . . .	− 2.3	+ 0.8	− 2.8	− 1.2	+ .04

The period of settlement under the Dawes plan witnessed a recovery in efficiency both in production and in commerce. During the five years 1925 to 1929 there was a year-to-year increase of exports, averaged over the period, of 1,000 million marks (say $250 million). It was characteristic of the German situation, however, that the country accomplished this result only by an increase of imports which went far to wipe out the gain. The

significant figures are given in the preceding table, in rounded milliards (thousand millions) of marks.

Obstacles to exports

The gains in exports were mainly in the class of finished manufactures, which rose from about two-thirds, the pre-war proportion, to nearly three-fourths of the total. Comparing the exports of 1925 and 1929, coal and coke increased slightly, chemical products increased by a third, iron and steel by half, electrical machinery and equipment by three-fourths, and other machinery nearly doubled. The obstacles to further extension of the German export trade were those which have already been reviewed in considering the post-war condition of England. Other countries had learned during the war to produce for themselves goods which had formerly been imported, and sheltered their growing industries behind protective tariffs; the world as a whole, and particularly Europe, had been impoverished by the war and could not afford to purchase the wares which Germany was prepared to produce. Furthermore, a matter of sentimental rather than of practical importance, Germany had lost by the peace of Versailles all its former colonies, and enjoyed no favors anywhere. These were the external obstacles to expansion. At home Germany suffered from a dearth of capital which made it expensive or impossible to stimulate sales in foreign countries by extending short-time credits or making long-time loans to them. Wages, which had been desperately low during the period of inflation, had reached or passed the pre-war standard, and taxes (including the contributions to various forms of social insurance) constituted a burden which every producer had to take into account when he figured the prices at which he could afford to sell his goods.

Strain on credit

The result of all the factors is pictured in the table of exports and imports printed above. Even in its period of recovery under the Dawes plan, Germany, so far from paying reparations out of a surplus of exports, was running deeper into debt. The year 1925 was one of restocking and reconstruction, in which money was borrowed both at short and long term to cover the surplus of imports, and set the industrial organization in order. The strain on credit was greatly relieved in 1926 by the reduction of imports and

the increase in exports. This was a year of consolidation, in which a large amount of money at long term was borrowed by the sale of bonds, and a considerable part of the floating commercial debt, a liability always dangerous because its payment could be demanded at any time, was paid off. The next two years, 1927–28, witnessed a reversal of the balance. Exports showed an increase, but the growth of imports was still larger. Business was expanding and demanded funds for its development; some of the German municipalities were spending somewhat lavishly in improving their public services. The steady gain of exports brought the foreign trade in merchandise into balance again in 1929, and reduced the funds borrowed to an amount actually less than payments remitted for reparations. This was the year in which the Young committee was convoked to amend the reparation terms. Even to those who had been persistently blind to the practical aspects of the reparation problem it had at last become evident that even the Dawes plan demanded too much of Germany in terms of money, gave that country too little power and responsibility in raising and remitting the funds. The nature and results of the Young plan have been briefly described above. The credit and currency crisis which culminated in 1931 made any plan of the kind inoperable.

Position of labor

The revolutionary government, which succeeded to power in 1918 after the fall of the Hohenzollerns, was devoted to the interests of the working classes. It passed a flood of popular measures, including various forms of social insurance and relief, and the compulsory eight-hour day. It was lavish in offering employment to the demobilized soldiers in the railroads and in other branches of the public administration. At a time when every incentive to efficiency was needed, piece wages were generally replaced by a time wage. Under the pressure of popular demand the pay of common labor was raised nearly to the level of that of the skilled. Not only as regarded different classes of labor but also as regarded different industries the new theory demanded the abandonment of the principle of payment according to results, and the acceptance of the principle of payment according to need. It was one of the paradoxes of the German situation that under this socialistic government, so generous in its intentions, the working classes

declined more rapidly than in any preceding period of history, were rescued from destitution, and were brought back to their former standard by a government rather capitalistic in inclination, devoted above all to business interests. It would be unjust, of course, to refuse to recognize the peculiar difficulties of the situation, and to rate the relative merits of socialism and capitalism by the particular experiences of the period. The first post-war government, whatever its complexion, was sure to fail in the task of rehabilitation. The failure would not have been so complete and the consequences to the mass of the people would not have been so disastrous if the leaders of the early period had recognized more clearly that the burden of unproductive expenditure always bears heaviest on the class least able to support it, and that of all methods of raising funds the issue of paper money is the most cruelly unjust.

Labor during inflation

During the period of inflation the government endeavored to keep track of the rise of prices, and to require adjustment of wages to the added costs of living every month, later every week. Representing the cost of living in 1913 by 100 as par, it had risen, measured in paper marks, at the beginning of 1920 to 573, in January, 1921, to 944, in January, 1922, to 3,779. The years 1922 and 1923 were those in which depreciation proceeded most rapidly, and in which wage earners suffered most; an example was given on an earlier page of the fabulous height to which the cost of living soared, when a laborer might be receiving millions of marks a day and still be starving. By the latter part of 1923 real wages, measured not in marks but in the commodities which marks would buy, had sunk in many cases to a half, a third, or even a quarter of the pre-war standard, which was by no means high. A German author expressed the situation by saying that wages had been depressed to the standard of a horse's ration. The Chancellor, when the Allies demanded payment late in 1922, said, "Bread first, reparations afterward." It is most extraordinary that in these years from 1919 on the death rate tended to fall rather than to rise, and was in general much below the death rate before the war. One evil of the situation was the irregular adjustment of wages to prices, in different places and in different trades, which reduced some classes below the minimum of subsistence. That this con-

dition did not lead to a higher death rate, whether from actual starvation or from weakened power of resistance to disease, must be taken as evidence both of individual vitality and of efficiency in maintaining sanitary conditions and in administering social relief.

Wages

Average wages were estimated, early in the period of stabilization (January, 1924), to be for a skilled worker about two-thirds of the pre-war standard, for the unskilled about four-fifths. From that point they rose gradually, in the period of recovery during the operation of the Dawes plan, until they reached or even exceeded the pre-war level. Such variable factors as taxes and social benefits make exact comparison with other times and places impossible, but a competent judge (Angell) thought that in 1928 the German working classes had a slightly higher standard of living than they had had in 1913, that their position was inferior to that of the workers in England and in some of the smaller countries, was as good as or better than that of the workers in France, Belgium, and Italy, and much better than that prevailing in eastern Europe. He estimated their real wages to be about half as high as those of workers in the United States. The German working class suffered all through this period from a scarcity of housing; rents kept low by law were but a partial compensation. Improvement in their condition in other respects was attested by a rise over the pre-war standard of the per capita consumption of meat, imported fruits, sugar, and tobacco.

Labor organization

The rise in wages was due in considerable measure to the energetic action of the German trade unions. Late in developing as compared with the English unions, they had grown rapidly in numbers during the period of industrialization before the war, and had developed a highly efficient organization. The post-war period was marked by many strikes and lock-outs, incident generally to contests over wages. When the issue could not be settled by a compromise of the interested parties it must be referred to arbitrators acting with the authority of the government and inclined, by reason of the political strength of the socialist party, to favor the side of the workers. In the years after 1928 the question rose, more and more insistently demanding answer, whether wages had not been pushed up too high, whether in the long run the German

workers could earn the wages which they were receiving. In Germany as in England the extent of unemployment forced attention to this issue.

Unemployment

The number of unemployed varied greatly in the troubled period after the war. It approached a million early in 1919, sank almost to zero, and rose again to several million as a result of the occupation of the Ruhr. Similar fluctuations marked the succeeding period. Germany did not have a persistent and menacing horde of unemployed until the economic crisis which spread over the world after the autumn of 1929. In 1930 the number of unemployed reached about 5 million; in January, 1932, it exceeded 6 million, and surpassed the aggregate of the unemployed in most of the other European states taken together.

The problem of unemployment was so similar in Germany and in England that it need not again be analyzed in detail. The Germans could raise food from their own land to support themselves for only 9 months in the year, and must buy the remainder abroad. If they could not manufacture at costs so low as to win a foreign market they must either emigrate or starve. In spite of a decline in the birth rate from over 40 in the 1870's to less than 20 in the 1920's (less than 10 in Berlin), the country faced an increase in the working population of some 400,000 a year, for whom work (and wages!) must be provided. It is characteristic of the difficulty of the German situation in the period at which this account closes that economists looked forward to the years 1933–36 with slightly less concern because in those years babies born during the war would reach the working age, 18, and the addition to the working population would drop by some 100,000 a year.

QUESTIONS

What events, in external and domestic affairs, marked the years 1918, 1919, 1923, 1924, 1929–30, 1931?

Summarize the losses of Germany in the war.

What amount was Germany bound to pay in reparations; why?

What amount was paid to 1922? In what forms were payments made?

How did Germany get funds in foreign currency to make payment?

What were the reasons for the inflation of the currency? Why was the process, once started, hard to stop?

Where and what was the Ruhr? What conditions led to its occupation? What results followed?

What were the main features of the Dawes plan, with respect to its introduction, amount of annuities, protection of German interests?

What were the results of the Dawes plan?

What were the major considerations calling for a revision of the Dawes plan?

Why did foreign capital flow into Germany in this period; to what purposes was it applied?

What were important respects in which the Young plan differed from the Dawes plan?

What conditions led to the Hoover moratorium of 1931?

Distinguish the response to inflation of different classes of prices.

Distinguish the effects on different classes of people.

What classes gained by inflation, and how?

Why did not gains balance losses?

What was the course of German agriculture during the war?

What were the effects of inflation on spending and investment?

What conditions followed stabilization of the currency?

Illustrate the application of scientific method, and the conditions it encountered.

Illustrate the persistence and conditions of small-scale manufacture.

Illustrate the development of the industrial organization with respect to stock companies; cartels.

Explain the rise of large combinations during inflation; illustrate.

What change marked the combination movement after stabilization?

Explain the term "rationalization" as understood in Germany. Why did not American methods give the same results as in the United States?

What was the character of industrial investment during inflation?

Explain the gain in productivity after stabilization.

Illustrate with respect to coal; lignite; iron and steel; chemicals.

Compare Germany and England with respect to the nature and importance of their foreign trade.

What peculiar difficulties did Germany face in its foreign trade after the war?

What was the course of the export trade during inflation; after stabilization?

What industries contributed to expansion; what obstacles did it face?

Show the relation between German borrowings and the balance of trade, 1925–29.

In what respects did the government endeavor to improve the condition of labor after 1918? Explain its failure.

Illustrate changes in the cost of living during inflation; the effect on real wages. How can the low death rate be explained?

What was the course of real wages after stabilization? How did the wage level compare with that of other countries?

What influence was exerted by trade unions?

What was the course of unemployment after the war? its extent in 1932?

Illustrate the difficulty of the German situation at that time.

READING

By far the best book for collateral reading on the subjects covered in this chapter is *The Recovery of Germany*, by James W. Angell, New Haven, 1929; references below have in general been restricted to that book. Books which may be used to

supplement it are Walter Meakin, *The New Industrial Revolution*, London, 1928, and Sir Philip Dawson, *Germany's Industrial Revival*, London, 1926. The reparations problem, which lies outside the scope of the present volume, is well presented in *Germany's Capacity to Pay*, by H. G. Moulton and C. E. McGuire, N. Y., 1923, and in other publications of the Institute of Economics. Periodical literature is full of articles on subjects in all parts of the field.

War losses. (Angell, pp. 7–16.)
Inflation, social results. (Angell, pp. 18–39.)
Inflation, economic results. (Angell, pp. 40–60.)
The Dawes plan. (Angell, pp. 61–81.)
Reorganization: coal, coke, lignite, power. (Angell, pp. 82–103, 130–138.)
Iron and steel. (Angell, pp. 103–130.)
Machinery and the electrical industry. (Angell, pp. 140–157.)
The textiles and chemical industry. (Angell, pp. 157–178.)
Industrial survey; rationalization. (Angell, pp. 179–189.)
Capital and the money market. (Angell, pp. 190–215.)
Cartels, combines, business finance. (Angell, pp. 224–243.)
Foreign trade and the balance of payments. (Angell, pp. 285–305.)
The Young plan and its prospects. (Angell, pp. 333–361.)
Conditions of labor. (Angell, pp. 254–271.)
Labor organization and politics. (Angell, pp. 271–284.)

CHAPTER XIV

RUSSIA BEFORE AND AFTER EMANCIPATION

Physical

One of the czars is reported to have said that beside the five continents there was a sixth part of the world, peculiar to itself, Russia. Even as regards area the remark is almost literally true; the Russian state covers a surface greater than that presented by the moon at the full. In character, moreover, it is individual; it combines the features of Europe and of Asia so as to deserve the descriptive adjective Eurasian. The Ural Mountains, rounded ridges, forest-clad and reaching to no great height, make no sharp boundary. European Russia is less European than Asiatic in physical characteristics. In contrast to the piecemeal structure, the indented coast line and the maritime climate of the West, Russia in Europe is a vast continental block, almost flat, with the sharp extremes in heat and cold of a continental climate.

Northern Russia is a land of forests, where snow lies a large part of the year, and where even such hardy cereals as rye and barley are grown with difficulty. Southern Russia is a treeless plain, with a rainfall scanty and irregular, shading off into steppe and desert. "From the economist's viewpoint Russia is a natural tragedy." The judgment is justified mainly by reference to the climate. Even in the agricultural regions between the extremes of north and south, in the regions where the great majority of the people live, the cultivator has a growing period of only three to five months, suffers temperature differences of over 100° Fahrenheit, faces always the dangers of drought, of night frosts, or of hot winds and dust storms.

The population of Russia, very sparse in the north and in the south, is crowded into this intermediate region, where the cultivators are settled in a density comparable to that of western Europe. Between the forests and the steppes lies the band of the "Black Earth," stretching from southwest to northeast (roughly, Kiew to Kazan). The soil here is a blackish humus, for a foot and a half to

four or five feet in depth, readily absorbing water and the sun's heat, rich in phosphate, potash, and especially rich in organic matter. The result of the decomposition for uncounted centuries of the prairie grasses, the soil resembles in fertility that found in some parts of the United States, and needs only adequate rainfall and good cultivation to return a bountiful harvest.

Peoples

The north and the south of Russia are linked together by great rivers, and supplement each other's needs; the north requires the food supply of the south and the south requires the lumber of the north. Thus destined by nature to economic unity, the lack of internal partitions has made also inevitable the growth here of a single great political unit. Yet the problem of organizing an effective government is almost infinitely difficult, not only because of the great area involved but also because of the variety of peoples contained within it. The census of 1897 distinguished in the whole empire some two score nationalities, without any pretense to making the classification complete; it would be easy to make a list of half as many in European Russia alone. Open on the east to Asia, in the pathway of migrations to the west, Russia was bound to harbor representatives of many varied peoples, both European and Asiatic. Even the Slavs themselves, speaking a language distantly related to the Teutonic and distinctly members of the European family, were split into parts, which are recognized in modern geography by the distinction of Great Russia (Moscow), Little Russia (Kiew), White Russia (Minsk, Dvinsk, Pinsk, etc.).

History

Russia celebrated in 1862 the thousandth anniversary of its establishment. Without taking too seriously the exact date, we may believe the story that about 900 A.D. a band of the Scandinavian adventurers who were making history all over Europe in that period started in what is now western Russia (Nowgorod, Kiew) the crystallization of Slavic tribes in some approach to political organization. In the later history of these Slavs there are a few elements of outstanding importance to one who would understand contemporary Russia.

The first appears in the conversion of the Slavs to Christianity about 1000. According to an old chronicle the heathen ruler was

approached by representatives of Mohammedans, Jews, the Catholic Christians of the Roman West, and the "orthodox" Christians of the East, who had built up a separate creed and church at Byzantium (Constantinople). The Slavs had traded with Byzantium, down the Dnieper through the Black Sea, and chose to accept their religion from that source. Even now the Russians use in writing and printing the characters of the Greek, not the Roman alphabet. That difference is a superficial sign of a far-reaching contrast; the Russian Slavs from then on had their backs turned to western Europe, and had no share in the development of Catholic civilization.

Mongol rule

A second element of importance appears in the conquest (1240) of the Russian Slavs by a Mongol successor of the "Heavenly Emperor" Genghis Khan. For centuries the Slavs were more or less subject to the Khans of the Golden Horde, who established the seat of their power on the lower Volga. While before they had faced southeast to Christian Byzantium, they must now face directly east to an Asiatic, non-Christian people. In a negative way they were again given a twist which kept them from touch with Western civilization. There were further some positive changes which resulted from the situation. Under the rule of the alien they clung with the greater tenacity to that which distinguished them from him, their orthodox faith and their native princes. The Greek cross became the symbol of Holy Russia; the people were made ready for that absolute subjection to church and ruler which marked the later period. Genghis Khan prepared the way for Ivan the Terrible, that czar of a later century who with ruthless ferocity quelled all opposition and built up the autocratic state. The Russians showed in their succeeding history more persistence, more continuity of thought and action and less mobility than other Slavic peoples; the discipline which they suffered under Asiatic rulers contributed to this result.

The country which we now call Russia was known to the English of the Elizabethan period as Muscovy. Moscow was the center in which the forces of opposition to the Asiatic rulers developed; the princes of Moscow, acting first as tax collectors and agents for the foreigner, won their independence and rapidly extended their power. Great Russia, centering about Moscow, was built up by a

process of colonization; a whole people spread out to occupy the vacant territory and lay the foundations of modern Russia.

Peter the Great

Before 1700 Russia might still be regarded as an Asiatic country. When an ambassador from Muscovy was received in France in 1668, a medal was struck to commemorate the event, as was done when an ambassador came from Siam. A single man changed the whole situation. Peter the Great, with the energy of a hero, the ability of a genius, and the rudeness of a barbarian, forced Russia abruptly to turn about face, to look West instead of East. By the founding of St. Petersburg (1703) he opened his "window on Europe." On his travels he acquired with an insatiable curiosity what other peoples could teach him of the trades of war and peace; he imposed Western institutions, wholesale, on his backward Slavic people. All that a single man could do to make Russia modern and European he did. But no man can hurry a great people in a few years over a gap of centuries, and down to the present day Russia has still been trying to catch up, to assimilate the foreign institutions of the West, and to combine them in a consistent whole with native institutions of a very different order of development. The process has lasted over two centuries and still is unfinished.

Rise of serfdom

At the very time when Peter was trying to make Russia modern the country was actually crystallizing in a medieval structure marked by the serfdom of the great mass of the people. In an early period there were many outright slaves, but the common people were still personally free. The cultivators of the soil, however, were distinctly inferior to the men of war; they were called "little," "half," "black (dirty)" men. Their position in periods of anarchy and war was precarious; they had to seek protection where they could, and to pay for it by surrendering some of their rights. The princes needed taxes and the help of warriors, and got them by granting the military class rights over land and persons. The princes of Muscovy, in the great period of colonization, found their position menaced by the rich nobles, who used their power to attract cultivators from the land of others, even to kidnap them by regularly organized forays with armed bands. The government, to assure itself taxes and the military assistance of the common nobles, interfered to protect them from being drained of their help.

A series of enactments tied the cultivators to the land on which they were settled, made them "ascript" to the soil, to use the medieval phrase. The process of ascription was gradual and uneven, but about 1600 it had gone so far that the common people had lost the most evident mark of freedom, the right to move about as they pleased. Slaves and free were being merged in one common class, serfs of the soil. For a time the cultivator might retain his civil rights to make contracts and to appear as accuser or defendant in the public courts. The force of the situation was against him. Tied to the land, paying taxes through his lord, often hopelessly in debt to him, abandoned by the government which sought only the favor of the lord, the common man was helpless. Peter the Great completed the process. To obtain revenue he imposed a poll tax on all the common people alike, whether in form they were slave, serf, or free; he merged them in a single class inscribed in a census register. The tax was collected not from individuals but from the landlord on private estates or from the village community on land which had not been ceded by the government to individuals. In either case the serf was bound to the soil.

Serfdom about 1800

After the middle of the eighteenth century it is estimated that seven-ninths of the Russian people were in bondage, of whom more than half were serfs of a private lord, and the remainder were serfs of the crown or of some member of the imperial family. Conditions became constantly more severe. Russian serfs before 1800 were distinctly worse off than the serfs of medieval western Europe who had at least the opportunity to flee for refuge to the towns, and whose dues were limited by custom if not by law. The lord imposed such duties and such dues as he pleased, judged without appeal, inflicted any punishment short of death, could exile to Siberia or, what was almost as terrible, could condemn to long service in the army. In law and in fact the serfs became chattels, "cattle." The lord might not sell them at open auction, and might not sell them at the time of the military conscription; with these exceptions he was free to dispose of them as he pleased, selling them not only with the land but also away from it. He had practically the power to breed serfs as he bred cattle. Prince Kropotkin, in his Memoirs, describing conditions as late as about 1850, tells of a land owner who went over the list of serfs on his

estate, picked out five boys over eighteen, five girls over sixteen, and ordered that the five couples be married within ten days. At the church one of the girls refused to be married to the boy assigned her, but was threatened with exile to the steppes for her whole family, and so was forced to consent. Kropotkin tells of a similar instance in his own family. A young serf, in love with a girl on a neighboring estate and hoping to save money to buy her freedom that he might marry her, had arranged with a girl of about the same age in the Kropotkin household that they should act together as godparents of a child; they were afraid that they might be paired, and according to orthodox belief this relation made their marriage impossible. To punish this act Kropotkin's father sent the young serf away for twenty-five years' service under the terrible discipline of the army — yet the father was regarded as a humane man and one of the best of masters!

Conditions of serfs

Part of the serfs were used as domestic servants; some of them were allowed to work as they pleased in return for money dues paid to the lord; most of them on private estates were required to give half or more of their working time to the service of the lord, doing his agricultural work as demanded, and cultivating the bits of land left for their own subsistence as best they could. A ukase (imperial law) of 1801 attempted to limit to three days a week the working time given to the lord, but it was ill observed. The crown serfs, on the other hand, were much better off. They paid taxes and money dues, but were relatively free from the interference with their daily lives which the presence of a private landlord almost always involved.

Obviously the conditions lent themselves to grave abuses. Some classes of masters were notorious for their oppression: retired army officers, with barbarous ideas of discipline, speculators or masters approaching bankruptcy and greedy to wring the most they could from the estate in a short time. Kropotkin narrates facts of which he had personal knowledge in his childhood: serfs sold, lost in gambling or exchanged for hunting dogs, and torn from their families, children sold away, "flogging in the stables," much more serious than the usual flogging inflicted by the police or the fire brigade when the serf arrived with a note from the master requesting that a hundred blows with a birch rod be inflicted. The gov-

ernment interfered only in the most serious cases, when murder or inhuman torture was suspected. After 1800 a few cruel proprietors were punished by exile, one, for example, a woman who had murdered a boy serf with a pen-knife because he had not taken proper care of a pet rabbit.

Evils of serfdom

Shocking as are these and similar examples of the abuses possible under serfdom, they are still superficial phenomena, limited in their effects. Deep down, inherent in the system of forced labor, were evils which were not occasional but general, the effects of which have lasted to our own times. Both masters and serfs were demoralized. The landlords, whether they were "petty," holding up to 100 serfs, "medium" with 100 to 1,000, or "great" holding even 100,000, were getting something for nothing; serfdom was established in the very period in which the landlords were relieved of the public feudal services formerly required of them. Like slaveholders in all ages they were careless and extravagant, always in debt. Some few of them showed ability as organizers, and contributed to Russia's political and economic development; most of them were dead weights on the organization. Still more serious were the effects on the mass of the people. Labor forced by the lord was inevitably reluctant and careless. Inefficiency, learnt in the lord's service, became ingrained in the people. Even when they worked for themselves there was small incentive to efficiency in an organization which discouraged progress. The lord had such power over his serfs that those who acquired wealth had every reason to fear it would be taken from them. Extortion by a sort of blackmail, the threat of punishment or exile, was always an ugly possibility.

A native Russian, knowing his people well, described the typical member of the ordinary village as follows: "He is poor, a drunkard, unreliable, apathetic as regards the community, indifferent to his neighbor, to his family, and careless of his own fate." No one will suppose that this dark picture is a fair description of a whole people. Yet all agree that the Russian peasant, along with some splendid virtues — patience, persistence, obedience to authority, a simple faith — is prone to grave faults illustrated in the extract. To scold him for them is unreasonable; they were bred in him by the system to which for generations he was subject.

Emancipation

The Russian serfs were emancipated by imperial proclamation in 1861, a date curiously near to that at which, across the Atlantic, Lincoln emancipated the negro slaves of the United States. Long before that time thoughtful students of Russian life had become convinced that serfdom must go if the country were to fit itself to take a place among the states of modern Europe. Reference will later be made to the experience of those who attempted to establish manufactures in Russia, and who became convinced that modern industry could develop only on the basis of free labor. Even in agriculture the very partisans of serfdom were forced to recognize that the lord gained more by free contract with hired labor than by the compulsion of his own serfs. After 1800 serfdom was on the defensive; various laws attempted to alleviate conditions in detail, and the question of general emancipation was given serious attention. Unfortunately the question was involved in the activities of secret revolutionary societies, and the czar drew back from the reform because a concession in this matter appeared to menace his own autocratic power. Meanwhile the serfs reacted against the system in the only ways open to them, by passive resistance in general, by open outbreak when conditions became intolerable. Individual landlords and stewards were murdered; insurrections marked by incendiarism and brutality affected whole regions, and were subdued with ferocious severity. These revolts increased in number toward 1850, and were especially serious during the Crimean War, when the government drafted many serfs for military service. This war, unnecessary in its inception and fruitless in its results (John Bright, by a change of the letters, designated it as " a crime "), was still a momentous event in Russian history. It convinced the autocracy that Russia, in spite of its great area and population, fighting on its own territory, was helpless in conflict with modern Western states such as England and France. Both its economic and its political organization were hopelessly inefficient when subjected to strain. It lacked roads and railroads to make use of its resources, its arms and munitions were antiquated, its commissariat broke down, its finances became inextricably confused. It was betrayed by its own agents; peculation was rampant; lint made for the Russian wounded was sold to the enemy! In the complex of institutions which conditioned the Russian life of the time serfdom was only one element, but it was fundamental;

so long as production depended on forced labor reform of the economic and of the fiscal system was impossible. Even the landlords came to realize that the day of serfdom had passed.

Emancipation plan

The plan of emancipation was worked out by a commission appointed by the czar. In some respects it was liberal. The serfs were given, as a matter of course, personal freedom, the right to do what they pleased, the right to move about so long (this should be carefully noted) as they fulfilled their public obligations, particularly in the matter of taxes. Furthermore, in contrast to the policy followed in Poland and the Baltic provinces, where the lords kept their estates, the Russian serfs were to be given not only liberty but also land. Finally, in contrast to the plan followed in part of Germany, the peasants were given full power to settle their own affairs in the village assembly, free from interference by the lord.

To sketch the broad outlines of the plan of emancipation is easy; to describe in detail the way in which it was carried out is, within the limits of space of this book, impossible. So many variables were involved that a concise statement cannot pretend to accuracy. For example, domestic serfs were treated differently from the agricultural serfs; crown serfs got better terms than the serfs of private landlords; serfs in the north, in the central region, and in the south of Russia got different amounts of land; and, to conclude an incomplete statement of the complex situation, a private agricultural serf in a particular part of Russia had several different options offered him. All that can be attempted here is a suggestion of some features of the process which are of interest and of importance.

The government depended on the support of the class of landlords and could not afford to alienate them by emancipating their serfs without compensation. It could not afford to compensate them except as it could collect payment from the serf. What it could and did do was to advance the necessary funds, borrowing by the issue of bonds, and planning a system of repayment in installments by the emancipated serfs which in time would wipe out the debt.

Example of procedure

Suppose, for example, a serf in central Russia whose dues or services were estimated to be worth to the lord 9 rubles a year.

At 6% interest this would be equivalent to a lump sum of 150 rubles. The state would advance four-fifths of this, 120 rubles, leaving the remainder, 30 rubles, to be paid by the serf. The landlord would then be fully compensated if we assume that the bonds in which he was paid could be sold at their face value, and that he could collect the remainder from the serf. Neither assumption was true in fact, but among the parties to the transaction the landlords unquestionably fared best in general; one great flaw of the emancipation procedure was the undue favor shown the landlord class.

The state, borrowing with its superior credit at 5%, could fairly charge the serf 6% on the advance which it had made, and would then have the means not only to meet the interest charge on the bonds which it had issued, but also by applying the extra 1% received from the serf to the repayment of principal could hope to wipe out the debt and relieve the serf of further payment in the course of 49 years.

Finally, the serf, paying to the state 6% of 120 rubles, or 7.2 rubles a year, for a definitely limited period, and paying his share of the lump sum, 30 rubles, in installments to the lord over a shorter period, would actually be paying out from year to year little if any more than he had previously been giving the lord, and yet at the end of the transaction would emerge with full ownership of the land and free from other payments. The result at first glance appears to be too good to be true, and suggests some concealed trick. But the only magic in the transaction is the ability of the state to borrow at better rates than can individuals. The state acted as a banker, using its credit to guarantee the transaction, and relying on its power over the debtor to bring the process to an effective conclusion. A similar plan had been employed successfully in Western Europe, in the enfranchisement of unfree tenants, and much later was employed in Ireland to finance the transfer of land from English owners to the native Irish.

