ECONOMIC DEVELOPMENT OF THE UNITED STATES

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PREFACE

The business achievements of the last hundred years, with all they signify for the satisfaction of human wants, are a remarkable performance. They are a revelation of what man can do in this respect when his attention is focused strongly on the pursuit of wealth. It may be assumed that the student is interested not only in what has been done, but why it was done. That is to say, while the mere record of our industrial advance may be of interest, the surpassing object of study is the forces that have brought about our unusual economic development. No study of our industrial past would be satisfactory which failed from this point of view. If we are merely seekers after practical things, the causes are certainly important, for in these are to be found an explanation of what has been accomplished; these causes also provide a basis for the criticism of our past industrial policy, and they must be understood in formulating a policy for the future.

In this volume I have treated the subject matter of economic history as a record of development. Throughout the study an attempt has been made to bring together causes and results. Herein the student will find most of the economic material with which he is familiar, with some additions perhaps to suit the particular emphasis of our study. Emphasis has been laid on the development and use of raw materials, on technical improvements, on the growing use of by-products, on the expansion of our industrial organization, on the growing specialization in all branches of industry, on the introduction and development of numerous commercial facilities, on the growth of government regulation,

and on the development of business education. Among other things, emphasis has also been laid on the effect of the expansion of our national domain and on the acquisition of our new possessions on our economic growth. No study of industrial development would be complete without a knowledge of the new methods of marketing and of our foreign commercial aims.

In organizing the material for this volume it has seemed to me that something is to be gained by tracing through a period the great branches of industry, as for example, manufactures, commerce, agriculture, and by showing the relation of these branches in process of development by the use of summaries and by introductory matter at the beginning of the chapters.

In presenting this material I have tried to keep in mind the needs not only of students in departments of economics and in schools of commerce, but also of the general reader. A study of economic development may serve as the starting point for the reader who wishes an initial survey of the whole field of industry, and as an outline of the field for the student who is pursuing specialized studies.

ISAAC LIPPINCOTT

PREFACE TO THE SECOND EDITION

Changes in our economic development since 1921, when the first edition of this volume appeared, have made it necessary to revise a great deal of the material of the text. The revision has been comprehensive, including additions to some of the earlier chapters, changes in all the tables so as to give the latest available data, and many additions to the body of the text. The remarkable development of trade and industry since the close of the World War has presented new material which no writer can overlook. This is notably the case with the new status of agriculture, of the railroads, of foreign trade, and of the new relations growing out of the settlements with the debtor countries of Europe. I have added a new chapter at the end of the volume giving an estimate and an appraisal of the economic development of the United States. The present volume is amply supplied with maps and charts illustrative of the materials of the text.

I. L.

CONTENTS

PART II

THE COLONIAL PERIOD

PART III

FOUNDING OF THE NATIONAL INDUSTRIAL SYSTEM 1789–1866

PART IV

EXPANSION OF NATIONAL INDUSTRIES 1860–1914

PART V

THE WAR PERIOD AND AFTER

ILLUSTRATIONS

PART I

FACTORS IN ECONOMIC DEVELOPMENT

ECONOMIC DEVELOPMENT OF THE UNITED STATES

CHAPTER I

DEFINITIONS AND CAUSES

1. The Relation of Economic History to Economics.— It might be well to begin our discussion with a statement of the relation of economic history to economics, or political economy, as it is sometimes called. Writers on the latter subject are interested chiefly in the laws or principles involved in business relations. Questions of value, price, wages, interest, profit, and rent are uppermost in their minds. Their task is to explain why goods exchange at certain prices, why wages of artisans are at certain levels, why the interest rate on certain kinds of loans is 5, 6, or 7 per cent, the effect of competition and monopoly on industry, and many other problems suggested by this statement. In short, they explain how economic forces act, what results they produce, and sometimes venture an opinion as to the good or bad effects of the outcome. Modern textbook writers often include chapters on practical economic problems, including money, banking, forms of business organization, labor problems, protection and free trade, and public finance. But whatever the subject matter, the chief purpose of these writers is to state, explain, and criticize modern business relations. They do not trace systematically the growth of industrial society. If they refer to economic history at all it is in a detached way for the purpose of illustrating some principle under discussion.

Writers of economic history have a different point of view. They study in an orderly way the economic development of a country. They seek to answer the question how we grow in wealth and prosperity. To be sure, their subject matter includes money, banking, forms of business organization, labor problems, etc., but their purpose is to trace and explain development, to point out relations between different branches of industry in process of development, and, as far as possible, to present a complete and continuous picture of growing industrial society.

A moment's thought will convince the student that this subject is of something more than mere academic importance. Economic history is a record of industrial successes and failures. Many of our greatest problems have been economic. All our states have legislated on business matters, and in addition, the national government from the beginning has enacted laws for the promotion and regulation of industry. Some of the great issues have been protection of domestic industries, the administration of the public domain, money and banking, internal improvements, and in recent years, the regulation of big business and control of certain industrial relations, including numerous problems arising from relations of employers and workmen. What was the purpose of the laws? What did they accomplish? What were their good and bad features? These are matters of record. The United States is wonderfully rich in natural resources; the task of developing these has been left almost entirely to private initiative with very little interference from the government. What has been the outcome of this policy? This, also, is a matter of record. The study of economic history contains a statement of the policies we have followed, a record of successes and failures, together with the reasons. This study makes the past valuable because of its lessons. Students of economics, business men, and law makers can all find here an

abundance of material for guidance in their respective spheres.

2. **Industrial Groups.**—The commodities we eat and wear do not spring ready-made from nature. They pass through a number of stages of production before reaching ultimate consumers. It is true that in some instances raw products are ready for use in the home, but in the vast majority of cases they pass to factories where they are worked into finished forms. Sometimes they pass through a series of specialized industries before delivery to final users. To obtain illustrations of this statement the student has only to trace the industrial history of iron ore from mine to safety razor, or of hides from the animal to the shoe, or of timber from the forest to the handsome furniture of the home. As industry is managed to-day, an elaborate organization is required to carry raw products through all the stages of production. Specialization is one of the great features of modern industry. This means that in order to do the work of society most effectively, producers concentrate attention on this or on that industry or stage of production. Some industries are devoted entirely to mining, some to farming, others to transportation; some to banking and others to manufacturing. There was a time in the United States when all stages of production began and ended within the household. In the pioneer period, for example, farmers tanned hides, converted them into leather, and made the leather into boots, shoes, and harness. Likewise they sheared sheep, prepared the wool, had it spun into yarn, from which was made cloth and clothing for the family. It was the rule in new and isolated communities for families to produce almost everything they needed from the raw materials, and to consume almost everything they produced. There was little or no specialization. But to-day one can hardly find an industry which takes raw products from nature and prepares them completely for the final consumer.

Each group of industries now contributes something towards the finished product, but no group does all the work.

One should not get the impression that the specialized industries are separate from, and independent of, each other. Indeed, they are all a part of one industrial organization. Together they compose the well rounded, fully developed industrial society of to-day. It is especially important to bear this in mind, because in tracing our industrial development it is impossible to keep the whole field in mind at one time; it is necessary to study growth first in one department and then in another. But it should be understood that all industries are expanding together, that they are all necessarily related, and that changes which influence one, affect others also.

Modern business activities may be divided into four groups and these, in turn, into sub-groups. Group I covers the raw material producing industries, including principally (*a*) agriculture, (*b*) mining and quarrying, (*c*) lumbering and related industries, and (*d*) fisheries. In a rough way this statement classifies the leading sources of raw products. The chief function of industries in this stratum is to obtain the crude, unfashioned products from nature. It should be observed, however, that some of these products are nearer the final consumer than others. Vegetables and fish, in many instances, have only to be marketed to be ready for home use, while iron ore, among many other raw materials that might be named, must pass through a number of manufacturing stages before it emerges as a final product.

Group II includes manufactures. The function of industries of this class is to convert raw materials into finished forms,—to create form utilities,—using the phraseology of economics.

Group III includes commercial industries. Again to use the terms of economics, their principal function is to pro-

vide time, place, or service utilities. Here, business activity is concerned with buying, selling, holding, storing, and insuring of goods, and providing credit machinery for exchange. Thus the principal subdivisions are: (*a*) merchandising, including wholesale and retail buying and selling; (*b*) banking, of which the most important forms are commercial, savings, and investment banking; (*c*) communication, including railroad and water transportation, telephone, telegraph, and postal service; (*d*) insurance, notably against fire, wind, accident, and bad debts; (*e*) credit rating and collections.

Group IV covers professional service available for business. The work of scientists, consulting engineers, lawyers, and to some extent of teachers, belongs in this group. In so far as service is rendered to business, these professions are a part of the industrial organization of society.

Each of these groups and sub-groups might be divided further; it is not our purpose, however, to give an exhaustive classification, but only to provide the outline for subsequent chapters.

3. The Relative Importance of the Groups.—In the growth of industrial society these groups change in relative importance. In new countries, farming, cattle-raising, lumbering, fishing, fur-trading, and mining—according to the nature of the resources—are the leading industries. In time, with the increase of capital and labor, and with the development of skill and experience, manufactures begin to rise in suitable localities. Meanwhile commercial organization, although very simple at first, becomes more and more complex, keeping pace with the expansion of industries.

Professional service is usually the last to be requisitioned for aid in industry. As long as the relatively inefficient producer can make profits, there is no need for the expert. In time, when competition becomes severe, and when clev-

erness and skill are required to finance enterprises, to answer delicate legal questions, and to plan new systems of management and production, there arises a demand for the specialist, and lawyers, engineers, chemists, and efficiency managers, among others, are trained for service in industry.

The order of development described above, with some modifications, has been the course of growth in the United States. It is the purpose of economic history to trace this evolution.

4. **Industrial Evolution.**—Evolution conveys the idea of unfolding, widening, differentiating, the specialization of functions within differentiated parts, and, later, the integration of these specialized parts. In the growth of industry three notable phenomena are observed, namely, the separation of occupations, the divisions of labor within these separated occupations, and the localization of industry. Indeed, these are all phases of one phenomenon; they involve the principle of specialization applied to (*a*) occupations, (*b*) individuals, (*c*) localities. In the long run and in the absence of artificial regulations, the result of the operation of this principle is that occupations or trades are carried on by persons who are best fitted for them, and industries develop at places which offer superior advantages.

5. **The Division of Labor.**—We have outlined above the specialization by groups. Many examples could be found in the United States to-day of a second kind of specialization, namely, that which applies to individuals, and which is sometimes called the division of labor. An illustration may be drawn from the manufacture of boots and shoes. A few of the divisions include: cutting the material for the uppers; skiving and leveling, by which the edges of the leather are leveled so that they may be neatly turned; turning, a process which involves the application of cement to

the inside of the beveled edge, and the turning the leather over to give a finished appearance; ornamenting the tips; sewing together the different parts of the upper; eyeletting, including the insertion of eyelets and hooks; fastening of buttons; stiffening the toe, and so on through a large number of processes.

These processes as a rule require separate groups of laborers; each man, of course, performs only a small part of the entire work. This division of labor is not only a result of industrial evolution, but greatly promotes further evolution, because it makes possible still further division with all the advantages that follow. Some of these advantages are: an increase in the skill of the workman, due to his concentration on a few processes; an increase in speed, due partly to the same cause and, also, to the saving of time by eliminating changes in tools and places; a saving of capital, because the machines and tools are kept busy most of the time; a better selection of laborers, due to the fact that within the subdivided processes it is easier to place workers in jobs suited to their capacities. Finally, the process leads to further simplification of industry and to further division of labor with all the resulting advantages.

6. The Localization of Industry.—The third kind of specialization mentioned above is the localization of industry. By this is meant the development of enterprises in certain favored localities. To some extent this feature characterized Colonial development. Shipbuilding, and the production of salt, naval stores, and flour, among others, were localized at favored places. But, in course of time, the process of localization was greatly extended. The introduction of improved means of communication with the resulting widening of the markets greatly promoted the movement. The leading forces involved are: nearness to supply of raw materials; nearness to water

power; an available supply of labor; an adequate supply of capital; facilities of transportation; appropriate climatic conditions; and nearness to the markets. Usually a number of these factors combine to cause one locality to be preferred to another. The fact that an industry has become established in a region, that capital has been invested in plants, that laborers have become settled in the region, and that markets have been organized tends to perpetuate an industry in a given locality. This is what is meant by the term "momentum of an early start" as a factor in localization.

Illustrations of the operation of these forces will be given in later pages. We should observe here, however, that these forces are of varying degrees of intensity. If the risks are not great, capital is relatively mobile; hence, it is not of as great importance in the localization of industry as some of the other factors. Not many years ago, water power had to be used at the source; but with the introduction of electric transmission, power derived in the first instance from waterfalls may be used long distances from the original source; thus, power sites tend to lose their influence as agencies of localization. The nearness to raw materials is usually a dominant influence, but cheap transportation may lessen its importance. Likewise climatic conditions may, to some extent, be reproduced in factories and this element deprived of significance. Not only manufacturing, but extractive and commercial industries are localized under the influence of some of the forces named above. With the latter, nearness to the markets is the principal cause of localization; while extractive industries must be pursued where the resources are suitable.

The principles of localization lie at the basis of trading among regions. No community produces all it needs. It usually attends to the industries in which it has advantages and exchanges with other regions, which follow the

same principle. The vast domestic and foreign commerce of the United States is based on regional specialization.

7. The Integration of Industry.—By this is meant the union of separate or specialized industries under one management. It is the latest movement in the industrial development of the United States. The extraction of raw materials, the conversion of these into finished or partly finished products, and these again into a variety of finished forms, and the marketing of them, in many instances, are carried on under a single direction. Formerly the management of the specialized industries was separate. A notable case of integration is found in the production of iron and steel, where each of several large organizations controls production from mines to consumers. Another related development is the "parallel combination" of industries where enterprises in the same stratum are combined.

Industry in the United States has run the whole gamut of evolution outlined above. From unspecialized industries progress has been in the direction of more and more specialization, along with greater and greater division of labor, and localization at favored places. And finally, many specialized industries have been combined and integrated.

8. Periods in the Industrial Development of the United States.—In a rough way it is possible to distinguish certain periods of industrial growth. Within the scope of certain years prominent features may be observed, and these may be taken as characteristic of the period under discussion. But when history is thus divided into epochs, it is not the intention to convey the impression that there are abrupt breaks in the growth. It is true that here and there great inventions, wars, and changes in industrial policy seem to mark the starting point for new development. Undoubtedly, the formation of the Constitution,

which put the shaping of our industrial policy in our own hands, marks an epoch; in a smaller way the War of 1812 and the events that preceded it form a rough boundary line, and in a larger way the Civil War was responsible for great industrial changes. But in none of these cases were the changes great enough to break the continuity of the development. Indeed, these great events themselves grew out of antecedent industrial events.

Another difficulty in dividing our history into periods results from the fact that the development has been composite; it is made up of expansion in many industrial fields, and the epoch-making changes in one frequently do not coincide with those in another. The periods for agriculture do not coincide with those for manufactures and commerce. Because of these limitations the periodic divisions can only be approximate. Taking into account these conditions, we may mark off four periods:

1. From the discovery of America to 1789.
2. From 1789 to the end of the Civil War.
3. From 1866 to 1914.
4. From 1914 (the recent war period) to the present.

This latter period should include a discussion of the various measures adopted in the United States to cope with the war conditions and the legislation designed to restore American industry to a peace basis.

The discussion of the characteristics of these periods is postponed until each is taken for study. Within each epoch we shall be concerned with (*a*) the growth of population, including its composition and distribution throughout the country and the relation of these matters to industrial growth; (*b*) the development of the raw material producing industries; (*c*) the growth of commerce and related industries; (*d*) the development of manufactures. Before we can study this growth, however, it will be

necessary to learn some of the leading conditions of industrial development in the United States.

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CHAPTER II

CONDITIONS OF ECONOMIC DEVELOPMENT

The essential conditions for economic development are found in (*a*) man himself, in (*b*) the institutions he creates, and in (*c*) the resources of the regions he inhabits.

9. **Man as a Factor.**—Man enters as a factor into economic development in two ways, first as a producer, and second as a consumer. The character of economic development in a country is largely determined by the conduct of men in these respects. Physical strength, endurance, ability to resist disease, or to devise means for their prevention, nervous energy, versatility, thrift and enterprise, all play an important part in constituting the right kind of a man to develop a country. The history of economic growth in the United States has been a long record of success through the application of these qualities. On the side of consumption, equally important traits have characterized our people. Unless men were willing consumers there would be little incentive for production, except of the bare necessities of life. The desire for goods is probably one of the strongest forces encouraging production. It encourages managers of enterprises to be on a keen outlook for commodities that consumers are likely to want, and it stimulates the workers to labor to obtain the wherewithal to make the purchase. As a rule, in order to demand we must supply; to consume, we must produce. Among a people like our own, who are ambitious to raise the standard of living, who pride themselves on decent, comfortable living, and who respond readily to appeals to their likings for these things, desire stimulates work.

The skilful manager of to-day does not wait for consumers to learn of his goods by chance, or for them to take their time in making up their minds to purchase. He brings to bear the most powerful forces known to man to call attention to his wares and to encourage prompt purchase. Advertising and salesmanship are the agencies through which these have been accomplished, and both have been great forces in encouraging production.

10. **Man's Institutions.**—Social institutions may be classified in various ways. Men are bundles of interests, which bring them into various kinds of associations with other men. Among the principal social groups are the religious, cultural, political, and economic. We are interested here only in the two last named, although the others may, and frequently do, have an important bearing on economic development.

11. **Government and Industry.**—Governments may encourage or fetter economic growth. The spirit of institutions in Anglo-Saxon countries has been expressed in the great freedom given to private enterprise. Inventors have been safeguarded in their discoveries; men have been permitted to accumulate and transmit wealth with little or no restrictions; they have been allowed to exploit their ideas to the fullest extent with little or no aid or interference from their government. The government itself has engaged in industry only to a small extent. In all this, we have proceeded on the assumption that individuals, when left to follow their own interests in their own way, will not only accomplish more for themselves, but more for society at large than if directed by their government. However, with the expansion of industries, it has become necessary for the government to take on new functions. There are certain things that individuals, or groups of individuals, will not, or cannot, do because of the expense involved, or because of the remoteness of the reward.

or because the reward is general and not particular. Cases of this kind are improvement of rivers and harbors, draining of swamp land, reforestation of devastated areas, irrigation in arid regions, and aid to railroad building across vast stretches of unsettled country. Possibly the opening of new fields for foreign commerce, a work which is now undertaken by one of the bureaus of the Department of Commerce, falls within this scope. Undoubtedly evils arise under the system of free enterprise; but the remedy adopted has not been for government to take over industries in which evils arise, but to apply remedial measures through agencies of regulation. Thus the economic work of the Government has been directed to two ends: (*a*) aid and promotion to development where it is obvious that the task was too great for individual enterprise; (*b*) regulation of evils that have arisen under private control. The latter development has become a notable characteristic of legislation in the United States since 1887. The Federal Government has developed quite an extensive organization for the two purposes named above. It is impossible, in a short space, to discuss all the present relations of government to industry, but the economic work of some of the leading departments may be presented in outline as follows:

DEPARTMENT OF THE INTERIOR:

- General Land Office
- Patent Office
- Bureau of Education
- Geological Survey
- Reclamation Service
- Bureau of Mines

DEPARTMENT OF AGRICULTURE:

- Weather Bureau
- Bureau of Animal Industry

Bureau of Plant Industry
Forest Service
Bureau of Chemistry
Bureau of Soils
Bureau of Entomology
Bureau of Biological Survey
Bureau of Crop Estimates
Office of Public Roads and Rural Engineering
Bureau of Markets

DEPARTMENT OF LABOR:

Bureau of Immigration
Bureau of Labor Statistics
Children's Bureau
United States Employment Service

DEPARTMENT OF COMMERCE:

Bureau of the Census
Bureau of Foreign and Domestic Commerce
Bureau of Standards
Bureau of Fisheries
Bureau of Lighthouses
Coast and Geodetic Survey
Bureau of Navigation
Steamboat Inspection Service.