Variety of options

The serf in the example assumed above was supposed to have been eager to acquire as much land as the law allowed, in this particular instance (the amount varied greatly in different regions) about 14 acres. This he could do only by reaching an agreement with the lord, and by assuming the charge of one-fifth of the

capital sum involved in the transfer. If he held back, forcing the lord to take the initiative, he could get half the amount of land free of the one-fifth payment; or he could get a quarter lot free of any charge whatever, even that of the interest on the sum advanced by the state. The reader may not have found it perfectly easy to understand the operation of the emancipation laws as outlined above. If so he will sympathize with the Russian serfs of 1861, of whom most were illiterate, ignorant, and blindly credulous. The rumor spread through the country that the czar sitting on his golden throne in the Crimea gladly gave land to all who asked for it, and such a movement of people to the south began that the military had to intervene to repress it. It was a common belief that faithless officials were preventing the czar from dividing up all the land among the cultivators, and many serfs held back, fearing a trap in the offers made to them, and hoping to get more land by waiting. Kropotkin frequently heard the rumor among the peasants that Napoleon III in the treaty closing the Crimean War had required the czar to free the serfs; later one peasant said, in discouragement, " Nothing will be done unless Garibaldi comes." Disorders and revolts marked the execution of the emancipation plan.

Faults of emancipation

Under these conditions the best of governments would have found it hard to settle the affairs of some twenty million peasants in a way of which all could approve. The government of the time was very far from good. The emancipation of the serfs, a step of vital importance in the progress of Russia toward efficient organization, had in it flaws which troubled government and people for generations to come. The most serious difficulty rose from the fact that the land-hunger of the people was not appeased, that after emancipation as before they were clamoring for more land. The government was really faced by a dilemma. If it gave every family enough land from which to live, made the people into full and independent peasant proprietors, it bereft the lords of their labor supply. The money received by the lords in compensation would have been of little use to them if they could not hire cultivators, forced to look to them for employment because they could not make a living on their own share of land. On the other hand, the grant to the serf of a plot too small to support a family served

only to stimulate the craving for more. Later critics of the emancipation plan have suggested that the government would have avoided some of the difficulties which it had to face later if it had boldly chosen one horn or the other of the dilemma, had given all the land either to the lords or to the peasants, and had then let the two parties work the situation out by free economic contract. Political objections to such a course were insuperable; opposition might have culminated in revolution. The government actually chose a middle course. The plan was designed to leave to serfs and to lords about the proportion of land which each had been enjoying under the old system. The results in some parts of the country accorded with this design.

Results

In many districts, however, partly because of the people's distrust and credulity, the free cultivators actually took a share of land less than that which they had been enjoying under serfdom. Russia is a country of such vast extent and such varied climatic conditions as to make very difficult the interpretation of the statistics of land-holding; an acre in the rich belt of the Black Earth has a very different value from one in the forest region of the north, or on the dry steppes of the south. With that caution the following statistics are presented, giving in Russian measures and in rough equivalents (a dessiatine is equal to about 2.7 English acres) the land lot assigned to the male serf at emancipation in various provinces. On the average the male serf received:

in 3 provinces over 10 dessiatines	27 English acres
in 3 provinces 7–10 dessiatines	19–27 English acres
in 12 provinces 5–7 dessiatines	14–19 English acres
in 15 provinces 4–5 dessiatines	11–14 English acres
in 12 provinces 3–4 dessiatines	8–11 English acres
in 4 provinces under 3 dessiatines	8 English acres

The author from whom these figures are taken estimates a lot below 5 dessiatine (14 acres) as inadequate to the support of a peasant, and taking Russia as a whole (the figures above do not cover the whole country) thinks that at least half the people did not get sufficient land to feed the family and to occupy its labor. Somewhat later (1870) an investigation of selected districts including 9 million peasants showed only one-third with a lot sufficient

to support a family, and still later (1897) a more extensive investigation of the peasant population gave the following results:

45 million, 70%, could not raise food for themselves from their land
13 million, 20%, could raise food for themselves but not for their stock
5 million, 10%, could raise food both for themselves and for their stock

In the division of land at emancipation the former serfs chose unwisely not only as regards the amount of land which they took, but also as regards its character. They were so eager to get the plowland for their grain crops that they neglected other land necessary for a balanced agriculture: meadow, pasture, and forest. A disproportionate share of these latter varieties remained in the hands of the lords, and the lack of them proved later to be a serious disadvantage to the peasants. To the fortunes of this class we shall return in the next chapter. It will be convenient here to trace briefly the course of the landlords after emancipation.

Large estates

The lords were heavily in debt in 1861. In the past they had borrowed money from the state on the security of their serfs, and their estates were mortgaged for a large part of their value. A considerable part of the redemption payments was absorbed by the liquidation of these debts; much of the remainder was squandered in extravagant living, in unwise investments, or in unprofitable improvements. Lords, like serfs, were medieval in their psychology, quite unqualified to keep their place in a more modern society. Their place and privileges had in the past been assured them by custom. When they had to enter into a system of contract, they soon betrayed their inexperience and their poor judgment. In spite of help extended to them by the government, the history of their estates is that of a constant shrinkage in number and extent, until the considerable remnant was at last swallowed up in the revolution attending the World War. Some of them learned by bitter experience. One of them told Mackenzie Wallace: "Formerly we kept no accounts, and drank champagne; now we keep accounts and content ourselves with kvass (beer)." Many of them imported from Germany trained stewards to oversee the operations of the estate and to undertake its business management. Some estates became model farms. Some proprietors rose to the opportunities of their position, were useful teachers of improved agricultural technique, and made important contributions to the

development of an effective provincial administration. The part played by them just before and during the World War was highly creditable. In the course of two generations the weaker members of the class had gradually been weeded out. Their estates had been nibbled away, by sale and lease, and they had left the country for the town, generally to enter the service of the government. If the fortunes of this class are dismissed thus briefly, it is because the future did not belong to them, but to the peasants.

QUESTIONS

In what respects is Russia Asiatic?
In what respects is the climate unfavorable?
Meaning and situation of the Black Earth?
Explain the variety of peoples.
What were the historical results of the conversion to Christianity?
What were the results of the period of Mongol rule?
What is the historical significance of Moscow? of St. Petersburg?
Date and explanation of the establishment of serfdom?
Conditions of serfdom about 1800?
What were the economic dues of different classes of serfs?
Instance abuses to which the system was subject.
What evils were inherent in the system?
Date of emancipation, and reasons for it.
What were the principles of emancipation?
What was the plan? Illustrate its operation.
What options were open to the serf? What was his attitude?
What was the dilemma of the government in the distribution of land?
How much land did the average serf receive?
How does this compare with the average American farm? (In 1920, 148 acres, of which 78 were improved.)
How far were the land holdings of the peasants about 1900 adequate to their support?
How did the landlords fare after the emancipation?

READING

The single book which best presents in interesting form the background of contemporary Russia is Sir Donald Mackenzie Wallace, *Russia* (references are to the revised edition, N. Y., Holt, 1905). Less substantial but likewise interesting and well informed is Francis H. E. Palmer, *Russian Life in Town and Country*, N. Y., Putnam's Sons, 1901. James Mavor, *An Economic History of Russia*, 2 volumes, London, Dent, 1914, is by far the most complete and scholarly treatment of the subject in English, and provides an abundance of supplementary reading on the subjects of this and the following chapters, but will be found severe and technical by the ordinary reader. An historical account of the agrarian development, with abundant concrete detail, is presented by Geroid T. Robinson, *Rural Russia under*

the old Régime, N. Y., Longmans, 1932; this is by far the most important book on the subject in English. Maurice G. Hindus, *The Russian Peasant and the Revolution*, N. Y., Holt, 1920, covers a shorter period. For other references see Ogg and Sharp, pp. 325–326; Knight, Flügel and Barnes, pp. 794–795.

Mixture of peoples. (Wallace, chaps. 10, 13, 16, pp. 135–148, 177–194, 215–224.)
The Cossacks. (Wallace, chap. 15, pp. 204–214.)
The Mongol domination. (Wallace, chap. 14, pp. 195–203.)
The Orthodox church. (Wallace, chap. 19, pp. 256–266; Palmer, chaps. 14–15, pp. 182–214.)
Dissenting sects. (Wallace, chaps. 17, 18, pp. 225–255; Palmer, chap. 16, 215–233.)
The rise of serfdom. (Robinson, chap. 1, pp. 1–24.)
Serfdom in the eighteenth century. (Robinson, chap. 2, pp. 25–33.)
Serfdom in the nineteenth century. (Robinson, chap. 3, pp. 34–51; Wallace, chap. 28, pp. 405–428; Palmer, chap. 5, pp. 51–64; Hindus, chap. 2, pp. 27–39.)
Servile revolutions. (Hindus, chap. 11, pp. 179–202.)
Lords in the period of serfdom. (Robinson, chap. 4, pp. 52–63.)
The Crimean War and its consequences. (Wallace, chap. 27, pp. 383–403.)
Emancipation. (Robinson, chap. 5, pp. 64–93; Wallace, chap. 29, pp. 429–451.)
Landed proprietors since emancipation. (Robinson, chap. 8, pp. 129–137; Wallace, chap. 30, pp. 452–463.)
Life on large estates. (Wallace, chaps. 21, 22, pp. 283–319; Palmer, chaps. 2, 3, 7, pp. 8–35, 81–94.)
The noblesse. (Wallace, chap. 20, pp. 267–282.)

CHAPTER XV

ORGANIZATION OF RUSSIAN AGRICULTURE

In the last chapter the institution of serfdom was described at length, because it was so widespread and reached so deep into the life of the people that it conditions their ideas and their acts even to the present day. A considerable part of the present chapter must be devoted to the description of another institution, even more foreign to the life of Western Europe in recent centuries, which existed along with serfdom, persisted after emancipation, and has been extinguished only by the drastic measures of the revolutionary government in recent years. This institution is communal land tenure.

Communal land tenure

Communal ownership is familiar to all of us. In a modern American village, for example, the town hall belongs to the whole village group. Every member of the village is a part owner, and shares in the use of the building, but he cannot distinguish a definite part of the building as permanently his own. The village assembly or the officials who represent it decide the uses to which the building is put, rent the hall for a lecture, give the use of a room to a boys' club, maybe lease a part of the building for some private use for a term of years; but the ownership, the right of final disposition, rests always in the group as a whole. We must conceive this group ownership extended from one particular building to the whole agricultural land of a village and we have the institution which predominated among the Russian peasants down to the twentieth century. Statistics of 1905 showed over four-fifths of the "share" land, the characteristic peasant holding, subject to this system; only along the western fringe of the country did family property, more like that of Western Europe, predominate.

Origin of communal land

The origin of this communal land tenure is still the subject of bitter dispute. It used to be supposed that it was an aboriginal

Slavic institution, connected with the settlement of the country by great groups of blood relations many centuries ago. More recently, however, observers have pointed out the development of a similar system in contemporary Siberia, among people who were composed of many different families, and certainly did not let the question of blood relationship affect their acts. It is now the general opinion that the system developed in Russia in a relatively recent period, and there is pretty general agreement that the spread, if not the inception, of the system was due to the growing burden of taxes and to the method by which the taxes were collected.

From a very early period, while Russia was still paying tribute to the Mongols, the people were formed into groups for the payment of taxes. To reach all the different individuals in a country, to levy on each and collect from him his due share of the tax, requires a relatively good administration. The task is made many-fold easier if the government reduces the number with whom it deals, imposing the tax on the lord, if serfs are in question, or on the village as a whole in the case of freemen, in either case leaving the individual incidence of the tax to be determined inside the group. Under this system of taxation the group has a joint collective responsibility for raising the money; if one man does not pay his share the deficiency has to be made up by others. Assume now a considerable increase in the burden of taxation; for illustration, it is estimated that taxes per capita increased nearly fourfold in the fifty years before and after 1700. The group will find it more and more difficult to raise the sum which is imposed upon it. If it finds one man lacking enough land to enable him to produce a surplus to contribute to the tax, and another man with more land than he can cultivate efficiently, it will take land from one man and give it to another, to increase the total amount which can be exacted for the village treasury. Under conditions in which cultivation is carried on by independent families, not by a system of hired labor, the increase of taxes beyond a certain point leads inevitably to a division of the land, giving each family that share which will enable the group as a whole to meet most effectively the fiscal demand. As changes occur in the population, adults dying in some families, children growing up to manhood in others, there appears a disparity between labor force and the land for it to cultivate; then a redistribution becomes necessary. A man can no longer say:

"This land is mine; I shall hold it during my life and can assure the enjoyment of it to my children." He is merely the possessor of it for the time being; the village as a whole is the proprietor, and can give him notice to quit at any time.

Communal bondage

Whether or not, as some people think, this system grew up as recently as the eighteenth century, it was, at any rate, the ruling system through the nineteenth. The emancipation legislation accepted it and left it as it was. It was convenient from the fiscal viewpoint, it was thought, to offer social and economic advantages which will be discussed later, and even if it was not, as some thought, an original Slavic institution to be cherished, it was so bound up with the national life that it could not easily be eradicated. The laws which broke the bond between lord and serf left the peasant still tied to the village group of which he formed a part.

The reader now can understand the significance of a description by a foreign writer of conditions after emancipation. "From dependence on the noble landlord the mujik has fallen into dependence on his commune. The bond that tied him to the soil has, then, not been really broken. He is still bound to it by a double chain: undivided property and tax-solidarity. The peasants' liberty is, in a way, like their property: undivided and collective." The village government kept jealous watch of its resources, particularly of the adult males who must be the main contributors to its tax fund. A peasant could not leave the village to seek work elsewhere in field or factory without giving security for present and future liabilities, he must get written permission serving him as a sort of passport, he was merely on leave of absence and was subject to recall.

Administration

In the administration of the system there was a great variety of procedure and it is possible here only to sketch some features which may be taken as broadly typical, but which must not be assumed to have been universal. The usual practice was to divide the land in proportion to units of labor power of the people. The adult male or the married couple would be a natural unit. Families including several adult workers would be given more land — and would have to take it, be it noted, as their taxes would be

increased proportionately, and could be paid only by raising more crops. Often fractions of units were recognized; a young unmarried man or a man past 55 would be counted as a half, a man too old to work would be given no land and could be free of taxes. Often account was taken of the live stock, which would be, of course, an important factor in efficiency.

Examples

Before emancipation the practice was usual of enumerating the people by "souls," male serfs, and all through the later period the peasants constantly used that unit of reckoning. So in one village (Trirogow, Saratow) families were grouped in the following classes, with taxes and land to correspond:

(1) Households "without souls," "unfit"
(2) Households with one soul, but without a farm animal
(3) Households with a horse, cow, sheep or half-grown lad: counting 1½ souls
(4) Households with more males, and stock: counting from 2 souls up.

In another village (Aráshin) according to a common practice the difficulty of fractions was avoided by increasing the number of lots into which the land was divided. In a certain year the distribution of land among families was as follows:

3 families "without souls": no land or taxes
10 families "half-power" with one soul but no horse: each 1 lot
45 families normal, one soul, 1 or 2 horses: each 2 lots
30 families superior in number of men or animals: each 3, 4, or 5 lots.

The portions of land and of taxes allotted to families in this village varied every year. A certain family had 4½ lots in 1874, 5 in 1875, 5½ in 1876; children in it were growing up. One family which had 4 souls according to the conventional enumeration had only 2½ lots, because one of the men concerned had bad eyes and another had a chronic throat trouble.

Lot-groups

This system of proportioning land and labor required a village to establish units of each in working out the equation. The method of estimating labor power has already been suggested. In the smaller villages each family was given a certain rating, and the land was then divided directly among the families. In the larger villages it was more convenient to combine families into equal groups, divide the land in the first instance among these groups, and then let each

group subdivide its land among the component families. This practice simplified somewhat the administration of the system, leaving details to be worked out by those most directly concerned, and facilitated the apportionment of public duties. Every village had such obligations as the making and repair of roads, ditches, and bridges, the provision of quarters for soldiers, the transportation of goods for the government. If, for example, in a village with 40 families, a task was imposed requiring 8 days of labor, it was more convenient to divide it among 8 lot-groups, letting each send a man for one day, than to require each " soul " to give one-fifth of a day to the work. These lot-groups, ranging up to 30 souls in number, were formed in different ways, sometimes following the arrangement of houses in the village, sometimes by lot. Copper coins or bits of wood with a distinctive mark (rarely paper with written names!) would be drawn by a child from a cap, or shaken out of an urn. As the group approached completion it would be filled out by lot among those offering suitable units or fractions. Villages would allow exchanges among lot-groups, to bring relatives together or to keep enemies apart, but distrusted lot-groups formed by free agreement; they were afraid that the most capable would get together excluding the drunkards and incompetents, who would form a group by themselves, letting weeds grow on their land and unable when the tax collector came to meet their share of the village dues. It seemed better to make each group take its share of the shiftless, and do what it could to keep them in order.

Land division

The division of the people into equal units of labor power and tax-paying capacity solved only half the problem. The land also had to be divided into units to match. The division of the village territory into blocks equal in area would have satisfied nobody. Even in a country like Russia, marked in some regions by great uniformity of the soil, there are countless variations within the limits of a single village, apparent to anyone with agricultural experience, and even if the uniformity had been complete there was always one variable, distance from the village, which made an acre in one situation more desirable than an acre in another. In this as in other matters there was in Russia a variety of procedure, and the following description must not be taken as universally applicable. It was, however, the system generally followed in

central Russia, where the agricultural population was most numerous, and it may be taken as the characteristic and the most important of the Russian field systems.

Fields

To understand the arrangement the reader must distinguish three terms which will be used in the description: field, shot, strip. Russia still adhered to the three-field system of agriculture, known already to the reader in its application in Western Europe, and requiring the division of the plowland into three parts, roughly equal. Rarely, however, did the field dedicated in a certain year to its special use, winter grain, summer crop, or fallow, consist of one block of land; it was usually made up of several different pieces, permanently marked off but scattered over the territory of the village.

Shots

Every family must have its share not only in each of the three fields, not only in each part of each of the fields, but beyond that in each part of these parts differing in quality from another. Each of the larger blocks, composing a part of one of the three fields, was therefore divided into shots, to use the old English term. Within the bounds of a shot the land was roughly uniform with respect to the important variables, quality of the soil, exposure and water supply, distance from the village.

Strips

If, then, each shot was divided into as many parts as there were families or lot-groups in the village and distributed among them, land and labor were matched as closely as was possible. Every shot, therefore, was cut up into strips to suit the number of labor units, and every family got strips according to its number of souls. If in a certain shot, for example, the unit strip was 10 feet broad, a family with one soul would get merely that, a family with two souls would get 20 feet, and so on.

In the province of Moscow there were, on the average, 11 shots to a field, making 33 for the three fields; the number varied from 3 to 20 in one field, being larger, naturally, in the larger villages. The width of the strip would evidently depend on the number of families in the village, on the size of the shot, and on the number of

souls in the family. In one province (Jaroslaw) the narrowest strip of a single soul averaged 14 feet in breadth; the usual breadth was 26 feet. The peasants in one place complained that the strip of a single soul was no broader than a harrow, and in the province of Moscow a strip was recorded measuring 7 feet for 2 souls. The normal family was reckoned at more than one soul, and the small families could do something to obviate the narrowness of their strips by exchanging strips in different shots, or by combining strips in the same shot and dividing them crossways. The effect of all these arrangements on the productiveness of agriculture will be the subject of discussion later.

The house lots in the village, with small garden plots used for growing vegetables and hemp, were not included in the communal division but were hereditary family property. The meadows were either allotted like the plowland, with frequent redistribution to suit the changing growth of grass, or were mowed in common, with a division of the hay. Woodland was generally utilized by clearing a part in common and then dividing the product.

Redistributions

Like as was this Russian system in its externals to the open field system of Western Europe, it differed in one characteristic of great importance. In the West, during the centuries of which we have sure written records, the strips remained permanently in the possession of the families holding them. Even the servile tenants of a manor were protected by custom in the possession of their land; even in their case we do not find any general practice of redistribution. In Russia, on the other hand, changes in population were accompanied by a constant process of equalization. A general redistribution, affecting the size and number of the strips, was not an easy matter to administer, and was deferred as long as possible. The question would be debated in the village assembly, sometimes for two or three years, and often with a great deal of bitterness. Changes in the taxpaying capacity of individual families would be met by exchanges of lots, or by drawing on a reserve of land which in some villages was kept for this purpose. These partial allotments, however, soon complicated arrangements so much that a general redistribution became necessary. A commission which reported on the subject in 1872 found that annual redistribution was not uncommon, but that periods of 3 years or of 6 years,

suited to the rotation of the three-field system, were more usual. There had been, in the time immediately preceding, a tendency to extend the term to 12 or 15 years or even more. In the province of Moscow the average term was a little over 12 years; only one-tenth of the villages had a term under 3 years, and nearly half of them had a term of 15 years or more.

The Russian village was called *mir*, a word signifying also "world." In fact it was a little world of its own, nearly self-contained, paying its taxes but in other respects having few contacts with the rest of the country. In politics as in economics the *mir* was nearly autonomous; to a Russian peasant it *was* the world. Its constitution and operation were, therefore, of vital significance to the people.

Slavic faith in the *mir*

A German, Haxthausen, well educated, well read, who had traveled widely in Europe, visited Russia in 1843–44, and wrote a book extolling the Russian as the ideal organization. Everywhere else in Europe he had found signs of revolution against wealth and property, a demand for equal division of the land and a platform of opposition to the privilege of inheritance. In Russia he found these utopias of the revolutionist established in the life of the people. "'I know the rural constitutions of many countries of Europe, in part from my own observation and investigation; but I have not become acquainted with any which would be regarded as equal to the Russian village constitution, in well-ordered organization, in inherent moral strength, in social and political significance, in distinguished value to the government to serve as foundation and support of the whole structure of the state."

Similar ideas were cherished by native Russian writers. The Slavs had entered the European family late, and resented the claims to superiority of the Western peoples. The Slavophils (literally "Slav-lovers") idealized native institutions and felt it a patriotic duty to magnify their virtues. They conceded to the peoples of the West, Romanic and Germanic, leadership in the past, but asserted that the future belonged to the Slavs. "He who has just been born is happier than he who is dying." Readers of Kipling's story, "The Man Who Was," will recognize the type. In particular, they asserted that the proletariat which menaced the industrial West was impossible under the Russian system.

The justice of these claims will be examined in later pages, in which the attempt will be made to describe in some detail the life of the Russian *mir*, not only economic but also social and political. A warning is necessary at the start. Communal land tenure, the most characteristic feature of the Russian system, was only one of a complex of institutions, and it is extraordinarily difficult to distinguish its particular effects from the influences of other factors. It is particularly important to remember that the Russian peasant had just emerged from serfdom, that he was almost incredibly narrow and ignorant, and that we must look mainly to this fact, in the ultimate analysis, to explain the inefficiency and the faults of the organization.

Open-field system

Part of the criticism directed against communal land tenure applied really to the open-field system, and although reference has already been made in earlier pages to the faults of open-field agriculture, as evidenced in Western Europe, the subject must again be illustrated with the abundant material provided in the recent history of Russia. The land lot of the peasant after emancipation was not large, say 10 to 20 acres, to give some vague conception of the area. Yet an author, writing after 1900, asserted that in most of Russia one could scarcely find a village in which the holding of one peasant was not scattered at least in 20, often in 30 or 40, sometimes in more than 100 separate fragments. Instances are mentioned in this later period in which strips were actually less than a yard broad.

Faults

Obviously there was a waste of labor in cultivating the strips; a width of 26 feet was regarded as a desirable minimum, but even on a strip of that size it was impossible to plow or harrow across. There was a waste of seed in sowing; some of it inevitably fell on the boundaries between the strips. There was a waste of land in boundaries. The shots were divided by roads or by stretches of brush some 7 feet broad; the strips were separated by balks or furrows only a foot or two broad but absorbing in the aggregate a considerable amount of land and affording a refuge to weeds, insects, and birds. A cultivator was more or less at the mercy of those on either side of him, who might let their strips grow foul

with weeds if the community did not interfere, as it often had to do. There was a waste of soil by erosion, particularly in the region of the Black Earth. Strips were laid out at right angles to the water courses, as the quality of the soil varied in this direction; furrows therefore ran down hill and started gullies which are described as a cancer of the region. There was a waste of time in going with the implements of cultivation from the house in the village to one strip and then to another. Finally, and in some respects most serious of all, the open-field system tied the people hard and fast in the routine of the medieval three-field system. Some villages levied a fine (payable in whiskey!) on any member departing from the usual course of operation. He must sow a crop ripening at the same time as that planted by the others, he must leave the stubble open to pasture by the village animals. The same compulsion prevented him from giving an extra plowing to the fallow. The cultivation of such an important food plant as the potato never became important, because it could not be introduced without a general agreement. This three-field system, which was general except along the Baltic and on the steppes, exhausted the soil and kept the land foul with weeds. It needed a great supply of manure, but did not provide the forage crops to support numerous live stock, and furnished a very poor pasture in its stubble and fallow.

All these faults marked the open-field system; there is really nothing to be said in its favor, when it is compared with the American block farm. This system could be and was maintained where there was no communal tenure; it had existed in western Europe and it existed in western Russia under family ownership as well as in central Russia. Yet it was a necessary accompaniment of communal tenure, bound up in its operation, and presenting one of its worst features.

Faults of communal tenure

An imperial committee which investigated rural conditions in 1872 took evidence from some 300 persons well acquainted with village life, many of them peasants; of these only 30 favored the existing system of communal tenure and open fields. The great majority urged a reform, specifying such evils of the open-field system as have already been considered, and, further, describing evils peculiar to communal tenure which must now receive attention. The opinion was all but unanimous that the peasant who

might at any time have his land taken from him to be given to another, showed little care in maintaining its fertility. In the province of Kaluga, " The peasant carries almost all the manure to the hemp field; the arable is manured scarcely at all, for fear that by a redistribution 'the manured land would go to a different man.' " In the province of Nowgorod the testimony was that the more attention some peasants paid to their strips the more frequent were redistributions, as the poorer peasants envied them and hoped to get the benefit of their improvements. In other provinces there was evidence that redistributions coming as frequently as every 5 or 6 years brought exhaustion of the soil, but that extension of the term to 15 years or more led to better agriculture, though even then there was less care taken of the land when a redistribution was in prospect. When Arthur Young used the term " magic of property " and said that it would turn desert sands to gold, he hardly exaggerated. One official said that one would have to live with the people to realize what effect secure property rights had upon them, " with what determination, independence, frugality, and industry a man distinguished himself." It was the general complaint that the combination of insecure land tenure and joint responsibility for taxes (and the two naturally went together) made the peasants lazy and negligent. It was said that the western provinces where private property in land was prevalent, in spite of a poorer soil, showed much better economic conditions than central Russia, and it was asserted, perhaps with some exaggeration, that in one district the yield and rental of communal land were only half that of land held in individual property.

Combination of institutions

The communal tenure in itself was an evil, without question, yet the bad results proceeding directly from it have probably been exaggerated. Investigations made shortly after 1900 would tend to show that only half of the villages had periodical redistributions, and that the term of these was usually 12 to 15 years. In a considerable proportion (about one-third) of the villages there had been no redistribution since 1861, the year of emancipation. Communal land tenure seems to have been little if any worse in its effect than the joint responsibility for taxes, which, as actually administered in the villages, tended to exempt the shiftless and to throw an undue share of the burden on those who had saved enough

to own good farm stock, and who were hence reputed able to pay for others. Even the open-field system, bad as it was, did not make an improvement in the system of crops impossible, if the villagers would agree to give up their right to let the farm animals graze on the strips after a certain date, and if (as was often the case) a cultivator could reach his strips without passing over those of others. At the risk of wearying the reader I must repeat that not any single one of these institutions was responsible for the backwardness of the Russian peasant, that it was a combination of all and more of them which kept him back, and that the situation was so bad because these institutions exactly suited him.

The evil of conditions, bad enough at best, was intensified by two special phenomena which may be summed up in the phrase: villages too large and families too small.

Over-large villages

The usual Russian village, like most agricultural groups of the kind, consisted of a few hundred people. In the belt of the Black Earth, however, and on the steppe, villages approached or exceeded 2,000 inhabitants in size. In those regions it is hard to find an adequate water supply, the drifting snows of winter make the separation into smaller groups unpleasant, and protection from marauders is an element of some account. The land of these villages stretched out for miles from the houses; it had to be divided into many shots, the strips were necessarily far distant from each other and from the home of the cultivator, the large population led to frequent changes in personnel and in land distribution. It did not pay to haul manure more than a mile or two, and the cultivation was in general wasteful and bad. Some of these evils appeared even in the smaller villages, whose land at emancipation had been set apart not in one compact block but in several pieces or in an area with the village on the edge. When a lord had his country house near the village he would want to keep his own land about it, and the result last described would be natural. One case is mentioned in which the village was enveloped by the lord's land on three sides, and in many cases the village land extended in a narrow strip for miles.