The titles of departments and subdivisions given above suggest the scope of the economic work done by these departments. The work of the Department of the Treasury and much of that of the Department of State has an economic bearing. The Post Office is an economic department. One of the earliest Acts of Congress in 1789 provided for the temporary organization of this department; it was shortly put on a firm foundation, and its services rapidly extended. An important function of the Department of the Treasury is the supervision of the money system of the country and of that part of the banking system which is organized under national laws.

Some idea of the work of the various bureaus may be obtained from the following statements. Among other duties, the Secretary of the Interior is charged with the supervision of patents and inventions, survey of public lands, and the distribution of appropriations for agricultural and mechanical colleges. He has general supervision over the work of constructing the Government railroad in Alaska. In the case of the Geological Survey, the work includes an examination of geological structures, mineral resources, and products of the national domain. The bureau annually collects statistics of the mineral products of the United States. Its publications are of great value not only to the student, but to the business man. An important part of the work of the Reclamation Service is the survey, construction, and operation of irrigation works in the arid states.

The services of the Department of Agriculture cover nearly the whole field of farming from production to marketing. Indeed, some activities of this department touch even the social life of the farmer. The Secretary is charged with the duty of "promoting agriculture in its broadest sense." The activities include a study of soils, insects, birds, and mammals that may in any way affect crops. The purpose of soil study is to secure an adaptation of crops to the peculiar soil conditions; living creatures are studied for the purpose of eliminating harmful varieties and of perpetuating those that are beneficial. This service saves the farmer millions of dollars annually. The Department also renders valuable service in teaching farmers better business methods. This covers advice as to methods of accounting, buying, selling, insuring, and the organization of farming as a business enterprise.

The work of the Department of Commerce includes the taking of the census and the study of domestic and foreign commerce. An effort is made to bring opportunities to

the attention of the business man by showing where markets are, by explaining peculiarities involved in foreign trading, by giving needed information about foreign tariff regulations, packing, insuring, and invoicing of goods. The department has jurisdiction over the registry, licensing, measurement, and transfer of merchant vessels, and the movement of cargoes and passengers. The Bureau of Standards is authorized to "exercise its functions for the Government of the United States, or for any scientific society, educational institution, firm, corporation, or individual within the United States in manufacturing or other pursuits requiring the use of standards or standard measuring instruments." The work of the Bureau of Fisheries includes the propagation of useful food fishes, the collection and compilation of statistics of fisheries, the administration of matters relating to the fur-seal herds on the Pribilof Islands, and the fur-bearing animals of Alaska.

Another point of contact between the Government and industry is through various boards and commissions. Among the most important of these are: the Interstate Commerce Commission first established in 1887; the Federal Trade Commission provided by an Act of September 26, 1914; the Tariff Commission called into existence by the Act of September 8, 1916; the Federal Reserve Board which came into existence in connection with the new banking system; and the United States Shipping Board created by the Act of September 7, 1916. A number of other Government organizations were brought into existence during the late war. The functions of these will be discussed in a later chapter.

12. **State and Local Governments.**—Not only the Federal Government, but State and local governments are active in various ways in the interest of industry. The States, in some respects, do a work in their limited field similar to that of the United States. Many maintain

bureaus of mines, a forest reserve, promote the development of agriculture by methods similar to those of the general government, provide for the health, general welfare, and working conditions of the laboring classes, and provide for general, and often industrial, education.

13. **Private Institutions.**— Since industrial development has been largely a matter of private enterprise, the existing economic institutions are chiefly those that individuals, or groups of individuals, have created to promote the production and exchange of goods. As in all other fields, specialization became the order of the day. This specialization was both cause and result of industrial development. As a cause, it was among the greatest of the factors promoting economic growth, because it led to increased effectiveness of production and exchange. In pioneer days farmers were not only producers of grains and livestock, but manufacturers of flour, leather, liquors, etc., boat builders, boatmen, and merchants. They combined farming, manufacturing, transportation, and merchandising. Obviously this was a wasteful procedure. Not only did these farmers lose the crop of one season because of their absence while on the way to and from distant markets, but they were poor navigators and poor merchants. In time the different tasks of marketing commodities were taken up by specialized groups. Then farmers could devote attention entirely to their fields, with far better results. Likewise household manufacturers were at the same time artisans, packmen, and merchants. They combined manufacturing, transportation, and selling, and the results were no better than with the unspecialized farmer-merchant. With the growth of industry, the specialized industries themselves became specialized. Banking, for example, was divided into commercial, savings, investment, and exchange banking, and in addition, the financial field was occupied by stock and bond houses, stock exchanges, and

middlemen of various descriptions. Meanwhile organized markets appeared for such raw products as grains, cotton, coffee, etc., and for manufactured goods of many kinds, and each of these markets was served by a considerable number of specialized merchants, brokers, communication agencies, etc.

Then followed another interesting development, namely, the increasing interdependence of all these activities. Manufacturers could not prosper without the aid of banks, railroads, and merchants; the prosperity of railroads depended on the success of farmers, manufacturers, merchants, and bankers. The component parts of the industrial organization were thus bound together by innumerable lines of interest. The common objective of all economic effort was the largest possible service to society, and this was the source of profit and the chief incentive in manifolding industries and services.

In addition to these organizations which have profits as their immediate goal, there developed a large number of non-trading organizations. These have become a feature of industrial society. There is a scarcely a trade or industry without an association, and scarcely a community of any considerable size without an organization of some kind to promote its general business interests. The titles of such associations are Chamber of Commerce, Business Men's League, or Commercial Club, or something similar. They usually combine civic and industrial activities and a social feature is often included. Their work is usually developmental. One of the first organizations of this kind in America was the Chamber of Commerce of New York, founded in 1768. Since then many others have been formed and their work has become a great factor in promoting industrial growth.

14. **Resources.**—A third group of factors requisite for economic development is found in man's physical sur-

roundings. An industrial community may not possess all the important raw materials, but, at least, it must have means of obtaining them. Frequently this means the possession of other materials which, either as raw or finished products, may be offered in exchange, or, perhaps, the possession of some other favorable combination of factors inviting the localization of industry, such as abundant capital and labor supply. From the point of view of modern industry, the leading resources include fertile soil, favorable climate, an ample supply of timber, and an abundance of important minerals. These constitute, in the case of soils, the source of food and of much of the material for clothing, and in the instance of timber and minerals, materials for buildings, tools, machines, and for hundreds of other important manufactures.

15. **The Soil and Climate.**—An abundance of fertile soil is by all odds the greatest resource of a nation. In one form or another its products supply not only more wants, but more important wants than are provided by any other resource. We are accustomed to think of the soil only as a source of food, but, in addition, it supports all the plant life which yields lumber, fruits, nuts, vegetable fibers for clothing, materials for the production of essential and vegetable oils, beverages, stimulants, gums, dyestuffs, tanning materials, and many medicines. Hundreds of industries are based upon these raw products. The cotton plant alone contributes to the manufacture of cloth and clothing, explosives, celluloid, artificial silk, cooking oil, paper, fuel, and meal cake used as food for stock and for fertilizer; and corn to the production of food, starch, alcohol, corn syrup, and oil.

In the future man will probably be even more dependent on the soil than at present. "With the exhaustion of coal and iron," said a recent report of the Bureau of Soils, "it (the soil) will supply, if rightly used, not only food

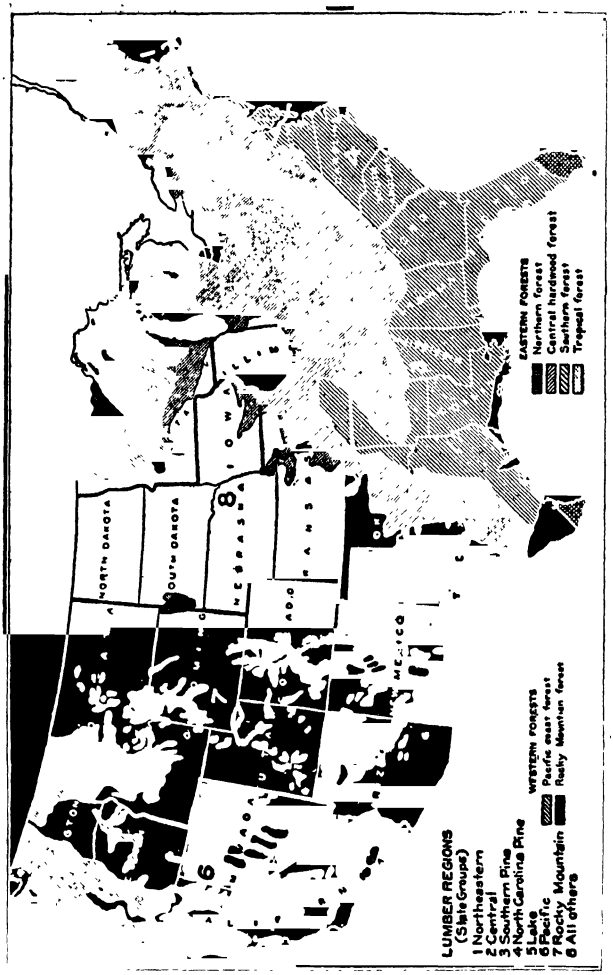
and clothing, as at present, but fuel, light, power, and structural materials now supplied to a greater or less extent by the minerals."

Some of the leading industries which draw their materials from the soil are the manufacture of lumber and timber products, which ranks ninth among our manufactures in the value of the product; flour and grist mill products, which rank sixth; and cotton goods, fifth in rank. Even this does not tell the whole story because slaughtering and meat packing, which ranks first, men's clothing, which occupies the twelfth place, and the manufacture of boots and shoes, the thirteenth, are dependent in one way or another on agriculture or forestry.

In 1919 the total gross wealth produced on the farms of the United States was over twenty-one billion four hundred million dollars. This does not include the value of the forest products. In the same year the value added by manufacturing processes amounted to a little more than twenty-five billion dollars.

The productivity of the soil and the fitness for various kinds of vegetation depend on a number of conditions, the most important being the composition, conditions of heat, moisture, drainage, exposure, and elevation. The character of the soil is itself complex; its composition includes principally a number of chemical compounds and organic matter, all of which are necessary for plant life. Just what the relation is, however, between physical conditions and the success of given kinds of vegetation is not definitely known. But the test of experience has shown that a great variety of products may be grown successfully on the soils of the United States.

The soils of the country have been grouped by writers of the Bureau of Soils into seven provinces and six regions. The provinces cover the Eastern half of the United States. They are grouped according to obvious physical conditions.



LUMBER PRODUCING REGIONS AND FOREST AREAS

They differ in character depending on the kind of material from which the soil has been derived, topography, elevation, and on the process by which soil material was accumulated. The soil regions cover the Western half of the United States. They conform to the great physical divisions. The soils within the regions are of different origin.

16. **Forest Resources.**—The products of the forests like those of the field contribute in many ways to the growth of industry. In early stages of development the demands for timber were relatively simple. The principal needs were for building materials, fuel, simple furniture, and lumber for boats and ships. When the colonists began to emerge from the log-cabin stage, demands arose for flooring, sash, door, blinds, and finished timbers of various descriptions. Finer woods for interior finish were demanded later. With the diversification of industry, timbers were sought which satisfied more accurately the specific needs of particular industries. Some of the desirable qualities were strength, hardness, toughness, weight, resistance to the action of moisture, color, texture, and beauty of grain. Each new industry brought its peculiar requirements. Thus, in the course of development, demands for lumber became not only more intense but more varied. Ample illustration may be found in the production of furniture, agricultural implements, wooden ware, and musical instruments. For example, maple, in the early days, was used for fire wood, for charcoal burners, rifle stocks, runners for sleighs, shoe pegs, and saddle trees. Modern industry found other uses; bird's-eye maple is used for furniture, musical instruments, and for interior finish of houses; sugar maple in the manufacture of handles for tools, some kinds of wooden ware, agricultural implements, and shipping-boxes and crates. All the specialized industries of the present day demand timber that meets their peculiar requirements

more or less exactly. It is necessary, therefore, that the timber resources of the country should not only be abundant but varied.

In addition to lumber for manufacturing, forests contribute a wide range of useful by-products. In Colonial times the production of pearl ashes was an important activity; now, alcohol, tar, pitch, turpentine, and wood pulp, used in the manufacture of paper, are some of the other forest products. To-day the relation of forests to the control of floods and to the conservation of soil and wild game is an important industrial question.

The timber supply of the United States has amply fulfilled the requirements of growing industry. Originally the forests probably covered 850 million acres, with a stand of not less than 5,200,000,000,000 board feet, measured by present standards. This supply was included in five great regions: (*a*) the Northern, (*b*) the Southern, (*c*) the Central, (*d*) the Rocky Mountains, and (*e*) the Pacific.

White pine was one of the most important timbers of the Northern forests. With it grew red pine, spruce, hemlock, cedar, balsam fir, and several varieties of hardwoods. Before exploitation began, this area probably covered 150 million acres and contained about 1,000,000,000,000 board feet. The composition of the Central forests was principally hardwoods, of which the most important were: oak, yellow poplar, elm, hickory, chestnut, red gum, ash, and walnut. This region covered about 280 million acres, and contained about 1,400,000,000,000 board feet. The Rocky Mountain forests were conifers, Western yellow pine was the most common tree, with lodgepole pine, larch, spruce, Western red cedar, Western white pine, and Douglas and other firs abounding locally. This area covered about 110,000,000 acres, with a stand of about 400,000,000,000 board feet. The Pacific forests were chiefly evergreens, with the following trees predominating: Doug-

las fir, Western yellow pine, redwood, Western red cedar, sugar pine, and several other firs, cedars, and spruces. This region covered about 90 million acres, with an estimated stand of 1,400,000,000,000 board feet. The Southern forests contained chiefly yellow pine, with an intermingling of hardwoods on the better soils, and cypress in the swamps. The area was about 220 million acres, with a stand of 1,000,000,000,000 board feet.

Farmers, who ruthlessly destroyed the forests to make room for agriculture, and lumbermen, have reduced the original supply to about 550,000,000 acres, with a probable stand of 2,500,000,000,000 board feet. The largest reduction has been in the Central forests, and the least in the Rocky Mountain and Pacific regions. This supply seems ample, yet with the enormous demands of the nation's industries and the numerous losses due to wasteful methods of logging and to fires, the time has come when this supply must be carefully conserved.

17. **Mineral Resources.**—From the point of view of modern industry, the most important minerals are those which yield iron, copper, coal, lead, zinc, gold and silver, and petroleum. Fortunately the United States is abundantly supplied with all of these. Indeed, according to a report of the Geological Survey, "The only essential minerals of the first rank of which the United States has no known supply at all commensurate with its needs are nitrates, potash salts, tin, nickel, and platinum, the list thus comprising two essential mineral fertilizers and three very useful metals. Probably no other nation in the world so nearly approaches absolute independence in respect to mineral resources."

Metals, like the products of field and forest, are worked into a great variety of finished commodities, and form the basis of numerous industries. Coal, for example, first consumed only as a fuel, is now the source of coke, used largely

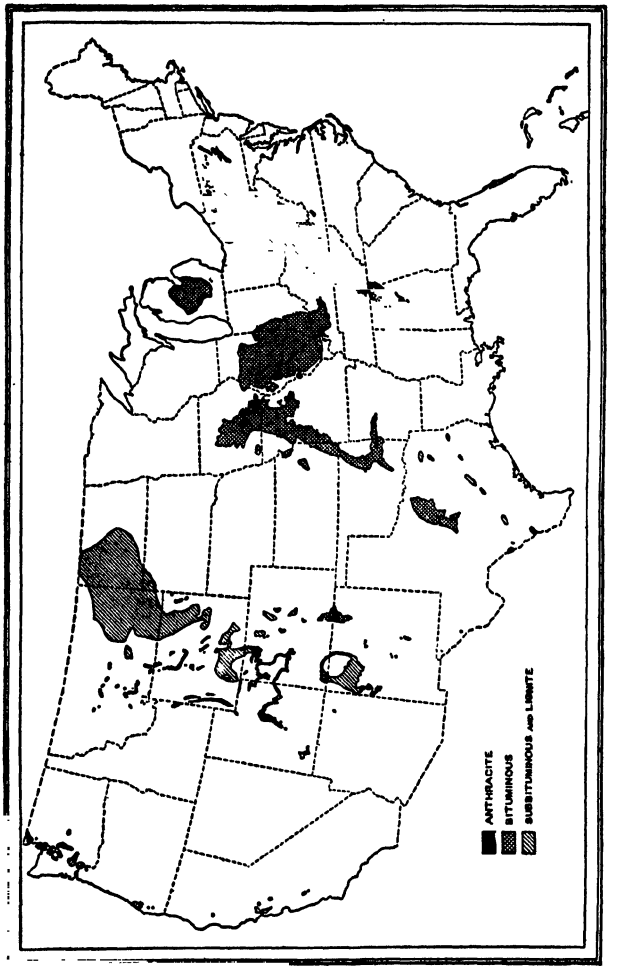
in the production of iron, of gas for fuel and illuminating purposes, and of gas carbon, employed in producing carbon rods for electric arc light. Coal is also the source of many important chemical compounds, among the most useful of which are the coal-tar dyes so important in the development of the textile industries. Iron, in the wrought form, is manufactured into chains, bolts, and wire; as crucible steel, it enters the production of watch springs, needles, pens, razors, and high-grade tools; other grades of steel are used for machinery and for structural and railway purposes. The compounds of iron have a number of industrial uses. Copper is extensively used in the electrical industries, not to mention other uses. Gold and silver form an important part of the money medium of all advanced nations, and are employed also for plate and jewelry.

The industrial importance of a material should not be measured alone by the quantity produced, nor by its money value. Only small quantities of the rarer elements are mined, but these are absolutely essential for the success of certain industries. Only small quantities of tungsten, chromium, nickel, and molybdenum are produced, but without them it would be impossible to manufacture certain highly useful kinds of steel. When tungsten and chromium are added to steel, the product becomes "self-hardening," will not soften even when red hot, and retains its edge for a long time. This property makes it important in the production of speed tools. Like tungsten many substances are produced only in small quantities, but contribute greatly to the development of industry.