Small families

Patriarchal customs still persisted in Russia when serfdom was abolished, married sons remained in the family under the authority

of the father, and at emancipation the average Russian family had two or three adult male workers over 18 years of age. In the course of a generation the number of workers diminished to one or two. Adult sons could get land for themselves and wanted to escape from a household in which there was almost always tyranny or dissension. The break-up of the large family, socially and morally a benefit, was attended by economic disadvantages. It was necessary either to duplicate the equipment of home and farm, house, stove, shed, horse, implements, or to put up with poorer substitutes. It was more difficult to arrange an effective division of labor, in the farm work or in a by-industry; under the old system one male would frequently be sent away to earn money while the others kept agriculture in operation. A large family, prosperous according to peasant standards, might dissolve into several small ones, all on the brink of destitution.

Village proletariat

The Slavophils exalted the *mir*, the village world, as a native institution which would protect Russia from the class divisions of the West, and would make forever impossible the growth of a proletariat. Under the régime of serfdom, indeed, a certain measure of equality was maintained. Liberty and equality, however, are an ill-assorted couple. After emancipation a process became apparent to which the Russians applied the borrowed word "differentsiasia." The strong, thrifty, and industrious began to rise in the village world, the weak and thriftless began to sink.

The Russian village is, one would suppose, the last place in which to look for the vices of capitalism, yet all over the world, in Asia as well as in Europe, the agricultural village is the setting in which the power of capital is exploited in its most horrid form. To those who have more is given, from those who have not even that little which they have is taken away. Some incident, a crop failure, the death of a horse, a fire, illness in the household would start a family on the downward path. A study of a number of peasant households which had gone to pieces in the province of Moscow showed over one-third which had not worked their land, presumably from lack of seed or stock, another third ruined by borrowing or drink, the remainder reduced to destitution by a death in the family, by the number of children, or by other causes. If a family met the emergency by the sale of live stock or farm

equipment, which together composed most of its scanty fund of capital, it reduced productive efficiency; it hired a horse when the owner had finished plowing, but got its seed in too late, had less manure, and declined from year to year.

Usury

The alternative was borrowing at rates of interest which to those accustomed to the competitive markets of the western organization seem incredibly high. Interest on a cash loan was usually at least 5% a month, 60% a year. The regular usurers made loans under conditions which would net them at least 100%. A measure of grain borrowed in the winter when the price was 0.82 ruble might have to be paid back before the harvest when the price had risen to 1.10 or 1.15. The difference does not seem excessive, but it amounted to an interest rate of 80 or 100%, and the reader can imagine what would happen to a speculator on the stock exchange who regularly sold short at 80 and had to cover at 110 or 115! Investigation showed individual cases in which the interest rate rose to fantastic heights, 150, 300, 800, even 1,200 or 2,500%! When the village borrowed as a community, to buy seed after a crop failure or to meet taxes, it enjoyed better credit; a rate of 40% is given as an average. Yet the village of Bosilow, which in 1871 was forced, as the result of a hail storm, to borrow 2,800 rubles at a stipulated rate of 20%, had in 4 years paid 4,400 rubles and still owed, according to the accounts, 2,600! We may well accept the remark of the peasants regarding the financier who administered this transaction: "He is a clever fellow."

Kulaks

The term *kulak*, "fist," or "mir-eater," was given to these usurers who, under the régime of apparent equality, managed to reduce weaker members of the village to dependence on them. They were often, in form, mere peasants themselves, often they sold liquor and used it to master victims, they were sometimes members of the clergy or of the administration. If not themselves officials, they managed generally to have an understanding with the secretary and head man of the village, and used political influence to further their private fortunes; the apportionment and collection of taxes offered them regularly an opportunity to exercise their financial genius.

The statement was made on an earlier page that the serfs, freed from their lords, were held in bondage to the *mir*. Many of them were reduced still further to personal dependence on a "fist" who proved to be a harder master than the noble landlord of the past. The official representative of the Imperial Economic Society said in his report (1890): "The peasants now work for others not less than four days a week, that is to say, more than when serfdom existed." The peasant, under the communal system, had no land which he could sell, but he could lease his lot to another, and he could sell his most valuable asset, his working time. The "fist," driving an extortionate bargain in both regards, could make a peasant work his own land to the usurer's advantage, or he could sell the man for a time to work away from his land.

Credit bondage

"There exists a veritable trade in slave labor. Traveling from village to village these usurers furnish the peasantry with money, binding the borrower to repay the debt by summer work; and having thus acquired a working force, sell it at a price two or three times higher to those who require summer labor. This system obtains as generally in the south as it does in the north. In winter time, when some unfortunate peasant is threatened with an execution for non-payment of taxes, or in spring when he is threatened with starvation, the usurer buys for a trifle his summer labor, giving him in advance from 15 to 30 rubles (£2 5*s*. to £4 10*s*.) [$11 to $22]. In spring the usurers drive whole *artels* [coöperative groups] to field labor and to factories, having sold their labor at double the price they paid. . . . Traders of another sort travel through the country engaged exclusively in the traffic in children. Many poor parents for a trifling sum sell their children for a certain number of years, in the course of which the children are to be left with tradesmen or artisans in the capacity of apprentices. Having bought in this manner a score of children, the trader sends them in carts to St. Petersburg, precisely as traders of another kind send calves. In St. Petersburg these children are sold to shops and factories at a profit of from 200 to 300 per cent. Such a trade in children and in adults is generally prevalent in the Moscow, Ryazan, and other governments."

Obviously conditions like this were never intended by the reformers who enfranchised the serfs. If imperial laws could have

remedied the situation they would have been published without hesitation. The government was powerless to correct the evils. It could not reach into the villages, to regulate their affairs; there were, in Great Russia alone, 180,000 *mirs*, in all Russia 243,000. It had to let the people find their level for themselves.

Village autonomy

In the days of serfdom the lord or his steward had great influence in the ordering of village affairs and in the administration of justice. Villages on the crown estates were much more independent, and at emancipation practically complete autonomy was granted to all the village groups. Russia, as Mackenzie Wallace said, was a land of paradoxes: "In 'the great stronghold of Caesarian despotism and centralised bureaucracy,' these Village Communes, containing about five-sixths of the population, are capital specimens of representative constitutional government of the extreme democratic type!" The *mir* decided the complicated questions involved in the apportionment of taxes and the distribution of land, it imposed on its members the fulfillment of their communal duties, it granted them leave of absence and recalled it at pleasure. It had not the right of justice in the case of crime, but could punish ordinary misdemeanors by fines or short terms of imprisonment, or by flogging up to a (theoretical!) limit of twenty blows with a rod. By a two-thirds vote, at a full village meeting, it could banish the "vicious or pernicious," a very serious matter for it implied ordinarily exile to Siberia. This power was abused, particularly when the village was relieved of part of the expense, and had to be restricted; but in 1884 it was said that 5,000 peasants, expelled from their villages, yearly crossed the Urals.

Village politics

The ultimate authority in the village was vested in the assembly, the "town-meeting," composed of heads of households and often including female members. These last, however, were not encouraged to speak except on matters directly concerning them; "the hair is long but the mind is short" was the peasant adage. This system of government, so much like that which the Puritans operated with signal success in colonial New England, was, as applied to a society of enfranchised serfs, a grievous failure. There is practically unanimous judgment that the village governments

were arbitrary, inefficient, wasteful, and corrupt. Wallace witnessed in one village the decision of the question whether a gin-shop should be established there; the whole female population and the best part of the males opposed it, but the would-be proprietor, by "strong arguments," got the vote of the majority. A landed proprietor in one of the provinces testified that the village assembly was often ruled by two or three men, to whom the majority were in debt and whom they did not dare offend. These men ran the village affairs to suit their private interests. This condition seems to have been not exceptional but typical. The head man of the village occupied a position of disagreeable responsibility, in which he might be ruined by the pressure of the powers above; the better elements in the village shunned office and left it to the less respectable. One authority, who reported to the British government on the matter in 1870, said bluntly that often the most vicious was made head, generally a greater drunkard than the rest, and friend of the keeper of the dram-shop. A careful observer wrote in 1880, "It is the current opinion that every peasant becomes a rascal when he gets to be village head, and in fact I have not been able to find an exception to this rule." He pictured the head man as dodging taxes himself, imposing a double tax on another, speculating with the village funds, always open to corruption. Not until 1880 did the imperial government do something to protect the people from their own weakness and inexperience. A law of that date established the office of "land captain," to be filled by some members of the landed nobility of the region, who would keep an eye on the village government and do something to curb its faults.

QUESTIONS

Illustrate communal ownership; what was its extent in Russia?

Explain how communal land tenure may have arisen.

Explain how and why emancipation merely substituted one master (the village) for another (the lord).

How were the people classed for the distribution of land and taxes? Illustrate.

Meaning and advantage of "lot-groups"?

Why could not the land be distributed in blocks of equal area?

What was the width of a strip?

How did the system differ from the medieval?

What was the usual period before redistribution?

What was the judgment of Russians on this system?

In what respects was the open-field system wasteful?

How did it affect the system of crops? the keeping of live stock?

What were the evils peculiar to communal land tenure?
What institutions combined to prevent progress?
Why were some villages so large? What were the bad effects?
What economic disadvantages attended the break-up of the patriarchal family?
Illustrate occasions of economic decline of a peasant's family. Why was recovery so difficult?
What were characteristic rates of usury?
How did kulaks depress weaker members of the village?
Illustrate credit bondage.
What were the political powers of the village?
What were the vices of village government?

READING

Maurice G. Hindus, *The Russian Peasant and the Revolution*, N. Y., 1920, gives a vivid picture of agrarian conditions before 1917. A book of great value, if a copy be available, is *The Industries of Russia*, published at St. Petersburg, 1893, for the World's Columbian Exposition, by the Ministry of Finance; the English translation was edited by John M. Crawford. Volume III contains 14 chapters on Russian agriculture.

The peasants after emancipation. (Wallace, chap. 31, pp. 464–490; Knight, Flügel, and Barnes, chap. 15, pp. 749–756; Ogg and Sharp, chap. 15, pp. 302–315.)
The village community. (Wallace, chaps. 8, 9, pp. 107–134.)
Peasant agriculture. (Palmer, chap. 4, pp. 36–50; Hindus, chap. 5, pp. 73–92.)
Peasant characteristics. (Palmer, chap. 8, pp. 95–112.)
The Slav family. (Wallace, chap. 6, pp. 79–89.)
The legal and social position of the peasant. (Hindus, chap. 4, pp. 61–72.)
Village government. (Palmer, chap. 9, pp. 113–126.)
Political ideas of the peasant. (Hindus, chap. 9, pp. 138–152.)
Social ideas of the peasant. (Hindus, chap. 10, pp. 153–178.)

CHAPTER XVI

THE RUSSIAN PEASANT

Agricultural yield

Under the conditions described in the last chapter the yield of agriculture, the mainstay of the population, was miserably small. Even in the period just before the World War, when conditions had improved, the yield of wheat was only 10.4 bushels an acre, about half that of the yield in France, less than one-third that of the United Kingdom, little over one-fifth that of Denmark, where, it is true, the crop was produced under exceptional conditions. The only European countries in which a lower yield was recorded were Bulgaria and Portugal. These figures for the Russian yield, moreover, include the grain grown on the large estates, where cultivation was much more efficient and the yield higher than on peasants' land. The following table, in which figures have been boldly rounded, illustrates the difference, and also the improvement in the course of the period.

AVERAGE ANNUAL YIELD OF CEREALS, BUSHELS PER ACRE

Years	*Peasant Holdings*	*Other Lands*
1861–1870	6	7
1871–1880	7	8
1881–1890	8	9
1891–1900	9	10
1901–1910	10	12

Comparisons

The Russian peasant of the '60's was obtaining a yield no better than that which the English had reached at the time of Domesday Book, 800 years before. In the next 20 years improvement brought him up to the average level of the fourteenth century, but at the very end of the period he got no more than was obtained on a certain Norfolk manor before 1300. An author well acquainted with conditions in Central Russia in the period 1861–1880 estimated the yield of oats at 2-fold the seed sown, of rye at 3- or 4-fold;

with this may be compared the statement of the anonymous author of *Hosebonderie*, written before 1300, that oats should return 4-fold, rye 7-fold. Most impressive is the comparison with regard not to area or to seed but to the persons engaged in cultivation. A careful German statistician estimated that the production of wheat per person occupied in its production was in Russia, about 1900, 1.2 tons per head, while in the North Central states of the United States it was 20.65! This difference, not 2-, 3-, or 4-fold, but over 17-fold, testifies to the enormous disadvantage of Russia, not only in the relatively small amount of land available for cultivation, measured with respect to the agricultural population, but also in farm methods and equipment. The yield per acre in the United States was not greatly in excess of that in Russia,* but the farmer had vastly more land at disposal, and used modern mechanical equipment in cultivation and harvesting, so requiring a relatively small labor force.

Implements

In this period, as a rule, the peasant had only the ancient hook plow, lacking a mold board to throw the sod over to one side; this instrument served only to scratch or stir the soil to a depth of 3 or 4 inches. Even as late as 1910 half of the peasants retained this antiquated model, by the use of which they had exhausted the upper soil of its fertility, and exposed themselves constantly to crop failure when the rainfall was at all deficient. The old wooden harrow was practically universal. The peasant reaped his grain with a sickle, threshed it with a flail, cleansed it as best he could without any appliance for the purpose. He raised his own seed, inevitably of mediocre quality and impure at that, and sowed it by hand from his apron. Under the three-field system it was difficult, at best, to keep sufficient stock for effective farm work and for the needed manure, and the growth of population tempted the peasants constantly to take land from grazing and put it under the plow to raise food. The scarcity of work animals became a crying evil. Of peasant householders in 1912 one-third had no horse whatever, one-third had 1 horse, only the remaining third had 2 horses or more.

*The yield of wheat per acre in the United States as a whole, in 1899, was 12.5 bu.; in the West North Central states, where most wheat was grown, it was slightly less, about 12.2.

Income

It is obviously hazardous to attempt a statement in precise figures of the money income of the enormous Russian population, with all their differences and all their peculiarities. Stating figures in rubles, with a rough equivalent in dollars, estimates for the period about 1900 would make the per capita annual income of the whole population 63 to 73 rubles ($32 to $37), and the income per capita of the peasants from agriculture about 34 rubles ($17). The people of the peasant class were supposed to have spent in maintaining their existence some 49 rubles ($25) apiece, leaving a deficiency, to be made up outside agriculture, of some 15 rubles ($8).

If the figures above could be taken as indicating the real net income enjoyed by the people they would still be desperately low. They picture Russia about 1900 in a condition actually below that of England in 1700, and, by and large, the comparison seems to be a fair one. A very considerable deduction, moreover, must be made from the Russian figures to allow for the share taken by the government in taxes.

Taxes

This was estimated about 1900 to amount to nearly one-fifth (19.6%) of the national income. The Russian people were paying heavily to support a government which did them very little good and, on occasion, a great deal of harm. Military and naval expenditures were such a heavy charge on the budget that little could be allowed for such purposes as education, sanitation, or other measures to advance the general welfare.

The peasants, be it remembered, had still to make their redemption payments, to wipe out the advances made by the government when they were enfranchised.[1] These payments were merged with taxes; a village made no distinction among different kinds of demands made on it (land tax, poll tax, redemption dues), but lumped them all in one sum which it raised in any way it could. Even if the peasants had received no special favors they would have had to bear a heavy burden. But in fact the favors all went to other classes with political influence, the landed nobility and the industrial capitalists. Paying redemption dues and communal taxes from which the great landowners were exempt, holding a

higher proportion of arable land, the peasants paid not only four or five times as much per acre on their land, but paid a much higher proportion of their income. There is no question but that the tax system was regressive, that it burdened the people in inverse proportion to their capacity to pay. Not only did the peasants bear a disproportionate share of the direct taxes; the burden of the tariff fell mainly on them, as consumers of protected manufactures (including agricultural implements!) and exporters of grain. It was they, finally, who paid most of the internal excise taxes, of which the most important were levied on articles of general consumption, such as liquors, petroleum, and matches.

Burden of taxes

The figure of an imperial commission in 1871, showing that peasants were paying in dues and taxes nearly *half* (about 45%) of their total income from all sources, seem perfectly incredible, and as a general statement may be an exaggeration, but on the other hand seem to be only too well proved at least for certain districts in the later period. It is said that a book by a Russian professor created a sensation when it was published (1877), showing that the peasants had been paying more than the net (rental) value of their land. Yet if the book was greeted with surprise, it could be only because the reading public had not before become conscious of the conditions under which the mass of the people were living. The very essence of the communal tenure was the indication it furnished that the ownership of land was a burden rather than a benefit, that land must be cultivated as a duty rather than enjoyed as a privilege. One author, Nicolai-on, writing with a distinct anti-governmental bias, estimated from official reports of 1871–73 that in about half the provinces of European Russia, excluding the western region in which private land ownership was most frequent, the crown peasants paid nearly all (93%) of the net yield of the land in taxes, and that those who had been the serfs of private lords paid nearly double (198%)! These statements must not be misconstrued; net yield or rental value means that which is left after the necessary expense of cultivation, including the subsistence of the laborer, has been paid. To assert, therefore, that the taxes consumed more than the net yield means merely that the peasant could not support his family and pay the taxes merely by working his land, but must make up a deficit by earning something

from some other source. Approaching the subject from another angle Nicolai-on sought to determine how much of the grain which a peasant produced he was allowed to consume, and concluded that in 1871–82 he kept over half, but a few years later not much over a third (37%). The peasant, exclaimed Nicolai-on, was working only 2 days in the week for himself and his family, and 4 days for others!

Destitution

After the harvest, in August and September, most peasants lived comfortably, many consuming in the household and in frequent festivals grain which they missed sorely afterward. Taxes were collected in October, and this was a dreadful time of reckoning. The village head and elders made out the lists, and by argument, by threats, and even by blows collected — if they could — the sum which the village had to pay. Money is never plentiful in a simple agrarian community, and the peasants who had not saved for this occasion (of these there were lamentably few) had now to raise the cash as they could, usually by selling grain at the lowest price of the year. They were fortunate if they did not later have to buy some of it back again, at a much higher price, to stave off starvation or to supply seed for the next crop. A sober critic estimated that most of the peasants had enough to eat only up to Christmas, and that only the relatively well-to-do had enough until Easter; then they had to tighten their belts and get along as best they could until the new crop came in. A Russian writing about 1880 said that the threat of a flogging was generally enough to make a peasant pay his taxes if he actually had the means to do so, but toward 1900 floggings became so common that a special term to describe them became current, "threshing out the arrears," and in 1904 the government intervened to prohibit the practice. It is said that not only individuals but whole communities fled by night to escape the taxes — but where were they to go? The answer to that question was so difficult that most stayed where they were, and got along as best they could.

Arrears of taxes

This gloomy picture of the burden of taxation on the peasant has been contested, but it seems to accord with the facts, and to be confirmed by the growing difficulty of collecting taxes. The per-

centage of the amount of the tax in arrears in different periods was as follows:

1871–75	22%
1881–85	30%
1886–90	42%
1891–95	45%

In 1900, of 499 districts of European Russia, only 23 had paid all their direct taxes; the rest were in arrears, some of them for more than 5 years. Examples could be given of villages absolutely ruined by taxation, whose productive power had been so lamed by the demands upon them that they were able to pay less and less, until they were crushed by the arrears. The government granted some alleviation in 1881, and reduced its demands for redemption payments, without remedying the condition.

Famines

Another indication of a people strained beyond the breaking point was the persistence and apparent increase of famines. During the last decades of the nineteenth century they became the rule rather than the exception; for considerable periods every year was marked by one, in one or another region. Some people thought that the cutting of the forests had affected the climate and reduced the rainfall. It seems more reasonable to ascribe the famines to the impossibility of feeding a rapidly growing population on an area which although large was limited, by agricultural methods which were altogether antiquated. The people, as a rule, lived so close to destitution that a reduction of the crop by a small proportion, one-sixth or even one-eighth, a difference which in many countries would not be at all serious, spelled disaster. Russia has always suffered from a rainfall seasonally uneven, but the people were not prepared for the variations. Shallow plowing and the lack of manure to conserve moisture would entail a crop failure, when in fields alongside which were well cultivated and adequately manured a good crop was being raised.

Housing

The standard of living of the Russian peasant of the period, measured alongside that of a prosperous Western country, seems almost impossibly low. Where wood was plentiful the dwelling place was a log cabin, perhaps 16 or 18 feet square, thatched with

straw; in regions where wood was scarce and the cabins were built of planks they were often so small that they appeared fit shelters only for animals, not for men. The interior was usually partitioned, with a place for the poultry, pigs, and calves which in very cold weather were brought into the living room. Of this a quarter of the space was taken up by the stove of clay or brick, around and on which the family slept; a man might be born, sleep, and die on the stove. The floor was generally of earth. A measurement of peasant houses in the province of Moscow showed an allowance of air one-quarter or less of that considered normal. Light entered through small openings filled with tanned bladders or with glass; in winter every chink was stopped, and so far as possible the outside air was prevented from entering altogether. The atmosphere can be imagined, particularly when live stock shared the living room or a trade such as leather working was carried on there. Even outdoors the traveler could measure his approach to a Russian village by the sense of smell.

The peasant worked and slept in the same sheepskin, and all the cabins were infested with vermin; any one of them was said to harbor more fleas than there were soldiers in the Russian army. Some religious sects had personal cleanliness imposed upon them as part of their ritual, but most of the peasants showed their agreement with the proverb, "The wolf and the bear are healthy, yet they never wash." The salvation of the people was the vapor bath, enjoyed for the reaction which it afforded. The peasant would stew in steam from water thrown on hot stones, and would then go out and roll naked in the snow; a change so abrupt as that was needed to stir his sluggish nervous system. That he could feel.

Food

The food varied more or less according to the region and the season, but in general the mainstay was black bread, half baked from rye; the peasant would eat 2 or 3 pounds of this a day, if he could get it. Kvass, a mild beer fermented from bran or flour, was thought to aid digestion of the dough. Other staples were cabbage soup, *stschi*, and gruel made of oats or buckwheat. Cucumbers were the national luxury; they lent distinction to any meal. In summer the peasants would gather berries and mushrooms and make a soup to which bread and salt might be added. The rigid fasts of the orthodox church, covering nearly half the days of the

year, were more readily observed as the peasants rarely ate meat except on festivals, and the poorer peasants rarely tasted milk, butter, eggs, or meat even then. In Little (southwestern) Russia a family would enjoy the flesh of 1 or 2 pigs in the course of a year, saving the fat for the harvest season when it was needed to sustain the workers through their long hours of labor.

Drink

A curse of Russia in this period was drink. The consumption of alcohol, measured per capita, was less than that of many other countries, but it was taken in the form of strong spirits, vodka, and when it was taken it was taken to excess. Various explanations have been offered for this. The most plausible appears to be that it was due to what is expressed by the German word *Kummer* — " care," " worry," " nerve-strain," to suggest inadequate equivalents. The monotony, tonelessness, of life in the Russian countryside can hardly be exaggerated. In the good old times the landed proprietor would actually stop travelers by force, kidnap them, to get some relaxation. This resource was not open to the ordinary villager, who was entirely shut off from the outside world; he would not have been able to read a letter or newspaper if the infrequent posts had brought him one. Caught in the treadmill, always facing want, he sought relief in occasional intoxication. The church, so rigorous in the matter of eating meat, was indifferent to drink. Kennan, traveling in Siberia, came to a village in which every inhabitant but one was drunk; they were consecrating a church, and this exceptional individual was the only one not a Christian! " Drunkenness is in Great Russia not only an individual but a social phenomenon," said a good observer. Uspensky, writing about 1880, said that village business consisted entirely in collecting taxes and drinking vodka; the people had put more time and thought on the ritual of drinking than on anything else except the distribution of land. " Every village drinks in its own fashion, according to its own rules, following a definitely fixed ritual." In one village, B., they drank rarely, and only the village elders took part, all in a determined order; beer and vodka were mixed and were drunk for 3 days and nights without stopping. In another, S., there was a variety of programs for all occasions, to suit the number of " pails " * of vodka available, 1, 2, 3, 4, 5, or more. The

* A measure equal to about 10 quarts.

people of a third village, R., had poor rules; they were thought to drink very stupidly.

Drink was coming to be recognized as a national evil in the period before the World War, when the government exercised a fiscal monopoly in the sale of spirits, and offered 40% vodka at 30 to 40 cents a quart. Consumption was rapidly increasing. A temperance orator asserted that a million people drank themselves to death every year, and that the hospitals were crowded with sufferers whose minds or bodies had been wrecked by alcohol.

Vital statistics

The best index of the conditions under which the people lived is furnished by the vital statistics, which present to those able to appreciate them a shocking picture. Figures below state the births and deaths and the difference, measured per 1,000 population, in an average of the 5 years, 1905–09.

Birth rate	45.5	Compare Bulgaria, 42.5; Roumania, 40.1; Hungary, 36.3; Germany, 32.3; England, 26.7; France, 20.1
Death rate	29.4	Compare Roumania, 25.9; Hungary, 25.7; Spain, 24.9; Germany, 18.3; England, 15.1; France, 19.5
Excess	16.1	Compare Bulgaria, 19.0; Netherlands, 15.3; Denmark, 14.3; Germany, 14.0; England, 11.6; France, 0.6

The figures show the Russian people breeding at a rate not matched by that of any other country in Europe. The population was increasing, but in nothing like the same rate of superiority. That which held it back was the grim agent, death.

Death rate

A Russian economist said that the only country with a death rate higher than that of Russia was the Fiji Islands. Even the countries of the Balkan peninsula and of Southern Europe showed distinctly better conditions. Again Russia in 1900 presented a picture comparable to that of a country in Western Europe in 1700. A rough computation, assuming a uniform stationary population, would give an average age at death of 33, if 30 persons in 1,000 die every year. Actually, of course, the mortality was unequally distributed in different age-groups. The rate of infant mortality was nothing less than terrible. One-quarter, one-third, even one-half and more in certain districts, died within a year of birth. Mothers lacked knowledge, lacked means, lacked time, to give the

babies proper care. A member of the Russian Geographical Society, quoted in a British parliamentary report of 1870, said that he had seen children not a year old left for 24 hours entirely alone, while the family went out to work. The baby would have feeding bottles attached to the hands and feet, or would have poultices bound on it made of black bread, curds, oatmeal, or the like. The child was sometimes smothered by these, or was robbed of them by domestic animals.

Medical service

The death rate was considerably higher in the country districts than in the towns, in spite of sanitary conditions in the latter which, as will later be shown, were almost incredibly bad. One reason for the difference was the scarcity of doctors in the rural districts. We may dismiss as an exaggeration the statement made about 1880 that the rural doctor had to look after the health of 300,000 people, scattered in a territory as big as that of all Germany, but even after 1900 there was but one doctor to 20,000 or 30,000 peasants.* And again the fundamental difficulty was the ignorance of the peasant. When he took medicine he wanted something with a bad taste, and a great deal of it; he had to be watched lest he drain the bottle of many doses at a draught, or pass his bottle of camphor liniment about to be quaffed by the family. An ugly feature of the situation was the prevalence of venereal disease. Syphilis was a scourge, both in town and country, and was in some districts so prevalent that the doctors were absolutely discouraged in their attempts to curb it.

Illiteracy

Reference has frequently been made to the ignorance of the people. The census of 1897 showed that, of those above 7 years old in the whole Russian Empire, less than one-third were able to read and write. Conditions varied immensely in different times and places. In the most advanced class, the industrial laborers in Moscow, 1901–10, half and more of the males about 50 were illiterate, but below that age the elements of an education were general. Among the females in the older age-groups, only 1 in 100 could read and write; at the age of 35, 1 in 10; at the age of 20, 1

* In the United States, according to the census of 1909, there was 1 physician or surgeon to 610 total population; in 1919, 1 to 730; the ratio would be different in the rural districts.

in 3; and so on. These were, however, the members of a select class. A doctor in western Russia, investigating the 1,300 patients whom he had had, found 6% able to read and write a little, but among the Russians proper (excluding Poles and Letts) only 2%. In Orel, central Russia, the figure of literacy was about 4%. Villages of 500 to 2,500 inhabitants would often be found in which absolutely no one could read or write. Taking the statistics of recruits to the army, young men who would make the most favorable showing, in 1885 only 1 out of 5 could read or write at all; in 1900 half of them were counted literate.

Education

A measure of the quantity and of the quality of the education provided in the elementary schools at this last date can be got from the funds annually appropriated for their maintenance, which amounted to less than 25 cents per capita of the total population. In this period, after 1900, one author estimated that 1 peasant in 12 could spell a few words, 1 woman in 25 could read her own name, 1 child in 20 attended school occasionally, and 1 in 10,000 received "the most miserable elements of primary instruction."