18. *Iron.*—Iron is widely distributed in the United States. In Colonial times it was obtained from swamps in several of the Eastern Colonies. As the industry moved westward, mining was developed to a limited extent in Connecticut, eastern New York, and northern New Jersey, and more extensively in eastern Pennsylvania. Later de-

CHIEF IRON ORE DEPOSITS IN NORTH AMERICA

In 1925 iron ore was mined in 20 states. All the iron ore produced in California and Montana and a small quantity of that produced in New Jersey and Utah was used for flux; a small quantity of ore from New Jersey and Pennsylvania was used for purifying gas; all of the output from Washington was used in the manufacture of ferromagnesite; the ore produced in the remaining states was mainly for use in blast furnaces; Michigan, Minnesota, New Jersey, New York, Pennsylvania, Tennessee, and Wisconsin produced small quantities that were used for paint. The rank of the three states producing the largest quantity of iron ore is Minnesota, Michigan, and Alabama. Minnesota, which has furnished nearly 61 per cent of the total for the United States in the last five years, is producing more iron ore than all the rest of the states together.



TYPES OF COAL OF THE VARIOUS PRODUCING AREAS

posits in western Pennsylvania, southern Ohio, and northern Kentucky were drawn upon. The principal source of iron ore to-day is the Lake Superior region, which includes a portion of the peninsula of Michigan and nearby portions of Minnesota and Wisconsin. Another important district includes northern Alabama, eastern Tennessee and Kentucky, and portions of North Carolina, South Carolina, Georgia, and Virginia. The total available supply from these regions is about four billion long tons, which is about four-fifths of the available supply of the United States. But, in addition, this country possesses enormous quantities of low-grade ores which cannot be profitably worked in the present state of the industry.

19. *Coal.*—There are six coal producing areas of the United States: (*a*) the Appalachian, which extends in a broad belt from southwestern New York to northern Alabama, covering about 66,000 square miles; (*b*) the Central coal fields covering about 48,000 square miles in Illinois, Indiana, and Kentucky; (*c*) the Northern field, covering a relatively small area in Michigan; (*d*) the Western field, extending with slight interruptions from central Iowa to Texas, and covering about 98,000 square miles; (*e*) the Rocky Mountain area, with deposits scattered in many areas; (*f*) the Pacific fields with scattered deposits in California, Washington, and Oregon.

Although large quantities of anthracite are produced every year, by far the greater part of the nation's supply is bituminous. Anthracite is found chiefly in a few counties in northeastern Pennsylvania. The estimated coal reserves of the United States, including both anthracite and bituminous, are fifteen hundred billion short tons.

20. *Petroleum.*—During the years from 1857 to 1915 the United States produced over 60 per cent of the world's output of petroleum. During this period the United States produced over 3,600,000,000 barrels of 42 gallons each.

This statement gives some idea of the magnitude of the resource. The unused reserves of this country have recently been estimated at about 7,629,000,000 barrels. Of this about 2,345,000,000 are in the California field; 1,874,000,000 in the Kansas-Oklahoma field; and 1,500,000,000 in the Gulf Coast field. The remainder is distributed mainly in the Appalachian field, including principally western New York and western Pennsylvania, southeastern Ohio, and portions of Kentucky, Tennessee, and Alabama, and in the Illinois field, and in northern Texas and Wyoming and Montana.

21. *Lead and Zinc.*—Lead and zinc usually occur together, sometimes one, sometimes the other predominating. Although lead was discovered in the seaboard region in Colonial times and mined to a limited extent, the first production on a considerable scale was in southeast Missouri, where the metal was first worked by French miners sent to this country about 1720 in quest of gold and silver. This section has been worked almost continuously from that time to the present. The growing demand for lead and zinc and the discovery about 1850 of abundant sources in southwest Missouri have raised this state to the first place as a producer of these metals. Lead and zinc occur in the southwest corner of Wisconsin, and in adjacent regions in Iowa and Illinois, and in numerous places in the Rocky Mountains.

22. *Copper.*—The great demand for copper is an incident in the development of modern industry. The mineral occurs in considerable quantities in the Appalachian region, but the principal sources at present are Montana, Arizona, Michigan, California, and Utah, ranking in the order named.

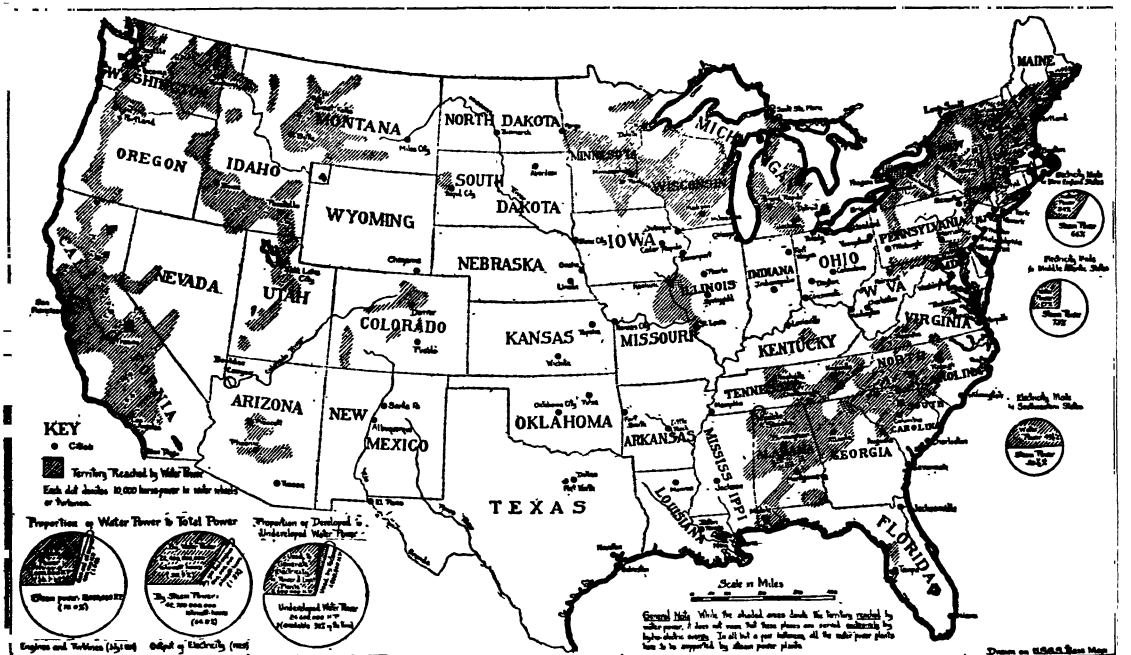
23. *Gold and Silver.*—The quest for gold was one of the reasons for the English, French, and Spanish explorations. Though precious metals occur in the Appalachian

region, production in this section has never been of much importance. The first discoveries in the United States were in California in 1848. Other important producing regions at the present time are Colorado, Alaska, South Dakota, and Utah. The producers of silver, named in the order of their rank, are Nevada, Montana, Idaho, and Colorado.

24. **Water Resources.**—Water resources may be considered from three points of view, namely, (*a*) as sources of fish, (*b*) of power, and (*c*) as means of transportation. The important fishing regions of the United States are the North Atlantic, the Great Lakes, and the Pacific Coast and Columbia River. At present, the leading commercial fish are cod, salmon, shad, herring, mackerel, halibut, and sturgeon. Experts with the Bureau of Fisheries are constantly experimenting with varieties hitherto thought to be useless for food purposes, with the result that varieties of fishes that were long neglected are now brought into the markets.

The second important use of our water resources is as a source of power. In a former page we said that water power was sometimes a cause of the localization of industry. At present upwards of 5,300,000 horse power are generated from waterfalls. The greatest development is in the North Atlantic section, notably along the Connecticut, Merrimac, Hudson, and Susquehanna Rivers; in the St. Lawrence region, including notably the Niagara River, and sources along Lakes Ontario and Michigan; and in the Mississippi and Ohio River sections. Water power is also developed to a large extent in the North Pacific States.

Finally, the rivers have long served as means of communication. The streams of the Atlantic Coast section, although short, were used for navigation for many years. The greatest navigable waterways of the country, however,



Courtesy of the National Electric Light Association

WATER POWER DEVELOPMENT IN THE UNITED STATES

MINERAL PRODUCTS OF THE UNITED STATES, 1921

Product	Quantity	Value
Aluminum, pounds	.....	$ 10,906,000
Bauxite, long tons	139,550	889,800
Copper, pounds	505,586,098	65,221,000
Ferro-alloys, long tons	248,627	21,697,785
Gold, troy ounces	2,422,006	50,067,300
Iron ore, long tons	26,652,528	89,745,308
Lead (refined), short tons	398,222	35,840,000
Silver, troy ounces	53,052,441	53,052,441
Quicksilver, flasks	6,339	300,595
Zinc, short tons	198,232	19,823,000
Asphalt, short tons	920,632	11,033,804
Borax, short tons	50,000	1,600,000
Cement, barrels	96,046,549	181,675,440
Clay (raw), short tons	1,716,746	6,025,300
Coal (bituminous), short tons	415,921,950	1,199,983,600
Coal (Pennsylvania anthracite), long tons	80,779,867	452,304,903
Feldspar, short tons	91,865	617,652
Fluorspar, short tons	34,960	724,094
Fuller's earth, short tons	105,609	1,973,848
Graphite	1,189,523	75,664
Grind stones and pulp stones	26,340	1,227,322
Gypsum, short tons	2,890,784	23,700,290
Lime, short tons	2,532,153	24,895,370
Mineral waters, gallons	34,781,238	4,876,445
Natural gas, cubic feet	662,052,000	174,617,000
Petroleum, barrels	472,183,000	814,745,000
Phosphate rock, long tons	2,064,025	12,270,070
Pyrite, long tons	157,118	711,432
Salt, barrels	4,981,154	24,557,966
Sand	78,564,649	54,268,310
Slate	411,500	7,322,006
Stone	63,538,740	106,962,266
Talc and soapstone	126,434	1,821,451

are the Mississippi River and its tributaries with upwards of 20,000 miles of navigable waterway. Without this great advantage it would have been impossible to open up the

central portion of the United States in the absence of railways.

25. Other Resources.—We have discussed above only the leading resources. But, in a varying degree, many others have contributed to development. Among these are building stones, clays, mineral waters, salt, quicksilver, antimony, borax, fertilizers, and materials for the production of cement. For many years the great abundance of fur-bearing animals constituted a valuable resource, and at the same time offered one of the chief incentives for the exploration of the country. The extent to which we are drawing upon our mineral reserves is indicated in the table on the preceding page.

26. Summary of the Factors of Economic Development.—It has been necessary to study separately each group of fundamental factors involved in economic development, but it is understood that all factors operated contemporaneously. As with the growth of commerce and manufactures, the use of resources has been a matter of evolution. Many elements now extracted from the earth were of no use in the early industrial stages, and some resources which are now extensively developed were used only to a limited extent, or not at all, in former times. Coal, for example, which is now an indispensable material, was used only in a very small way before 1835, and copper and petroleum were exploited only to a limited extent before the Civil War. Bauxite, the mineral from which aluminum is obtained, and a number of minerals of rare elements, which are now of great importance to manufacture, were not exploited until after 1860. We are just beginning to learn how to use nitrogen of the air for industrial purposes, and there are even now indications that some of the rare elements composing the atmosphere will find an industrial use before long.

The progressive utilization of resources depended on a

number of conditions. First, it was intimately related to the expansion of population. Industries engaged in exploiting resources experienced a westward movement contemporary with the westward movement of population. It was not possible to exploit even the richest resources until labor was supplied and until the favored regions were opened by communication. This was the case with the fur trade and farming, and with timber, coal, petroleum, iron, copper, gold, and silver. Second, the utilization of resources was conditioned by the stage of industrial development. Extensive demands for the metals had to await the expansion of manufactures and the growth of invention. The introduction of the steam engine in all its uses both intensified and diversified the demand for metals, and discoveries in the field of electricity after 1860 increased the demand for copper, lead, zinc, and aluminum. Third, the minute specialization of industries emphasized the need of raw products which would yield as nearly as possible the exact qualities desired in the finished product. Hence, an incident of industrial development was the demand for a great variety of raw materials, and this was a cause for the increasing diversity of demands upon resources. Scientists were set to work, laboratories were kept busy, encouragement was given to inventors, with the result that new methods of producing commodities were discovered, new uses for present resources were found, and, as it often happened, methods were discovered of utilizing materials which had hitherto been of no industrial use. The upshot of this development has been both to intensify and diversify demands upon resources.

In the first period of our industrial growth, which we are now about to study, demands upon nature were relatively simple; they grew on apace after 1790, were augmented somewhat before 1860, and after that date expanded with remarkable rapidity.

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PART II

THE COLONIAL PERIOD

CHAPTER III

EXPLORATION AND SETTLEMENT

27. Early Conditions.—A brief survey of the period from the discovery of America to 1789 will bring out some of the leading characteristics. The European background of American history, including the important events which led to the discovery of America, the discovery itself, the awakening to the fact that America was a new world, and exploration and settlement stand for rather definite stages in our early history, and may be studied as initial features. The exploration of the country, however, was by no means complete at the end of this period. Much of the region east of the Mississippi and even some of the country bordering on the western tributaries of that stream had indeed become fairly well known before 1789; but it remained for the exploring enterprises of later times, notably that of the Americans, to open the vast country west of the Mississippi. And of course the great era of settlement which goes under the title of the "westward movement" came chiefly after 1789, although it was begun before that date.

Before 1789 three great nations had explored various sections of the continent on a large scale, and these, together with Holland and Sweden, had formed settlements. English explorations were mainly in the Eastern portion of the continent, those of the French along the Great Lakes and in the Mississippi Valley, and the Spanish in the South and Southwest. During the years before 1763 these three nations founded colonies. The region of densest population was along the Atlantic seaboard where the

English were settled. French settlements were mainly in the form of small posts and villages scattered throughout her vast domain. The Colonies of Spain were in Florida and Texas and in New Mexico and California. In 1656 the Dutch took possession of the Swedish settlements along the Delaware, and these, together with New Netherland, were taken by England in 1664. In 1763 France and Spain were eliminated from the country east of the Mississippi River. Thus, at this date, after France had ceded the eastern portion of Louisiana to England and the western to Spain, and after Spain had surrendered her claims to England, the country east of the Mississippi became entirely English domain, and that on the west was Spanish. Some changes in territory occurred in 1783, notably the return of the Floridas to Spain. When the United States began its career as an independent nation, its domain extended from the Atlantic to the Mississippi and from the Great Lakes and St. Lawrence River to the Spanish Floridas.

Industry of some sort was developed in much of the territory of the colonizing countries, but, owing to differences in character and aims of the settlers and to the nature of their institutions and resources, there was a great difference in their industrial accomplishment. Progress was most rapid among the English. The French and later the Spanish Colonies in Louisiana were able to make some strides forward, but of the Spanish Colonies in the Southwest there is little to record. All the great nations applied their colonial system to their American possessions. In the case of the English this is an especially important feature because of its influence on the larger English settlements, and because after 1763 the growing friction between the home Government and the Colonies, due to the increasing rigors of regulation, was one of the causes of the Revolution.

To a large extent, both in the case of the English and French Colonies, the period to 1789 was one of industrial experiment. This was due in part to the newness of the country and to ignorance of its resources, and in part to the efforts of the home governments to encourage in the colonies the production of commodities needed at home. Before the close of the period, however, the experiments had been so far successful, that a number of industries had been firmly established. This was the case of tobacco in Virginia and Maryland, rice and indigo in the Carolinas, and of fishing in New England, and, shortly after 1789, of sugar in Louisiana. And, of course, the farmer had learned how to grow the important vegetables and cereals under American conditions.

The scarcity of labor and capital accounted for other leading features of the period. Because capital in the form of machines and tools was scarce, it was necessary to rely largely on hand labor for productive purposes; and since labor, also, was scarce, the colonists were forced to resort to a system of labor coöperation, of indentured service, and negro slavery. Throughout the period the implements of production were very simple; there were no important inventions, and little or no improvement in productive methods. Industry was unproductive measured by the standards of later times. Wealth, therefore, accumulated slowly. Again, the scarcity of labor and capital made it necessary to rely largely on the more abundant resources and on commerce as the leading sources of wealth. Lumbering, fishing, fur trading, and certain branches of farming were the leading industries. The products of these enterprises formed the principal materials for the export commerce of the colonies.

We may study these features under the titles of (*a*) exploration and settlement; (*b*) the development of extractive industries, and (*c*) the growth of Colonial commerce

and manufactures. Each title in turn provides the subject matter for this and the two following chapters.

28. The Discovery of America.—For more than half a century before Columbus sailed westward in quest of a new route to the East, Portuguese navigators had been slowly pushing their explorations southward along the west coast of Africa. In 1441, Nuno Tristam discovered Cape Blanco; four years later Dinis Diaz reached Cape Verd, fifteen hundred miles down the west coast of Africa. In 1486 Bartholomew Diaz rounded the southern extremity of the continent and moved northeastward until his sailors refused to go farther. Finally, in 1497, Vasco De Gama, sailing from Lisbon, succeeded in reaching India by this route and returned safely with a cargo from that region. Explorers had discussed the feasibility of reaching the Far East not only by sailing around Africa, but by crossing the sea north of Europe. Columbus proposed to reach the Far East by sailing westward. What was the cause for this great interest in the discovery of a sea route to that distant country? Why was the East so important? "The answer to these questions," said Professor Cheney, "will be found in certain changes which were in progress in those lands east of the Mediterranean Sea, which lie on the border land between Europe and Asia. Through this region trade between Europe and the Far East had flowed from immemorial antiquity; but in the fifteenth century its channels were obstructed and its stream much diminished. Mediaeval Europe was dependent for her luxuries on Asia Minor and Syria, Arabia and Persia, India and the Spice Islands, China and Japan. Precious stones and fabrics, dyes and perfumes, drugs and medicaments, woods, gums, and spices reached Europe by many devious and obscure routes, but all from the eastward."

Three principal routes had been followed in communicating with the Far East. The northern route was chiefly

by land across the continent of Asia from Pekin or Quinsay to the Caspian Sea, thence in several directions to the Mediterranean. The middle route followed the Arabian Sea and Persian Gulf and thence by the Tigris or Euphrates to Asia Minor and to the Mediterranean. The southern route approached the Mediterranean through the Red Sea. Because of the successive conquests of the Turks either the western termini of these routes were closed or such heavy burdens placed on commerce moving in that direction that trading was no longer profitable, and it became necessary to find new lines of communication. The discovery of a sea route was the most obvious solution to this problem.

29. **Explorations of the Interior.**—The achievements of Columbus led other explorers to sail westward. It took the discoverers a number of years, however, to realize that America was not an island off the coast of Asia, but a new world. When they awakened to this fact, it was not with a feeling of pleasure but of regret that a continent stood in their way. This realization, together with the desire to know whether the new world contained mines of gold, provided the chief motives for the early exploration of the interior. The Spanish were the first to undertake this enterprise, and at times from 1513 to 1542 their explorers traversed portions of what is now the Southern part of the United States. This enterprise, however, produced no results except the negative one of discouraging further exploration or settlement because of the apparent absence of the precious metals.

The task of making extensive explorations of the interior fell to Frenchmen. Entering by the St. Lawrence gateway, one of the two possible approaches to the continent at that day, and led on by missionary zeal and by eagerness to trade with the Indians, they reached the head of Lake Michigan within fourteen years after the founding of the English settlement at Plymouth. Champlain reached Lake

Huron by way of the Ottawa River in 1615. Jean Nicolet, an emissary of Champlain, penetrated to central Wisconsin and thence to the Illinois in 1634. In 1673, Joliet and Marquette made their famous voyage down the Mississippi River as far as the Red River. With the explorations of La Salle (1682), and of the traders who followed immediately in his footsteps, a large portion of the interior became known to men of this nationality. The preparation for permanent settlers had now been made.

30. **The Difficulties in Founding Settlements.**—The establishment and maintenance of colonies in the New World was by no means an easy task, as is abundantly witnessed by the early trials at Jamestown and Plymouth. The great distance from the home country, the time and expense of travel, and the cost of transporting animals and provisions, were only some of the initial difficulties. Add to this the need of a year or more to fit the soil for the first crop, the uncertainties of cultivation in a new country, and the further facts that often forests had to be cleared and defenses maintained against the Indians, and the task seemed almost insuperable. Capital was required, therefore, to make the start which had to be provided in the form of ships, tools, and provisions. Whether the object of the colonizing venture was mining, fur trading, or some other enterprise, no person could hope to succeed without the indispensable capital. Usually no individual of means cared to venture alone, owing to the many risks connected with the enterprise. He preferred to associate others with him and thus divide the risks. Thus the founding of settlements and the exploitation of the resources of the new country came to be a business enterprise, indeed, it was one of the greatest enterprises of the day.

In the case of Spain the founding and protecting of distant colonies and the development of their commerce was largely controlled by the home Government. Individual

initiative was reduced to the minimum. "All goods which were sent from Spain to America must be shipped from the one port of Seville, and they must be landed at either one or other of two American ports, Vera Cruz, in Mexico, or Portobello on the Isthmus of Panama. Two fleets were sent from Spain each year, one for each of these destinations. All arrangements for these fleets, all licenses for those who shipped goods in them, and all jurisdiction over offenses committed upon them were in the hands of the Government established of the Casa de Contractacion at Seville. No intruders were allowed in Spanish Colonies; the only persons who could take part in the trade were merchants of Seville, native or foreign, who were especially licensed by the Government. Monopoly as well as government support was thus secured to the distant traders between Spain and her Colonies in the West and in the East Indies." An attempt was made to apply these rigid restrictions to Louisiana during the early days of Spanish domination, but the regulations were gradually relaxed towards the end of the period.

In the case of England and France the task of performing the initial work of development was left largely to groups of individuals. One method of financing such an enterprise was in the form of the joint stock company, where a number of persons who had obtained a patent or charter from the Crown undertook to put up the funds and manage the enterprise. Chartered companies were given great privileges. These usually included the monopoly of trade in the region covered by the grant, exemptions from duties on goods taken out of the home country, and the right of government subject to certain restrictions. In the first Virginia Charter, for example, the rights included a grant of land between thirty-four and forty-one degrees of north latitude, the right to maintain defenses, to take out from England "such and so many subjects, as shall be

willing to accompany them," and the exclusive right of trade. In connection with these privileges were certain responsibilities, notably the duty to govern the colony in the manner described in the Charter, and the duty of yielding to the Crown a fifth part of the gold and silver, and a fifteenth part of the copper mined. Since laborers were required to develop the grant, one of the first considerations of a commercial company was to find colonists and provide them with tools and food, until the establishment could become self-supporting.

After some of the pioneering work of opening the new country had been done, it became the custom, in the case of England, to provide for the establishment of new colonies in another way. Large grants of land were made to favored individuals, who, as proprietors, undertook to encourage emigration, to fit out ships, provide tools and provisions, and to secure the immigrants to populate their domain. In this way the financial burden of making the start in the new world rested on the proprietors. In return they expected some form of service, or an income of some description from their land.

With the growing success of the Colonies, still another method was found of bringing over immigrants. In time, as planters prospered, they were able to pay the transportation of a limited number of persons. For this service planters expected a grant of land and the labor of the new comers for a term of years. Owing to the difficulties described above, immigration during the earlier years of settlement, required the support of some individual or groups of individuals who could bear the expense. To build up from nothing was a slow process. Yet progress in the new world had to start at the bottom and by toilsome methods accumulate gradually the means of self-support.

Later on, with the growth of enterprise in America, it

became possible for persons who had no more than passage money to make a start; but this could take place only after the Colonies had become firmly established.

31. French Colonies.—The motives which promoted French colonization in America were partly economic and partly political and religious. The reason for attempting settlement in Florida (1562–1568) was to escape religious persecutions in France. In the interior of America settlements grew up around missions and in connection with posts founded for the promotion of the Indian trade. At a later time some of the French posts were established as a defense against the expanding English Colonies.

As early as 1518 a futile attempt was made to found a colony on Sable Island. It was not until the beginning of the seventeenth century that French colonizing efforts were finally crowned with some success. Commercial companies were formed with grants of exclusive privileges of trade with the savages. Under this form of enterprise traders and settlers rapidly pushed into the interior. Trading posts and missions were established on many of the waters of the interior, notably along the Great Lakes, on the Wabash River, and on the Kaskaskia River, and in Illinois not far from the Mississippi. The Illinois Country, as it came to be called, reached its greatest prosperity just before the last French and Indian War when the population was variously estimated at from 2,000 to 5,000. While the fur trade was the dominant interest, many of the colonists were farmers.

In 1699 the first settlement was made in lower Louisiana at Biloxi. The French Government sought to develop Louisiana through a monopoly. In 1712 such a grant was made to Antoine Crozat, and on the surrender of his patent in 1717 a similar grant was made to the Company of the West. The powers of this company included the exclusive commerce of Louisiana for twenty-five years, property in

mines without the payment of duty, power to fit out ships of war, to grant land, to build churches and provide clergymen, and the right of government. The riot of speculation during the régime of John Law lent a temporary interest to Louisiana. Metallurgists were sent to explore the country in the hope of finding gems and precious metals, which alone would have saved Law's enterprises. One of the permanent results of this activity was the establishment of a colony of miners in southeast Missouri and the introduction of negro slaves into upper Louisiana for the purpose of working the mines. New Orleans was founded in 1718 with the expectation that its location would be more favorable for the commerce of the Mississippi River than the posts on the Gulf of Mexico. Other settlements were made higher up on the Mississippi and also on the Red and Alabama Rivers. Natchitoches, on the Red River, became of considerable importance, because it was the point of contact between French traders of Louisiana and the Spanish settlements of Texas. In 1764 St. Louis was founded by Pierre Ligueste Laclede, an enterprising trader of New Orleans, who had received the exclusive right of trade with the natives along the Missouri River. This place soon became the seat of an enterprise which was destined to exploit much of the country west of the Mississippi River. The population of Louisiana in 1769 was about 13,200, and in 1803 about 49,000. New Orleans numbered about 3,190 at the former date and about 8,050 at the latter.

32. **Spanish Settlements.**—The settlements of Spain were in Florida, with Pensacola the leading establishment, in Texas, New Mexico, and in what is now California. These settlements were principally in the form of military posts and missions. As early as 1582 the Franciscan Friars opened missions in the valley of the Rio Grande and Gila Rivers; these were gradually extended until they reached the Gulf of California in 1687, and from thence

up the coast in the direction of San Francisco. In 1598 some 200 Spaniards coming up from the South, possibly in quest of gold, settled in New Mexico. Shortly after the settlement of lower Louisiana by the French, New Mexico became the objective of the trading enterprises of the French in the hope of obtaining some of the gold and silver for which Mexico was famed. Spain also founded military posts and missions in Texas. As late as 1740 the number of Spaniards in that region did not exceed 1,400. The population of New Mexico in 1793 was estimated at 19,700 Spaniards. The principal settlements of Spain in Florida were St. Augustine and Pensacola, the latter enjoying considerable trade with the French Colonies and with the West Indies. In 1763 Spain also came into possession of Louisiana west of the Mississippi River.

33. English Business Enterprise: Background of English Colonization.—The years immediately preceding and following the settlement of Jamestown witnessed great changes in industrial England; in these changes may be found the explanation of a large part of English colonial enterprise. The development of the over-sea possessions of Spain, which brought huge sums of gold into that country, stirred the jealousy and ambitions of Englishmen. Prominent English writers expounded the methods by which their great rival could be humbled. Hakluyt, for example, in a tract entitled *How Spain May Be Abased,* urged an attack upon the West Indian possessions of that country, and the establishment of posts on the continent of America where ships could be built and supplied.

Spanish gold was destined also to produce momentous effects in other directions. Gradually filtering into the channels of trade, it caused a rise of prices which increased the profits of the trading class and promoted business enterprise. Capital now became more abundant than ever before. The wealthy classes of England were eager to in-

vest this surplus not alone in the industries of the home country but in more speculative ventures in foreign lands. A significant change of the times was the improvement in methods of credit, which was destined greatly to facilitate foreign trading. The shops of the goldsmiths in London were converted into banking rooms; mediaeval opposition to lending at interest passed away, and borrowed capital came to play a larger part in the financing of trade. The legalizing of interest promoted saving.

Meanwhile English commerce grew on apace. After the sack of Antwerp by the Spanish in 1585, London fell heir to a considerable amount of the commerce of that city. With the growth of commercial power England was able to liberate herself from foreign control of her trade. The growth of her merchant marine and the increasing wealth of the merchant class enabled her to extend her trading ventures not only to the nearer lands of the Atlantic, but to Spanish possessions in America, and to Muscovy and Tartary. Some years before the Virginia Company was chartered, English merchants had already had some experience with chartered companies. Among these were the Muscovy Company of 1554, the Turkey, or Levant, Company of 1581, and the East India Company of 1600.

Nor does this tell the whole story of English industrial progress. Alien workers driven from the Continent by wars and religious oppression contributed immensely to the upbuilding of new industries. The Huguenot immigration alone was said to have numbered 50,000, representing a capital investment for England of over £3,000,000. The production of the finer kinds of cloth, paper making, glass working, and the manufacture of pottery were some of the industries introduced into England by the emigrants.

The rise of English industries made necessary the quest of new markets, and on the other hand, new sources of raw

materials. Arguments insisting on these points are found in the writings of the day. In the days when the current commercial policy of the nations was to throw great restrictions around trade with outsiders, the safest way to find markets and secure raw products was through colonial possessions.

Arguments based on these conditions may be found among the writers of the time. Sir George Peckham, a partner in the colonizing schemes of Sir Humphrey Gilbert, maintained that colonial trade "is likely to proue to the particular profit of the adventurers," and that it "shall be vnto the sauages themselves very beneficiall." The substance of the various arguments was that the Indians in time would become large consumers of British goods; to this would be added the demands of the colonists; the growth of trade would promote the development of the merchant marine, increase the number and skill of the sailors, and provide a substantial basis for a larger and stronger navy; the colonists would afford a source of supply of many raw materials of manufacture, and a place where the idle population of England could find occupation. To this was added the benefit of the fisheries. Meanwhile, the Royal Treasury would be augmented by duties on tonnage and taxes on commerce. For full measure the writers rarely failed to mention the benefit of Christianizing the Indians. King James in his first Virginia Charter did not overlook this point. The above were the principal motives which moved the English in establishing their first permanent settlements in America.

34. The First English Settlements.—On a number of occasions before the founding of Jamestown, the Atlantic Coast had been explored by Englishmen for the purpose of learning advantageous places of settlement. Explorers usually brought back favorable accounts of the country. Raleigh and his associates had attempted colonization; but

the first settlement that succeeded was Jamestown, founded in 1607, by the London Company, one of the subdivisions of the Virginia Company. The business nature of the enterprise is indicated by the terms of the Charter quoted on a former page. The Company was organized on a joint stock basis. Among the subscribers to the stock were the trade guilds of London, citizens of Dover and Sandwich, and certain members of the House of Commons. The failure of the first expedition to yield profits discouraged some of the stockholders, and certain shifts occurred in the Company, but the enterprise went on. The early colony encountered many misfortunes before it was firmly established. Difficulties in clearing the land, troubles with the Indians, fever, and the shortage of food were some of their embarrassments. Another discouraging feature was the form of communism under which the colonist labored. "Previous to the arrival of Dale, the settlers did not have even a modified interest in the soil, or a partial ownership in the returns of their labor. Everything produced by them went into the store, in which they had no proprietorship. The influence of this fact was most obstructive to the growth of the community in prosperity; there was a very natural disposition on the part of the colonists to idle over their tasks or to avoid the performance of their tasks altogether, and it was observed that those who were the most honest and energetic by nature, were comparatively indolent and indifferent in attending to their duties in the field." This evil was partly remedied by the assignment of three acres to cultivate on their own account, to some of the colonists who "were distinguished for superior qualities." From 1606 to 1625, 5,649 emigrants left England for Virginia; of these 1,095 were living in Virginia at the latter date. Some of the original number had returned to England, but death, due to disease and starvation, was the principal cause of the loss.

Jamestown was the early center of population of that part of America. Another center was soon to be established in Massachusetts, where Plymouth was founded in 1620, Salem in 1628, and Boston and other Colonies in 1630. As in the case of Jamestown, funds were needed to make the start. The founders of Plymouth secured financial aid from a group of London merchants. "The basis of the arrangement was the cost of transporting one emigrant to America. This was assumed to be ten pounds, and the shares of the enterprise were given a par value of that amount. Each emigrant was rated as holding one share. For seven years the colonists were to be fed and clothed out of the common stock. At the end of that time there was to be a division of all the property of the association, each member, whether colonist or capitalist, receiving according to the number of his shares." This plan not only proved of great annoyance to the colonists but discouraged their labor as in the case of Jamestown. "The younger men grew restive when they saw the fruits of their strength and activity being used for the support of other men's families, while the able men thought it injustice that they should have no more food and clothing than those who could not produce one-quarter as much as they did." Finally, in 1627, a compromise was reached with the adventurers by which the colonists were released from the claim of the Company for £1,800, which sum was guaranteed by the leading men of the settlement. In the case of the Massachusetts Bay Colony, the Company itself emigrated to America; new members were admitted from time to time as the Company saw fit.

In time other settlements were formed nearby. The colonization of Rhode Island began in 1636, and of the Connecticut Valley in 1635–1636. The emigration to Massachusetts in 1630, and in the years immediately following, added materially to the population of the Colony. In

1630 seventeen ships arrived bringing upwards of two thousand immigrants. In 1634 the population of this Colony was estimated at four thousand.

The beginning of settlement in New York, or New Netherland, was in the form of trading posts established at Fort Amsterdam, on Manhattan Island, and at Fort Orange, the site of Albany. Traders first came to these places in the hope of profiting by fur trade with the Indians. The Dutch West India Company, formed in 1621, shortly undertook to colonize the region. An arrangement was made by which members of the Company who transported colonists at their own expense should be entitled to grants of land along the Hudson River. While this arrangement was favorable to the landowners, it did not work well for the tenants, and thus immigrants moved into the Colony only slowly. The Dutch West India Company, as its name suggests, was a trading company with rights and duties similar to other companies of the kind. In 1664 England took possession, and New Netherland was granted by King Charles II of England to his brother, the Duke of York and Albany.

Most of the other Colonies were developed under the form of proprietorships. One of the greatest of these was Pennsylvania, granted to William Penn in 1681; New Jersey had been granted to Berkeley and Cartaret in 1664; Maryland to the first Lord Baltimore in 1632; the proprietors of Georgia received their grant in 1732. By 1660 settlements had spread along the Coast in certain places, notably from southern Virginia as far north as Annapolis, Maryland; along both sides of the Delaware beyond Philadelphia; a short distance along both sides of the Hudson; along Long Island Sound, and on the eastern coast of New England extending into Maine. Before 1763 the Atlantic Coast region was fairly covered with settlements of varying density of population. Along this whole belt settlers

had moved inland from a dozen to several hundred miles. Following the line of least resistance, settlements moved up the Santee, Potomac, Susquehanna, Mohawk, Hudson, and up the Connecticut, Merrimac, and Kennebec Rivers. A number of the valleys of the Alleghany ranges had already been reduced to cultivation. The location of the French and Spanish Colonies has been given on a former page. Before 1789, people from the English Colonies had begun the conquest of the region west of the Alleghany Mountains. The Proclamation of 1767, prohibiting the settlement beyond streams flowing into the Atlantic, was made partly because Great Britain feared the effect on the Indians and partly because of the belief that the inland settlers might become independent of England. But with the Declaration of Independence the Americans were free to move westward.

The total population of English Colonies in 1640 may have been 25,000, of whom about 60 per cent were in New England, and the remainder principally in Virginia. The numbers increased slowly during the first century of settlement; in 1700 the total was probably not in excess of 262,000. The next ninety years, however, witnessed a rapid increase. In 1760, the number was about a million and a half. According to the first census of the United States in 1790 the population of the country was 3,929,214. The most populous states were Virginia, Pennsylvania, North Carolina, Massachusetts, New York, and Maryland, in the order named.

Almost from the beginning America became a melting pot, where the people of many nations were fused into a new composition. Not only were immigrants from other countries mingled with the English, but, because of intercolonial migrations, the original settlers or their descendants were fused with the settlers of other Colonies. The chief non-English elements in this heterogenous mass were

the blacks. First introduced into Virginia in 1619, the negro population increased slowly at first. In 1715 the number was about 58,000. But with the increasing demand for labor and with the growing conviction that negro labor could be employed with profit in rude agricultural work, increased numbers of slaves were imported. Multiplication from the stock in the country also increased the supply. In 1754 the number was estimated at 260,000 and in 1780 at 560,000. While negroes were an element in the population of all the States, they were concentrated principally in the region south of Pennsylvania. Their number was greatest in Virginia and Maryland. Though the number was smaller in South Carolina, they were relatively more numerous. After 1730 they outnumbered the whites; after 1760 the proportion of negroes to whites was as much as two to one.

For years the Dutch were the principal inhabitants of New York. Among other non-English elements in the Colonies were Scotch, Irish, French, Swiss, Germans, Welsh, and Swedes. Many of these came to the new country to escape political and religious oppression and hardships of war. The economic factor also played a part in bringing over immigrants. Wretched conditions at home made earning a living almost impossible; on the other hand, the great opportunities in America held inducements to those who were resolute enough to grasp them. The mingling of the races was greatest in the middle Colonies and least in New England. It has been estimated that at the time of the Revolution, upwards of 98 per cent of the New Englanders were either English born or descendants of English. However, there was in this section a scattering of Huguenots, Welsh, and Scotch-Irish. In North Carolina the foreign element was prominent, notably in the lumbering districts where there were French Huguenots and Germans along with Swiss and Scotch-Irish.

Among the most numerous of the foreign population were the Germans. Even French Louisiana had its German colonies. Thousands of them found homes in New York and Pennsylvania. Beginning about 1717 and extending to the Revolution, the migration grew in a steady stream. Because of poverty the newcomers among the Germans frequently sold themselves into a form of servitude to the older settlers for a term of years. On gaining their freedom, they acquired land and rose in the scale of wealth. The early prosperity of Pennsylvania owes much to their industry and thrift. Another important element in the Colonial population was the Scotch-Irish. Those who entered the port of Philadelphia spread into Pennsylvania and Maryland, down the valleys of the Alleghany and westward to Kentucky and Tennessee, and to western Carolina, where they met another stream that had entered at Charleston. These men were among the pioneers who fought their way into the backwoods of America, cleared the forests, and paved the way for the rise of industry in the New West. The non-English element contributed largely to the early development of the Colonies not only because of their labor, but because they frequently brought the knowledge of new trades.