Literacy is hard to define and measure. A more certain index of a country's education is furnished by postal statistics. In Russia, in various years, the following averages obtained:

in 1825	1 letter was posted per 10 inhabitants
in 1856	1 letter was posted per 3 inhabitants
in 1888	3 letters were posted per 1 inhabitant.

Comparable figures for this last date were: France, 18; Germany, 33; England, 53. More recent figures, counting all pieces of mail per inhabitant and including the United States for comparison, were as follows:

Russia		*United States*	
1912	11	1913	193
1928	17	1928	239

Ignorance

The statement that newspapers were unknown in the country districts may, in one sense, be an exaggeration, yet in another was beneath the facts. When the census of 1897 was taken, villages were found in which no one had any idea even what paper was. In matters of national and international politics men were children,

to be led blindfold where the ruler chose to take them. The Russian author Gogol in his book *Dead Souls*, written of the period of serfdom, tells of a locality where the people had revolted and refused to pay any taxes because some vagabonds had circulated the rumor that the serfs were to become owners and were to wear swallowtail coats, while the gentry were to be made peasants and wear blouses. The idea of a "black division" of the land, all to the people, persisted all through the nineteenth century and into the twentieth, until it was finally realized by revolution; formal statements by the government, often repeated, could not correct it. Innumerable stories are told illustrating the credulity of the peasants. One author tells of the sect of "Medalmen" in a certain district, who thought that the czar meant to free the peasant from taxes and believed that medals struck, in commemoration of emancipation, would protect them if displayed to officials; they would sacrifice a large part of a year's income to procure one of the precious medals.

Distribution of land

Land was held in Russia by so many different classes of owners, under so many different forms of tenure, and in regions differing so much in physical characteristics that the subject of its distribution can be treated here only in the barest outline. The accompanying table presents the average holding per male soul of the share-land of the peasants, the form in which most of their land was held; Russian measures are reduced to rough equivalents in English acres; and the holdings in different agricultural regions are distinguished.

Regions	*1860*	*1880*	*1900*
Northern	21	17	13
Northeastern	22	17	12
Eastern	26	18	13
Central Volga	11	8	6
Central agricultural	10	7	5
Central industrial	11	9	7
Southwestern	8	6	4
Little Russia	9	7	5
New Russia	17	11	7
Baltic	9	8	7

Inadequacy of peasants' land

The figures are averages per male soul, and the normal peasant family would have at its disposal more than double, perhaps triple

the area given in the table. Many estimates have been made of the minimum necessary to support a family, but the amount varied so much under different conditions that it would be unprofitable to discuss them. In spite of a great area added to peasant holdings in the course of 40 years, the table shows that the peasant population increased even more rapidly, that there was not a region of Russia in which the land, under the methods employed, even if it had been adequate to support the peasants in 1860, would have sufficed in 1900. Abundant evidence from many sources shows that there was a deficiency, growing constantly more acute. The peasant to make a living had to work for another or find a by-industry in some trade which he could exercise independently or in factory work. If earnings there were scanty, he was reduced to a condition of chronic hunger. The figures of the table, be it noted, give only averages. Inside the peasant population the process of "differentsiasia" was going on; under the forms of equality in land division, a class was growing up with no land or so little that it formed a menacing proletariat.

Technical improvements

The gravity of the problem was at length recognized. In the following part of the chapter an account will be given of measures taken by the government in the hope of effecting a reform. Some contributions were made by individual enterprise. Landed proprietors, represented in the provincial (zemstvo) government, led a movement toward better methods in agriculture: the use of improved seed and implements, the introduction of root crops and grasses and of more fruit and vegetables, the improvement of live stock. In the 6 years of 1906–11 the importation and the home production of agricultural machinery and implements tripled, the number of agricultural societies tripled, coöperative societies of various kinds increased in number and scope. In many villages the three-field system was modified to give the land a chance to recover from the continuous cropping with cereals; in some a four-field system was established, reducing the amount of idle fallow.

Reform encountered not only the stolid opposition of a peasant class shackled by tradition; it was opposed by many of the upper class who feared lest it undermine the national institutions on which society and government rested. Shortly after 1900 Witte, a statesman of ruthless energy who realized that the government finances

were endangered by the situation, stimulated an extensive investigation, but the results of this, characteristically enough, were prejudiced by the fact that the conservatives would not allow the facts to be frankly stated. Russia needed the convulsion attending the war with Japan (1905), which both in town and country led almost to revolution, to bring the government to action. Under Stolypin (1906) a momentous decision was finally registered in imperial ukases. The government had at last decided to reform the *mir*, to abandon the communal land tenure in favor of private property.

Reforms

Before entering on the complicated questions involved in the carrying out of this decision, it will be well to review the steps preceding and attending it. A law of 1889, to which reference has already been made, had limited the authority of the village by subjecting its votes to review by land captains, chosen from the upper class and later given special powers to intervene in matters of land distribution and taxation. A law of 1903 abolished the joint responsibility of members of the village group. A St. Petersburg newspaper, in approving this act, said that the joint responsibility had encouraged the evasion of taxation by peasants really able to pay, while those who did pay were remorselessly harsh in endeavoring to collect their advances. "They have been known to sell the fences, gate, roofs and even parts of the cottages of the debtors." A law of 1904 forbade flogging to force payment. An imperial manifesto of 1905 freed the peasants from the redemption dues, of which some were calculated to run still to 1931. In spite of the payments which the peasants had made, arrears had accumulated to such an extent that the peasants were charged with a capital sum very little less than the amount charged against them in 1861! But the remission of this vast sum was an act more generous in appearance than in reality; the government had profited so much by the reduction of the rate of interest at which it could borrow that it had already collected enough to wipe out the debt. Finally, a ukase of 1906 removed the class distinctions which still marked the peasants as an inferior order of society, and allowed them to live where they pleased, to enter the service of the state, to enter college or the church without the permission of the *mir*. When the land captains of the upper class were replaced by justices of the

peace in 1912, the peasants had become full citizens, with rights equal to those of others in the state.

Peasant Bank

The economic status of the peasant remained still a critical problem. For a generation after the enfranchisement of 1861 the government had discouraged the settlement of fresh land, in the interest of landlords who desired a supply of cheap labor, but in the '90's, with the construction of the Siberian railroad and the growing agrarian discontent, it furthered emigration. Moreover it took steps to provide the peasants with more land at home. The Peasant Bank, a government institution founded in 1883, advanced on mortgage to villages and to individuals three-fourths of the money needed in the purchase of land. The Bank assisted the peasants in the acquisition of more than 20 million acres of land, and they acquired even more than that in other ways. Tremendous as these figures are, they shrink in importance when compared with the vast peasant population (roughly a total of 70 million in 1900), especially when it is realized that very little of this fresh land went to the class which needed it most, the poorer peasants. A plan of Witte (1905) to expropriate the land of private estates beyond a certain maximum area broke down in the face of the opposition of the landlords. In 1906, however, the czar by a stroke of the pen turned over to the Peasant Bank more than 5 million acres which had been set apart for the maintenance of members of the imperial family; and in the same year promised to make over eventually an area of the crown estates three times as large.

Even in an area as great as that of the Russian empire there was a limit to the amount of good agricultural land available. In the agricultural region of European Russia an increase of the peasants' land by one-half was absolutely impossible, an increase by one-quarter was practically impossible. An increase in the yield per acre, however, by one-quarter, one-half, or even more, was quite within the bounds of possibility, and would confer practically the same benefit. If the countries of the West produced on an acre of land two or three times as much as the Russian, surely he could hope, on better soil, to approach if not to reach their standard. The main obstacle — and it was formidable — was the Russian village with its complex of institutions and individual habits, its communal land tenure, its open-field system, and so on.

Secession from communal group

A law of 1893 had prohibited the redistribution of communal land oftener than once in 12 years; it forbade changes in the distribution within the period, and endeavored to protect the interests of a peasant who had improved his share. A ukase of 1906 went much further, and it is interesting to note that this was published in spite of the opposition of the Douma, the first national representative body, and was not finally confirmed until 1910, by the third Douma. It gave every peasant the unconditional right to secede from the communal group, keeping his share of land as his individual property. Now that the principle of joint-responsibility for taxes had been abandoned, and peasants were relieved of the burden of redemption dues, the reason for the maintenance of the communal system had disappeared. Many peasants took advantage of this opportunity to transfer to the system of individual property and responsibility; the majority hung back, fearing a future under conditions which to them were strange; some left the communal group and asked later to be received in it again. The government pressed constantly in favor of private property, and the system of communal ownership was in process of extinction when the World War broke out. The form of private property adopted was like that of the West, individual ownership; proposals to recognize the strong family ties of the past by vesting ownership in the family were not accepted. The government was still unwilling, however, to treat the land of the peasants like ordinary property, subject entirely to free contract. This land was destined to be permanently "soul-land." It might not be sold or mortgaged outside the peasant class. Further, even inside that class restrictions were imposed. The law of 1910 fixed the maximum which a single peasant could own at 6 "soul-shares," an amount varying in different regions according to the quality of the land.

Economic and political factors

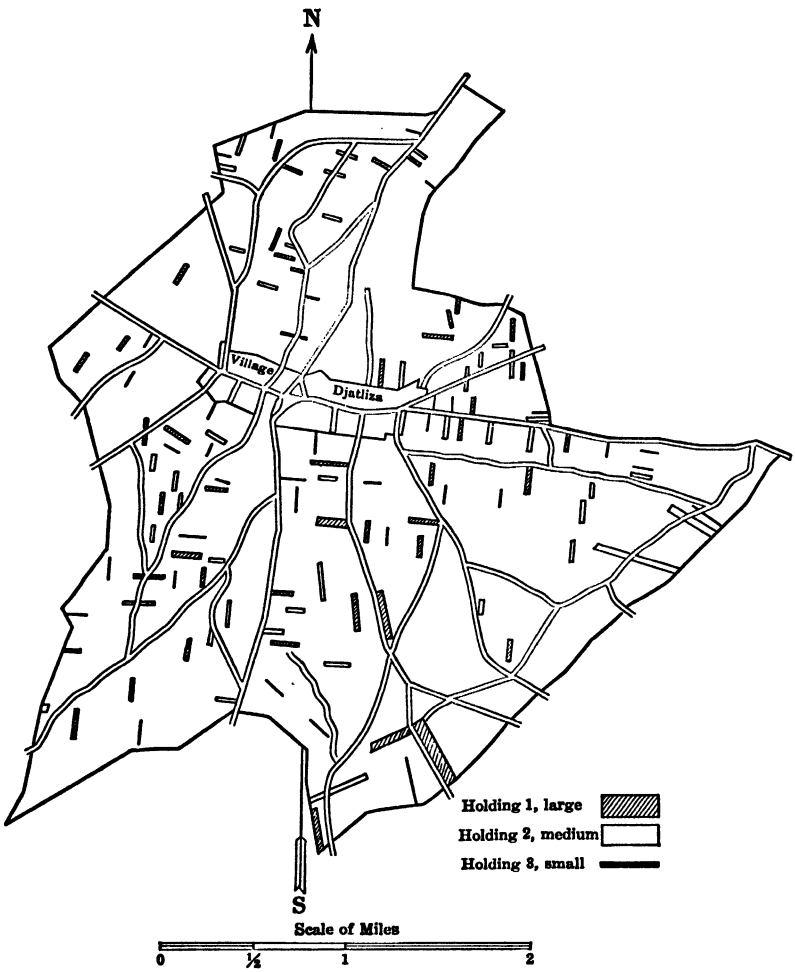
Even with these restrictions the reform represented an immense departure from the old theory of the *mir*. Conservatives saw in it a grave social danger, and prophesied the creation of a landless proletariat. The answer was that the proletariat was already there. Stolypin said in the Douma that it was time to stop making laws favoring the lazy and the drunkard. The new policy offered to the able and industrious a real chance to better their condition.

A German author instanced the case of a peasant in the province Twer who, given in private ownership 50 acres of swampy land of which only a bit (3½ acres) was already in cultivation, had reclaimed and brought under the plow half of the remainder in the course of a year; he was old and deaf but happy as a king. Political considerations undoubtedly played a part in the reforms. The war with Japan in 1905 had stirred up an agitation amounting practically to revolution. Many landed proprietors had fled in panic to the towns. The new policy promised to build up in the villages a class with a substantial interest in private property who would stand with the landlords in resisting attacks on it. Socialistic doctrines were already widespread both in town and country, but the author just quoted instanced the case of another peasant who, during the revolution of 1905, had sworn by Marx and Kautsky, but who was one of the first in 1906 to apply for an allotment of private property. The policy aimed to create a conservative class in the villages who would support the landlords, while the proletariat was to be forced into the towns to work at low wages in the factories of the industrial capitalists.

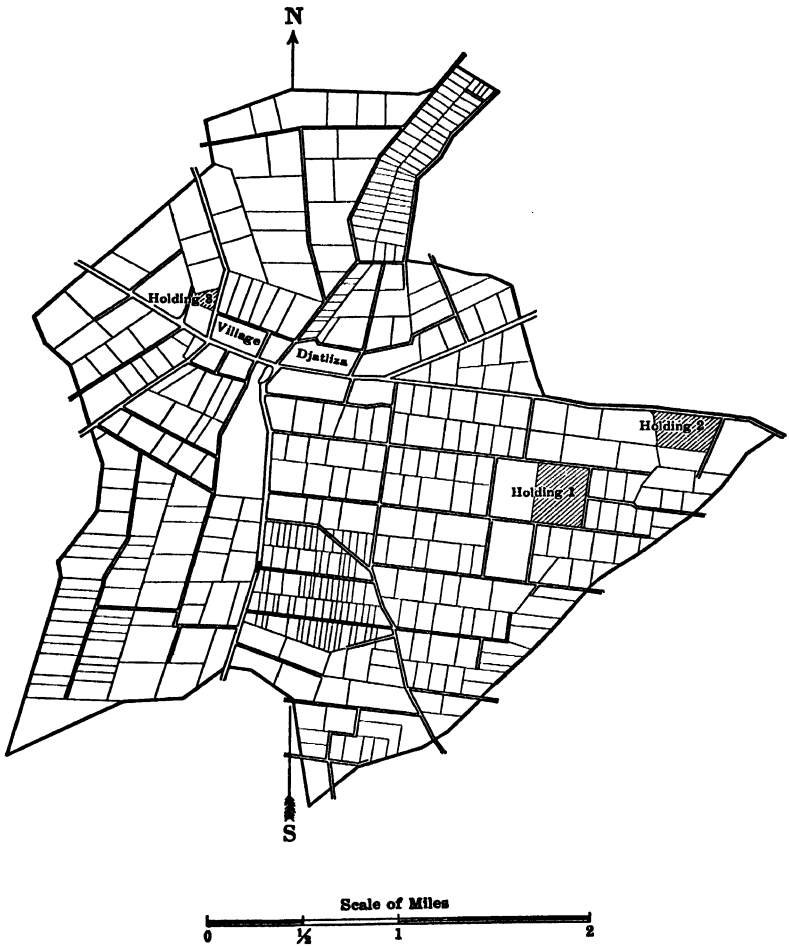
Problem of enclosure

Involved in the question of communal tenure but more extensive, more serious in its effects, and much more difficult to solve, was the question of the open fields. A law dating as far back as emancipation, 1861, had permitted the enclosure of the open fields and consolidation of the strips in separate blocks, but had not led to results of any importance. The question rested until the reform period, after 1900, when an official, Koefoed, who had had experiences in the matter in Denmark and who realized its importance, brought the government to action.

Anyone who reviews the land arrangements of the Russian village, as described in the preceding chapter, will realize that their transformation into a system like that of American farms was bound to be both expensive and difficult to execute. The ideal holding was considered to be a square including not only plowland but also meadow, pasture, and woodland, with the dwelling at the crossing of the diagonals. Any departure from the square forced the cultivator to traverse greater distances to his work, and the separation of meadow, pasture, or woodland from the home lot was still less desirable. An arrangement inferior to any of these left the



SAMPLE HOLDINGS IN A RUSSIAN VILLAGE WITH OPEN FIELDS BEFORE ENCLOSURE.



THE SAME HOLDINGS AFTER CONSOLIDATION.

dwelling in the village group, as it had been, at a distance from the cultivated land, but still gave him this in a compact piece, not in scattered fragments.

Difficulties

The ideal solution was usually impossible. Meadow, pasture, wood, and water could not be shuffled and dealt in a new combination even by the imperial ukase of the czar of all the Russias. It was hard enough at best to evaluate the different grades of plowland, and to distribute lots equal in quantity and quality combined. The uniformity of the soil in many regions somewhat simplified this problem. But everywhere government agents were hampered in their work by the ignorance and distrust of the peasants, and were often faced by threats of violence. In eastern Russia the experts and surveyors found a widespread belief that the land was being taken from the peasants to be given to the French, to reward the latter for help given in the war against Japan! One author recalls the remark of an early economist that it was easier to convert the peasant to a new religion than to get him to introduce a new variety of potato.

Difficult as was the problem in a single village, the reader, to realize its scope, must recall the immense area involved. The share land of the peasants covered an area equal to that of the agricultural land of Germany, France, and England combined. Hundreds of millions of acres, tens of millions of people, hundreds of thousands of villages, were involved. With 12,000 agents employed in the work, it was estimated that 20 years would be needed to bring it to a conclusion.

Results

Actually, in the 9 years before the Bolshevik revolution, very considerable progress was achieved. Applications from nearly 9 million peasants, asking for at least the establishment of individual property rights and the laying out of roads so that an individual could reach all his strips, were received. More than 1 million block farms were created from the strips of the share-land; counting in farms made from land purchased from the Peasant Bank and the state, the total number of block farms exceeded 1.5 million, averaging about 27 acres apiece. Important as were the results already accomplished, they still left the larger part of

the work to be done when the World War distracted attention, and the revolution changed abruptly the course which had been followed.

QUESTIONS

What was the agricultural yield compared with that of other countries? Compared with the medieval?

How did the yield compare with that of the United States?

What was the character of agricultural implements and methods?

What was the estimated annual income per capita of the Russian people and of the peasant about 1900? How was it affected by taxation?

What was the nature of the tax system?

Estimate the burden of taxes on the peasant.

Illustrate the difficulty of collecting taxes.

Explain the frequency of famines.

What was the standard of living measured by (*a*) housing, (*b*) food?

Explain the evil of drink.

How did vital statistics compare with those of other countries?

Why was the death rate so high for infants? in the rural districts?

Illustrate the prevalence of illiteracy.

Compare the use of the post with that in other countries.

What was the average land holding of the individual and the family at different times? (Note what was said above regarding the concentration of population in central Russia.)

What evidence of improvement was there after 1900?

Give the date and occasion of Stolypin's reform.

What reforms had preceded this?

From what sources was fresh land provided?

What were the measures taken to dissolve the communal village?

What were the economic and political factors in the reform?

What different forms might enclosure (consolidation) take?

State the difficulty of the problem, and results.

READING

Elements of the peasant problem. (Robinson, chap. 7, pp. 117–128; Hindus, chap. 15, pp. 278–290.)

The demand for land. (Robinson, chap. 6, pp. 94–116; Hindus, chap. 8, pp. 124–137.)

Life of the peasant. (Robinson, chap. 12, pp. 243–265; Hindus, chap. 1, pp. 3–26.)

The coöperative movement. (Hindus, chap. 16, pp. 291–307; Knight, Flügel, and Barnes, chap. 15, pp. 766–769.)

Education. (Hindus, chap. 3, pp. 40–60; Palmer, chap. 21, pp. 296–304.)

Taxation. (Hindus, chap. 6, pp. 93–107.)

The country priest. (Wallace, chap. 4, pp. 46–64; Palmer, chap. 6, pp. 65–80.)
Medical service. (Wallace, chap. 5, pp. 65–78.)
The revolution of 1905. (Robinson, chap. 9, pp. 138–168.)
Results of the revolution. (Robinson, chap. 10, pp. 169–207.)
Attempted reforms in land tenure. (Robinson, chap. 11, pp. 208–242.)

CHAPTER XVII

RUSSIAN MANUFACTURE: EARLY FORMS

Before Peter the Great the manufactures of Russia were in a stage of development like that of Western Europe under Charlemagne nearly a thousand years earlier. The serfs made for themselves or for each other the simplest necessities of home life. The lords imported luxuries, brought in foreign artisans to make them, and got some products from their own domestic serfs. Aside from these workers, relatively few, there were none who made their living in manufacture.

Factories under Peter

In his determined effort to modernize Russia, Peter needed money, above all for war. In his budgets the military expenses made up three-quarters, in one year even 96%. Money was hard to get; Russia was still medieval in organization, with little money in circulation. He levied taxes on beards, coffins, bathrooms, chimneys, cellars, wells, on anything which promised to yield a return, and still lacked funds. To get what he wanted he was forced to make it. He opened mines and built factories, and stocked them with a labor force of crown serfs and of riffraff: vagabonds, criminals, prisoners of war, deserted wives, and orphans. Some of the mines and factories were large enterprises, employing a number of laborers approaching or exceeding 1,000 apiece. All of them were based on the simplest hand work, without power or anything but rudimentary machines. "Strikes" in these factories were little revolutions, quickly repressed by the knout.

In this way the czar obtained the essentials for his military organization: gunpowder and arms, cloth for uniforms, sailcloth for the navy. Further, he stimulated the manufacture of many luxuries which had previously been imported — silks, ribbons, stockings, and so forth. Russians and foreigners were encouraged to start factories by the grant of substantial privileges: protection from foreign competition, remission of taxes and other obligations to the state, above all the power to draft labor. A ukase of 1721

gave the manufacturer the right to buy whole villages for factory work; one of 1736 bound laborers forever to the factories in which they were working and granted the right to punish them "according to domestic usage."

Faults of early manufacture

Under the reign of Peter some 100 private factories were started, but of these most were feeble undertakings, created to enjoy privileges but unable to make an effective use of them. A report of 1727 showed that the products were dear and of poor quality; merchants petitioned to be allowed to import better goods at a lower price. The processes and implements had to be adapted to unskilled forced labor, and remained always the same; long hours were required to make up for low productivity. An account of woolen factories about 1750 shows them dark and dirty, with leaky roofs and earthen floors; some of the laborers had not even a whole shirt for clothing. In the latter part of the century the Empress Catharine, by abolishing many of the special favors, stimulated more enterprise and started a growth which continued after 1800.

Manufacture in 1826

A report of 1826 supplies a statement of the number of laborers employed in different industries which is particularly useful because it distinguishes different classes of labor; this will be made the basis for a description of Russian manufacture in the period of serfdom.

Industries	*Manorial Serfs*	*Possession Serfs*	*Free Serfs*	*Total*
Woolen	38,583	13,315	14,705	66,603
Cotton	247	2,239	44,535	47,021
Linen	1,483	6,629	18,720	26,832
Silk	658	1,065	8,481	10,204
Iron, steel	14,820	2,650	4,970	22,440
Cordage	167	33	2,303	2,503
Leather	539	2	7,460	8,001
Other	10,228	3,395	13,341	26,964
Total	66,725	29,328	114,515	210,568

At the time when these figures were compiled the total population may be set, roughly, at 40,000,000. Obviously factory industry played a very small part in the national economy. The

figures omit some of the smallest factories, which would make little difference if they were included in the aggregate. It is important, however, to realize that most of the manufacture in Russia at this time took the form of peasant *kustar* industry, which will be described later.

The most significant feature of the table is its distinction of different kinds of labor, very unequally distributed in the various industries. In every factory the work was done by serfs, but by serfs working under very different conditions.

Manorial factories

Manorial factories belonged to nobles who got the labor force from their own serfs. The nobles wanted money to spend and sought it by arranging for the production of wares which could be sold off the estate. They managed to restrict the right of members of the commercial class to buy serfs, and were for a time the prominent representatives of the manufacturing class in Russia. The table shows that most of the laborers in these manorial factories were to be found engaged in making either woolen cloth or iron and its products. The cloth industry was still predominantly a peasant trade, it required some crude machinery and some little division of labor, without needing great skill or refined technique to produce the coarser products. For a time every large estate had a cloth factory, of which the ruins could still often be seen toward the close of the nineteenth century. The establishment of a factory was a summary process. A certain landlord, P., took the land away from his serfs, and ordered them to work in the factory which he had started; another, V., bought up in 1828 an abandoned country house and gathered in it a labor force made up of serfs collected from his villages in 7 neighboring provinces. Little is known about the conditions in these manorial factories. A report of 1803 shows that in some the laborers received no pay, in some they got pay in money or in kind. In all, we may be sure, they were punished if they did poor work or did not finish the task set for them. A certain Mme. Voejkova, employing about 300 serfs in her manorial factory, tyrannized over them so heartlessly that, as recounted by an old man who had worked under her, they still could not think of her without horror and trembling. Every day she would have some 10 or 15 workers unsparingly punished for the slightest fault.

Iron

To a reader accustomed to the huge undertakings in which the manufacture of iron and steel is now carried on, it will seem strange to find these metals listed with woolen cloth as the leading products of servile groups working under private landlords. It may seem even more strange that in the period about 1800 Russia was able to export large quantities of bar iron, sold in western Europe in competition with home industries. Russian iron was well known in the London market by the name of the maker, Peter Demidoff, Strogonoff, etc.; and it is said that Russian landlords who engaged in the iron manufacture in the eighteenth century made princely fortunes. The explanation is found in the fact that the iron was produced by the most primitive methods in which crude labor and abundant raw materials (charcoal!) played the major part. The iron export diminished rapidly as Western countries improved their methods. Serfs worked in the Russian industry under conditions approaching slavery, and under those conditions progress was not possible. The more advanced branches of metal manufacture were carried on not in factories but by little groups of peasants working in the villages.

"Possession" factories

"Possession" factories were those which had received from the government favors in the form of subsidies (land, buildings, money), and particularly in the form of labor: the permission to buy serfs even though the proprietor was not noble, and actual grants of serfs from the crown estates and from miscellaneous sources. Some of these possession factories were very large; Count Potemkin's cloth factory at Gluskow employed over 9,000 males, and other factories had a labor force considerably exceeding 1,000. The possession serfs were bound not to the individual but to the factory; the proprietor was obliged to keep this in operation, and in theory was subject to supervision and regulation by the government. The semi-public position of these factories, which represented in fact the remnants of the policy of Peter the Great, has preserved a fairly definite record of conditions prevailing in them. Wages were low; the average *monthly* wage about 1800 may be put at 4 rubles, which would equal 6.40 rubles ($3.25) of 1900 if account be taken of the change in the price of bread. These wages were reduced by truck and by fines; hours

of work were long; punishments were frequent. In Vigel's cloth factory children began work at 10 years of age. They had to rise at 1 A.M. on Monday, 2 or 3 A.M. on other days, and work to 9 P.M., with allowance of 3 (winter) or 4 (summer) hours for meals and rest. The firm of Jakowlew, in the town of Jaroslaw, had the largest linen factory in Russia, employing over 2,000 possession serfs. In 1803 these took advantage of the theory of state regulation to petition for an increase of wages; their representatives got merely a whipping. A deputation to the czar again in 1804 was similarly rewarded. Another deputation in 1805 was again punished by the knout. In 1824 wages were at last raised, and the working time was shortened. The history of these possession factories was a constant succession of labor disorders, repressed by the knout, by condemnation to the army, or exile to Siberia.

"Free" labor

The expression "free serf" may seem to be a contradiction in terms. It is used to describe a person who was by status a serf subject to a lord, but who had made a bargain with his lord by which he paid a certain sum, *obrok*, in place of rendering labor. This process of commutation of customary labor dues for definite sums of money had been common in Western Europe in the later Middle Ages (fourteenth century), and extended rapidly in Russia before and after 1800. It offered advantages to both parties. If, for illustration, a serf rendered forced labor which was worth to his lord $10, it is quite conceivable that working freely for himself he might produce something worth $20. Commutation of the dues for $15 would then leave each party $5 better off, the result of the release of a new spring of energy.

Superiority of "free" serfs

In manufacture the defects of forced labor became particularly apparent. Laborers who worked not in hope of a reward but in fear of punishment did as little work as they dared. They could be trusted only with the simplest tasks and the simplest instruments. It would be an entire misapprehension of the great "possession" factories to assume that they resembled in anything but in mere number of laborers the factories of the West. They were simply great groups of peasants, collected to work under a taskmaster, without power, without machinery deserving of the

name, without effective organization. Both the manorial and the possession factories declined in importance in the first half of the nineteenth century. Even in Russia under serfdom the superiority of free contract to compulsion became apparent, and the "free" serfs formed a constantly larger proportion of the factory workers. The proprietors of possession factories found them to be not a privilege but a disagreeable responsibility. A law of 1824, passed at their instance, allowed them to grant freedom to their serfs, on approval by the government; another law, of 1840, facilitated further the process of liquidation. It is thought that half of these factories renounced forced labor of their own accord. They wanted to be able to introduce the superior machinery which was in use in factories employing free labor; they wanted the higher output which came with free labor; they wanted to be relieved of the sullen resistance and constant vexations attending compulsion. A typical illustration is that of a woman who had inherited a factory, had always to be appealing to the authorities to assist her in keeping order in it, and who now petitioned for permission to free the workers. It is significant that the cotton manufacture, which became the most important branch of industry in Russia, grew up from the start on the basis of free labor. Introduced about 1750 in St. Petersburg by Englishmen, it had no help from the state except the protective tariff, yet it distanced the other industries.