The importance of man as a factor in industrial development has been discussed on a former page. In one respect the growing numbers give some idea of the prospect for development. The labor element was provided on a larger and larger scale. But the productivity was relatively low because of the poor implements the population had to work with. The surplus was small because of this fact; thus the accumulation of capital went on slowly. During this period the population was dependent chiefly on nature not only for food and clothing but for the principal articles of commerce. The purpose of the next chapter is to study the

development of the extractive industries during the colonial period.

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CHAPTER IV

COLONIAL AGRICULTURE

Owing to differences in resources, the various Colonies, almost from the start, began to give particular attention to industries in which early experiments showed they had advantages. It is impossible to draw hard and fast lines because some branches were pursued with varying success in all Colonies, but in a broad way certain industrial activities stand out as characteristic of given sections. We may study four regions; namely, (*a*) New England, (*b*) the Middle Section, (*c*) the Southern Colonies, and (*d*) French and later Spanish Louisiana. The principal branches of the extractive group pursued at this time were farming, lumbering, fishing, and, to a limited extent, the production of iron. Since capital was scarce, and since the bulk of the work fell on hand labor aided only by simple implements, the chief causes for success were the prolific nature of the resources and the thrift of the colonists. Except in New York, where trading was the leading interest, agriculture throughout the Colonies was the most important activity. Even in New England, where industries were more diversified than elsewhere, farming ranked first among the industries. Agriculture provided not only the principal materials for food and clothing but the chief commodities of commerce. We may study the extractive industries under the titles of (*a*) crops and livestock, (*b*) methods of cultivation, (*c*) systems of land tenure, and (*d*) systems of labor.

35. Agricultural Experiments.—Not only were the general agricultural conditions in America new to Englishmen,

For years many of the settlers of Virginia engaged in futile efforts to produce silk and grapes. Mulberry trees were introduced; writings on silk culture were translated from French and Italian for the instruction of the colonists; skilled workers were imported under a system of indenture; but these efforts produced no important results. The Indian troubles of 1622 interrupted the experiments, and meanwhile the increasing success of tobacco diverted industrial efforts to more profitable fields. From time to time the government of Virginia sought in vain to revive the industry. Georgia was said to have been one of the principal seats of the "silk folly," but at one time or another almost every Colony was afflicted with the mania. Some New England colonists experimented with cotton, rice, indigo, and hemp, among other things. In the South olives and cinnamon were tried. Propagandists of the time urged the domestication of the buffalo as a substitute for the ox, the "unwilding" of the James River sturgeon, and training the Indians to wind silk and to dive for pearls in the waters of Virginia. Many of these experiments encountered insuperable economic difficulties, such as the great cost involved and the ignorance of methods to be followed; but the chief handicap was the success of other products which yielded materials of commerce without the uncertainties involved in long and costly experiments.

thriftiness, how great a debt our forefathers and their descendants owe to this child of nature, subdued by the natural sons of the soil, and developed ready to hand of the incoming Europeans." At a time when labor was scarce, and when other crops were uncertain, it was of great advantage to the pioneers to possess a plant which yielded abundantly even under slight tillage, and which produced a wholesome food both for man and beast. Its hardiness and long harvest added to its value as a pioneer crop. The colonists at Plymouth received their first instruction in the cultivation of maize from a friendly Indian. Said Governor Bradford: "They began to plant ther corne, in which servise Squanto stood them in good stead, showing them both ye manner how to set it, and after how to dress & tend it." In Virginia, in order to learn the red man's methods, Captain John Smith availed himself of the services of two Indians who fell into his hands in 1608. The entire operation was performed with the assistance and under the immediate supervision of the Indian prisoners.

Equally valuable lessons in clearing the primeval forests were learned from the Indians. The removal of timber was one of the most arduous tasks the pioneers were called upon to perform. "Clearing new ground," said P. A. Bruce, in his *Economic History of Virginia in the Seven-*

teenth Century, "has always been regarded as the most tedious and searching task of the Virginia laborer, and however frequently he may be called upon to perform it, he always shrinks from the tax which it imposes upon his strength and patience." At first, the colonists at Jamestown attempted to clear the land by chopping down the trees, but in 1608 they learned the Indian method. Trees were killed either by girdling with an axe, or by kindling a fire around the base. The first crops were planted in the midst of the standing deadwood. Later, the tree was felled, chopped into sections of convenient lengths, rolled into heaps, and burned. This method not only saved a great amount of labor, but enabled the farmer to plant his first crop promptly. For more than two centuries and a half, while the pioneers were migrating across the continent, the Indian method of clearing the land and cultivating maize was largely followed.

36. Farming in New England.—Harsh climate and sterile soil were great obstacles to the development of agriculture in this section. Some of the more favored areas, however, produced good crops of corn, hay, potatoes, and certain garden products. Indian corn was the most important cereal. It served as food, as currency, and as an article of trade. Corn was often bartered with the Indians for beavers. When this grain was used as currency, it was usually rated at a certain amount in the coin of the Colony. In 1641, for example, Indian corn at 4 s. a bushel was made legal tender in Rhode Island. Wheat was cultivated by the early colonists in Massachusetts, but it was an uncertain crop, and the chief dependence was placed on other products. The blast of 1644 and of succeeding years discouraged its production. In new ground it sometimes yielded abundantly, but the productivity even of such soils declined rapidly. Much of the wheat supply of the New England Colonies, particularly in later times

with the growth of population, was imported from the middle Colonies.

Many of the valleys contained fertile stretches where grasses grew waist high. These provided pasturage in summer and hay for the stock during the long winters. Until the introduction of the potato, the turnip was the most common vegetable. Other farm products were onions, peas, carrots, parsnips, pumpkins, and cucumbers. Apples were the most important fruit. Cider became a common drink among the New Englanders. It was served cold in summer, was heated and spiced in winter, and was said to have been "much in demand" at funerals. Potatoes did not become an important crop until the early part of the eighteenth century. Their first cultivation is attributed to Presbyterian immigrants from Ireland in 1718. The early production was probably discouraged by the superstition that potatoes were injurious if consumed regularly. Thus it was held that if a man ate them every day he would not live beyond seven years.

The chief raw materials for clothing were wool, flax, and hemp. Some cotton was imported from the West Indies, and hemp was brought from England, or directly from Russia and Sweden. Flax was used in the production of homespuns, sheeting, napkins, and as warp for so-called cotton fabric. Hemp was consumed largely in the production of cordage to supply the rising shipping industry. As early as 1719 the manufacture of linen received an impetus from the settlement of about one hundred Irish families on the left bank of the Merrimac, a few miles below Manchester, New Hampshire. Cattle, sheep, horses, and, in early times, goats were raised in large numbers. Sheep were imported into Plymouth and Massachusetts Bay shortly after the founding of these colonies. The first cattle were brought to Plymouth about 1624, four years after the founding of the colony.

37. **Farming in the Middle Colonies.**—Soil and climate in this section were better suited for general farming than in any other region along the Atlantic seaboard. Wheat came to be the most important single crop, although farmers usually produced large quantities of other cereals along with the common vegetables and fruits. By the middle of the eighteenth century from eight to nine thousand Conestoga wagons each drawn by from four to eight horses were needed to bring to Philadelphia the surplus of the surrounding country. Large quantities of grain were also floated down the Delaware, the Schuylkill, and the Susquehanna; while the Hudson and Mohawk Valleys supplied New York with wheat and flour both for consumption and export. This large supply of grain laid the foundation for the important milling industry along the Patapsco, Brandywine, and the Delaware. No section of the country was better supplied with garden products than the middle Colonies. German farmers, who introduced the methods of their home country, were noted for this type of agriculture, and the Dutch on Manhattan Island and along the Hudson were among the best Colonial gardeners. Domestic animals were produced in large numbers. Cattle provided the materials for salt meat, butter, cheese, and hides from which were produced boots, shoes, harness, and straps. The rich pasturage and abundant grain supply of Pennsylvania made possible the development of another important industry; namely, the fattening of cattle driven from the country as far south as the Carolinas. These animals were ultimately offered for sale in Philadelphia. Conestoga horses, noted as the finest draft animals of Colonial times, were developed by the German settlers in Pennsylvania.

38. **Agriculture in the Southern Colonies.**—While the farmers of this section produced the common grains, vegetables, and fruits, they were accustomed to specialize in the cultivation of one or two great products, for the growth

of which this region offered great advantages. Thus tobacco was the leading crop in Virginia and Maryland, and rice and indigo in South Carolina. Cotton was of little importance at this time. It was grown in a small way in the region from New Jersey southward, but the difficulty of cleaning the fiber prevented it from becoming a commercial crop. The first settlers of Virginia learned that the virgin soil was too rich for wheat; the plant grew rank and high with but little grain, but, when sown in fields formerly used for tobacco, the yield was satisfactory. Virginia and Maryland produced large quantities of Indian corn, and subsequently both Colonies became exporters of both maize and wheat. Hogs multiplied rapidly even in the early years of settlement; and cattle and horses were also produced in large numbers.

39. *Tobacco.*—Two circumstances greatly favored the early success of tobacco in Virginia. No experimenting was necessary to demonstrate that soil and climate were favorable for its production, since the plant was noticed to thrive under Indian cultivation. In the second place, a considerable market already existed for the commodity before the founding of Jamestown. A party sent out by Columbus on his first voyage to explore Cuba brought back reports of natives who carried firebrands with which they ignited fires, and who perfumed themselves with certain herbs. A Franciscan who accompanied Columbus on his second voyage observed the Indians using snuff, and Spanish explorers on the east coast of South America in 1502 observed the natives chewing tobacco. After Ralf Lane and Sir Francis Drake brought to England the implements and materials of tobacco-smoking, the habit was soon acquired not only by the courtiers but by many of the common people. In its rise as an article of commerce tobacco ran the gauntlet of "the counterblast of a great monarch, penal enactments of the most severe description, the knout, ex-

communication, and capital punishment." King James denounced its use as "A custom loathsome to the eye, hurtful to the nose, harmful to the brain, dangerous to the lungs, and in the black stinking fumes thereof nearest resembling the horrible Stygian smoke of the pit that is bottomless." But in spite of King James and other opponents the demand for tobacco grew, and Virginia and Maryland found their leading industry greatly stimulated.

The tobacco industry of Virginia rested on a firm foundation. Soil and climate were favorable; suitable land was almost unlimited; the crop could be produced with profit not only by the large planter with gangs of slaves and indentured servants, but by the man just released from bondage with no other capital than an axe, a mattock, and a hoe. The economy of shipping, due to the broad rivers which extended far inland and which were navigable to the ocean-going vessels of the day, was an important factor; finally, the growing market assured prosperity to an increasing number of planters.

The production of tobacco affected profoundly the economic and social life of Virginia. That the plant could be successfully cultivated was demonstrated at a time when the Colony was struggling against hardships and famine; the prospective profits from the industry encouraged the immigration of persons of means, adventurers of various descriptions, and laborers, and with this the success of the Colony was assured. The insatiable demand for labor in this growing industry was one of the causes for the development of the slave system. Other influences should be noticed. The cultivation of tobacco gave rise to large estates, to wasteful methods of farming, and to the neglect of manufactures and the handicrafts. As a result of this latter effect, Virginia was largely dependent on other Colonies and on England for manufactured goods. Describing the influence of tobacco, Bruce said: "The moral influence of

the large plantation was equally extraordinary. It fostered habits of self-reliance in individual men; it assisted in promoting an intense love of liberty; it strengthened the ties of family and kinship at the very time it cultivated the spirit of genial hospitality. . . . The large plantations by giving birth to a class of great landowners, increased the importance of leaders in the community. It promoted the aristocratic spirit not the less strongly because there was no legally definite rank in society. It created a rural gentry as proud as that of England." It might be added that the success of tobacco thwarted one of the leading aims involved in the founding of the Colony; namely, the supply of various commodities which were imperatively demanded in England; its success stood in the way of completing experiments with other crops.

Some idea of the extent of the tobacco crop may be obtained from the following: in 1688 upwards of one hundred vessels departed for England laden with the product and it was estimated that enough remained in the Colony to load fifty vessels more. In 1730, some 24,000 tons of shipping were required to transport the crop of Virginia and Maryland, and before the close of the Colonial Period upwards of 200 vessels carried 100,000 hogsheads annually. Tobacco was grown in other Colonies at this time; Delaware and New York and some of the New England Colonies reported limited quantities. In later times the production spread to other sections.

40. *Rice and Indigo.*—Small quantities of rice were occasionally produced in Virginia, and at one time enthusiasm ran high for the production of indigo; it was supposed that one laborer could produce two thousand pounds of the plant in one year, and that shortly the whole world would be supplied from this source. But the task of making a success of both rice and indigo fell to South Carolina. An unprofitable kind of rice had been tried as early as 1688.

The early success of the industry, however, was due to the efforts of Thomas Smith, who began to experiment with the Madagascar variety about 1696. Seed was obtained from a vessel that chanced to visit Charleston. The new grain was first raised on the uplands, but it was soon discovered that the swamps were best suited to its production. Cultivation required the labor of negroes, for no white man could stand the hard work in the malaria-breeding lowlands. In Carolina as in Virginia, therefore, agriculture demanded slaves. In the earliest years cleaning and polishing were done by hand; but in time mills operated by horse, or ox power, or by the tides, were introduced to clean the grain. In 1754 upwards of 100,000 barrels of rice were exported from South Carolina.

Indigo, the cultivation of which began about 1742, soon became a staple crop. The great amount of labor required to prepare the product for the market increased the demand for negro slaves. The plant was fermented in a vat of water under pressure; the resulting liquid was treated to obtain the coloring matter, and this was pressed into cakes and dried for the market. About 1747 more than 200,000 pounds were sent to England. The success of rice and indigo greatly promoted the growth of wealth in South Carolina. In many respects the economic and social results were similar to the effects of tobacco in Virginia.

41. **Agriculture in Louisiana.**—In a measure, the farm products of upper Louisiana supplemented those of the southern portion of the country, since the latter was often dependent on the former for provisions both for local consumption and for trade. Industrial contact was established between the seaboard Colonies and the settlements of the Mississippi Valley.

The principal crops of Louisiana were the leading food crops, and tobacco, indigo, and rice. Tobacco was grown in the greatest quantity and of the best quality along the

Red and Yazoo Rivers. It often ranked first in the value of the exports of the Colony. Easily and quickly cultivated, requiring little skill and experience in production, and usually in good demand, it was well suited to pioneer industrial conditions. The cultivation of indigo required more labor; but this was gradually supplied through the introduction of negro slaves. The German colonists produced corn, vegetables, and fruits, and for some years were an important factor in the supply of these commodities. The colonists also experimented with cotton. Though the quality was good, difficulty was encountered here, as in the seaboard Colonies, in cleaning the fiber, and the crop was of relatively small importance. The crop for which Louisiana became especially noted was sugar. In the early years of settlement the French Government strongly urged the cultivation of cane, but little attention was given to the crop until about 1751, when the Jesuits of Santo Domingo sent the plant together with negroes who understood its cultivation to their brothers of Louisiana. A small sugar mill was erected in 1759, but, owing to want of experience and capital, the enterprise met with little success. The destruction of the crops of indigo by insects in 1793 and 1794 caused the planters to interest themselves again in sugar. Credit is given to Etienne Bore for laying the foundation of the modern industry by demonstrating in 1794 that the juice of Louisiana sugar could readily be made to crystallize. Before the close of the century Louisiana was supplying the United States annually with upwards of a million pounds of sugar.

In upper Louisiana industry was quite like that of the American pioneers in Illinois, only more primitive. Wheat was produced in small quantities; corn was an abundant crop; and cattle and hogs were produced in large numbers. This agricultural industry both supplied the colony and provided a surplus for export down river.

42. Colonial Methods of Cultivation.—It is hardly correct to say that all of Colonial agriculture was characterized by lack of progress. The colonists adapted themselves to New World conditions, which in itself was a notable accomplishment; they developed several great crops which contributed immensely to their prosperity. In Virginia, the planters made improvements in the quality of the tobacco and devised methods of grading and preparing it for market. Improvements were made also in the growth and preparation for the market of rice, indigo, and tobacco. The spirit of experiment which was rife in Colonial times was an evidence of enterprise; the criticism upon it was that it was often unwisely directed. Lack of progress, however, characterized general farming methods and the development of agricultural implements. Implements consisted chiefly of the plow, spade, wooden fork, and harrow. Plows were constructed largely of wood and were heavy and clumsy, requiring from two to four animals to drag them. In the Southern States the shovel plow was in general use. "It was made of a rough hewn stick for a beam, with another stick framed in, upon the end of which a piece of iron, shaped somewhat like a shovel sharp-pointed, was fastened. The two rough handles were nailed or pinned on to the side of the beam, having a wooden prop, with a draft iron or raw-hide hoop at the forward end of the beam." In Virginia in the seventeenth century when wheat was cultivated in a small area, the common plan was to prepare the land with a hoe. One can scarcely understand how a farmer could get along without a plow, yet the number increased slowly. There were but 37 in the Colony of Massachusetts Bay in 1637 and only 150 in Virginia in 1649. The tardy introduction of this instrument was due largely to the difficulty of plowing fields filled with stumps and roots; by the time the stumps had rotted the original fertility of the land

had been so far exhausted that the farmers were ready to take up new lands. In New England the rocks and bowlders with which the fields were strewn gave the plowmen trouble.

Methods of harvesting were as primitive as those of tillage. Wheat was cut with a sickel, threshed with a flail, or trodden out by horses or oxen. Scarcely any progress was made in methods of farm transportation. Skids were sometimes employed; carts were in general use; cart wheels were often imported from England. When shod with iron they were considered valuable articles and passed from father to son by bequest. Wagons were not used to any considerable extent to transport products to market until the improvement of Colonial roads. Along the streams rafts and boats were used as means of conveyance. Fertilizers were employed only to a limited extent even where the supply was available. Farmers along the coast or rivers sometimes used fish for this purpose. During the greater part of the Colonial period domestic animals of all kinds were generally neglected.

Shortly before the Revolution changes for the better were observed in a number of these respects. Jared Eliot of Massachusetts wrote essays in which he urged fertilizing the fields with mud from the swamps and cultivating clover to restore the fertility of the fields. Before 1765 the growing of timothy had become general in some sections, providing a more nutritious food for stock. Towards the end of the period farmers, especially in Virginia and Pennsylvania, began to give more attention to the breeding of horses.

A moment's thought will convince the student that at this time very little was to be expected in the way of general agricultural improvement. Industry generally was backward; thus we have another illustration of the fact that all branches are related and that improvements in

other departments of industry are necessary to afford the means and stimulus for progress in any particular branch. Farming can make little progress in the absence of adequate means of transportation and without suitable manufactures to provide implements and supplies. Other causes were involved. During the greater part of the Colonial period agriculture was backward in England; thus immigrants to the New World were scarcely able to inaugurate better methods than they were accustomed to at home. In a measure the natural abundance of the country stood in the way of improvement, for even with primitive methods the amount produced was greater than the markets would take. Nor was it good economy to use labor, which was relatively scarce and expensive, for intensive methods of cultivation when fertile land existed in abundance. The isolation of the farmers, the limited opportunity for travel and observation, and the conservative mental attitude, militated against improvement. Superstition, also, played a part; for, when the signs of moon and stars were accepted as guiding principles in the planting and cultivation of crops, there was little room for thoughtful observation of better methods.