Conditions of "free" labor

We must not exaggerate the amount of "freedom" which crept into Russian manufacture in this period. The term is always relative, and in Russia, even after 1861, it meant something different from what it meant in Western Europe. In one of the biggest spinning factories in the province of Moscow, in which the work was done by laborers working under "free contract," there was an insurrection in 1844 which had to be repressed with the help of the army. The men revolted because they were not paid the full wage for which they had contracted; part of it was paid to overseers and to the village authorities. They lived still in buildings called "serfs' dormitories," named after the landlords of villages from which the men came. The most curious mixture of freedom and serfdom appeared in Iwanowo, the seat of a highly developed manufacture of textile products. The place and the

people belonged to a great landlord, Count Schermetyeff. The manufacturers were serfs who made their contracts for buildings, machinery, and laborers, always in the name of their lord and under the control of his agent. He made a princely revenue, imposing fees on all these transactions, and extorting money from the serfs according to the wealth which they had accumulated. He would make the son of a wealthy serf pay up to 30,000 rubles to avoid a sentence to army service, a daughter 10,000 rubles or more for permission to marry as she pleased. The charge for complete emancipation was very high indeed. Some of the manufacturers who were eminent in the later period of capitalism traced back to a servile origin. The Morosoffs, prominent manufacturers in the latter part of the century, rose from a serf who started a silk factory soon after 1800, made wares of good quality and fast color, and prospered so that in 1820 he could buy his freedom for 17,000 rubles.

Difficulties of manufacture

A Russian economist, Tegoborski, estimated that about 1850 the value added by the manufacturers of the country was less than one-fifth the value of the gross product of agriculture. The value of the manufactured product per capita of total population was only 8.38 rubles (roughly $6.50), not much more than half that of a Central European country, Austria, and about one-third that of a western country, France. Yet the total which he cites was made up mainly of the products of peasant artisans and of village industries; the factories contributed the smaller part. If the reader will review the scheme, in the chapter on the English Industrial Revolution, showing elements in the course of manufacture, he will realize how ill-prepared Russia was to succeed in this branch of industry. Raw materials it had in abundance, and labor which was cheap measured by the day wage. But most links in the chain were weak: means of transportation, credit and marketing organization, funds of capital, expert and resourceful leaders. While the Russian organization remained medieval, it could not possibly develop modern manufacture. A disadvantage not quite so obvious but really most serious of all was the narrow market. A population composed mostly of serfs, thinking themselves fortunate if they could keep body and soul together, presented very poor customers. The Russian, in a climate marked by severe

cold, could afford per capita less than a quarter of the woolen goods bought by the average Englishman; his consumption of sugar was less than one-tenth of that of the Englishman.

Contemporary opinion

In their judgment on the economic institutions of the period the Russians show some curious conflicts of opinion, to be explained by the fact that they were trying to reconcile their own conditions with those of countries which had progressed hundreds of years beyond them. So they received with enthusiasm the work of Adam Smith, teaching the benefits of trade and of individual freedom, while they still clung to local self-sufficiency and serfdom. The conservative preached the benefits of agriculture, and questioned the moral influence of factories at the very time when the government was taking every means to stimulate their growth. Haxthausen, the German author who has already been quoted in praise of the system of communal land tenure, opposed private factories and wanted manufacture carried on by associations of crown peasants working under the supervision of officials, a system much resembling that of the " possession " factories whose evils have been described. The Slavophils would accept the factory only when its moral worth was proved, when it realized the principle " The manufacturer is the father, the laborers his children." One manufacturer actually wrote an essay to prove that his factory, at least, was a fine moral influence.

Imperial policy

There can be no doubt that the imperial government paved the way for its own dissolution when it built up the class of factory workers, locally concentrated, trained to organization. The revolutions which overthrew the government of the czar in the early part of the twentieth century might have been indefinitely postponed if the government had had to face only a scattered and ignorant peasant population. Why then did the government of the czar establish prohibitive protective duties, give all kinds of subsidies, grant all kinds of privileges, to further the growth of factories? It was not that it lacked forebodings, but that it could not withstand the pressure of interested individuals, nobles and merchants, who sought their personal gain, and cared little what happened to others so long as they got it. Only to the

ignorant peasant did the czar appear divinely powerful. Those near to the court knew that he was pitifully weak, an ordinary man surrounded by people who had selfish interests at heart, dependent on them for information and advice.

Kustar industry

Before entering on the development of the factories in the period after 1861, it will be convenient to consider the peasant *kustar* industries. In passing through its medieval period Russia never developed a system like that of Western Europe, in which craftsmen, professional manufacturers, collected in towns and supplied their products to the country districts immediately surrounding them. Russian towns were garrisons and places of administration, not centers of industry. What little manufacture existed was carried on in the country, for home consumption, on the estate of the landlord or in the home of the serf. Climatic influences played a part in developing a manufacturing industry from these crude beginnings. The short growing season, 4 or 5 months compared with 7 in the West, left the serfs with little to do for the larger part of the year. If they were to make a living they must find a productive use for this spare time. They employed it in part in supplying their own needs of clothing and other manufactured wares. An author writing in 1880 describes the domestic industry of a village in central Russia as he had seen it, a picture resembling that of the Colonial American "spinning-bee." The girls of the village would assemble in the evening, from November on, in a warm room in one of the houses; the young men would gather with them, passing nuts about and singing. The girls would spin wool in the first part of the winter, would spin flax and weave linen in the latter part. They had not a spinning wheel, usually not even a distaff, but with a comb to cleanse the fiber would spin the yarn entirely by hand.

Examples of *kustar* industry

This pleasant picture of a merry social gathering is true undoubtedly of peasants who were well-to-do, and needed merely to supply their own household requirements. But a large, perhaps the major, part of the country population had to take their industry more seriously. They must produce not only for themselves but also for an outside market, to supply the deficiencies

of their agriculture; not only women but also men must work; and they must work day as well as night. Every locality had some appropriate raw material: flax, hemp, wool, fur, leather, clay, wood, iron. A German writer about 1800 describes the country people as manufacturing for sale shoes, slippers, boots, coats and other articles of clothing, furs, beds and coverlets, tables and chairs, " in short every imaginable thing." Particular regions became noted for their specialties. The village of Pawlowo on the river Oka (province Nijni-Nowgorod) was in a region where iron was smelted, and took up the manufacture of locks. Before 1800 it had added the trade of knife-making, and about 1830 it was taught by a French merchant to make shears. The region became noted for its cutlery and hardware; many villages were engaged in their manufacture. The manufacture of nails, established in the seventeenth century in the village Uloma (Nowgorod) became the major winter industry in 200 villages of the region. Scythes became the specialty of Chritonowo, pottery of other places, wooden spoons of still others, and so on indefinitely.

Relation of *kustar* to factory industry

Russia, unlike the West in so many respects, is peculiar also in the succession of its industrial stages. Its industry, before 1700, was based not on a class of professional craftsmen, but on an agricultural population pursuing manufacture as a by-industry. Then the factory, an exotic institution, was introduced ready-made. The next step was a reversion, measured on the Western scale. Factories spread the knowledge of manufacture in the districts about them, and built up competition among peasants working at home, either under merchant employers or more or less independently. Village industries grew up like mushrooms in a ring around the factories. The burning of Moscow at the time of Napoleon's invasion (1812) was an important event; it scattered merchants and workmen who had gained a knowledge of the new wares and processes, and used it to start a new industry in the home village. A petition from the Chamber of Commerce of St. Petersburg, 1823, complained that factories could not develop because of the competition of peasants, who paid no industrial taxes and obeyed no regulations, and (the usual charge against a competitor) who gave short measure and poor quality. There was a district check to the growth of the factories after 1840, due to

the development of *kustar* industry. The number of workers employed in weaving mills declined, while the importation of cotton and yarn increased rapidly; peasant weavers were taking away the trade. They bought the yarn, wove it into cloth which they dyed or printed, and marketed it at the fairs. Some carried the product, mostly on their own horses, for over 500 miles; some went to a fair with 3 wagons full. It must be understood that power looms were not introduced into Russian textile mills until about 1850, so the peasants were in this regard on an equality, and had the advantage of superior initiative. With the development of improved machinery in the factories, power looms and cylinder printing machines, the balance was turned the other way. Yet even in the latter part of the nineteenth century more than half of the peasants engaged in industry on a small scale in the province of Moscow carried on trades which had been developed first in factories or large workshops.

Variety of peasant occupations

In 1900 some 7 or 8 million peasants were estimated to be regularly engaged in *kustar* industry; their products were valued at about 500 million rubles (say $250 million). The ordinary peasant had to eke out the living from his land by some other source of revenue. Many left the village for part of the year, to work in a factory or to undertake some service; those who stayed at home could remain their own masters by plying a trade. Thus, a skilled observer who lived in central Russia and wrote about conditions before 1880, said that in his village the peasants who were not needed to cultivate the land were sailors in summer, dug gypsum at home in winter. In a nearby village the surplus peasants went to Moscow as carters in summer, wove baskets in winter. " Every single village has besides agriculture a by-industry, either a trade carried on at home or a migrant trade (*Wandererwerb*). Here the peasants work at home in the forest, they cut down, carry, and raft the wood, or they quarry stone or earths, or they are spinners and weavers, printers and dyers, smiths and locksmiths, tanners and curriers, saddlers and shoe-makers, hat- and cap-makers, tailors, candle-makers, brush-makers, cabinet-makers, cartwrights, spoon-makers, basket-weavers, potters, painters, or practise another trade. There the peasants go abroad as carriers or as workers on boats, in building, on railroads or in factories,

as tailors and cobblers, coopers, servants of all kinds, as peddlers, veterinaries, and even as professional beggars." He estimated from the issue of passports and tickets of leave (good up to six months) that nearly half of the adult male peasants of his region were away part of the time, in earning their living; the number increased after a crop failure. They went all over Russia, even to Siberia and Central Asia; they went into factories, to the cities, to other country districts, or made their living on the road.

Kustar industries in Central Russia

An idea of the nature and organization of the *kustar* industries may be had from statistics of the province of Moscow before 1880; figures of the number of villages engaged are lacking for some industries and the table following is merely an extract from the original.

Kustar Industries	*Villages*	*Establishments*	*Workers*	*Workers per Establishment*
Pictures	14	174	342	2.0
Cabinet work	87	708	1.979	2.8
Iron work	—	36	114	3.1
Pottery	—	121	452	3.7
Hooks and eyes	15	44	197	4.7
Copper ware	—	139	716	5.1
Brushes	16	150	835	5.4
China painting	—	37	313	8.5
Pins	6	10	163	16.3
Horn combs	14	53	1.020	20.0

Characteristics

We have here a picture of little workshops, manned by members of a family or small coöperative groups, scattered all over the countryside. The workers were free from the prison discipline of the factory. They had lost, however, the economic independence which apparently many had enjoyed in their earlier development. Merchants had inserted themselves between the producer and his market, and the workers were helpless in the hands of these middlemen. Good enough to hold their own against the early factory, they had still all the faults of a small and primitive organization; they depended entirely on hand work, were slaves to routine, lacked knowledge and capital. The results were inevitable; they worked hard for a living. At Pawlowo the lock

trade was still carried on entirely by hand, and every lock was individual, but the keys were ill fitted and the returns were desperately low. The smiths got up to work at midnight and worked stark naked until 9 at night, with pauses aggregating 3 hours for meals and naps. Working thus 18 hours a day, young and old, they were earning in 1879 not over 3 rubles ($2.30) a *month*. The nail-smiths of Moma worked from 2 A.M. to 8 P.M., the pin-makers of Serpuchow from 4 A.M. to 11 P.M. Other trades were not as bad as these, in which the competition of machine products seems apparent; and the long hours were alleviated by pauses, by frequent holidays (130 to 145 in a year, counting Sundays), and by the change to outdoor work in summer. Yet in the village shop of the period, as in the field and in the factory, the portion in life of the Russian workman was very scanty.

QUESTIONS

What were the occasion and character of factories established by Peter the Great?

What were the faults of the early factories?

What different classes of labor were employed before 1861? In what industry was each most important?

What were the occasion and character of the manorial factories? In what industries were they important? Why?

What were "possession" factories? How were the laborers treated?

Explain the term "free serfs." Explain their superiority to manorial and possession serfs.

Why did factory owners favor emancipation?

Illustrate respects in which "free" labor was unfree.

What were the obstacles to effective manufacture in this period?

Explain inconsistencies in theory and policy.

Explain the importance of village *kustar* industry.

Give examples of *kustar* industry.

Explain Russian contrast with the succession of stages normal in the West — handicraft, merchant employer, factory.

Illustrate the extent and variety of *kustar* industry.

What were characteristics of conditions of work?

READING

The Industries of Russia, St. Petersburg, 1893, contains 22 chapters on different industries and other chapters on wages and hours in Volumes I and II, and chapters on household (*kustar*) industry in Volume III. Scattered accounts appear in books of travel and in periodical literature.

Industrial development since emancipation. (Ogg and Sharp, chap. 15, pp. 315–324; Knight, Flügel, and Barnes, chap. 15, pp. 756–766.)
Domestic (*kustar*) industry. (Hindus, chap. 7, pp. 108–123; W. B. Steveni, "The Village Industries of Great Russia," in *Contemporary Review*, March, 1922, 121 : 338–343.)
Peasant work in winter. (Palmer, chap. 17, pp. 234–248.)
Industrial coöperative associations. (Palmer, chap. 20, pp. 281–295.)
Town life and trade. (Palmer, chaps. 10–12, pp. 127–165.)

CHAPTER XVIII

RUSSIAN FACTORY INDUSTRY

Economic development after 1861

Before the emancipation of the serfs in 1861, partly as a result of the Crimean War and the reforms to which it led, Russia passed through rapid changes in its business organization. From the founding of the first joint-stock company in 1799 down to 1853 there had been formed 26 companies with a total capital of 32 million rubles. In the 2 years, 1857–58, 47 companies were founded with a capital of 358 millions. The new companies were devoted mainly to the development of the transportation system. In manufacture the emancipation dislocated the labor system of the past and required a reorganization which lasted through a considerable period. Laborers who as serfs had been held to their task fled from the factories and the mines. The manorial factories melted away; in some cases they were bought out by peasants. Gradually the factory system was adjusted to the new conditions and developed on the basis of free labor. Reliable statistics are lacking, but it is estimated that the factory population grew three- or fourfold in the period 1860–1900. Russian manufacture continued, however, subject to the peculiar conditions inherited from the period of serfdom, and developed in forms different from those of Western Europe.

Weakness of manufacture; reasons

The weakness of Russian industry in 1861, the date of the emancipation, can be measured by the part it played in foreign commerce. The only important manufactures which the Russians could produce to such advantage that they could export them to foreign markets, in competition with others, were flax and hemp yarn, rope and string, and sacking; less important items among the exports were spun silk, sailcloth, linens, and coarse woolens. In the world exposition of 1867 Russia made a creditable showing only in old domestic industries based on cheap raw materials and peasant labor. Factory products could still be produced only

under the protection afforded by the distance from western sources of supply, and by the high rates of the customs tariff.

The Russians, entering late the stage of machine industry and borrowing its ideas ready-made from other peoples, showed the weakness of inexperience. It has been said, perhaps with some exaggeration, that the only native Russian invention was the samovar, tea-urn. Certainly the Russian manufacturers had to depend on foreigners for technical guidance; they got their experts first from the English, later particularly from the Germans, who entered Russia by the tens of thousands in the period before 1900, most recently from the Americans. Statistics will be supplied later to illustrate the lack of natives with a good technical or even with an elementary general education, to take the subordinate and intermediate posts in the Russian factory organization.

Comparable in importance to the lack of technical knowledge was the inability to coöperate effectively in modern business organization. Peter the Great had found the sharp class divisions which always attend a system of serfdom, and had intensified them by legislation which made still more definite the separation of nobles, merchants, and peasants. Those who knew well the Russian people in the nineteenth century described the divisions between classes and even inside classes as almost unimaginably sharp. Even after 1900 the proprietary class was pictured as in the position of feudal barons, separated by a social abyss from the salaried managers and technical employees. An official commission in 1886 charged that the owners of the great factories of central Russia were often ignorant of the business, took no active part in the management, worked spasmodically if at all, and lent themselves to useless extravagance.

Relation to agriculture

The characteristics of Russian factory labor will be the subject of somewhat extended discussion later. At this point in the survey attention need be directed only to the peculiar fact that the Russian factory worker remained in most cases still a peasant, still tied to the soil. Investigations in 1879–85 showed 94% of factory workers in the province of Moscow to be peasants, members of some village community in which they paid taxes and from which they had a leave of absence. A considerable part of the population of the towns, even of the great cities, was composed of peasants. The

great size and modern equipment of some of the factories must not blind us to the fact that manufacture was still in a sense a by-industry, carried on in combination with agriculture. Factory wages were affected by the outcome of the harvest; factories paid 10% to 20% higher wages in summer than in winter; many factories shut down entirely during the harvest season. The situation was bad from the viewpoint of the manufacturer, who could not count on a steady supply and permanent force of laborers. It was bad as regards the laborer, in that he was not solely dependent for his livelihood either on agriculture or on manufacture. Manufacture being to him merely the means of filling out an income gained mostly from the soil, he was a poor bargainer over against the manufacturer, and was made to submit to the low wages, the long hours, and the other wretched conditions which will later be described. The situation resulted in the manufacturer shifting to the village the responsibility of making up a living wage.

Stages of factory development

An acute German observer, Schulze-Gävernitz, distinguished four different stages of development in the Russian factory organization of this period. The first and most primitive had passed away, for the most part, before 1900. A small factory would be established out in the country to get what labor it could pick up from the peasants of the region. No provision was made for housing them. They would come bringing food for a week — little but black bread — and would spend Sunday at home. They would eat and sleep where they could in the factory, on the floor, on the work-table in a chocolate factory (!), wherever there was a vacant space. The labor force was very irregular; the manufacturer would engage 3 or 4 times the necessary number, and would still lack hands.

In the second stage, which became the most common form, the manufacturer employed laborers coming from a distance and staying a considerable time. These were mostly men, who left their wives and children at home in the village. This stage was an improvement in that permanent quarters were provided for the workers, but accommodations were still primitive. Two shifts of men might occupy the same bunks; the kitchens were dirty, soup would be made in the wash kettle, and so on. To illustrate conditions the author cites a scene in one of the best-known fac-

tories in Moscow where the owner, drawing a curtain, showed him a gigantic privy occupied by 60 or 70 workers of both sexes; it served as a common smoking and conversation room, and was often the playground of the children.

Extent of plant

In the third stage, found in the more progressive factories about Moscow, particularly the spinning mills, the working force was composed not of single men but of married couples. An employer could get both a better quality of labor and a more permanent force if he made provision for lodging both the man and his wife. They slept in gigantic halls with hundreds of beds curtained off. The factory provided not only a hospital but a lying-in establishment, where children were born. Most of the children were sent back to the village, but those of specially valuable laborers were allowed to remain and were educated in a factory school. It is said that children of this class were able to learn in 3 or 4 months as much as the ordinary peasant could in 3 or 4 years; they were the beginning of a regular class of competent factory labor such as had been developed in Western Europe.

To illustrate a factory of this kind the author describes one which he visited, employing 6,000 workers and lodging a population of 20,000. It was established in the midst of a boundless forest. It included a spinning factory with buildings of 4 to 6 stories, sheds for weaving, a bleachery, printing and dye houses, shops for carpentry and metal work, immense warehouses for raw material; further, stone barracks for the workers, cottages for the foreign superintendents, retail shops, a bakery, a slaughter-house, baths, a general hospital and a lying-in hospital, 2 churches, a school, and a fire department. All this and the forest about it were owned by one man.

The fourth and most advanced stage scarcely needs description, for it was that usual in Western Europe. The plant was restricted to the factory proper; the workers were free to lodge where they pleased. This stage was found in the large cities, particularly in the machine industry, but was still exceptional.

Requirements of capital

From the preceding description an obstacle to manufacture in Russia can be inferred which has not yet been emphasized, the

need of great capital to establish a factory plant. The manufacturer must provide all the supporting services, warehouses, repair shops, etc., and must further provide the living quarters for his working force. A spinning factory was estimated to require 3 or 4 times as much capital per spindle as in England. The rate of interest was much higher in Russia than in Western Europe, and this intensified the disadvantage.

Factory labor

We return now to the subject of labor, to be considered in such detail as is merited by its economic and its social importance. Let it be remembered that the typical factory worker was a peasant, removed only one or two generations from serfdom. He still had what may be described as a medieval nervous organization. All observers were impressed by his capacity to endure pain and privation. The porter at the entrance door or the driver of the sleigh would sit quiet all night in a temperature well below zero Fahrenheit; women would wash their clothes through holes cut in the ice. Potters working in a temperature of 90°, stark naked, would carry their wares a hundred yards outdoors, in a temperature far below freezing, without putting on a stitch of clothing. These sluggish nervous reactions are at best negative merits; they imply a body hard to train to the quick response needed for the manipulation of machinery.

Faults of labor

More serious still than the physiological was the mental and moral make-up of the peasants. Serfdom had trained him to subordination and to patience; these again were negative virtues. Serfdom had tended to repress rather than develop such qualities as ambition, foresight, thrift, initiative. "The unanimous judgment of the employers," wrote the Consul General of the United States at St. Petersburg, 1884, "is that the Russian laborers as a class are idle, unreliable, and wasteful. They are intelligent and obedient, but these redeeming qualities shine forth only under the strictest control. . . . The principal causes of their degradation are drink, to which they are excessively addicted, ignorance, and the absence of anything like home life." Roscher, the German economist, commenting on the adage "Time is money," noted that in Russia the church towers seldom had clocks. The Russian

peasant when he could afford it dearly loved to own a large silver watch, but it was for display and not for use. Trained to routine by their village life the peasants resisted any change, even for the better. When the proprietor of a large sugar factory, to improve the barracks where the men slept, built separate sleeping cots, they complained: "Are we cattle that we should be thus cooped up in stalls?" Andrew D. White, American ambassador in St. Petersburg at the time of the cholera epidemic of 1893, says that when the people were instructed to drink only boiled water or tea they answered: "If God had wished us to drink hot water he would have heated the Neva." Taking together all the characteristics of the peasants, they could not and they would not do their work with an efficiency comparable to that of the Western factory worker.

Labor cost

In spite of low time-wages, the labor cost in manufacture and mining was higher than in an advanced country like England. Redgrave said at Bradford, in 1871, that Russian factories with two shifts, each of 75 working hours a week, would not produce more than an English factory in which a single group worked only 60 hours; in Russia there were never more than 2 looms to a worker, and they ran at only two-thirds the English speed. Writing in 1866, possibly with reference to conditions under serfdom, an author reports: "I once heard it remarked by an ironmaster carrying on his trade in Russia that he would rather have 300 English workmen, at their high wages, than 2,000 Russians." An Englishman, Hughes, complained of "dear labor" as the cause of the high price of coal, when he was paying miners 1 to 1.50 rubles ($0.75 to $1.15) a week; the men came from the plow and hacked away any fashion at the coal. It was said that the iron produced in the Ural region in 1893 by 142,000 men could have been produced in southern Russia by 24,000 and in Belgium by 11,000.

Hours

The low rate of production of the worker was bound up, both as cause and effect, with low wages, long hours, and bad working conditions. Even the freedom of contract which in theory now prevailed existed for most of the workers and for a large part of the period only in appearance. The bad features of compulsory labor

persisted when the peasant was forced into a factory which he hated, to work on terms which he was powerless to alter or to reject.

In the Moscow district about 1880, the working time was as follows:

in 55 factories	12 hours
48 factories	12 to 13 hours
34 factories	13 to 14 hours
9 factories	14 to 15 hours
2 factories	15½ hours
3 factories	18 hours

An extreme case was presented by a mat factory in another province in which work began at 1 A.M. and lasted to 11 P.M., with half-hour intermissions for breakfast and dinner. Such a schedule seems impossible, even if the workers slept night and day on Sunday and holidays, as they were said to do; and one is less ready to accept it as a fact because a large proportion of the workers in these mat factories were children, of whom many were under 10. If not a fact, it represented at least a limit toward which facts tended. A Russian author writing in 1869 said that factories in which men, women, and children worked 14½ hours a day were regarded as "model." In bakeries and some other branches the hours ran up to 14 to 16 and even more. In the latter part of the century the 12-hour working day became usual. Too often, however, the manufacturer, desiring to make the most of his expensive capital, arranged shifts to use the whole 24 hours, and divided the time between them in such fashion that effective repose was not possible. Examples are given below of the division of the day between shifts, the last plan representing the advanced practice of the best spinning factories towards the end of the century.

PLAN A

Day Shift	*Night Shift*
4 : 30 A.M. to 8 : 00 A.M.	8 : 00 A.M. to 8 : 30 A.M.
8 : 30 A.M. to 12 : 30 P.M.	12 : 30 P.M. to 1 : 30 P.M.
1 : 30 P.M. to 8 : 00 P.M.	8 : 00 P.M. to 4 : 30 A.M.

PLAN B

	Shift I	*Shift II*
First day	4 A.M. to 10 A.M. 4 P.M. to 10 P.M.	10 A.M. to 4 P.M.
Second day	10 A.M. to 4 P.M.	4 A.M. to 10 A.M. 4 P.M. to 10 P.M.

Child labor

Facts published in 1870 showed that children under 10 years of age worked in most factories the same long hours as the adults, up even to 15 and 17. The factory owners asserted that if they did not work there they would waste their leisure and ruin their health in the bad atmosphere of home! With the picture which they presented of the "bright and wholesome" factories should be compared the accounts by factory inspectors, published about 1880. They found tanneries in which the workpeople ate and slept in an atmosphere fetid with decomposing animal matter; a leather works which the inspector was absolutely forced to leave, coughing, and eyes running after a stay of 3 minutes; a large bakery in which the people slept on the tables on which they made bonbons and cake. The large textile factories were kept clean, but at such a high temperature that the workers appeared prematurely aged.

Wages

Wage statistics are notoriously uncertain; we cannot expect to find in the Russia of this period figures as reliable as those now compiled, and even if we had them should find it difficult to make an exact comparison with other countries, since all the conditions in Russia were so different. But all the facts available support the general statement that the Russian factory worker received a time-wage which was a mere fraction of that paid in Western countries. The following table gives figures, from a good source, of monthly wages paid to adult male workers about 1885. Women received somewhat over two-thirds of the man's wages in Russia, children somewhat over one-third.

	Cotton Spinning and Weaving	*Construction of Machinery*	*Hours of Labor*	*Pay per Hour*
Russia (Moscow) .	$10.50	$18.00	285	
England	32.00	34.00	235	× 4
Massachusetts . .	41.00	51.00	256	× 5

The figures for the Russian wages are averages of the rates nominally paid, but these were subject to deductions which would make the real wages actually less. A Russian writer asserted in 1869 that in all the factories the laborers were not making a living; the frequent impositions so reduced the small pay that the workers were all in debt to their employers. Records of the

period about 1880 show an elaborate list of fines: so much for climbing the factory fence, 1 ruble for going to the gate, ½ to 1 ruble for lying down in the wrong place, 3 rubles for bad language, the whole day's pay for 20 minutes' tardiness. Factory stores, at which high prices were charged, were usual except in the large cities. A man leaving employment frequently lost the pay of 1 or 2 weeks, in many cases the pay of a month; in one factory he lost half of the total pay due him. Before 1886, when the government intervened to furnish some protection, the proprietors paid when they felt like it, in some cases once a year. More commonly they paid at the great festivals, from 4 to 8 times a year, and would sometimes give advances on the wages, but at a discount of 10%.

Living conditions

Conditions of life in factory barracks have already been suggested. The decencies of life, as they were rated in Western Europe, were not regarded. Factory inspectors reported, about 1880, that in many factories they found no privies, and nowhere proper provision of them. In some districts the factory workers in summer left the barracks, which were hot and infested with vermin, for shelters outside which they built of boards and broken boxes. These resembled hen coops. They measured perhaps 6 by 8 feet and were less than 4 or 5 feet high, yet each would shelter 2 or 3 workers, who entered by crawling on their hands and knees through a little opening. Over 100 of these would often be seen about a factory.

The condition of workers who lodged outside the factories, and who seemed in that respect to enjoy the advantage of independence, was in many cases actually worse. Russia was not prepared for the growth of large industrial towns, and was slow to provide such municipal services as street paving, removal of refuse, provision of water, and so forth. A sober observer, in noting the fact that a little girl was drowned in attempting to cross the street in the city of Kharkoff, 1885, says that there were many cases of the kind. It was asserted in 1869 that in 10 of the 12 industrial provinces the mortality was higher than in the worst quarters of London. Russia about 1880 was passing through the stage from which England had begun to emerge some 50 years before. A report on an industrial quarter of St. Petersburg stated that it was

exceptional for a family to have a room to itself. One room might contain several families, crowded into bunks.