43. Land Tenure.—The form of ownership of landed property exerts a tremendous influence on industrial development. For illustration it is only necessary to refer to the influence of communal holdings at early Jamestown where the settlers refused to put forth their best efforts as long as the fruits of their labors were shared by others. The magic of property is a most powerful stimulus to development. One of the most favorable conditions of growth is the ownership of land in fee simple, that is, the form of possession where the individual exercises the right to use the property or to transmit it to his heirs or assigns as he may see fit. It was fortunate for the growth of the Colonies that land passed readily into the hands of the actual

cultivators. They did not in all cases own it in fee simple, for, as we shall see presently, much of the land in some of the Colonies was held subject to a rental tenure. But for practical purposes the cultivator was the possessor and enjoyed the benefit of his improvements and the fruits of his labor.

The theory which obtained in England was that the title to the land in America was vested in the King. Indian titles were ignored. From the King all subsequent rights to the soil were derived. Thus from the Crown title passed by grant to companies, large or small, or to proprietors; these, in turn, disposed of the land in any way that suited their interest, subject always to the terms of the grant. In the case of Crown colonies the process of obtaining land was more direct; authority was given to the Crown agents in America to dispose of the domain under conditions imposed in England. But whatever the procedure, much of the land in America passed to the actual cultivator.

There was considerable variety in the land systems of the Colonies. Notable differences existed between the Northern and Southern Colonies. In the latter large holdings came to be the rule; settlements were scattered; estates were cultivated by planters with the aid of slaves and indentured servants. In the Northern sections the typical holdings were small, usually in the form of towns, the farmer himself with the aid of his family, sometimes assisted by his neighbors, sometimes by servants, performing the work. Fundamentally the difference in the two systems is found in the nature of soil and climate, but religious and political ideas exerted an influence also, and in Virginia the lax administration of the land laws came to be a factor in promoting large holdings.

Much of the soil of the Colonies was disposed of under some form of feudal tenure. This was especially the case with land granted to the proprietors. It was natural that

. . . There were certain tracts devoted to the pasturage of the cattle in the common herds, and known as "herd walks." These "herd walks" were then undivided but were parcelled out in 1659. . . .

In later times with the expansion of population groups of promoters received tracts of land which were sold outright to settlers, save when they sometimes reserved chosen portions for themselves. The operation of the New England system was to give possession eventually to small farmers who held their land in fee simple.

After the Revolution the rights in the land held by the Crown passed to the American people. The unclaimed portion within the States could be disposed of as the new State authority saw fit. In addition to the country occupied by the original thirteen colonies was a vast domain stretching to the Mississippi River. The principal claimants to this area were Virginia, Massachusetts, Connecticut, Georgia, and North Carolina. This land was subsequently (1784–1808) ceded to the United States and was thus at the disposal of the Federal Government. A discussion of the land policy of the United States belongs to a later chapter.

In connection with the method of obtaining and holding land was the process of transmitting it to heirs. In New England and Pennsylvania the eldest child received a double portion; the remainder was divided equally among the other children. In New York and in the Southern Colonies the law of primogeniture prevailed — the right of the oldest child to inherit. Even in this latter section attempts had been made to abolish the system, but these encountered the royal veto. The Revolution removed English control over this matter. The ideals of the country with respect to inheritances were probably expressed in the Ordinance of 1787 which applied to the country

northwest of the Ohio River. It was provided in substance that where a person died intestate, or without a will, his property should be divided equally among his children or other representatives, except that the widow was to have a third part of the real and personal property.

44. Systems of Labor.—As indicated in a former chapter, labor is one of the factors of production. The demand for labor in Colonial times was exceptionally great, partly because of the peculiarity of the work incident to the opening the of the new country, such as the clearing of the primeval forests and the building of roads and bridges; partly because the scarcity and poor quality of the tools and machines threw the burden of the work on hand labor; in part also it was due to the difficulty in maintaining a supply of white laborers, because the abundance of land and the opportunities for independent labor in the trades encouraged men to work on their own account. These conditions explain the peculiarities of the Colonial labor system. They explain, for example, the early efforts to regulate wages and prices, the willingness of planters and others to pay the cost of importing laborers, the system of indentured servants, and the introduction and growth of slavery.

Labor of Colonial times may be classified as follows:

Work of members of the family.—Owing to the scarcity of hired labor, the labor of members of the family was in many sections the only source of supply. It was depended on largely in the Northern Colonies not only for agricultural purposes, but for the production of food, clothing, farm implements, and, to a considerable extent, in manufacturing commodities for the market. The Colonial farmer was of necessity a jack-of-all-trades. In the newer communities there was much coöperation among farmers in planting and harvesting crops and in building houses and cabins. A large family in Colonial times was decidedly

In time there developed in England a regular business of supplying the Colonies with indentured servants. London and Bristol were the principal seats of the industry. The business was conducted as a legitimate enterprise by merchants interested in the colonial trade, by shipmasters, and even by brokers with no Colonial connections. Planters often instructed their English agents to obtain servants, but the initiative usually came from the shipmasters and traders who were willing to transport the emigrant, confidently expecting a ready market in America. Much of the business of obtaining a supply of servants, however, was not by lawful methods. Misrepresentation was used to encourage persons to emigrate. Thousands of children were kidnapped for export to the Colonies and even adults were at times unwilling victims. In 1670 ten thousand persons were said to have been "spirited" from England, and in 1671 a kidnapper stated that during the past dozen years he had sent annually to America upwards of five hundred persons.

The term of indenture was a matter of contract and therefore varied with conditions. As a rule the term of service was longer for persons some years under age than for those near twenty-one. In general, for persons nineteen and over, the period was five years; under that age the service was until twenty-four. The tenure of convicts varied from seven to fourteen years. With the growing demand for servants the period was shortened. In time, the terms of indenture crystallized into law, and relations between master and servants were stated with some definiteness. The master was protected in his right to service with all that implied; and the servant was guarded against unjust exactions and was assured adequate supply of food, clothing, and shelter, and medical attention when needed. The statutes recognized the personality of the servant—a condition which greatly alleviated his hardships

—and his position before the law came to be little different from that of the freeman.

Undoubtedly the labor of the indentured servant was hard as was most of the work in the New World. Some encountered harsh masters; others were with men who cared liberally for their interests. But whatever the fortunes of the present, the future offered a bright outlook. Many servants were skilled artisans, and some were of good origin and well-educated. Those of ability could look forward to profitable employment. On occasions a thrifty servant was able to accumulate a small sum to assist him in making a start. Masters sometimes bought female servants for their wives, and not infrequently male servants on obtaining their freedom married into the families of their former masters. It was not uncommon for former servants to acquire wealth and attain to good standing in the community.

The system of indentured service conferred benefits on all parties concerned. It offered the servant an escape from wretched conditions at home, provided him with a means of transportation, and offered him a hope of rising to a better status in the new country than was possible at home. The planter, on the other hand, obtained labor at a cost much less than the profit on the servant's labor. In this connection Balleigh says with particular reference to Virginia:

> Designed not only as a labor supply, but as an immigration agency, it had generally the effect of industrial apprenticeship, greatly strengthened the position of the capitalist employer, and developed a class of industrially efficient freemen. It supplied almost the entire force of skilled labor in the Colonies for more than half a century and continued to be a source of high-grade labor long into the eighteenth century. It provided for the growth of a strong yeoman class and prevented the complete absorption of land into great estates; and it furnished a great

number of independent settlers and citizens, particularly for the back country; it had a marked effect on the political as well as the economic development of the country.

While indentured service began to decline in importance from the first quarter of the eighteenth century, it continued until after the Revolution, and finally gave way before the wages system which came into prominence with the increase of immigration to the United States.

46. Negro Slavery.—Negro slaves were first introduced into Virginia in 1619. Slavery had long existed in the Spanish Colonies and was introduced into French Louisiana shortly after settlement. The first negroes were brought to upper Louisiana about 1720. Two conditions were necessary for the development of this traffic; first, the development of tobacco and rice culture; and second, facilities for importing slaves. Englishmen had engaged in the slave trade long before 1690, but the successful prosecution of the business on a large scale began about that time. The trade was encouraged in 1698, when permission was given to private enterprises to participate in the business. A further stimulus was given in 1713 by the terms of the Assiento signed between England and Spain by which the former was to have a monopoly of the slave trade of Africa for thirty years. Provision was made for the export of a certain number every year, and the English and Spanish sovereigns were to have one-fourth of the profits of the business. In 1670 the white servants in Virginia probably outnumbered the negroes three to one; but the subsequent increase in importation of slaves made the negro the principal element in the labor supply. From 1698 to 1707 the estimated number brought to America was 25,000 a year, and after 1713, about 30,000 annually. A considerable portion of these were sent to the Spanish Colonies. The slave population of the American Colonies in 1714

was estimated at 59,000; in 1790, according to the Federal census, it was 697,800.

Negroes offered certain advantages over whites for labor in the South. One of the greatest drawbacks in the use of indentured servants was their brief term of service; scarcely had the white man become inured to the climate of the New World and trained to his work when his term expired. No such handicaps were encountered with negro slaves. Their term was for life; their offspring were the property of their masters; their cost of maintenance was less than that of white servants because they lived on plainer food, in humbler dwellings, and were clad with the cheapest clothing; they were more easily acclimated. Indeed, in the cultivation of rice they were almost the only kind of labor that could endure the work. The problem of management, moreover, was relatively simple. The negro had few rights the planter was bound to respect, and as a rule they were more docile and tractable than white servants. It is thus easily understood why this form of service grew in favor.

For various reasons the slave trade, in the course of time, began to encounter opposition among the colonists. In South Carolina, and to a smaller extent in Virginia, the fear of slave insurrections led to the desire to check importation. In New York traders were anxious to limit the numbers to keep up the price. Meanwhile moral opposition in all degrees of intensity grew throughout the country. Restrictions on the traffic varied from light import duties to absolute prohibitions. Provisions such as the latter, however, were vetoed by English authorities. During the years of legislation on the subject duties in South Carolina ranged from 2 to 150 pounds; in 1760 that Colony prohibited the importation of slaves, but this act was disallowed by the Privy Council in England. In 1710 the legislature of Virginia imposed a duty of five

pounds on imported slaves, but this was vetoed. The opposition of English authorities to Colonial wishes with regard to the slave trade aroused bitter feeling in America. An illustration of this is found in the severe arraignment of the British Sovereign by Jefferson in the original draft of the Declaration of Independence. Statesmen of the Revolutionary period found both economic and moral reasons for opposing the slave trade. In New England and in the Middle Colonies negro slavery had met with no great success. Indeed, except for the traders at some of the ports, the inhabitants of these sections had little interest in the continuance of the slave trade. Many Americans felt that slavery was inconsistent with the spirit of the Revolution, and in many sections of the South, the old fear of slave uprisings was a potent cause for limitation. Thus, when the representatives of the new States met in the Constitutional Convention in 1787, they were in a favorable frame of mind to consider restricting the traffic. Before 1789 a number of the Northern States had provided for gradual emancipation. The Southern States, however, were not willing to go to this extreme.

47. **Lumbering.**—What we have said hitherto in this chapter has referred to the growth of agriculture. We have been interested chiefly in the nature of the growth and in some of the leading elements which promoted it; namely, the methods of cultivation and systems of land tenure and labor. Another extractive industry which contributed greatly to industrial development at this time was lumbering. The two factors which were particularly responsible for the growth of this industry were the abundance of timber near the streams and the presence of water power. These factors determined the localization of the industry. Lumber, of course, then as now was demanded for a variety of purposes.

Lumbering was pursued in a primitive way in all new

communities in connection with the clearing of fields and the founding of settlements. Demand existed for timber for cabins, rude furniture, firewood, and implements. As settlements grew, demand increased. Because of inadequate means of transportation in Colonial times, the increasing demand had to be supplied largely from the neighborhood. Thus there developed hundreds of little lumbering centres. Sometimes these were provided with small sawmills; sometimes the logs were floated down stream to a source of water power. Lumbering was therefore almost as widely dispersed as the settlements. The aggregate of this business was large, and it was of more significance for the development of the country as a whole than the production of timber for export.

Lumbering on a large scale for the purpose of supplying not only local but distant wants, including foreign markets, was concentrated in a few regions. The larger streams of New England were the principal seats of the industry; but considerable quantities of timber were extracted from the forests up the Hudson and taken to Albany or New York for manufacture or export, from the Delaware and Schuylkill whence they were floated to Philadelphia, and from the Susquehanna for the supply of the Baltimore and foreign markets. The forests of North Carolina and Georgia were for many years the source of supply of naval stores, but in time both regions came to supply large quantities of lumber. From the forests of the lower Mississippi was taken timber for export and for manufacture into lumber to supply the West India markets. Myrtle wax of this section was in great demand in Europe for the manufacture of candles.

In New England the advantages of lumbering lay chiefly in the abundance of timber and in the splendid water power. That this region had few other resources to compete for its capital was one of the reasons for con-

centrating on this industry. Lumbering in this section experienced many changes in the course of development. Referring to the period from 1713 to 1745, Weeden said: "There are indications that the business of making lumber, sawing boards and shingles, so profitable in the seventeenth century, was now waning. In 1718, they found it better to export timber from Maine, rather than to saw it into boards. . . . The best and most accessible trees in all the river valleys of our Colonies had fallen under the pioneer's axe. A product less bulky in transport, more valuable in kind than lumber, must be had from the remote districts now invaded by settling families." In short, the three notable changes mentioned here were the growing tendency to export timber in the form of logs, the use of forests in the remote regions for the production of potash, and the exhaustion of the forests in the older regions.

The lumber industry moved to the Northeast and to the West. As early as 1631 the business was started on the Piscataqua. For years Portsmouth, New Hampshire, had been the centre of the trade in masts, but after 1727 that centre moved to Portland, Maine, (then Falmouth), where it continued until the Revolution. Meanwhile the lumbering business moved up the Connecticut River. The peace of 1763, which removed French influence over the Indians, made the upper portion of that stream a safe place for the pursuit of the industry.

The influences of the forests on the industrial development of New England were many. In the early times, while the colonists were searching for commodities that would sell abroad, the forests offered one of the earliest marketable commodities because the scarcity of timber in England made her look to the Colonies for a supply. The forests supplied important materials for the West India trade. That they afforded valuable articles for general

commerce is shown by the following lists of exports: masts, logs, planks, clapboards, staves, headings, tar, pitch, rosin, turpentine, and potash. Finally, the New England forests provided the material for shipbuilding. The forest resources, therefore, provided important materials for commerce, supplied the Colonial needs for shipping, and contributed meanwhile to those of the mother country.

48. Fisheries.—The fisheries of the North Atlantic supplied commercial products of even more value than those of the forests. As in the case of lumber, fishing was pursued in a small way to supply a local market in many of the Colonies. But the industry was pursued on a large scale in New England. The advantage of this section lay chiefly in the nearness to the fishing banks and to the facilities for building vessels. For years before the founding of Plymouth English fishermen had visited the waters of the North Atlantic; indeed, one of the early reasons advanced for the colonization of this section was the opportunities for fishing. Cod and whale were the most important, though others were sought, and some sections gave attention to the river fisheries. To encourage the industry in its early years the General Court of Massachusetts exempted vessels and stock from all country charges for seven years, and excused ship carpenters, and millers, and fishermen from military training during the fishing season. Laws were devised for the protection and development of the business, and the relation between ship owners and sailors was defined. Cod were graded for the various markets. The first grade ("merchantable") was sent to all parts of the world, but chiefly to the Catholic countries of Europe; "middlings" were consumed principally at home; and the lowest grade, "refuse," was exported to the West Indies for consumption by the slaves.

The fishing business was often organized on the basis of partnership between the crew and the persons who owned

the ship. "This early fishing system," said Weeden, "like all the industries of the time, stimulated in the highest degree the personal powers of the participants. Great changes have been wrought gradually in the position of the individual fisherman, the laborer, and in capital, his environment, the tools and appliances of his work. At this period (1662–1685), the capitalists, fitting out the expedition with boats, provisions, seines, etc., took one-half the value of the catch, and the other part went to the crew. In the eighteenth century the capitalist's moiety was reduced to one-fifth, a portion which gave great opportunity to the individual fisherman, and which lasted until near our own time." Whale fishing, also, was conducted on the basis of shares.

As early as 1725, the Province of New Hampshire alone sent out upwards of 100 vessels in the cod fisheries; from Gloucester in 1741, about 70 were employed, and several other places sent out almost as many. From 1765 to 1775, the average number of vessels sent out annually from Massachusetts was 665.

For a number of years Nantucket was the seat of the enterprise which exploited the whale fisheries, but other places later became interested. The industry evolved through several stages. At first only drift whales were sought but, in time, small vessels were fitted out to ply the business near the coast, and still later the "leviathan of the deep" was sought in distant waters. Vessels were sent to Davis Straits in 1746, to the mouth of Baffin's Bay in 1751, to the coast of Brazil in 1774, and shortly after the Revolution, American whalemen were plying their trade in the northern Pacific. The principal products supplied by the whale were oil used in the manufacture of candles and lubricants; ambergris employed as a basis of perfumes; and whalebones used for stays, an important article used in the toilet of the stately European ladies.

It is worth while to obtain some idea of the contribution of the fisheries to the industrial development of New England. As in the case of lumber, they provided a number of important materials for commerce, greatly stimulated business enterprise, and encouraged the development of ancillary industries, such as shipbuilding, the manufacture of salt and cooperage. To quote Weeden again: "... fish became more than mere merchandise for exchange. Though it was always that, it was a constant factor in the industrial organism of New England for two centuries. Not only the store and the shop, but the shipyard, farm, and homestead, became parts of a system of manufacture and exchange. In this industrial evolution, fish from the seas was the chief motor in starting the round of exchange."

49. **Metals: Products of the Mine.**—The only metals extracted from the earth during the Colonial period were iron, copper, and lead. Of these iron was by far the most important. Since the mining and the manufacture of the metals were so intimately related in colonial times, the discussion of the growth of the metal industries belongs properly under the study of manufactures. A brief account will suffice. Two forms of mineral were used: "bog ores found in eastern Massachusetts and in a few places along the New Jersey coast, and rock ores which supplied the furnaces and forges of the uplands from the Connecticut River, in a circle north of New York City, through northern New Jersey and eastern Pennsylvania southward." If the metal was to be cast, it was not converted into pigs, as in later days, but was molded directly into pots and kettles and other hollow ware. Throughout the colonial period there was little improvement in method.

With reference to the process of extracting the metal, Doctor Victor S. Clark says in his *History of American Manufactures:* "Colonial ore furnaces did not differ in gen-

eral construction from those now in use, nor were they improved materially in detail prior to the Revolution. They consisted of a hearth and a stack, blown with a leathern or wooden bellows driven by water power, producing a cold blast through a single tuyere. Charcoal was the only fuel, limestone or sea-shells the flux, and ores fished with an oyster rake from the bottom of a pond or dug from open trenches, usually without blasting, supplied the metal." The furnaces were usually small affairs and were fortunate to produce from a dozen to twenty tons a week.

Copper was mined to a limited extent in Connecticut. A mine was opened at Symsburg in 1721. There was also a mine in Hudson County, New Jersey, which yielded a considerable quantity of ore. In 1731 the export was said to have amounted to 1,386 tons. Lead was produced in small quantities in southeastern Missouri where mining was begun about 1720. The metal was supplied to hunters and trappers throughout much of the interior, and small quantities were exported.