The food of the factory workers, whether they lived in barracks or outside, was the characteristic peasant fare, ill-suited to indoor workers. It consisted of a monotonous succession of black bread, cabbage soup, wheat or buckwheat porridge with beef fat, potatoes, sour cabbage with hemp oil, kvass (small beer) with cucumbers. On fast days, of which there were 190 in the year, the salt beef in the cabbage soup was replaced by herring, and the beef fat by hemp oil.

Conditions in Chludowo's factory

A more definite picture of factory life about 1880 can be given by describing the fortunes of workers in the Chludowo textile factory in central Russia, employing about 2,500 hands. They were lodged in three-story barracks, damp, dirty, prison-like. A doctor reported that the allowance of air space was one-third of the normal. One room of 2,800 cubic feet capacity (such as would be enclosed, for example, in a room $20 \times 20 \times 7$) was occupied in work time by the resting shift of 17 persons, on holidays by 35 to 40. The people worked day and night in 6-hour shifts, a total of 12 for each. About one-quarter was aged 14 or less, another quarter 14 to 18. They were engaged for a year, and were not free to leave before its expiration, but could be dismissed at pleasure, and were sometimes turned off without pay. They were paid in truck, and fines were so arbitrary and so heavy that a man might have nothing coming to him at the end of a year of work. The incidence of illness was inordinately high, and the percentage of injuries by accident was over tenfold that current in Germany.

Mr. Chludowo, who had become a millionaire by his profits, was of a pious disposition, and had established a printing house to further the circulation of religious literature of the sect to which he belonged. When the prices of cotton goods fell, in 1880, he announced a cut of 10% in wages. The English superintendent fled; he had already been beaten once by the workers. The laborers asked for their discharge, which the proprietor refused. The governor of the province arrived with military, and got Chludowo to promise to keep wages at their former level. After his departure Chludowo announced that wages would be reduced

15%, and arrested the ringleaders of the opposition, who were kept in confinement 5 months until they were tried and freed. In January, 1882, the whole factory burnt down, and 7 wagon-loads of corpses of those who had been shut in the building to fight the fire were taken out.

Government regulation

The government awoke late to the evils of the factory system, and was slow to act in repressing them. In 1862, the year after emancipation, a commission which had studied the matter proposed regulations of the kind established in Western Europe, affecting the employment of children, hours of work, housing, etc.; and proposed that manufacturers should compensate the worker or his family for injury or death not due to his negligence. Against the opposition of the manufacturers nothing could be accomplished. This was a period in which a man who had lost his hand in the machinery could be dismissed without a cent, in which the dependent families of men who had been killed at work might be given a few rubles as an act of charity. Factories were supposed to maintain hospitals and doctors, but in many cases evaded the requirement.

A law of 1882 was the first to approach at all seriously the factory problem. It forbade the employment of children under 12 years of age, limited to 8 the working hours of young persons aged 12 to 15, and prohibited night work to those under 21. The most important part of this measure, however, was the provision of factory inspectors to watch its application. Russia had learned from the experience of other countries that factory regulations were utterly ineffective without a special administration to enforce them. So this new organization was important, even though at the start it was very weak; there were so few inspectors that each had an immense district assigned to him, and they could do little except to inform the government of evils which were too deep-rooted for them to eradicate. One inspector, with 1 or 2 helpers, had to cover a district larger than Great Britain. In time the more progressive manufacturers, particularly those in St. Petersburg, came to favor regulations which would raise the plane of competition, and the police urged them as necessary to prevent the open outbreak of workers. The abuses of truck payment and fines were restricted.

Improvement

An attempt to get the coöperation of manufacturers by the creation of factory councils in which they shared membership with officials was designed to improve conditions but had only slight results. Finally, in 1897, an act was passed of great significance. Previous measures had limited the working time only of women and of minors; this applied also to adult men. It restricted the working day to 11½ hours, on days before holidays and on days including some night work to 10 hours. It forbade labor on Sundays and on 14 (later increased to 17) festivals. The government itself found it impracticable, or, possibly, politically inexpedient, to uphold this reform; it was practically abrogated by a circular letter of the Minister of Finance (finance!) allowing unlimited overtime. The people at last accomplished what the government had been unable or unwilling to do. The revolution of 1905, in which the factory population showed itself a serious menace, led to a considerable reduction of the working time in the large cities. In Moscow, 1905, more than half the factories had (in form, at least) the 11½ hour day. In 1906 a little over one-tenth continued on this basis; by far the largest number (71%) had a 9- or 10-hour day. Many evils remained to be corrected when the World War broke out, but a competent German observer thought that at that time labor legislation was not far behind the Western standard, and that the administration by about 250 factory inspectors was at least fairly good.

Wages

The reduction in working time in the period 1880–1900 was attended by a rise in the rate of pay, and in many cases by an increase in earnings, measured by the annual income. An estimate based on figures in many different industries ascribed to the adult male worker a monthly wage of 20 rubles ($15), to the female three-fifths as much. Prices were rising also, however, and there is a question how much real wages, measured in goods and not in money, increased. One index of greater welfare is furnished by the statistics of the consumption of sugar per capita. While the average Russian (including all classes) consumed only 2 pounds a year in the early part of the century, the figure had risen to 11 pounds in the period 1897–1902, and rose again to nearly 16 pounds for the period 1906–11. It is impossible to determine

how this gain was shared among classes. This much is certain, that a considerable part of the factory workers remained on a desperately low level. In the revolution of 1905 there was a demand for a minimum wage of 1 ruble a day ($0.51; the currency standard was changed in 1897) for a male laborer, unskilled, and 0.70 for a female, and it is said that in many manufactures of Moscow and St. Petersburg the *average* wage was less than half of that. Even if the earnings of the St. Petersburg factory workers as a class had risen by 1910 to 30 rubles a month on the average, a figure for which there is some evidence, obviously the greater number of workers must have received less than this average. A Russian author pictures the status of this class in terms of annual earnings as follows:

up to 400 rubles ($200) a year: they remain single
from 400 to 600 rubles ($200–$300) a year: most marry
over 600 rubles ($300) a year: they can have children.

This author asserted that a deficit was the regular thing in the budget of the St. Petersburg factory worker, covered by borrowing when there was anything which could be pledged, borne by fasting when there was no other way out.

Conditions of life in the factory barracks improved in the period before and after 1900. The workers complained, "Horses in their stalls are better off then we," but the evidence shows a considerable reform in the arrangement of the sleeping quarters, and in the amount of space provided. In many barracks a room was still occupied by several families, but managers found that they could not keep the best class of labor unless they gave each family a room in which the members could sleep and eat by themselves, even though they still did their cooking in the common kitchen.

Housing

Conditions of housing in the large industrial towns, in which the workers lived in private lodgings outside the factory, remained very bad indeed. Building did not keep pace with the growth of the population. Rooms in the old houses were divided up, not only by vertical partitions reaching part way or all the way to the ceiling, but even by the insertion of new floors between the old (a practice used in the old-time Chinatown in San Francisco). One apartment was cited of which the ceiling was 3 feet high! Very few of these lodgings had the proper allowances of air. An

idea of their character can be given by extracts from the reports of Moscow inspectors: "damp and incredibly dirty"; "when it rains the water stands two fingers deep"; "the ceiling is so low that a tall man hits it"; "the plaster is crumbling on walls and ceilings, and the holes are stopped with rags. There is a great deal of dirt, and a multitude of lice and bugs. The stove has fallen to pieces. The privies are in such a dangerous condition that children cannot be allowed to use them. All the tenements in the whole house were like that."

To indicate the nature of these lodgings it is necessary to use a special vocabulary. On a scale of diminishing desirability the lodging may be rated in the following terms: room, roomlet, nook, bunk. The first and last of these will be familiar to a Western reader. Roomlet was a part of a room partitioned off; the term nook (German *Winkel*) may be used to indicate a smaller space protected only by a curtain. A typical group of the proletariat of St. Petersburg, with 200 to 400 rubles a year to spend ($100 to $200) was lodged as follows in 1908 (figures give percentages of total):

Single	*Families*	*Lodging*
5	—	Half bunk
20	7	Bunk
44	36	Nook
12	7	Half room
16	21	Room
—	21	Apartment with subtenant
—	7	Apartment without subtenant
4	—	Not specified

In Moscow, in 1899, roomlets were found housing 7 to 9 persons; they were let not only to families but to groups of strangers, including both sexes and all ages. A nook would accommodate a family of 4 to 5; the children slept with their parents or on the floor. A bed was sometimes used by different shifts, and in the course of 24 hours might take 4 or even 6 persons. Bunks ranged in width from 2½ to 4 feet, seldom over that, and often took 2 persons.

Strikes

Conditions of work and pay and life such as have been described above might appear tolerable to the Russian peasant just emerged from serfdom. To the second and third generation of worker,

able now to read and write, familiar with conditions in Western Europe, educated in theories the complete opposite of those ruling Russian life, these conditions became anathema. Strikes against them became more frequent. These were sporadic and ill-organized. They were no longer repressed by the knout of the Cossacks, but were often broken by high-handed measures of the proprietors who controlled both barracks and factory, and who would turn off the heat and light, or would simply turn the workers out of doors in freezing winter weather. A Russian author writing in 1907 could assert that the rights of the factory worker were little more regarded than they had been in the '80's. In many factories workers were still confined to the factory premises; in one large Moscow factory they were allowed to go out three times a week, but were subjected to a public personal search on their return. Inside the factory the strictest discipline was maintained. The foremen, of whom most had risen from the working class, tyrannized over the laborers, extorted "gifts" from them, still exercised personal violence. Arbitrary dismissal was still practiced and was pretty sure to follow an appeal by a workman to a factory inspector.

The position of the workers became stronger as more of them gathered in the large towns, living in private lodgings removed from the control of the factory owner. Strikes grew in number and importance. In 1903 the number of strikers reached an unprecedented figure, 200,000; in 1905, a memorable year in Russian history, the number was 10 to 15 times that. Students of Russian affairs could see already the writing on the wall, foretelling the fall of the old régime. The imperial government could not, of course, countenance an organization of the workers in the form of the Western trade union, but tried to guide the development by establishing *starosts*, elders, in the factories, through whom the manufacturers hoped to be better able to control the workers. This organization was merely superficial. Under the surface a class feeling was growing strong, destined to find violent expression in the World War.

Russian organization about 1900

An idea of the economic organization of European Russia about 1900 is supplied by estimates of the income derived from different sources of production. Figures are given in millions of rubles.

Occupations	*Rubles*	*Percentage*
Agriculture	2,738	45
Forestry and fisheries	326	5
Manufacture and mining	1,495	24
Transportation	531	9
Building	473	7
Trade	562	9
Total	6,125	

As these figures are based on the statistics of only a part of the country, they must not be compared with the total population; an estimate of per capita income, taking this fact into account, gives, as stated in a previous chapter, 63 to 73 rubles ($32 to $37).

An analysis in detail of the special branches of mining and manufacture gives the following results (figures in millions):

Net Yield	*Rubles*	*Percentage*
Mineral industry	249	17
Factory industry	506	34
Fiscal manufactures	198	13
Handicraft	338	23
House industry	204	14
Total	1,495	

The manufacture of certain products (sugar, beer, vodka, tobacco, etc.) was subject to special taxation and could scarcely be regarded as a free branch of industry. The other factories contributed only one-third, roughly, of the total in the table above, and contributed to the national income a value actually less than that ascribed to the *kustar* industries carried on in little shops or at home.

Foreign trade

Evidence still more impressive of the relative backwardness of Russia in modern industry is furnished by the statistics of foreign trade in a year (1912) just before the World War (figures in millions of rubles).

	Imports (Rubles)	*Exports* (Rubles)	*Imports* (Per Cent)	*Exports* (Per Cent)
Foodstuffs	138	740	14	56
Live animals	3	30	0	2
Raw materials and semi-manufactures	515	518	51	39
Finished manufactures	359	28	35	2
Total (including decimals)	1,015	1,317		

Some comment on the significance of these figures is pertinent. The very considerable excess in value of the exports, the so-called "favorable balance of trade," indicates that Russia was paying large sums in interest and dividends on money borrowed or invested in the country. It had every year to deduct from the national product, which in the aggregate was large but which seems pitifully small when divided up among the great population, a large amount to be shipped abroad, bringing no return.

The form taken by the exports is also significant. They were for the most part foodstuffs. In a country in which a large part of the people went hungry for a large part of the year, and in which famines were persistent, nothing better could be found to pay foreign debts than food. When the tax collector came to the village the peasant had to sell grain to get money; the grain passed into the hands of export merchants and was shipped abroad; the government with the money from the peasant bought up the bills of exchange representing these shipments, and with the bills paid foreign bondholders interest on the immense sums which it had borrowed for military expenditure.

Finally, and with particular reference to the subject of industry now under consideration, the absolute insignificance of the item of finished manufactures exported is impressive. Finished manufactures made up only 2% of the exports, and were exceeded more than tenfold by the manufactures imported. The tariff and other favors which had built up an extensive manufacturing industry had not made it strong enough to compete in free markets abroad, and had not relieved the country of considerable dependence on foreign sources of supply.

Management

At the end of the century there was still complaint that the native Russians were not prepared to organize and administer large-scale industry. The upper classes preferred government service; there was no real middle class; the lower class was insufficiently educated. An investigation in 1903 of establishments subject to the factory inspectors gave the following results, distinguishing the upper and lower ranks of factory administration:

Rank	*Russians*	*Percentage*	*Foreigners*	*Percentage*
Upper	15,013	91	1,421	9
Lower	14,330	83	2,855	17

Of the individuals in the table above, the percentage of those who had had a technical education, implying study not merely in primary and secondary schools but also in institutions of collegiate grade, was a follows:

Rank	*Russians*	*Foreigners*
Upper	14	40
Lower	14	29

In the lower ranks 265 were found, in the upper 97, who could neither read nor write.

The lack of effective native leadership was felt the more severely as the typical Russian factory was a large unit. Between the small shop and the great factory there was a dearth of undertakings of medium size; as the factory was not a native growth but an imported institution it was often a large undertaking from the start. Individual factories making porcelain, glass, rubber, cotton yarn, and shoes were among the largest in the world. Over half of the workers in textile factories were in establishments employing over 1,000 each; the 4 largest textile factories employed over 10,000 apiece.

In the period before 1900 the factories were reputed to return huge profits, from 10% up even to 50% on the capital invested. In the period after 1900 profits of this magnitude were exceptional. Most of the factories returned only moderate gains, some of them gave a net return below the average on industrial investments. Most of the gain, in any event, went to foreign stockholders, who got the benefit accruing from the low wages paid to the workers and the high prices charged to the consumers. The rates in the Russian customs tariff on manufactures were higher than those of any other country in Europe, and imposed on the consumer a burden which was felt the more as the per capita income was so small.

QUESTIONS

What were the conditions just before and after emancipation?

Illustrate and explain the weakness of manufacture then.

What was the relation of manufacture and agriculture? In what respects was this bad?

Distinguish four stages in the development of the Russian factory, with respect to character of labor and conditions of life.

How did the characteristic form of enterprise affect the requirement of capital?

REFERENCES

References below are given only to the more important sources from which the statements of the text are derived, but even in this summary form may serve as a check and as a suggestion of sources of information beyond those given in the body of the book. The list does not aim to present a bibliography. Only initial words of titles are capitalized and specifications are often abbreviated (L. for London, P. for Paris, etc.).

CHAPTER I

Occupations and Income: Gregory King, Natural and political observations, 1696, added with separate pagination to George Chalmers, Estimate of the comparative strength (L., 1804) [I have recast King's figures and corrected two mistakes in his multiplication]; International Statistical Year-book; Thorold Rogers, History of agriculture and prices, Vol. 6; National Bureau of Economic Research, Income in the U. S. (N. Y., 1921), 85, 134; Sir Thomas Smith, De republica Anglorum (1583) (Cambridge, 1906), 31 ff.; David Hume, Essays (L., 1875), 1 : 297; Sir William Petty, Economic writings, ed. Hull (Cambridge, 1899), 105 ff.

Economic Organization: Map from Gilbert Slater, The English peasantry (L., 1907), 9; Samuel Smiles, Lives of Boulton and Watt (L., 1904), 128; L. W. Moffitt, England on the eve of the industrial revolution (L., 1924), 136; Arthur Young, Tour through the north (L., 1771), 4 : 390; H. D. Fong, Triumph of factory system in England (Tientsin, 1930), 8 ff.; Friedrich Lohmann, Staatliche Regelung der englischen Wollindustrie (Leipzig, 1900), 41; W. A. S. Hewins, English trade (L., 1892), 17, 100; A. Young, Tour through the southern counties (L., 1769), 131; William Cunningham, Growth of English industry (Cambridge, 1903), 2 : 628; Daniel Defoe, Tour (L., 1738), 2 : 19, 3 : 145; Adam Anderson, Origin of commerce (L., 1787), 1 : 484; John James, History of the worsted manufacture (L., 1857), 261, 289.

Social-political: Bernard Mandeville, Fable of the bees (L., 1714), 105, 228; cf. edition by F. B. Kaye (Oxford, 1924), 1 : 129; William Petyt, Britannia languens (L., 1680), 100; Daniel Defoe, Complete English tradesman, ed. Scott (Oxford, 1841), 1 : 245; Benjamin Disraeli, Sybil, Book 1, chap. 3; R. H. Tawney, Agrarian problem in the sixteenth century (L., 1912), 316; J. Massie, Calculations of taxes (L., 1756), No. 30.

CHAPTER II

General: Arnold Toynbee, Lectures on the industrial revolution (L., 1884), 85; cf. Hermann Levy, Monopoly and competition (L., 1911), 3; and note that of the three "economic" foundations of the revolution cited by G. von Schulze-Gävernitz, Cotton trade (L., 1895), 23, not one is economic; W. H. Price, English patents of monopoly (Cambridge, Mass., 1906), 62; W. Cunningham, Alien immigrants (L., 1897), passim; for French terms, George Dodd, British manufactures (L., 1844), 4 : 58, and G. I. H. Lloyd, Cutlery trades (L., 1913), 101; "outburst" from Arthur Shadwell, Industrial efficiency (L., 1906), 1 : 61. For invention as a social process Witt Bowden, Rise of the great manufacturers (Univ. of Penn. thesis, 1919), and Industrial society (N. Y., 1925); and periodical references in Reading above.

Conditions: 21 Jac. I, c. 3, VI; O. J. Dunlop, English apprenticeship, 113, 123; S. Kramer, English craft gilds (N. Y., 1927), 163 ff.; Leslie Stephen, English utilitarians (N. Y., 1900), 1 : 111; Andrew Ure, Cotton manufacture (L., 1836), 1 : 186.

Manufacturers: A. Young, Travels in France (L., 1890), 140 (Sept. 29, 1788); Cunningham, Growth, 2 : 619; Edward Baines, History of the cotton manufacture (L., 1835), 195, 230, 233; Werner Sombart, Der moderne Kapitalismus (München, 1928), 3 : 430; Smiles, Lives, 154. M. H. Dobb, The entrepreneur, Economica (Feb., 1924), 10 : 66–81, belittles the entrepreneur, but cf. F. W. Taussig, Inventors and money-makers (N. Y., 1915). *Character:* Baines, 195; John Lord, Capital and steam power (L., 1923), 44; Smiles, 154.

Factory: For concept and development in general, H. D. Fong, Triumph of factory system (Tientsin, 1930); details from E. Lipson, Introduction to economic history of England (L., 1915), 1 : 413; British parliamentary papers, Factory enquiry, 1834, Vol. 20, Part 2, p. 3; Thomas Deloney, Story of John Winchcombe (L., 1859), 37; Defoe, Tour (L., 1738), 2 : 55, 3 : 33; Adam Anderson, Origin of commerce, 3 : 91; General description of all trades (L., 1747), 84; Carl Bücher, Industrial evolution (N. Y., 1901), 174; R. Campbell, London tradesman (L., 1747), 103; John Cary, Essay . . . poor (L., 1719), 98 [spelling modernized].

Machinery: Lipson, 1 : 426; Hewins, 107; Anderson, 2 : 354; Atkinson in Tenth Census, 2 : 941; Melvin T. Copeland, Cotton manufacturing industry (Cambridge, Mass., 1912), 81; M. R. Weyermann, in Grundriss der Sozialökonomik, 6 : 139, 175; Sombart, 3 : 243.

Textiles: Young, Northern tour, 4 : 390; E. Lipson, History of woollen industries (L., 1921), 132 ff.; Baines, 116, 130; Bowden, both titles cited above; G. W. O. Daniels, Early English cotton industry (Manchester, 1920), 78.

Steam: In general, Lord, and lives of Watt by Smiles and Carnegie; details from Karl Marx, Misère de la philosophie (Paris, 1896), 151

(Seligman's translation); J. W. Roe, English and American tool builders (New Haven, 1916), 2; statistics from Thomas W. Ashton, Iron and steel in the industrial revolution (Manchester, 1924), 41; and Fong, Triumph, 35, 63, 87.

Iron: In general, Ashton as above; W. S. Jevons, Coal question (L., 1866), 116; Joshua Gee, Trade . . . of Great Britain (L., 1738), 233; Roe as above; S. Smiles, James Nasmyth (L., 1883), 109; woodcuts in George Dodd, British manufactures (L., 1844–46).

Agriculture: Most of the facts from standard works by Prothero (Ernle), Hasbach, Garnier, Rogers, etc.; enclosures from J. L. and B. Hammond, Village labourer (L., 1911); Arthur H. Johnson, Disappearance of small landowners (Oxford, 1909); Arthur Redford, Labour migration (Manchester, 1926); Henry C. Taylor, Decline of landowning farmers (Madison, Wis., 1904); Arthur Young, Tours.

CHAPTER III

Population: N. S. B. Gras, Evolution of English corn market (Cambridge, Mass., 1915), 75; E. C. K. Gonner, Population of England in eighteenth century, Journal Royal Statistical Society (Feb., 1913), 76 : 285; King, 41; T. R. Malthus, Essay on principle of population, first ed., 176; B. Disraeli, Sybil (1845), Book 2, chap. 16. Cf. J. C. Symons, Arts and artisans (Edinb., 1839), iii; W. Cooke Taylor, Notes of a tour (L., 1842), 155.

Political: William Smart, Economic annals (L., 1910), 546; Sir Robert Peel, ed. Parker (L., 1891 ff.), 2 : 139; J. L. and B. Hammond, Town labourer (L., 1917), 315; Disraeli, Sybil, Book 4, chap. 5; T. H. S. Escott, England (N. Y., 1880), 80; M. Arnold, in Reign of Queen Victoria, ed. T. H. Ward (L., 1887), 2 : 242; Hammond, Town labourer, 52; Graham Wallas, Life of Francis Place (L., 1898), 145; G. Schmoller, Grundriss, 89; Schulze-Gävernitz, Cotton trade, 29. For an earlier threat on the bank cf. Peel, 1 : 376.

Theories: Edmund Burke, Thoughts . . . on scarcity, Nov., 1795 (L., 1800), 32; C. J. Fox, Substance of the speech . . . Nov. 1, 1783 (L., 1783), 3; Cunningham, Growth, 2 : 789; Hammond, 178; Joseph Townsend, Dissertation on the poor laws (1786) (L., 1817), 39; on the other side James Maitland (Lauderdale), Inquiry (Edinb., 1804), 324, 345, Thomas Chalmers, Christian and civic economy (Glasgow, 1821–26), 3 : viii, 112, and the Ricardian socialists. Journal Royal Stat. Soc. (1845), 8 : 351; N. W. Senior, Industrial efficiency (N. Y., 1928), 1 : 322, quoting Chadwick.

Hand Trades: John James, History of worsted manufacture (L., 1857), 329, 481; Kenyon in Econ. Review (1910), 20 : 164; Symons, 149; Charles Knight, Knowledge is power (L., 1859), 107; S. and B. Webb in Braun's Archiv (1897), 10 : 108; Wallas, Place, 14, 164.

Factory: A. Redford, Labour migration, 19 ff.; S. and B. Webb, History of trade unionism (L., 1902), 74; B. L. Hutchins and A. Harrison, History of factory legislation (Westminster, 1903), 30, 91; James,

441. For hours in handicraft see General description of all trades (L., 1747); for other countries Symons, and Baines, 480. *Wages:* Symons, 84; G. M. Trevelyan, John Bright (L., 1913), 74; Disraeli, Sybil. *Children:* O. J. Dunlop, English apprenticeship (L., 1912); Peel, 1 : 259; Hutchins, 45; W. C. Taylor, Notes of a tour, 231. *Criticism:* John Stuart Mill, Political economy, Book 4, chap. 6, sec. 2; Hammond, Town labourer, 160; Frank Podmore, Robert Owen (N. Y., 1907), 1 : 339; Sybil, Book 3, chap. 5. *Towns:* Report of 1840, passim [and cf. description of Coketown in Dickens' Hard Times]; W. E. Hearn, Plutology (1864), 61.

Labor: In general, the Webbs, Hutchins and Harrison; Wallas, 198; Hammond, Town labourer, 257; G. I. H. Lloyd, Cutlery trades (L., 1913), 251; Peel, 1 : 260 ff.

Agriculture: J. S. Nicholson, History of the English corn laws (L., 1904); table from G. C. Broderick, English land (L., 1871), 187, cf. 163; Lewis Mumford, Story of utopias (1922), 201 ff.; H. S. Furniss, Industrial outlook (L., 1917), 214, 229; B. S. Rowntree and M. Kendall, How the labourer lives (L., 1913), 22 ff., 50, 54, 82; F. Verinder in Galton, Workers on their industries (L., 1896), 164.

Agricultural Crisis: Periodical references in Reading above; statistics from R. H. Inglis Palgrave, in Journal Royal Stat. Soc. (March, 1905), 68 : 50–80; Charles Adeane and E. Savill, The land retort (L. 1914), 89; London Times (Dec. 17, 1913), 8.

CHAPTER IV

Commerce: See my History of commerce (N. Y., Longmans), for a more extended treatment. The chart was prepared for me from the official sources by H. H. Edmiston. A. L. Bowley, England's foreign trade (L., 1893), 39; David Macpherson, Annals of commerce (L., 1805), 4 : 503–504; C. J. Fuchs, Handelspolitik Englands (Leipzig, 1893), 109; Edgar Crammond in Quarterly Review (1911), 215 : 57; cf. U. S. Federal Reserve Bulletin (June, 1925), 11 : 407, and League of Nations Memorandum on balance of payments (Geneva, 1927), 2 : 360, for variants in 1913.

Export Trade: John H. Schooling, British trade book (L., 1911); W. J. Ashley, Tariff problem (L., 1903), 53 ff., 100 ff.; F. X. von Neumann-Spallart, Uebersichten (Berlin, 1896), 751; International statistical year-book (Geneva, 1927), 129; Economic Journal, 29 : 460; U. S. Consular report, Aug. 19, 1903; table of occupations based on Memorandum on British and foreign trade, 1903 [Cd. 1761], table xxiv.

Cotton: In general, Sydney J. Chapman, Lancashire cotton industry (Manchester, 1904); Gerhart von Schulze-Gävernitz, Cotton trade (L., 1895); M. T. Copeland, Cotton manufacturing (Cambridge, Mass., 1912); Survey of textile industries, Part 3 of (Balfour) Committee on industry and trade (L., 1928). Details from L. C. A. Knowles, Industrial revolutions (L., 1924), 27, note; F. W. Taussig,

Some aspects of the tariff question (Cambridge, Mass., 1915), 271, 283; Report of U. S. Tariff Board, Cotton manufactures (Wash., 1912), 1 : 11; Report of (Chamberlain) Tariff Commission (L., 1905), Vol. 2, par. 88, 213.

Asiatic Competition: Sydney J. Chapman, Work and wages (L., 1904), 1 : 147, and various review articles, National (1891), 17 : 1–11; Fortnightly (1895), 64 : 604–620; (1897), 68 : 732–749. On Japan, U. S. Tariff Commission, Japanese cotton industry (1921), 100; British Department of Overseas Trade, Cotton industry in Japan (1927), 56–57; cf. Taussig, Labor costs, in Quarterly Journal of Econ. (Nov., 1924), 39 : 112–113.

Labor: In general, books by S. and B. Webb, and Arthur Shadwell, Industrial efficiency (L., 1906); Chapman, Cotton industry, 250 ff.; Schulze-Gävernitz, 49, 130 ff.; T. M. Young, American cotton industry (N. Y., 1903), 12, 29; T. W. Uttley, Cotton spinning . . . in U. S. (Manchester, 1905), 16, 68; Report of Moseley Industrial Commission to U. S. (Manchester, 1903), 145; U. S. Consular reports (Jan. 27, 1904, Nov. 29, 1904).