50. The Role of the Extractive Industries.—A brief review of the development of the extractive industries during the Colonial period reminds us that while all the Colonies exploited a number of their resources with varying degrees of success, they devoted attention in particular to a few resources in which they had exceptional advantages. Thus the ranking industries in New England were lumbering and fishing; in the middle Colonies the production of grains and livestock; in Virginia and a portion of Maryland, tobacco; in South Carolina, rice and indigo; in Georgia and North Carolina, naval stores and lumber; and in southern Louisiana, indigo, sugar, and tobacco. The function of the extractive group of industries is to supply other departments with these products of field, forest, mines, and waters. The growth of the extractive industries during the Colonial times has been told in this

ter. Our next problem is to study the commercial and manufacturing industries which grew upon this foundation.

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CHAPTER V

COLONIAL INDUSTRIES AND REGULATIONS

We have stated in a former chapter that the course of economic development may be strongly influenced by the actions of government. It is worth while remembering that acts affecting colonial industries emanated both from English and Colonial sources, and that these laws were passed for the regulation both of commerce and manufactures. English lawmakers were supposed to have in mind the broad Imperial interest, while Colonial bodies legislated for their particular welfare. Imperial and Colonial interests were frequently in conflict. The policy favored in England was the encouragement of the production of desirable raw materials, protection of English manufacturers against nascent Colonial manufactures, and the reservation of the Colonial markets for the English to the exclusion not only of foreign producers but often those of other Colonies. The Colonies, on the other hand, were interested in the establishment of certain fundamental industries which could be depended upon to supply them at all times, and in ample supplies of commodities at as low prices as possible. These interests in particular affected the course of legislation.

51. Colonial Legislation.—In the case of Colonial legislation restrictions and favors were of many kinds. Usually they were made on the authority of Colonial legislatures, but towns, and even private associations and individuals, sometimes encouraged desirable industries.

Colonial legislation may be roughly outlined as follows: (*a*) Laws providing for the conservation of certain de-

sirable raw materials. Massachusetts, for example, by an act of 1640, required hides to be sent to a tannery under penalty of £12 fine, and leather searchers were appointed in each town to enforce the law. (*b*) Laws granting aid in many forms, or offering prizes for the successful production of desirable commodities. Measures of this kind included bounties, premiums, subsidies, grants of land to individuals and companies who proposed to found industries, loans with or without interest, and permission to raise funds for industrial purposes by lotteries. A number of Colonial legislatures offered bounties for the production of hemp, wool, flax, and silk. A premium in amounts of £6 and less was offered by a Maryland law of 1740 for makers of the finest homespun linen of certain dimensions. When Winthrop and his associates proposed to manufacture iron from the bog ore of Monontocot River, the General Court made a grant of three thousand acres in aid of the enterprise. In 1719 Maryland offered one hundred acres to any citizen setting up a forge or furnace in the Province. Rhode Island in 1725 loaned William Borden £500 at interest and later made him an additional loan of £3,000 without interest to aid the establishment of the manufacture of sail cloth. Many other instances could be given of this kind of assistance. (*c*) Laws prohibiting or restricting the export of certain raw materials were promulgated. Thus, Colonial legislatures at times prohibited the export of iron, wool, hemp, leather, and other articles, to reserve them for use of local manufactures or consumers. (*d*) Customs laws covering both imports and exports were introduced. (*e*) Tonnage duties granting special favors to owners or builders of vessels were imposed. (*f*) Grants of monopoly, including patents, were made. Prospective producers of salt and proprietors of saw and grist mills were sometimes encouraged by the grant of an exclusive market for their product.

That measures like those described above were so often employed is testimony to the fact that on the whole this policy was successful. In the long run, however, the effect on the course of American economic development was negligible, except perhaps, that such temporary and sporadic growth as resulted from the measures served to lay the foundation of a general prosperity which, in a general way, promoted further growth.

52. The Mercantile Theory.—The industrial policy which prevailed in England, and in fact in all the countries of the time, goes under the title of the Mercantile Theory. This doctrine has both a political and an economic aspect, but fundamentally, the object was the development of strong national power. This aim was worked out through a number of policies which affected almost every important phase of industrial life. In short, the dominant fact was the regulation of industry for the accomplishment of the aims of the mercantile doctrine. The elements of national strength, according to the mercantilists, included chiefly an ample supply of money, a large, sturdy, able population, and a variety of industries both agricultural and manufacturing, which made the nation as nearly self-sufficing as possible, and a fleet which could be used both for mercantile and war purposes. Some of the policies for the accomplishment of this end were the encouragement of native shipping; the protection of domestic farming so as to assure the nation its food supply; the promotion and protection of manufactures to provide not only goods, but to give occupation to a large population; and the regulation of foreign commerce so that the balance of trade should be in favor of the home country. The administration of the industries of the country in accordance with these principles was supposed to develop national wealth and power. Meanwhile, the principal function of the Colonies was to provide the home country

with needed raw materials and to afford a market for the surplus of the home industries. In a day when all the leading nations were restricting commerce both with themselves and their colonies, a prosperous colonial population which would consume the products of the home manufacturers was the most certain market. Hence England, like the other commercial nations, sought to build up and protect such a market for her own use. Each of the policies named above was worked out through various laws.

The mercantile doctrine as applied to England affected the Colonies in a number of ways. We have seen that bounties were granted on certain desirable raw materials, and that manufactures which threatened to compete with the products of England were restricted. Moreover, the operation of the English Corn Laws, by which import duties were placed on wheat, the limitation of the English market for fish, and the prohibiting of imports of salted meats, compelled the sections of America which produced those products to seek markets outside of England. Finally, the Navigation Acts brought shipping and trade under regulation.

The regulation of trade and shipping was brought about by a number of acts. As a rule the early Colonies were exempted, either wholly or for a term of years, from the operation of the laws regulating trade. But the success of the Dutch in securing a large amount of the Colonial carrying trade induced England to place restrictions on this commerce. Thus in 1645 was passed the first of a series of laws known as the Navigation Acts. This policy was amplified and extended notably in the acts of 1651, 1663, 1672, and 1696 until not only shipping, but trade with the home country, with Europe, and even inter-colonial commerce was brought within the purview of the laws.

The Act of 1651 applied only to shipping and was intended both to cripple the carrying trade of the Dutch

and to stimulate English shipping by giving the preponderance of advantage of English trade to the owners of English vessels. The purpose of the law as stated in the context was for the "increase of Shipping and Encouragement of the Navigation of this Nation." Among other provisions the Act stated that the products of Asia, Africa, and America and the outlying islands could be imported into England only in vessels belonging to Englishmen, including the planters, and of which the master and the majority of the crew were Englishmen; that the products of Europe could be imported into England or its dominions only in English ships or, at least, in those belonging to the country where the goods were produced; and that foreign products could be brought to England only from the place of production or from the port where the goods were usually first brought for transportation.

In the Act of 1660 the provisions of some of the earlier laws were restated, amplified, and in some respects made more specific. Not only shipping, as in the Act of 1651, but Colonial trade was regulated for the benefit of the home country. Ships were to be British owned, and masters and three-fourths of the crew Englishmen. The law enumerated certain commodities which could be exported only to Great Britain and the plantations. This list covered sugar, tobacco, raw cotton, ginger, indigo, fustic, and other dye-woods. From time to time other commodities were added to the list of enumerated articles. Molasses and naval stores were added in 1706, and copper, beaver and other skins, in 1722; coffee, pimento, hides and skins, pot and pearl ashes, iron, lumber, and other articles were added in 1764. Finally, in 1766, both enumerated and unenumerated articles could be shipped only to England or Ireland, or to some country south of Cape Finisterre. The non-enumerated articles originally could be carried directly from Colonial to Continental ports.

The purpose of the Act of 1663, which further developed the English policy, was to tighten the hold of England on Colonial commerce. Thus, the object of the measure as stated in the Act, was to make "this Kingdom a staple not only of the commodities of those plantations but also of the commodities of other countries and places supplying them." As might be inferred from this statement, the products of Europe could be imported into English Colonies only when shipped in English vessels from Great Britain. Thus England was to become the entrepôt for incoming and outgoing Colonial freight, and British vessels were to be the carriers. A few exceptions were made. Salt might be sent directly from any European port to New England, a privilege which was later extended to Pennsylvania and New York, and wines might be shipped directly from Madeira or the Azores.

Contrary to the provisions of these laws there was a considerable amount of direct trade between the American Colonies and the Continent of Europe, notably in tobacco. The purpose of the Act of 1672 was to prevent this commerce. The principal feature of the new measure was that bond must be given that the enumerated articles would be landed in England, Wales, or Berwick, or in default of this, that the goods were to bear heavy specific duties. This measure, also, failed to secure the desired results, hence the Law of 1696. This measure enjoined greater vigilance on the part of the executive officers and provided for the establishment of admiralty courts to aid in the enforcement of the laws. This Act "added the finishing touch to the Colonial system as far as shipping was concerned," though subsequent Acts added somewhat to the details of the regulations.

What was the effect of these laws on the development of Colonial commerce? It is impossible to state with certainty what the results were. Probably the only answer

that can be given is to indicate the general tendencies of the laws. This may be done as follows:

1. The Navigation Acts, by giving British subjects a monopoly of the carrying trade greatly stimulated shipbuilding and the related industries in the Northern section and thus contributed materially to the prosperity of those Colonies. But the natural advantages of shipbuilding already existed in that region, and the demand for vessels in the fisheries and for the carrying trade would probably have made shipbuilding an important industry without the aid of the navigation laws.

2. In some respects the laws tended to divert trade from the natural markets, deprived the colonists of the full benefits of commerce with England and the Continent, and thus placed some handicaps on the commercial development of the Colonies. The duties on grain, salted meats, fish, whale oil, etc., made it necessary for the Colonial producers to look to other markets than England for the sale of the larger part of these products. The high relative importance of the West India trade was largely due to the fact that the Northern Colonies could dispose of products in these islands which could not be sold profitably in England.

3. In case of some particular commodities the laws, to the extent that they were obeyed, tended to impose hardships on the colonists. Tobacco was the only product of the continental Colonies on the original enumerated list. The intention of the law was to require this article to be landed in England where it would pay the English duties, afford a profit to the English merchants who handled it, and be exported thence to Europe. This process probably depressed the price under what the planter could have obtained by direct sale on the Continent. On the other hand, there were compensating advantages. High duties were imposed on Spanish tobacco imported into England, and the growing of the plant in England was

prohibited. The enumeration of rice in 1706 deprived the planter of Carolina of the profitable Spanish and Portugese markets. This Act, however, was amended in 1730 so as to permit the direct export of this commodity to countries south of Cape Finisterre. The Molasses Act of 1733, which imposed prohibitive duties on sugar, molasses, and rum, imported from foreign plantations, threatened most serious consequences for the Northern Colonies. Since this Act was not enforced, the evil effects were not realized.

4. The provisions of the Act designed to make England the source of supply for manufactured goods imported into the Colonies probably imposed little hardships on the Colonies. The fact that the trade was largely financed by English merchants, and that the capital and ships were largely owned in this country made England the most available source of supply for manufactured goods, and the market to which the Colonies would have resorted had there been no laws of trade.

5. Finally, all estimates of the effects of the laws are tempered by the fact that the Acts were largely evaded, when the colonists found it to their interest to escape the laws. Shipmasters sometimes loaded tobacco without giving bond or paying the duty; goods were sometimes imported and exported from places other than the ports of entry and thus evaded the provisions of the law, or by collusion with the officials the laws were evaded. Even when the violators were brought into court, it was difficult to secure convictions from Colonial juries, and after the establishment of admiralty courts, the conflict between the admiralty laws and the common law tribunals impeded the enforcement of the laws. Finally, during the long premiership of Walpole, the policy which prevailed in England was that of "salutary neglect." Considering the restrictions as a whole, therefore, the burden was probably

very light. This situation was changed after 1763 by the introduction of a new policy.

53. **Commercial Regulations, 1763–1775.**—The year 1763 marks a turning point in the attitude of the English Government toward the Colonies. In the background were some important changes which bore on the situation. The ascension to the throne of George III in 1760 brought forward a monarch who was determined to rule. Connected with this was the departure from the former lenient policy of dealing with the Colonies. Meanwhile the Seven Years' War left England heavily burdened with debt, and there loomed on the horizon the need of maintaining troops in America to protect the new possessions obtained from France and to keep control over the Indians on the frontier. Since the Colonies derived the chief benefits from the removal of the French, it seemed just to the Ministry in England that they should share a part of the expense in maintaining the military establishment. The requisite sums were to be raised by taxation. Important changes were taking place in the industrial world, which affected a change in the relations with the Colonies. The growing importance of English manufactures made both producers and merchants more eager to secure control of the Colonial markets; hence a demand for a more rigid enforcement of the laws.

Thus, in substance, the old idea of regulating commerce for the benefit of the mother country still prevailed, but to this was added the purpose of raising revenue from the Colonies for their military protection and for the more certain support of the Colonial government. The new policy was characterized by Edmund Burke as "A new principle . . . with regard to the Colonies by which the scheme of regular plantation Parliamentary revenue was adopted. . . . A revenue not substituted in place of, but superadded on monopoly; which monopoly was enforced at the

same time, with additional strictness, and the enforcement put in military hands."

The leading laws passed in pursuance of this new policy were the Sugar Act of 1764, the Stamp Act of 1765, the so-called Townshend Acts of 1767, and the Tea Act of 1767. None of these laws was in operation long enough to affect the course of Colonial commercial development, but the student of economics finds them important because of their incidental effects.

The first of the new measures was the Sugar Act. As stated in the law, one of the purposes of granting certain duties in the Colonies was to apply "the produce of such duties, and of the duties to arise by virtue of said Act, towards defraying the expenses of defending, protecting, and securing the plantations." Other purposes were amending the Sugar Act of 1733, and the "more effectually preventing the clandestine conveyance of goods to and from the said Colonies and plantations, and improving and securing the trade between the same and Great Britain." Import duties were laid on indigo, coffee, wines, silks, calico, and other articles. The feature of the measure which threatened most seriously the prosperity of the Northern Colonies was the duty on sugar and molasses from the non-English West Indies. The former duties had been prohibitive but were evaded; while the duties were now reduced, the purpose of the government was to enforce the law. Since the successful commerce of the Northern section depended largely on the continuance of the West India trade, the people of this region looked with great alarm on the operation of the new law. In particular, distillers of rum anticipated the ruin of their industries.

Raising revenue by means of a Stamp Act tax was a part of the program outlined by Townshend in 1763. Before the passage of the Sugar Act Grenville had announced

his intention of introducing a bill to provide revenue by this method. According to the Act of 1765 stamps were to be affixed to legal documents, notes, bills of lading, licenses for retailing liquors, warrants for surveys, playing cards, newspapers, pamphlets, almanacs, and other papers and documents. The colonists opposed this measure on the ground that they should not be taxed by a body in which they were not represented. They were successful in securing a repeal of the bill, but not until Parliament had announced the principle that this body had the power to "legislate for the Colonies in all cases whatsoever."

Relying on this declaration, Townshend brought forward several measures which were passed in 1767. Taxes were imposed on wines, oil, glass, paper, lead, painters' colors, and tea imported into the Colonies. The proceeds of these duties were to pay the salaries of governors and judges in the Royal Provinces by which means these officials would become independent of the votes of the Colonial assemblies. A board of customs commissioners was provided to reside in the Colonies with the expectation that this body would be able to exercise effective control over the customs service; in addition, writs of assistance were legalized, and provision was made for trial of revenue cases in admiralty courts without juries. Again the colonists resisted with the result that in 1770 the obnoxious measures were repealed, except the tax on tea.

These laws, as indicated above, were opposed by the colonists. Protests, and in some cases open violence, and agreements not to import goods from England were the principal measures employed to secure the repeal of the Stamp Act. Merchants of New York, Massachusetts, Rhode Island, and Pennsylvania entered agreements refusing to place further orders with Great Britain, or to sell on commission until the Stamp Act was repealed. Similar methods were employed in 1769 against the Townshend

Acts, and again in 1774 as a protest against the oppressive measures of Great Britain. All the while the movement gained in force until in the agreements of the last named date all the Colonies entered except Georgia, and an effective machinery was devised for the enforcement of the agreements. In 1775 the non-intercourse policy was extended to cover exports. Thus, the Continental Congress resolved that the "exportation of all merchandise and every commodity whatsoever to Great Britain, Ireland, and the West Indies ought to cease unless the grievances of America are redressed before that time" (September 10, 1775). The results of this policy are shown by the fact that the imports from Great Britain declined from £2,590,-437 in 1774 to £201,162 in 1775.

Non-intercourse was the most effective method of protest, since it touched the pocket-books of English merchants and manufacturers and stirred them to add their protests to those of the colonists. But the policy was not without its disadvantages since the American merchants also suffered, and when the policy was applied to exports, Virginia and South Carolina had to be exempted because their industrial life depended on the marketing of those staples. Moreover, the inhabitants of these Colonies were not as able to support themselves by local industry as the inhabitants in the Northern Colonies. The non-intercourse measures tended to have another result. They gave an initial stimulus to the growth of Colonial manufactures. Additional stimulus came to this movement during the enforced non-intercourse of the Revolutionary War.

The disagreements between Great Britain and the colonists were cumulative. The clash over the laws of trade and measures of taxation resulted in a number of other events which widened the breach between England and her Colonies. The struggle over writs of assistance, the Gaspee affair, the closing of the port of Boston as a result

of the Boston Tea Party were among these events. The irreconcilable disputes over taxation and representation stood in the foreground as one of the causes of the Revolution.

54. Colonial Manufactures. — Manufacturing industry made some progress during the colonial era, although this was slow compared with the pace of later years. Whether the settlement was made up of colonists just arrived from Europe, or of people who had migrated inland from the coast regions, the new community was usually entirely self-sufficing. Such manufacturing as was done was performed by the members of the family for their own use, and there was little or no buying and selling. Everywhere in America, until the settlements obtained the means of communication with the rest of the world, this was the state of affairs at the beginning. Only with the growth of towns did differentiation in occupations take place and commerce begin. Indeed, at any time in the history of our country from 1650 to 1890, one could have found people existing in some of the industrial stages from the lowest to the highest, and even today, in a few of the out-of-the-way places are communities which live in some of the more primitive forms.

Comparing colonial industries with those of today we may observe that the former were characterized by (*a*) the great preponderance of hand work in production, (*b*) the lack of adequate power, (*c*) the absence of machinery, as we use the term, (*d*) the small size of the industrial units, (*e*) the close contact of master and worker in the shops, and (*f*) the relatively small amount of production for the market. Of course, these conditions varied from community to community, but they describe roughly the state of manufacture in colonial times.

55. *Textiles.*—The production of cloth and clothing was among the most important of the manufactures. The most

important textile fibres were wool, cotton, and linen. The cotton plant had been grown in a small way in some of the southern colonies from earliest colonial times, but it was of little commercial importance. The great development of the industry had to await the introduction of a labor saving device for cleaning the fibre. This was not contributed until 1793, when Whitney's cotton gin made its appearance. Nevertheless, some cotton was used in the manufacture of fabrics. Considerable quantities of the fibre were imported into the New England colonies from the British West Indies.

In the northern colonies the women and children performed most of the work of textile manufacture. They combed the wool, spun the yarn, and often wove the cloth, which was later fulled and finished in the "mills." In the South, these processes were often carried on by the household slaves. If the plantation was large, the labor was divided—one person doing the weaving, another the spinning, etc.