Woolen Industries: In general, John H. Clapham, Woollen and worsted industries (L., 1907); W. A. G. Clark, Manufacture of woolens, Bureau of Manufactures, Wash., 1908; Survey of textile industries (with full statistical material). Details from Report of Tariff Board on Wool (Wash., 1912), 1 : 16; Taussig in Amer. Econ. Rev. (1912), 2 : 267, and in Quart. Jour. of Econ., 8 : 34; quotation on labor from Report of (Chamberlain) Tariff Commission, Vol. 2, Part 2, par. 1491, cf. 1493, and cf. James, Worsted, 531.

Iron and Steel: In general, J. S. Jeans, Iron trade of Great Britain (L., 1906); British Iron Trade Assoc., Report on American industrial conditions, ed. Jeans (L., 1902); Report of (Chamberlain) Tariff Comm., Vol. 1, 1904; and espec. Survey of industries, Vol. 4, 1928. Details from Handwörterbuch der Staatswissenschaften, second ed., 3 : 466, 475; Chapman, Work and wages, 1 : 23 ff. On methods in comparison with American add Mrs. Hugh Bell, At the works (L., 1907); Frank Popplewell, Iron . . . production in America (Manchester, 1906); American engineering competition (N. Y., 1901), 42, 46; Moseley Indust. Comm., 41; speech of Westinghouse in London, Jan. 9, 1903, in Lit. Digest (Feb. 14, 1903); Taussig, Labor costs, 103 ff. A number of articles on the subject appeared in periodicals about 1900, and the reports of Albert Halstead, U. S. consul at Birmingham, contain much of interest.

Machine Trades: In general, Survey of industries, Vol. 4, and Report of (Chamberlain) Tariff Comm., Vol. 4, 1909; B. C. Browne, Our American competitors, National Rev. (1899), 33 : 568–580. *Small Industries:* I. F. Grant, in Econ. Jour. (Dec., 1922), 32 : 489–505; A. L. Bowley, in Economica (May, 1921), 2 : 113–115; A. W. Flux in Jour. Royal Stat. Soc. (May, 1913), 76 : 566. *Cutlery:* G. I. H. Lloyd, Cutlery trades (L., 1913); Shadwell, 1 : 130, 216. *Guns:* "Artifex," Causes of decay of a British industry (L., 1907). *Files,*

etc.: Shadwell, 1 : 148, 2 : 333; reports of Halstead (Jan. 12 and Jan. 25, 1909).

Organization: quotations of Board of Trade from Survey of industries, 4 : 146, 149. *Engines:* Dwight T. Farnham, America vs. Europe (N. Y., 1921), 104; W. C. Redfield, New industrial day (N. Y., 1913), 108; American Machinist (April, 1903), 26 : 470; Smiles, Boulton and Watt, 174. *Plant:* Moseley Ind. Comm., passim; Shadwell, 1 : 133, 2 : 61; A. F. Liversedge, Commercial engineering (Manchester, 1912), 167; W. H. Dawson in Fortnightly Rev. (1914), 102 : 759.

Trade Unions: Edwin A. Pratt, Trade unionism (L., 1904); Report of (Chamberlain) Tariff Comm., Vol. 4 (passim, see index); American engineering competition, 128 ff.; Chapman, Work and wages, 2 : 36 ff.; C. Edwards in Contemporary Rev. (1902), 81 : 113–128 [a defense].

CHAPTER V

General: Quotations from Survey of industries, Vol. 1, Factors in industrial and commercial efficiency (1927), 65, Final report (1929), 5 : 235; André Siegfried, England's crisis (L., 1931), 55, 75. *Statistics:* Report of Liberal Industrial Inquiry [cited henceforth as Liberal report], Britain's industrial future (L., 1928), 9, 54; Survey, 5 : 8; (Balfour) Committee on Industry and Trade, Survey of overseas markets [cited henceforth as Survey of markets] (1925), 4, 638. I have covered general aspects of post-war commerce in War shocks to European commerce, Foreign Affairs (July, 1927), 5 : 633–649. *Conditions:* Survey, 5 : 3, 246; Survey of markets, 13 ff., 638, 640, 670; W. F. Lloyd and B. Austin, Capital for labor (N. Y., 1927), 20.

Management: Farnham, 256; C. S. Myers, Industrial psychology (N. Y., 1925), 35; S. S. Hammersley, Industrial leadership (L., 1925), 87; Lloyd and Austin, 34 ff.; Siegfried, 65; Report . . . industrial conditions in Canada and U. S. [Cmd. 2833] (1927), 117 ff. Many periodical articles are devoted to the subject: Edinb. Rev. (April, 1916); Industrial Management (Nov., 1922); Harvard Bus. Rev. (Jan., 1925); Econ. Journal (Dec., 1927); Round Table (June, Sept., 1925, Mar., 1927). *Standardization:* Survey, 1 : 266 ff., 4 : 172, 5 : 194 ff.; Report of (Chamberlain) Tariff Comm., 4 : 495 (and see index); Annals Amer. Acad. Soc. and Pol. Sci. (1919), 82 : 247–252. *Research:* Survey, 1 : 305 ff., 5 : 214 ff. Publications of the Stationery Office contain reports of progress in many fields.

Labor: *Wages:* Liberal report, 6, 14 ff.; Survey, 5 : 95, 152; Flux in Jour. Roy. Stat. Soc. (May, 1913), 563; J. A. Hobson, Work and wealth (N. Y., 1914), 242. *Hours:* Survey, 2 : 97, 5 : 103. *Criticism:* Liberal report, 144 ff.; Survey, 5 : 239 ff.; Daily Mail trade union mission to U. S. (L., 1926), 6, 32, 76; Report indust. conditions, 20; Garton Foundation, Memorandum on industrial situation (L., 1919), 49.

Industries: *Coal:* Survey, 4 : 413 ff.; Liberal report, 341 ff.; emphasis on substitutes by Siegfried, 89, does not accord with figures. *Cotton:* S. J. Chapman, Cotton industry, 78, and Lancashire cotton industry (Manchester, 1904), 252; Survey, 3 : 12, 51, 69 ff. Among many periodical articles see Harvard Bus. Rev. (July, 1924, Jan., 1930); Econ. Jour. (March, 1927); Amer. Econ. Rev. (Sept., 1928); Jour. Roy. Stat. Soc. (1928), 91 : 153–206. *Iron:* Survey, Vol. 4; unemployment statistics from Ministry of Labour Gazette (supplement to Nov., 1931), 2. *Machinery:* Survey, Vol. 4, chap. 2, 5 : 241; W. H. Dawson, ed., After-war problems (N. Y., 1917), 126, 206; Henry Carter, Control of drink trade (L., 1918), 285; Farnham, 86, 97; Lloyd and Austin, 63, 136.

CHAPTER VI

Unemployment: Ministry of Labour Gazette (Nov., 1931), 39 : 414 ff.; Summary of Report of committee on unemployment insurance [Cmd. 3872], 1931, in U. S. Monthly Labor Rev. (Aug., 1931), 33 : 20 ff.; Survey, 5 : 130; Labour Gazette (Nov., 1931), supplement, 2.

Unemployment Relief: Summary from Handwörterbuch der Staatswissenschaften, fourth ed., 1 : 816; Survey, 5 : 131 ff.; Liberal report, 275; Siegfried, England's crisis, 78 ff.; National Industrial Conference Board, Tax burdens (N. Y., 1925), 20; Malthus, Essay, seventh ed., Book 4, chap. 6. *Wages and Costs:* Labour Gazette (July, 1931), 39 : 253; Survey, 5 : 254–257.

Balance: Figures from Board of Trade Journal (Jan. 29, 1925), 114 : 145; (Feb. 2, 1928), 120 : 135; (Feb. 26, 1931), 126 : 257; (Feb. 18, 1932), 128 : 130. I have followed the original form of the table, although it has been changed (and improved) in its last version. Figures for government payments are combined with "other." Electoral statistics from National Rev., 1931; figures differ slightly according to the source. *Tariff:* Survey, 1 : 398 ff.; Liberal report, 55.

CHAPTER VII

General: André Siegfried, France, a study in nationality (New Haven, 1930), 2; J. Bertillon, Dépopulation de la France (P., 1911), following Levasseur. *Finance:* Higgs in Cambridge modern history, 8 : 66 ff.; C. Gomel, Les causes financières de la revolution française (P., 1892), 1 : 357 ff.; G. Fagniez, Economie sociale de la France (P., 1897), 22; A. Delahante, Une famille de finance (P., 1881), 1 : 276; M. Kovalewsky, La France économique et sociale (P., 1909), 1 : 117; Lowell, Eve, 214 ff.; Tocqueville, 156. *Tax farming:* Delahante, 1 : 190 ff.; Fagniez, 341; Adam Smith, Lectures on justice (Oxford, 1896), 245. *Burden:* Taine, 370; J. B. Perkins, France under Louis XV (Boston, 1897), 1 : 43.

Agriculture: Kovalewsky, 1 : 55, 259, 345, 356; Paul Darmstädter, Befreiung der Leibeigenen (Strassburg, 1897), 18; Handwörterbuch der Staatswissenschaften, second ed., 2 : 383; G. D'Avenel, Histoire économique (P., 1898), 1 : 249, 294 ff.; Levasseur in Lavisse et Rambaud, Histoire générale (P., 1896), 7 : 658 ff., cf. 8 : 17; Tocqueville, 125; Taine, 38; Coyer, La noblesse commerçante (P., 1756).

Condition of Cultivators: Kovalewsky, 1 : 222 ff.; Champion in Histoire générale, 8 : 20 ff.; Taine, 54, 340 ff.; D'Avenel, 385; Albert Babeau, La vie rurale (P., 1885), 85 ff.

Manufactures: H. et G. Bourgin, L'industrie siderurgique (P., 1920), 471. *Gilds:* E. Levasseur, Histoire des classes ouvrières avant 1789 (P., 1900–01), Vol. 2, passim; L. Mosnier, Origines . . . de la grande industrie (P., 1898), 4; Kovalewsky, 1 : 34; W. Roscher, System der Volkswirtschaft, sixth ed., 3 : 623, 631; A. des Cilleuls, Histoire de la grande industrie (P., 1898), 101 ff., 113 ff. *Regulation:* Besides Levasseur, Mosnier, Cilleuls, add Germain Martin, La grande industrie (P., 1899), 61 ff., 96 ff., 147, 340; A. Dubois, Histoire des doctrines économiques (P., 1903), 273, 279. *Royal Manufactures:* Same sources. For general conditions add E. Tarlé, L'industrie dans les campagnes (P., 1910); Kovalewsky, 2 : 1, 102, 170 ff. *Invention, etc.:* Levasseur, 2 : 539; Martin, 103, 166 ff.; Rapport sur l'industrie française (P., 1919), 1 : 304–312; J. T. Merz, History of European thought (Edinb., 1904), 1 : 99; C. Normand, La bourgeoisie française (P., 1908), 185 ff. It is noteworthy that France offered instances of what was unknown to Young in England, industrial enterprises founded by landed gentry: Kovalewsky, 2 : 105; R. Lévy, Histoire écon. de la industrie cotonnière (P., 1912), 49. M. Rouff, Tubeuf, un grand industriel français (P., 1922), gives an interesting sketch of a promoter of the period.

CHAPTER VIII

General: Internat. Stat. Year-book (1927), 44, 158; Statistical Abstract, Foreign (1914), 104; Michel Augé-Laribé, Le paysan français (P., 1923), 14, 35; Siegfried, France, 11; Bertillon, Dépopulation, 29; Werner Sombart, Der mod. Kapitalismus, 3 : 277; Clapham, 364.

Agriculture: Estimates of distribution of land from Alfred de Foville, Le morcellement (P., 1885), 44, 52, 58, and F. W. Wolters, Studien über Agrarzustände (Leipzig, 1905), 16 ff. Some authors, as Loutchisky, La petite propriété en France avant la rev. (P., 1897), 79, would ascribe more land to the peasants. See Soc. Sci. Ab. (1930), No. 6031, for recent discussion by Lefebvre.

Conditions, 1815 ff.: La statistique agricole de 1814 (Paris, 1914) [by indicating the locality I avoid the need of giving page references]. Later conditions are described in a more general way in English Reports on the state of agriculture and the condition of the population, dated 1834, ordered printed 1836, cited as Reports, 1836; see table

of field systems, 69 ff. *Labor:* Charles Dupin, Forces productives et commerciales de la France (P., 1827), 1 : 23 ff.; [Earl Lovelace], Review of the agricultural statistics of France (L., 1848), 10. The table on the money yield of land is from Lovelace, 7 ff.; he says that it was based on an elaborate investigation by the government: "More than 100,000 persons were employed in the task, which was executed with great care and accuracy." Wheat yields from Annuaire Statistique (1913), 43*. [References to Résumé rétrospectif of Annuaire are marked by asterisk.]

Agricultural Classes: L. S. Sackville-West, Report on tenure of land in France [C. 66], in Parliamentary papers (1870), 67 : 59, 69; Lovelace, 23; J. H. Schnitzler, Création de la richesse (P., 1842), 1 : 9 ff.; M. Block, Statistique de la France, first ed. (P., 1860), 2 : 24. Figures of the classes which I have numbered 1–9 were in the agricultural statistics of 1868, and apparently refer to 1862. Figures of fragmentation from Lovelace, 22; they suffer not only from the mixture of urban and rural, but still more from the fact that, being made for a cadaster, they counted separately parcels of land used for different purposes even though they were contiguous.

Agricultural Conditions: Details from Stat. agric. (1814), and Reports (1836). Wages and budget from Block, 2 : 32 ff.; the price of wheat varied in two years from 17 to 33 fr. per hl. Tax on doors and windows from Block, 1 : 374.

Agriculture, 1870 ff.: Block, second ed. (P., 1875), 1 : 56; Grandeau, in Journal des Economistes (1899), V., 40 : 171 ff.; D. Zolla, Questiones agricoles (P., 1894), 116, 304. Wheat yields, being averages of the averages in the Ann. Stat., are only approximations. *Implements:* M. Augé-Laribé, L'évolution de la France agricole (P., 1912), 57.

Conditions, 1900: Comparative yields from B. Rambaud, Les progrès de l'agriculture en France, Rev. d'Econ. Pol. (May, 1920), 34 : 305; the Yearbook of agricultural statistics of the Internat. Inst. of Agric. at Rome (1928–29), ranks France thirteenth in wheat for the years 1909–13. Yields per person in Ballod, Schmoller's Jahrbuch für Gesetzgebung (1905), 29 : 831; he thought the French yield was a quarter or a third lower than the German. Holdings from Augé-Laribé, Evolution, 103–104; see there, 78 ff., for distinctions and criticism. *Large and Small:* La petite propriété rurale en France (P., 1909) [a monograph of the Ministry of Agriculture], 294 ff.; Augé-Laribé, Evolution, 93, 98; F. Evrard, Les grandes fermes entre Paris et la Beauce, Annales de Geographie (May, 1923), 32 : 210–225 [instance on p. 214 of a farm of 192 ha. still in fragments]. *Fragmentation:* Foville, Morcellement, 200 and passim; G. W. Coopland, Abbey of St. Bertin (Oxford, 1914), 121; Lady Verney, How the peasant owner lives (L., 1888), 6, 179; Augé-Laribé, Paysan, 247 [gain of 30% by consolidation]; especially A. Girault, Le morcellement parcellaire en France, Rev. d'Econ. Pol. (Oct., 1920), 34 : 607–621. Many examples of thrift in Lady Verney and in Hannah Lynch,

French life (N. Y., 1901). Balzac's Paysans dates from the '20's; the author spent 8 years on it and thought it the most important work which he had undertaken. The experience of M. Dussard, Verney, 13, parallels that of Balzac's proprietor; and cf. Lovelace, 24 ff., for "black bands," etc. Qualified judges think that Balzac and Zola are more true to the facts than Georges Sand and Bazin. *Mentality:* Y. Keravic, in Econ. Journal (1900), 10 : 12; Fortnightly Rev. (1900), 74 : 34; John Morley, Life of Gladstone, 3 : 486; R. Richardson, Europe from a motor car (Chicago, 1914), 175; Lit. Digest (Jan. 2, 1909) [on examinations of recruits cf. Herlaut, in Rev. de Paris (Dec. 1, 1911), 18 : 6 : 643–651]; Augé-Laribé, Paysan, 283 ff.; E. Faguet, Politiques et moralistes (P., 1891), 1 : 360; J. H. Rose, Development of European nations (N. Y., 1905), 1 : 55; Blowitz, Memoirs (N. Y., 1903), 143.

CHAPTER IX

Survey: Clapham, 53, 240; Block, Stat. (1860), 1 : 54, 2 : 124–125. The census included in "small industry" some classes [transport, postal, commercial] which I have excluded in the text. Figures for textiles compiled from Block (1860), 2 : 127 ff. *Wages:* Official statistics (1852) put mean wage in textiles, including women and children, at about 2 fr.; wages in mining averaged barely higher, Ann. Stat. (1913), 105*. H. Sée, La vie écon. de la France sous la monarchie censitaire (P., 1927), cites Villermé's estimate about 1840, 2 fr. for a man, 1 fr. for a woman; cf. Report of 1829, cited later. *Steam:* Block, 2 : 127; Ann. Stat., 1913, 54*. The figures of 1851 cannot be reconciled with those of 1843–45, quoted by Clapham, 63, and can be accepted only under reserve. *Small Industry:* Chaptal, De l'industrie française (P., 1819), 2 : 189; P. Leroy-Beaulieu, La question ouvrière (P., 1871), 28; Block, Stat., 2 : 160; G. et H. Bourgin, Le régime de l'industrie en France de 1814 a 1830 (P., 1912, 1921), 1 : 9, 11, 78 ff., 91 ff., 333 ff., 2 : x. *Development:* Sée, 49, 55; Clapham, 71 ff. *Steam:* C. Ballot, L'introduction du machinisme dans l'industrie française (P., 1923), 383 ff.; Lord, 209; it is hard to reconcile facts given there with the few engines of 1815, Clapham, 62; Sée, 65. English figures from Fong, Triumph of factory system, 35. Testimony from Enquête faite par ordre du parlement d'Angleterre pour constater les progrès de l'industrie en France (P., 1825), 80; the English original was not accessible. Alsace: Levy, 139. *Cotton:* I have combined the eight points of Baines, History of the cotton manufacture, 512 ff., and illustrated them with detail from Rapport de la commission libre nommée par les manufacturiers et negocians de Paris sur l'enquête relative a l'état actuel de l'industrie de coton en France (P., 1829). Levy, 154 ff., describes the gradual concentration of workers. *Iron:* Clapham, 60; Ann. Stat., 1913, 48*; Bourgin, L'ind. siderurgique, xxii ff., 463 : Chaptal, 2 : 152; Dunham, 161; George Porter, Progress of the nation (L., 1851), 288, 577. I

use for comparison the French figure 153 fr. per ton, from Ann, Stat., but should note difference in price for different grades, Block, 2 : 183. On introduction of coke, Ashton, 38; Sée, 52; Clapham, 59. Table from Block, 2 : 182 ff. *Machinery:* Enquête, 4, 5, 66, 81, 85; J. W. Roe, English and American tool builders (New Haven, 1916), 6, 50, 59, 129, 142. *Labor:* Journal des Econ. (March, 1924), 83 : 316 ff.; Gustav Schmoller, Umrisse und Untersuchungen (Leipzig, 1898), 632; Bourgin, Régime, 1 : 39. Rapport, 1829, assumed 12 working hours, but Symons, Arts and artisans (1839), gives longer hours; cf. Sée, 106. On labor organization cf. Clapham, 76 ff.

Development, 1850 ff.: Annuaire Stat., Résumé rétrospectif (1929), 2*, 74*; Clapham, 260; Dunham, passim, Siegfried, England's crisis, 68; cf. A. Dumont, Dépopulation (P., 1890), quoting Poulot's assertion that of 10 manufacturers at least 8 brought up their sons to other careers. *Movement of Population:* Bertillon, 152 ff., quoting Tallquist; Babeau, Vie rurale, 237; J. Turquan et J. d'Auriac, La dépopulation française (P., 1917), 23; Richet, in Réforme Sociale (1891), 21 : 507 ff.; Dumont, passim. *Bourgeois:* Siegfried, France, 6; Verney, 147, 168; Ann. Stat. (1913), 209 [inheritances; cf. Willford I. King, Wealth and income (N. Y., 1915), 87]; French Census of occupations (1896), 4 : ix.

Organization: Recensement des industries, 1896 (P., 1901), 4 : lxiii; Recensement générale, 1921 (P., 1927), 1 : Part 3, pp. 54, 61; Industries (1896), 4 : 199, group 4; U. S. Census of 1900, 7 : lxxiii, cf. ibid. xxxix for rejection of figures of sole workers; R. B. Forrester, Cotton industry in France (Manchester, 1921), 44, 52; W. C. Mitchell, Business cycles (N. Y., 1927), 177; League of Nations, Memorandum on balance of payments (Geneva, 1927), 2 : 128; Roscher, System, 3 : 513; H. Emerson, Efficiency (N. Y., 1909), 37 ff.; Lebon in Internat. Monthly (1901), 3 : 267.

Industries: *Silk:* A. de Foville, La France écon. (P., 1887), 244; Berge, in Rev. deux Mondes (1890), 5 : 191; Gonnard, in Rev. Econ. Internat. (Aug., 1905), 2 : 3 : 260 ff., 279; Taussig, Aspects of the tariff, 229, 235. *Cotton:* Forrester, passim; Enquête (1824), 141; Copeland, 90, 352. *Wool:* Dunham, chap. 11; James, History, 526; Clark, 9 ff.; J. H. Clapham, Woolen industries, 222, 226. *Iron:* Foville, France, 218; Dunham, chap. 9; Jeans, Iron trade, 85; Ann. Stat. (1929), 4*. *Machinery:* W. Williams, Horny hands (N. Y., 1922), 251; American Machinist (1906), 29 : I : 263; (1908), 31 : II : 374, 636; Farnham, 165.

Labor: Bulletin de Statistique (Oct., 1918), 8 : 88. I have combined figures of proprietors, salaried workers, and wage earners to compare with U. S. Census (1900), 7 : xlvii, xlviii; 8 : 31. *Wages:* Ann. Stat. (1929), 137*; Royal Commission on labour (1893) [C. 7063], 6 : 68; Report on cost of living in French towns [Cd. 4512], 1909; Handwörterbuch der Staatswissenschaften, second ed., 1 : 540 ff.; Clapham, 272.

CHAPTER X

War Losses: Ogburn, 21; M. Augé-Laribé, La paysan français après la guerre (P., 1923), 43; Ragatz, in Current History (May, 1923), 18 : 276; Bulletin du Ministère de Travail (Sept., 1931), 38 : 222 ff.; H. G. Moulton and C. Lewis, French debt problem (N. Y., 1925), 20, 103; J. M. Keynes, Econ. consequences of the peace (N. Y., 1920), 126 ff.; Econ. Rev. of Foreign Press (Jan. 9, 1925, Nov. 5, 1926); Eleanor L. Dulles, The French franc (N. Y., 1925), 5 : 132; A. Fontaine, L'industrie française pendant la guerre, P., n. d. (Carnegie series), 40 ff.; M. de Ville-Chabrolle, La population active en France avant et après la guerre, Bulletin de Stat. (Dec., 1931), 21 : 147 ff. [valuable statistics]; G. Jèze, Economic and financial position of France, Quarterly Jour. of Econ. (Feb., 1921), 35 : 180 ff.

Agriculture: Ann. Stat., 1929, 59*; Bulletin de Stat., Dec., 1931, 21 : 17; Ogburn, 481; U. S. Bureau Foreign Commerce, Special Agents, 1920, 191 : 11; Augé-Laribé, Paysan, 89; Ville-Chabrolle, 91 ff.; Augé-Laribé, Evolution, 124, and in Rev. d'Econ. Pol., 1930, 44 : 4; C. Fouchier, Essai sur l'abandon des campagnes (Poitiers, 1914), esp. chaps. 2, 3. *Wages:* Ogburn, 488; Fouchier, 62 ff.; Bulletin du Ministère de Travail (June, 1931), 38 : 125–133 [6,000 is a rough median; the extremes were 3,000 and 9,000, but in general the dispersion was small]; Augé-Laribé, Labour conditions in French agriculture, in Internat. Labour Rev. (Jan., 1932), 25 : 23 ff.; G. Risler, Le travailleur agricole français (P., 1923), chap. 3, 80 ff.

Technical: A. Alexandre, La vie agricole dans la Picardie orientale (P., 1928), 31 ff. [the author speaks of the scattering as still general in France]; U. S. Bureau Foreign Commerce, Special Agents, Report on farm implements and machinery in France (1920), 191 : 15, 20, 24. *Peasant:* Augé-Laribé, Evolution, 271 ff., and Paysan, 134 ff.; Alexandre, 12, 38. *Profits:* Jèze, 179; defending the peasant Augé-Laribé, Paysan, 38, 62 ff., 136 ff., and in Rev. d'Econ. Pol. (1930), 44 : 648; Lair in Rev. Econ. Internat. (July, 1926), 18 : 3 : 41. *Yield:* Augé-Laribé, Rev. d'Econ. Pol. (1930), 44 : 5; Ann. Stat. (1929), 54*; Ogburn, 493 [fertilizer].

Manufacture: Ann. Stat., 1929, 59*; Bulletin de Stat. (Dec., 1931), 21 : 17 [cf. Ogburn, 97 ff., and App. B.]; Fontaine, 83, 87. *Industrialization:* Ogburn, 186 ff., 219 ff., 252 ff.; Ann. Stat. (1929), 70*, 149; Levainville, in Geographical Review, 13 : 88; R. Blanchard, Utilization of water power in France, Harvard Bus. Rev. (Jan., 1928), 6 : 176 ff.; A. Pawlowski, L'industrie électrique en France, Rev. Econ. Internat. (Oct., 1928), 20 : 4 : 19–36. *Size:* Recensement, 1921 (P., 1927), 1 : Part 3 : 62, 66–67 [I use the figures for the 87 old departments in 1921 for comparison with 1901; the addition of Alsace and Lorraine raises the ratio of large less than would be expected]. The second table is a combination of figures in Recensement industriel (1896), 4 : 199; Recensement generale (1921), 1 : Part 3 : 135,

group 4; and U. S. Census of 1919, 8 : 90. W. L. Thorp, Integration of industrial operation (Wash., 1924), 89; Henry Ford, Today and tomorrow (N. Y., 1926), 109.

Organization: G. Martin, Industrial reconstruction of France, Harv. Bus. Rev. (Apr., 1927), 5 : 258 ff.; Farnham, 8, 204, 234 ff.; U. S. Bureau For. Com., Spec. Agents, Report on industrial machinery in France (1920), 204 : 9 ff. *Coal:* Rev. d'Econ. Pol. (1930), 44 : 673; Ogburn, 224; Taussig, in Quart. Jour. Econ. (Nov., 1924), 39 : 98; U. S. Bureau of Mines (Bulletin, 1931), 341 : 104. *Labor:* A. Siegfried, French industry and mass production, in Harv. Bus. Rev. (Oct., 1927), 6 : 5; Williams, 251; National Industrial Conference Board, Problems of Labor (Boston, 1919), 161. *Business:* Ville-Chabrolle, 129, 133; Ogburn, 551 ff.; U. S. Trade Information Bulletin (1924), No. 186 [steel]; Rev. d'Econ. Pol. (1920), 34 : 488; Martin, 263.

Industries: Ville-Chabrolle, 101; N. W. Posthumus, French cotton industry, in Harv. Bus. Rev. (Jan., 1926), 4 : 179 ff.; Blanchard, ibid., 6 : 186; Siegfried, French industry, 7. *Iron:* J. Levainville, French iron industry after the war, Geog. Review (1923), 13 : 86 ff.; Ogburn, chap. 11; U. S. Bureau For. Com., Spec. Agents (1920), No. 204, and Trade Information Bull. (1925), No. 367; Rev. d'Econ. Pol. (1920), 44 : 681; Ann. Stat. (1929), 2*; Williams, 96, 216. *Metal:* Ville-Chabrolle, 145; U. S. Trade Information Bull. (1928), No. 543, French market for industrial machinery. *Automobile:* Rev. d'Econ. Pol. (1929), 43 : 719 ff.; (1930), 44 : 796 ff.; U. S. Trade Information Bull. last cited, 543 : 11; Farnham, 114, 164; André Citroen, L'avenir de la construction automobile, Rev. Polit. et Parl. (May 10, 1929); I follow the summary in Soc. Sci. Ab., No. 10248.

General: *Income:* The estimate of Bernonville, in Bull. de la Statistique (Sept., 1931), 21 : 557, includes the item of pensions to the amount of fr. 6.5 milliard, but is criticized by Germans as too low; cf. Wirtschaft und Statistik (June, 1932), 12 : 12 : Sonderbeilage, 11. *Wages:* Bulletin de la Stat. (March, 1931), 20 : 216 ff.; U. S. Monthly Labor Rev. (Jan., 1932), 34 : 169 ff. *Labor:* D. J. Saposs, Labor movement in post-war France (N. Y., 1931), 233.

CHAPTER XI

There are three books on the economic history of Germany in the nineteenth century on which I have drawn so freely that I shall omit detailed references to them: Ludwig Pohle, Die Entwicklung des deutschen Wirtschaftslebens im letzten Jahrhundert, second ed. (Leipzig, 1908) [an admirable sketch in 150 pages]; A. Sartorius von Waltershausen, Deutsche Wirtschaftsgeschichte, 1815–1914 (Jena, 1920) [most detailed, with bibliographies]; Werner Sombart, Die deutsche Volkswirtschaft im neunzehnten Jahrhundert, seventh ed. (Berlin, 1927) [general, most suggestive].

Conditions: H. Richelot, L'association douanière allemande, second ed. (P., 1859); W. Roscher, System, 3 : 279; G. F. Knapp, Die Bauernbefreiung und der Ursprung der Landarbeiter (Leipzig), 1 : 67 ff.; Josiah Stamp, British incomes (L., 1916), 514; Margaret E. Hirst, Life of Friedrich List (N. Y., 1909), 20; W. Lotz, Ideen der deutschen Handelspolitik (Leipzig, 1892), 11 ff.

Industry: G. Schmoller, Geschichte der deutschen Kleingewerbe (Halle, 1870), 54, 103 ff., 164, 457 ff., 494 ff.; Rudolph Dietz, Die Gewerbe im Grossherzogthum Baden (Karlsruhe, 1863); the figures in the text are compiled from data p. 30 ff.; Matschoss, in Beiträge zur Geschichte der Technik (1909), 1 : 34; T. C. Banfield, Industry of the Rhine (L., 1848), 2 : 37, 41, 245; Das Weberelend in Schlesien, Preussische Jahrbücher (1891), 67 : 177 ff.

Agriculture: Social Science Abstracts (1931), No. 2541; M. Mendelson, Die Entwicklungsrichtungen der deutschen Volkswirtschaft (Leipzig, 1913), 21; figures of area from Statistisches Handbuch and Statistisches Jahrbuch.

CHAPTER XII

Development: Mendelson, 25; A. Braun in Yale Review (1902), 11 : 10; R. S. Baker, Seen in Germany (N. Y., 1901), 313; Sir Philip Dawson, Germany's industrial revival (L., 1926), 2; Albert Hesse, Die wirtschaftliche Entwicklung des deutschen Reiches (Jena, 1913), 33.

Forms: Statistics from K. Bücher, Entstehung der Volkswirtschaft, zweite Sammlung (Tübingen, 1921), 90, and Statistik des deutschen Reiches, 413 : 274 ff. *Handicraft:* R. Lavollée, Classes ouvrières (P., 1884), 1 : 123 ff.; Schmoller's Jahrbuch für Gesetzgegung (1913), 37 : 2144; cf. W. Sombart, Der mod. Kap., 2 : 83. *Merchant Employer:* Handbuch der Wirtschaftskunde Deutschlands (Leipzig, 1901), 1 : 310 ff.; G. Schönberg, Handbuch der Pol. Oek. (Tübingen, 1896), 2 : 1 : 490, 498; Schwiedland, in Grundriss der Socialökonomik (Tübingen, 1914), 6 : 31.

Early Factory: Chapman, Work and wages, 1 : 153; Georges Blondel, L'essor industriel du peuple allemand (P., 1898), 151; A. J. Wilson, Resources of modern countries (L., 1878), 1 : 345; Schoenhof, in Forum (1901), 31 : 90; Price Collier, Germany (N. Y., 1913), 121.

Factors: Sombart, Volkswirtschaft, 106–121; cf. A. P. Usher in Amer. Hist. Rev. (July, 1918), 23 : 797–815; F. Naumann, Central Europe (L., 1916), 118 ff.; Blondel, 110 ff. *Discipline:* August Bebel, My Life (Chicago, n. d.), 17; Howard, 40, 76, 80; F. E. Farrington, Commercial education in Germany (N. Y., 1914), 54; Collier, 392; Chapman, 1 : 166. *Education:* Report of Commercial Agent Harris, dated Oct. 28, 1903; R. G. Lévy in Rev. Deux Mondes (1898), 1 : 809; Naumann, 112, 125; Shadwell, 1 : 15, 2 : 75; Farnham, 419. *Books:* Jahrbücher fur Nationalökonomie (1923), 121 : 386; Lit. Digest (Dec. 5, 1903); 2 : 295. *Moral:* Friedrich List,

National system of political economy (L., 1904), 316; Shadwell, 1 : 43, 2 : 250; Collier, 371.

Leaders: S. H. Higgins, The dyeing industry (Manchester, 1919), 69, 141 ff.; Roscoe, in Monthly Rev. (May, 1901), 3 : 45; Howard, 71; report of Consul Harris of Mannheim, New York Times (Feb. 5, 1905); Dawson, Evolution, 79, 86; Schmoller's Jahrbuch für Gesetzgebung (1912), 36 : 443 ff.; Elster in Jahrbücher fur Nationalökonomie (April, 1929), Soc. Sci. Ab. (1930), No. 10251.

Methods: Baker, 199 ff.; Engineering Progress (Feb., 1924), 5 : 28; M. Schwob, Le danger allemand (P., 1897), 191; Dawson, in Fortnightly Rev. (1914), 102 : 758 ff.; Shadwell, 1 : 15, 26, 39; K. Francke, The German spirit (N. Y., 1916), 5; Roscoe, 44; B. H. Thwaite, in Nineteenth Century (1896), 40 : 926 ff.; Lévy, 810; W. H. Dawson, Evolution, 78, 82 ff.; P. Dawson, 5; American engineering competition (N. Y., 1901), 111; R. C. Epstein, in Quarterly Jour. of Econ. (Feb., 1926), 40 : 252; Lloyd, Cutlery trades, 23; Higgins, 128, 137.

Industries: *Metallurgy:* Jeans, Iron trade, 80 ff.; E. E. Williams, Made in Germany (L., 1987), 40 ff.; Chapman, Work and wages, 1 : 73; H. Schumacher, Weltwirtschaftliche Skizzen (Leipzig, 1911), 419 ff.; V. Cambon, Les derniers progrès de l'Allemagne (P., 1914), 159 ff. *Machinery:* Dawson, Evolution, 76; Shadwell, 1 : 149, 166, 214; P. Göhre, Three months in a workshop (L., 1895), 52; American engineering competition, 97; Baker, 34; American Machinist (1908), 31 : II : 636; Farnham, 166; Lloyd, 43, 348, 381. *Textiles:* Schulze-Gävernitz, Cotton trade, 78 ff.; Copeland, Cotton manufacturing, 90, 277, 331; Chapman, Work and wages, 1 : 156, 167; Shadwell, 2 : 435. *Chemical:* Howard, 60 ff.; Kershaw, in Fortnightly Rev. (1915), 104 : 325; Lévy, 812; Higgins, 97; Dawson, Evolution, 85; Cambon, 183 ff. *Electrical:* National Industrial Conference Board, Rationalization of German industry (N. Y., 1931), 106; Howard, 58; Cambon, 167 ff.

General: P. Dawson, 6 ff.; Nat. Ind. Conf. Board, Rationalization, 7, 40. *Wages:* Göhre, 14; Jahrbücher fur Nationalökonomie (1913), 46 : 411; Farrington, 50. The table is from R. Lauret, Les conditions de la vie en Allemagne (P., 1923), xiii. I do not find in the English reports [Cd. 4032] (1908), Vol. 108 (Germany); [Cd. 4512] (1909), Vol. 91 (France); [Cd. 5609] (1911), Vol. 88 (U. S.), the summary in the form reproduced in the text. Figures vary according to the standard of measurement chosen, and their significance should not be strained. *Standard of Living:* Karl Helfferich, Deutschlands Volkswohlstand, 1888–1913 (Berlin, 1914), 86 ff.; Schulze-Gävernitz, Cotton trade, 186; Shadwell, 2 : 249; W. J. Ashley, Progress of the German working classes (L., 1904), 51; Howard, 120.

CHAPTER XIII

References to Angell's book, of which free use has been made, are omitted. The compendious survey of German economic development

entitled Strukturwandlungen der Deutschen Volkswirtschaft, 2 volumes (Berlin, 1928), consisting of lectures delivered by many different authorities, is cited by name of the editor, Dr. Bernhard Harms, with references to the second edition, revised (Berlin, 1929). This book contains, 2 : 471–509, a systematic bibliography of the more important works on post-war conditions and problems.

Reparations: H. W. V. Temperley, History of the Peace Conference (L., 1920), 2 : 51; Moulton and McGuire, 75, 80, Appendix B.; H. G. Moulton, The reparations plan (N. Y., 1924); Max Sering, Germany under the Dawes plan (L., 1929), 34; J. H. Williams, German foreign trade and reparation payments, Quarterly Journal of Econ. (May, 1922), 36 : 495 ff.; G. Greer, The Ruhr-Lorraine industrial problem (N. Y., 1925), 198; Report of Agent General for reparation payments (Berlin, May 21, 1930), 335–336.

Inflation: Max Hermant, Les paradoxes économiques de l'allemagne moderne (P., 1931), 29; René Lauret, Les conditions de la vie en Allemagne (P., 1923), 70 ff., 166. Sir P. Dawson, 29, thinks the inflation was deliberate. For detailed study of effects of inflation on distribution, see Richard Lewinson, Die Umschichtung der europäischen Vermögen (Berlin, 1925).

Agriculture: Economic Review of the Foreign Press (Feb. 4, 1921), 3 : 222; Fritz Beckmann, Die Kapitalbildung der deutschen Landwirtschaft während der Inflation, Schmoller's Jarhbuch für Gesetzgebung (1924), 48 : 1 : 113 ff., 122 ff.; Lauret, 32 ff.; Harms, 1 : 117, 129, 143, 161 ff.; E. de Felcourt, Le crise agricole allemande, Revue Econ. Internat. (July, 1926), 18 : 3 : 50, 54; Sering, 182 ff.; Handwörterbuch der Staatswissenschaften, fourth edition, Ergänzungsband (Jena, 1929), 768, 787; The science of farm labour, Internat. Labour Rev. (1927), 15 : 381, 389.

Industrial Organization: Post-war conditions in the German toy industry, U. S. Trade Information Bulletin (Sept. 8, 1924), 267 : 2, 9, 14; Harms, 1 : 95, 218, 335 ff.; article Aktienrecht in Handwörterbuch (1929), 1–8; Hermant, 116 ff.; R. Liefmann, German industrial organization since the world war, Quart. Journal of Econ. (Nov., 1925), 40 : 93 ff.; National Industrial Conference Board, Rationalization in German industry (N. Y., 1931), 30 ff.

Rationalization: In general, Conference Board as above; Walter Meakin, The new industrial revolution (L., 1928), and articles Rationalisierung in Handwörterbuch (1929), 708–817. Details from Harms, 1 : 199 ff., 213, 227; Hermant, 136, 151; Farnham, 34, 202, 409; P. Dawson, 237. *Industries:* Harms, 1 : 209 ff.; Conference Board, 82 ff., 119 ff.; Meakin, 36 ff., 97, 104, 127 ff., 149.

Foreign Trade: Harms, 1 : 193, 396 ff.; Report of Agent General of Reparation Payments (Berlin, 1930), 249 ff., 266; Conference Board, 137, 146; Sering, 144 ff.; Hermant, 93 ff.

Labor: Harms, 1 : 463 ff., 486; Hermant, 172; Lauret, xi, 11, 50, 136; Econ. Rev. of Foreign Press (Feb. 11, 1921), 3 : 244; U. S. Federal Reserve Bulletin (Jan., 1923), 9 : 61; Dreher in Annalist

(Jan. 6, 1922), 19 : 199; Sering, 161, 170, 172; Statistisches Jahrbuch für das Deutsche Reich (1930), 32; Internat. Labor Rev. (Oct., 1928), 18 : 639.

Unemployment: Harms, 1 : 65, 393, 482; Hermant, 154; Wirtschaft und Statistik (Apr. 2, 1932), 12 : 240.

CHAPTER XIV

The best general accounts of Russia in English are Donald Mackenzie Wallace, Russia, revised ed. (N. Y., 1905), and the translation of Anatole Leroy-Beaulieu, The empire of the tsars, 3 vols. (N. Y., 1893); on economic history, James Mavor, An economic history of Russia, 2 vols. (N. Y., 1914). References to these books will in general be omitted. Robinson, Rural Russia, came out too late to be used in the text.

Physical: K. A. Wieth-Knudsen, Bauernfrage und Agrarreform in Russland (München, 1913), 3 ff.; George Vernadsky, A history of Russia (New Haven, 1929), 4; quotation from the U. S. Commercial Attaché at Petrograd, Annals Amer. Ac. Soc. and Pol. Sci. (July, 1919), 84 : 91.

History: In general, Vernadsky, and Josef Kulischer, Russische Wirtschaftsgeschichte (Jena, 1925); Paul N. Miliukov, Essai sur l'histoire de la civilisation russe (P., 1901); Vladimir G. Simkhovitch, in Handwörterbuch der Staatswissenschaften, second ed., 2 : 399 ff.

Serfdom: Peter A. Kropotkin, Memoirs of a revolutionist (Boston, 1899), 51 ff.; Nikolai V. Gogol, Dead souls (N. Y., 1886); H. von Samson-Himmelstjerna (Uspensky), Verlumpung der Bauern (Leipzig, 1892), 94; Howard P. Kennard, The Russian peasant (Phila., 1908), 42; Maurice G. Hindus, The Russian peasant (N. Y., 1920), 143.

Emancipation: Mavor; W. D. Preyer, Die russische Agrarreform (Jena, 1914), 5 ff.; Wieth-Knudsen, 25 ff.; report by Michell, in British parliamentary papers (1870), 67 : 22–122; A. Daudé-Bancel, La réforme agraire en Russie (P., 1926), 24; Handwörterbuch, second ed., 2 : 413.

Large Estates: Michell's report, 54; Gerhart von Schulze-Gävernitz, Volkswirtschaftliche Studien aus Russland (Leipzig, 1899), 319 ff.; Alphons Thun, Landwirtschaft und Gewerbe in Mittelrussland (Leipzig, 1880), 7 ff.; Samson-Himmelstjerna, 159 ff. (Terpigoriew, Verlumpung des Adels).

CHAPTER XV

Communal Land Tenure: *Origin:* Kulischer, 238 ff.; Preyer, 12–15; Miliukov, 175, 192; Johannes von Keussler, Zur Geschichte und Kritik des bäuerlichen Gemeindebesitzes in Russland, 3 parts cited in 4 vols. (Riga and St. Petersburg, 1876–1887,) 1 : 114 ff., 4 : 56 ff.; Simkhovitch, Die Feldgemeinschaft in Russland (Jena, 1898). *Workings:* Quotation from Leroy-Beaulieu, 1 : 475; examples from Keuss-

ler, 2 : 299 and Leroy-Beaulieu, 1 : 525; full account of lot groups in Keussler, 2 : 308 ff. *Land Divisions:* Preyer, 57; Wieth-Knudsen, 76, both with maps [maps also in A. Meitzen, Siedlung und Agrarwesen, Berlin, 1896, 2 : 221 and atlas]; full details in Keussler, 3 : 1–72. *Redistributions:* Keussler, 2 : 41; 3 : 5, 98 ff., 106 ff., 178 ff.; Thun, 111, 122.

Appreciation: August von Haxthausen, Die ländliche Verfassung Russlands (Leipzig, 1866), 415; M. Tugan-Baranowsky, Geschichte der russischen Fabrik (Berlin, 1900), 351; Faucher, in Systems of land tenure, ed. J. W. Probyn (L., 1876), 332. *Criticism:* Keussler, 3 : 8 ff.; Wieth-Knudsen, 81; Preyer, 56; Thun, 69, 73, 115; L. de Tegoborski, Études sur les forces productives de la Russie (P., 1854), 1 : 321; Alexander D. Bilimovich, The land settlement, in Alexis N. Antsiferov, Russian agriculture during the war (New Haven, 1930) (Carnegie series), 315. Extracts from report of 1872 in Keussler, 2 : 39 ff. *Qualifications:* Wieth-Knudsen, 70, 77; Bilimovich, 313; Keussler, 2 : 47, 63, 136 ff., 3 : 52 ff., 4 : 210; Thun, 130; faults of over-large villages in Keussler, 3 : 44 ff., 4 : 211, cf. Thun, 62–63; small families in Keussler, 2 : 53 ff., and Isaac A. Hourwich, The economics of the Russian village (N. Y., 1892), 93, 121.

Social: Thun, 68, 130, 133, 147 ff.; E. B. Lanin [pseudonym of E. J. Dillon], in Fortnightly Rev. (Feb., 1891), 55 : 188, 190, 195; Inostranietz, in Journal des Econ. (1893), V: 16, 233 ff.; Samson-Himmelstjerna, 72, 75; Hindus, 101; Hourwich, in Yale Rev. (1892–93), 1 : 428; I. S. Bloch, Future of war (N. Y., 1899), 205, quoting Sokolovski. *Political:* Leroy-Beaulieu, 2 : 4; Michell's report, 50; Daudé-Bancel, 28; Keussler, 2 : 44, 61; Thun, 149; Gogol, Dead souls, 1 : 40; Preyer, 63.

CHAPTER XVI

Yield: Internat. Stat. Year-book (Geneva, 1928), 57. The table, from Antsiferov, 54, unfortunately does not specify the nature of the " grain " or " cereals " to which it refers. I have used the 60-pound bushel in getting equivalents of puds per dessiatine; this is too heavy for other grains than wheat, but the yields of other grains are higher. Early English yields in Frederick W. Maitland, Domesday book and beyond (Cambridge, 1897), 438; F. G. Davenport, Economic development of a Norfolk manor (Cambridge, 1906), 30; Hosebonderie, ed. E. Lamond, in Walter of Henley (Oxford, 1890), 71. Yield per seed, Thun, 36; per person, Ballod, in Schmoller's Jahrbüch für Gesetzgebung (1905), 29 : 853. Figures in Michell's report (1870), 71, from Hausner's statistics, would make the Russian yield of grain below that even of Spain and Greece. *Methods:* Michell's report, 75; Thun, 108; Hindus, 84 ff.; Daudé-Bancel, 59–60.

Income: Sergej Prokopowitsch, Ueber die Bedingungen der industriellen Entwicklung Russlands (Tübingen, 1913) [Archiv für Socialwissenschaft, Ergänzungsheft 10], 24 ff., with discussion of other

estimates. *Taxes:* Prokopowitsch, 33, 82; Thun, 94; Miliukov, 165; Daudé-Bancel, 50; Hourwich, 32; Public Opinion, Sept. 16, 1905; Lanin [Dillon], in Fortnightly Rev. (Feb., 1891), 55 : 58. *Burden:* Stepniak, in Fortnightly Rev. (1892), 57 : 364; Michell's report, 45; Hourwich, 33; Nicolai-On, Die Volkswirtschaft in Russland nach der Bauern-Emancipation (München, 1899), 2; Samson-Himmelstjerna, 69 ff.; Schulze-Gävernitz, 333–334; Lanin [Dillon], in Fortnightly Rev., 55 : 187, 210. Wieth-Knudsen, 57 ff., thinks that the burden has been exaggerated, but is against the general opinion. *Arrears:* Table from Hindus, 105, citing Alexinsky; Daudé-Bancel, 49; Thun, 104 ff.

Famine: A. Heyking, Problems confronting Russia (L., 1918), 15; Lanin [Dillon], in Fortnightly Rev. (1891), 56 : 636–652; Bannerman, in Westminster Rev. (1902), 157 : 283 ff.; Stepniak, 367; Shishkoff in Nineteenth Century (1892), 31 : 2; Hourwich, in Yale Rev. (1892–93), 1 : 433. *Housing:* Thun, 52, 78, 225 ff.; Kennard, 20 ff.; J. D. Rees, Life in a Russian village, Nineteenth Century (1894), 35 : 818; Lanin [Dillon], Cholera and cleanliness in Russia, Fortnightly Rev. (1892), 58 : 304. *Food:* Michell's report, 80 ff.; Kennard, 80, 226; Shishkoff, 2; Thun, 50 ff.; Rees, 821; Wieth-Knudsen, 65. *Drink:* Thun, 150 ff.; Samson-Himmelstjerna, 51 ff.; George Kennan, Siberia (N. Y., 1891), 2 : 329; Edmond Théry, La transformation économique de la Russie (P., 1914), 64 ff.; Heyking, 158–159. *Vital:* Internat. Stat. Year-book, 1927, 25; Daudé-Bancel, 46; Statesman's Year-book, 1901, 964; Hindus, 19; Bannermann, 286; Michell's report, 89. *Medical:* Wieth-Knudsen, 21; Samson-Himmelstjerna, 100, 155; Kennard, 228, 237; Bloch, 220–221. *Education:* World Almanac (1931), 789; Economic Review (1914), 24 : 305; Kennard, 17, 244; Lit. Digest (Jan. 30, 1904, Oct. 28, 1905); Kennan, in Outlook (April 22, 1905); Miliukov, 123; U. S. Commerce Year-book (1930), 2 : 671; Hugo Ganz, The land of riddles (N. Y., 1904), 191; Gogol, Dead souls, 2 : 186; Thun, 55, 82; Hourwich, 12.

Land: Table from Wieth-Knudsen, 40. For details see the important contribution by the director of the central committee of statistics, A. Zolotareff, Propriété foncière . . . en 1905, Bulletin Inst. Internat. Stat. (1908), 17 : 176*–208*. I omit references to the polemics on the adequacy of peasants' holdings. *Reform:* Théry, 20; Auhagen, in Max Sering, Russlands Kultur und Volkswirtschaft (Berlin, 1913), 135; Koefoed in Sering, 147 ff.; Preyer and Wieth-Knudsen, passim [cf. the former's criticism of the latter in Jahrbücher f. Nat. (1914), 102 : 112–116, and Ballod's review of Preyer, in Jahrbuch f. Gesetzgebung (1914), 38 : 1645–1648]. For an account in English see R. T. Ely, in Amer. Econ. Rev. (March, 1916), 6 : 61–68.

CHAPTER XVII

Early Industry: Kulischer, 299 ff.; Schulze-Gävernitz, 4 ff.; M. Tugan-Baranowsky, Geschichte der russischen Fabrik, 8 ff.;

Miliukov, 106 ff. Table from Tugan-Baranowsky, 121, cf. 98. *Iron:* J. J. Oddy, European commerce (Phila., 1807), 1 : 73, 75. *Jakolew:* K. A. Pashitnow, Die Lage der arbeitenden Klasse in Russland (Stuttgart, 1907), 258. Statistics about 1850 from L. de Tegoborski, Forces productives, 1 : 317, 2 : 227, 358, 3 : 244 ff.

Kustar: Moratchesky in W. de Kovalevsky, La Russie à la fin du 19e siècle (P., 1900), 538 ff.; Tugan-Baranowsky, passim; Thun, 155 ff., 207 ff.; Miliukov, 114. Quotation and table from Thun, 175, 208.

CHAPTER XVIII

General references as in the preceding chapter. Schulze-Gävernitz gives an admirable analysis of the economic conditions of manufacture, and Pashitnow supplies full details from official sources on the condition of labor.

Conditions, 1861 ff.: F. Matthäi, Der auswärtige Handel Russlands, (St. Petersburg, 1874), 107; Iwan Golowin, Russland unter Alexander II (Leipzig, n. d.), 143 ff.; Kurt Schweikert, Die Baumwollindustrie Russisch-Polens (Zürich, 1913), 175, 331; Kurt Wiedenfeld, The remaking of Russia (L., 1924), 6; V. Wittschewsky, Die russische Zoll- und Handelspolitik (Leipzig, 1902), 434.

Labor: Pashitnow, passim; Thun, 226; Report of Stanton, Consul General at St. Petersburg, Aug. 1, 1884, in Labor in Europe (Washington, 1885), 2 : 1444; Andrew D. White, Autobiography (N. Y., 1905), 2 : 54; Chapman, Work and wages, 1 : 153; Francis D. Longe, A refutation of the wage-fund theory (L., 1866), 60; Schoenhof, in Forum (1901), 31 : 96; American Machinist (1904), 27 : 1 : 582; E. M. Dementjeff, in Braun's Archiv für soziale Gesetzgebung (1889), 2 : 553 ff.; Report of Geoffrey Drage, in Royal Commission on Labour [C. 7063 xiv], 1894.

Conditions about 1900: Statistics from Théry, 88, and Pub. Amer. Stat. Assoc. (1912), 13 : 276. *Legislation:* Tugan-Baranowsky, 459 ff.; Goebel, in Sering, 194; N. von Nolcken, Aus den Errinerungen eines russischen Fabrikinspektors, Schmoller's Jahrbuch für Gesetzgebung (1908), 32 : 1711 ff. *Wages and Living:* Sergei Prokopowitsch, Haushaltungs-Budgets Petersburger Arbeiter, Archiv für Sozialwissenschaft (1910), 30 : 66–99; Goebel, in Sering, 198 ff.; Economic Review (1914), 24 : 305; S. Patkanow, Etat actuel des lieux habités urbains de l'Empire de Russie, Bull. Inst. Internat. Stat. (1908), 17 : II : 430*–443*.

Organization: Statistics from Prokopowitsch, Bedingungen der industriellen Entwicklung, 19, 23; Deutsches Handelsarchiv (1914), 1 : 354–355. *Organization:* Goebel, in Sering, 186 ff.; Schweikert, 295. *Profits:* Schulze-Gävernitz, 273 ff.; Lanin [Dillon], in Fortnightly Rev. (1891), 55 : 183; Goebel, 201. *Criticism:* Prokopowitsch, 83; Goebel, 199.

CHAPTER XIX

Books from which items are so often cited that it would be tedious to multiply references are the following, in the order of date of publication: K. Leites, Recent economic developments in Russia (Oxford, 1922) (Carnegie series); S. N. Prokopovitch, Economic conditions of soviet Russia (L., 1924) [valuable statistics]; James Mavor, The Russian revolution (L., 1928) [detailed chronological narrative]; Maurice Dobb, Russian economic development since the revolution (L., 1928) [keen economic analysis]; William H. Chamberlin, Soviet Russia (Boston, 1930); A. Yugoff, Economic trends in soviet Russia (N. Y., 1930); Calvin B. Hoover, Economic life of soviet Russia (N. Y., 1931).

Political: Isaac D. Levine, Russian revolution (N. Y., 1917), 56 ff.; A. Heyking, Problems confronting Russia (L., 1918), 20; Albert R. Williams, Lenin (N. Y., 1919), 34; Schmoller's Jahrbuch für Gesetzgebung (1924), 47 : 143; Wiedenfeld, 14. *Soviets:* John Spargo, Greatest failure in all history (N. Y., 1920), 12 ff., 204 ff.; A. Ransome, Russia in 1919 (N. Y., 1919), 71 ff., and Crisis in Russia (L., 1921), 77; Bertrand Russell, Practice and theory of Bolshevism (L., 1920), 72.

Nationalization: Les conditions du travail dans la Russie des soviets, Questionnaire, in France, Bull. Min. Travail (July, 1920), 27 : 299 ff.; Wiedenfeld, 84, 108; J. M. Keynes, Laissez-faire and communism (N. Y., 1926), 104; A. A. Heller, Industrial revival in soviet Russia (N. Y., 1922), passim; Spargo, 208, 227; Ransome, Crisis, passim; Report of American Trade Union Delegation, Russia after ten years (N. Y., 1927), 39.

Agriculture: Antsiferov, 22, 45, 117 ff.; A. Daudé-Bancel, La reforme agraire en Russie (P., 1926), 78 ff.; Spargo, 69 ff., 104 ff.; Economic Review of the Foreign Press (April 15, 1921), 3 : 408; M. Farbman, Piatiletka (N. Y., 1931), 125.

Nep: Spargo, 128 ff., 298; Heller, 44, 90, 103; Farbman, 6; Association financière . . . Russe, La débacle des soviets (P., 1922), 81 ff., 106; Economic Review of Foreign Press (Nov. 19, 1926) [wages]; Report Amer. T. U. Delegation, 14, cf. Vernadsky, 286.

Five Year Plan: General references in addition to those above, W. H. Chamberlin, The soviet planned economic order (Boston, 1931); M. Farbman, Piatiletka Russia's five year plan (N. Y., 1931); G. T. Gringko, The five year plan (N. Y., 1930); The soviet union looks ahead (N. Y., 1929) [the last two Bolshevist]. In particular, Economic Review of Foreign Press (Nov. 19, 1920), 3 : 30 [Goldstein's estimate of capital]; Russell, 87; Hugh L. Cooper, Address at Engineers' Club, N. Y., Feb. 10, 1931.

Agriculture: Daudé-Bancel, 82 ff., 109 ff.; Prokopovitch, in Economic Review of Foreign Press (July 2, 1926); Vernadsky, 288; Auhagen, summarized in Soc. Sci. Abstracts (1930), No. 1473; see the Abstracts also for state farms (1929), Nos. 6274, 8587; (1930), Nos. 2702, 16102, etc. Most of the facts in the text are cited from the general references above.

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