In the course of time, the manufacture of textiles began to pass out of the home; then, specialized master workers undertook to spin, weave, full and dye materials, disposing of their products in the domestic market. But in this industry, as in all others in colonial times, household manufacture continued to exist in the same community with shop or "mill" production.

56. *Flour and Meal.*—A similar remark applies to the production of flour and meal. One of the earliest methods of production was to pound grain in a mortar, or to grind it in a hand mill. At a later stage the method was to produce the meal or flour in a small mill operated by water, wind or horse power. Towards the end of the colonial period the merchant mills of the Middle Colonies had become the most effective of the colonial industries. "Improvements which had been introduced gradually dur-

ing the previous decades, culminated in the invention of Oliver Evans of Philadelphia, who perfected devices by which grain was elevated mechanically to the top of the mill or warehouse, cleaned during gravity transmission to hopper, ground, conveyed by screw transmission, and a second series of elevators to the top of the building again, cooled, bolted, and barrelled during the second descent, without the intervention of any manual labor. This may have been the first instance of interrupted process of mechanical manufacture, from raw material to finished product, in the history of industry."[1]

57. *Mill Industries.*—In many cases, "mills" in colonial times combined a number of manufacturing operations; "Not only did they saw lumber and grind grain and full cloth—the most usual of the mill industries—but they ground rags, plaster, powder, malt, flaxseed, chocolate, mustard, and tobacco; they broke hemp and fulled leather; not only did they drive the forge bellows and operate the blacksmith's hammer, but they ground scythe and knife blades, bored rifles, and slit iron." It is evident from this description that a large number of processes which became specialized in later days, were, in colonial times, carried on under one roof.

58. *Iron.*—In the case of iron, mining and manufacturing were usually carried on by the same proprietor, and in addition, there was a large amount of home manufacture of such articles of tacks, nails, bars, etc. Two forms of mineral were used: "Bog ores found in eastern Massachusetts and in a few places along the New Jersey coast, and rock ores which supplied the furnaces and forges of the uplands from Connecticut river, in a circle north of New York City, through New Jersey and eastern Pennsylvania southward." If the metal was to be cast, it was not converted into pigs, but was moulded directly into pots,

[1] Victor Clark, *History of American Manufactures*, pp. 174–175.

kettles, and other hollow ware. Throughout the colonial period there was very little improvement in the processes of manufacture.

59. *Boots and Shoes.* — The manufactures of leather were found in all the colonies. Tanneries were established in every community. From leather were produced straps, harness, boots and shoes and articles of clothing. As with other industries, the manufactured leather products advanced through a number of stages. A recent study of the boot and shoe industry in New England gives a clear idea of the progress of this industry.[2]

In the early years foot-wear was produced in the home by the menfolk. This was the home stage of production. A crude kind of specialization began a little. later when the itinerant cobbler took up the work. He moved "from house to house with his kit of tools and a few lasts rolled up in a leather apron which was slung over his back, or trundled in a wheelbarrow along with his cobbler's bench." But even the cobbler worked in the home where his shoes were consumed.

Later, the industry passed into the handicraft stage. At times, to be sure, the cobbler worked in the home of his customer, but more often he labored in his own home producing shoes for local consumers who left orders with him. "Thus the Home Stage with its chief characteristics of production merely for home consumption gave way to the Handicraft Stage with its characteristics of work done for the market, or on the specified demand of a definite customer." Out of this stage grew the manufacture of shoes for stock, that is, for sale through merchants to customers who were not known to the cobbler.

During later colonial times, the boot and shoe industry moved one more stage towards the factory system of today.

[2] Blanche E. Hazard, *The Organization of the Boot and Shoe Industry in Massachusetts.*

This was marked by the advent of the "Domestic System." "Here the entrepreneur was a capitalist shoemaker, hiring workers in their homes to make boots and shoes for him to sell at retail or wholesale." [3] In Massachusetts "the domestic system was well established in its first phase, for the capitalist-merchant had appeared to venture, to lose or to profit in the boot and shoe industry in some communities by 1760, and in many by 1810. The impulse (*a*) of the sales during the Revolutionary War, (*b*) in the demands of the trade in the United States after it, and (*c*) of the tariff gave a big stimulus." Such was the beginning and progress of the boot and shoe industry. A similar development occurred in other lines of manufacture.

Among other manufactures of importance were the production of various timber products, carts, wagons, cabinet work, furniture, rope, cordage, sail cloth, spirituous and malt liquors, brick, pottery, soap, candles, and various articles of brass and copper. The manufacture of paper was begun by William Rittenhouse in 1690; salt was an important manufacture because of the demands for preserving meat, dairy and fish products. The supply of beavers at one time gave considerable prominence to the manufacture of hats.

60. **Colonial Commerce.**—Merchandise for the supply of local markets was obtained from a number of sources; merchants, of course, large and small, had a place in this round of buying and selling; but in addition there were peddlers, local craftsmen, domestic workers and farmers.

61. **Colonial Money.**—For many years domestic trade was carried on largely by barter. But this method was so inconvenient that the people began to devise substitutes for money; and thus Indian corn, wampum, furs, tobacco and tobacco warehouse receipts were used for exchange

[3] *Ibid.* Pp. 23, 40.

purposes. The Colonists experimented with paper money as early as 1690 when this currency was issued in Massachusetts to pay the expenses of a military expedition to Quebec. It was not long before other colonies began to issue paper. In most cases the issues greatly exceeded the domestic needs; depreciation was the inevitable outcome. Attempts were made to prevent this result by (*a*) making such money legal tender for the payment of taxes, (*b*) by promising to redeem it in gold, and (*c*) by conversion into new issues of paper. As a rule these methods proved to be a failure.

Metallic money is an expensive luxury in any new settlement, and it is always necessary to economize in its use. There was little or no English coin in circulation, partly because the balance of trade was usually against the colonies, partly, also, because the English laws discouraged the export of gold and silver. The Spanish "pieces of eight," (eight reals or ryals), were the metallic basis of the colonial money system. Several Portuguese coins were also in circulation, including the "johannes"—equivalent to sixteen Spanish milled dollars—and the half and quarter "joe." The Spanish milled dollar, which came into circulation shortly after 1728, gradually took the place of the pieces of eight. This monetary unit was adopted by Congress in 1786 as the basis of the coinage of the United States. The standard of value in the various sections was by no means uniform; in fact, each colony established the value of the Spanish coins in terms of shillings; in New England and Virginia, for example, the piece of eight was rated at six shillings, in New York and North Carolina at eight shillings, and a different rate was established in other colonies.

62. Fur Trade.—One of the greatest problems of trade in a new country is to find commodities to export. As a rule, such commodities must be different from those pro-

duced in the older countries, a demand for them must already exist, and due to the customary difficulties of transportation such articles must contain a high value in small bulk. Furs suited admirably these conditions. Fur trading was a pioneer industry over much of North America. It led the traders up all the streams which flowed into the Atlantic, and after the exhaustion of the resources of the East, the trader pushed his business deep into the interior.

The quest for furs was perhaps the greatest of the causes which led the Europeans into the Mississippi Valley. The Frenchmen who first penetrated the interior, enjoyed their monopoly for only a brief period, for the rapid expansion of settlements east of the Allegheny mountains, driving before them the fur bearing animals, soon brought the English also into the interior. In the struggle which followed for the Indian trade of the Ohio and the upper Mississippi valleys, the strategic advantages lay with the English. Their friendship with the Iroquois was an important factor in this contest. This tribe not only blocked the entrance to the shorter routes which might have been traversed by the French, but, provided by the English with arms and ammunition, they spread terror among the enemy throughout thousands of miles of territory. Thus for the greater portion of the time the French were compelled, after coming down the St. Lawrence, to cut across Canada to the Ottawa river, move up that stream to Lake Nipissing, then to Georgian Bay; and thence, from the Great Lakes, to proceed into the Mississippi valley by way of Green Bay, the Fox and Wisconsin rivers, or by way of the Chicago river, in either case entering, as it were, by a side door.

The control by the English of the shorter routes brought them important advantages; they were able to save much time going to and fro; they were able, moreover, to convey

their Indian goods to the interior and the furs to the coast at a much lower cost than that paid by the French; they were, in consequence, enabled to sell their goods much cheaper. The English enjoyed a further advantage in being burdened with fewer governmental restrictions than their competitors. As a result, it is claimed that the English were able to offer as much as fifty per cent more for beavers and to give better goods in exchange.

The outcome was inevitable. The red men sought the traders who bartered on the better terms. The French not only found it increasingly difficult to hold their ground, but their commerce was interrupted, and they were led into wars with the tribes whom their interest should have led them to pacify. To this problem there was for the the French perhaps but one solution, namely, to secure the sovereignty of the territory in which they were eager to trade. This struggle for commercial existence, therefore, formed one of the great causes for the French and Indian wars, which ultimately terminated in the cession of the territory east of the Mississippi to Great Britain.

Before 1749, the English had secured a firm foothold in the Ohio valley. In that year, Celeron de Bienville, who had been sent to vindicate the French authority in that region, stated that each village along the Ohio and its branches "has one or more English traders, and each of these has hired men to carry his furs." At the outbreak of the last French and Indian war some three hundred traders from Pennsylvania and Virginia came over the mountains annually.

The surrender of Canada gave the English new opportunities for the development of the trade of the West. In 1761, two important fitting-out places, namely, Albany and Philadelphia, were competing for this traffic. With a stock in trade of beads, gaudy ribbon, hatchets, knives, gunpowder, lead, and poor whiskey, traders from Albany

reached Presque Isle, now Erie, Pennsylvania, whence they advanced into Michigan, or proceeded down the Allegheny river to the Ohio. From Philadelphia, the route led over the Susquehanna at Harrisburg (Harris Ferry) thence through the Juniata valley, and across the mountains to Pittsburg, thence down the Ohio.

The fur trade left numerous far-reaching results upon our history. It found the red man merely a hunter for food and raiment; it put iron and guns into his hands, and made him dependent on the higher civilization of the white man. It provided a powerful stimulus to exploration, resulted in the determining of the geography of a large part of the valley, and brought to light and advertised its richness. "The trader," as one authority put it, "was the farmer's path-finder into some of the richest regions of the continent." The founding of various towns and even cities, and the determination of the shortest routes into the interior, are directly traceable to the same cause. St. Louis, for example, was founded as a French fur trading post. Over forty years after its establishment it was described as "only a residence of trappers and traders." As early as 1730, the confluence of the Allegheny and Monongahela rivers—the present site of Pittsburg—had been a place to which the Indians and the white men had resorted to trade. Here, in 1754, Captain Trent began to build a fort in the interests of the Ohio Company, and in 1768 a town was laid out near the fort, where cabins were built under the suffrance of the commander. The old portage routes followed by the traders became emigrant trails, later wagon roads, and still later, in some cases, the lines of railroads. The termini of the portages became camping grounds; here appeared mechanics to make the various repairs required by the traders; on account of the strategic nature of such locations they were frequently chosen as sites for forts, and in the next stage of their

evolution, villages grew up under the protection of the forts.

63. Coastwise Trade.—Because of differences in resources and in occupations, there was an abundance of opportunity for trade among the seaboard Colonies. Southern products, such as tobacco from Maryland and Virginia, and rice, indigo, and naval stores from the Carolinas, were gathered up by the New England traders and carried north; a small portion of these products was disposed of along the way; the balance was exported to Europe. Grain and flour from the Middle Colonies were taken to New England and Southern Colonies. Pig iron from the Middle States found its way to the New England shops where it was converted into manufactured forms and exported to the southern coast towns. The northern traders brought southwards goods previously imported from Europe, and implements, boots, shoes, tin ware, hats, and other products of domestic manufacture.

The coastwise journey of an American vessel was usually the part of a longer trip, which, before it was complete, included the circuit of the north Atlantic, taking in not only the continental colonies of America, but the West Indies, the West Coast of Africa, and some of the Mediterranean and other European ports. One of the "triangular routes" was covered by a voyage from Boston or Salem, to Lisbon, where the east bound cargo was disposed of; thence to the West Indies with a European cargo; after selling a portion of his freight, the captain took on board sugar, molasses, and rum, and proceeded to the home port. By another route the merchant took his cargo of rum, bar iron, and other products, directly from America to the Gold Coast, where he exchanged his wares for gold dust and slaves, and proceeded to the West Indies, where he sold the slaves; he then took on a cargo of sugar and molasses and proceeded home.

64. Trade with the West Indies.—Commerce with the West Indies was one of the most profitable branches of colonial enterprise. While New England derived the greatest benefits, the Middle, and to some extent the Southern Colonies, enjoyed some of the advantages. This commerce contributed to the prosperity of the continental colonies in a number of ways: (*a*) the traffic in sugar and slaves provided a large source of profit; (*b*) molasses from the West Indies was the raw material from which the New England distilleries produced rum; this product, therefore, laid the foundation of a leading manufacture, and provided an important article of commerce; (*c*) the gold and bills of exchange with which the planters of the sugar islands settled their unfavorable balance of trade with the continental colonies gave the latter a means of settling their adverse balances with the home country; and, finally, (*d*) the West Indian markets afforded an outlet for a number of colonial products which could not be disposed of elsewhere. From New England were exported a low grade of fish, lumber and shingles for dwellings, staves, hoops, and headings for barrels, candles, oil and soap; the Middle Colonies exported to the sugar islands flour, bread, corn, beans, poultry, horses and oxen. This trade included not only the British islands, but those of France, Spain and Denmark.

65. Commerce with Europe.—Throughout the colonial period the southern sections, including chiefly Maryland, Virginia and Carolina, were the largest exporters. In fact, the exports from Virginia and Maryland were usually valued at more than those of all the other colonies combined. This signifies that tobacco, which was the great commercial crop of that region, was the greatest single export. After the rise of indigo and rice, the exports of Carolina ranked second in value. The relative share of the various colonies in the export trade to Great Britain may

be shown by figures taken for four different periods, as indicated below:

EXPORTS FROM THE AMERICAN COLONIES TO GREAT BRITAIN
(VALUE IN POUNDS)

Year	New England	New York	Pennsylvania	Virginia and Maryland	Carolina	Georgia	Total
1697	26,282	10,000	3,347	227,756	12,374	.....	270,852
1725	72,021	24,976	11,981	214,730	91,942	.....	415,650
1750	48,455	35,632	28,191	508,939	191,607	1,942	814,766
1775	116,588	187,018	175,962	758,356	597,349	103,477	1,920,750

Besides the three great staples—tobacco, rice, and indigo—the Southern Colonies, particularly the Carolinas, exported naval stores and lumber. These products were exported to England; the first three were among the enumerated articles whose export was confined to England. The mother country, on the other hand, was able to take very little of the products of the Middle and Northern Colonies; these sections therefore looked to Southern Europe and the West Indies as their best markets. The imports into the colonies were obtained chiefly from England, and consisted of manufactured goods, of which fabrics of various descriptions constituted the larger part.

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PART III

FOUNDING OF THE NATIONAL INDUSTRIAL SYSTEM

1789–1866

CHAPTER VI

FORMATION OF THE CONSTITUTION AND THE IMMEDIATE RESULTS

The year 1783 marks a turning point in the industrial as well as in the political history of the country. Not that there were great economic movements that may be traced from this time, but that the colonists had succeeded in separating from Great Britain. They could now work out their own industrial destinies without interference from abroad. In the future economic policies were no longer to be a part of the imperial plan of Britain; on the contrary, they were to be such measures as the lawmakers of the new country saw fit to pass for its exclusive benefit.

66. Results of the Revolution.—Independence, however, did not prove to be a panacea; it raised many serious problems. One of the most difficult tasks was the establishment of orderly governments within the States, and of a central Governnent strong enough to maintain itself. The years from 1775 to 1783 were ones of great confusion, and the turmoil extended into the period immediately following the treaty of peace. The years from 1783 to 1789 have been appropriately called the "Critical Period of American History." Of these years John Fiske, the historian, wrote:

> The most trying time of all was just beginning. It is not too much to say that the period of five years following the Peace of 1783 was the most critical moment in all the history of the American people. The dangers from which we were saved in 1788 were even greater than the dangers from which we were saved in 1865. In the War of Secession the love of union had come to be so

strong that thousands of men gave up their lives for it as cheerfully and triumphantly as the martyrs of older times, who sang their hymns of praise even while their flesh was withering in the relentless flames. In 1783 the love of union, as a sentiment for which men would fight, had scarcely come into existence among the people of these States.

Not only was there no national sentiment, but among many people little or no respect for an orderly government. Thousands of persons were animated with the spirit of turbulence and revolution. Shays' Rebellion in Massachusetts in 1786 was one manifestation of this spirit. State governments were weak and timid, and many legislators and courts were afraid to cope with the situation. It can be easily understood that while this state of affairs prevailed very little could be accomplished in the way of industrial development, for even a simple kind of industry requires for its progress stable and settled conditions.

67. **The Results of War Financing.**—Not only did political conditions hamper the growth of industry, but the unfortunate aftermath of the financial methods of the Revolution worked to the same end. The Continental Congress tried to tap all the customary sources of revenue. It was hardly to be expected, however, that a Congress which had no power to tax could raise revenue by this method. It could only call upon the States to make contributions to the general treasury, but since the States were supporting their own militia they were loath to make grants to the general Government. Moreover, the colonists had not been trained to bear heavy taxation, their financiers were not versed in the art of raising revenue by this method, and what is more important, a taxing system which would have rested heavily upon the people would have defeated itself and the Revolution because of its unpopularity.

Borrowing, likewise, could not be relied upon as a

source of steady income. Very little could be obtained abroad, because the Colonies were rebellious governments with no status in the estimation of foreign countries, and consequently with no national or state credit. France perhaps might be persuaded to lend small amounts because of her sympathy with the Colonial cause, but no subscriber would take American securities as investments, at least in the early stages of the War when the outcome was uncertain. Between 1777 and 1783 the United States obtained as loans about $6,300,000 from France, and in 1781 and 1782 about $174,000 from Spain, and towards the end of the Revolution loans aggregating about $1,300,000 were obtained from bankers in Holland. But these sums were small considering the financial needs of the country.

Domestic loans scarcely met with better success. The issue of bills of credit in a large measure defeated the success of domestic borrowing, because subscriptions were paid in depreciated currency. Moreover many of the domestic sources of income were dried up or greatly diminished during the War, and as a result the lending power of the people was diminished. In addition, many of the well-to-do people were Loyalists who would not contribute to the support of the Revolution. Failing taxation and borrowing there was little left in the way of adequate resources. Some hope was placed in requisitions on the States, but this yielded only small amounts, probably less than one-quarter of the requisitions being honored. A lottery brought in considerable sums, and the seizure of property of the Loyalists provided some income, but in the end the chief reliance was in the issue of bills of credit.

As early as June, 1775, Congress authorized the issue of two million bills and added four million more before the end of the year. Towards the end of 1779 more than two hundred and forty million had been authorized. Congress called upon each State to pay an amount sufficient to re-

tire its proportion of the issues, but nothing was paid. Indeed, the States themselves were issuing bills of credit and were hard pressed to give value to their issues. The amount thus put out amounted to nearly two hundred and ten million dollars. The inevitable result of these huge issues was depreciation. This was slight and gradual at first, but with the addition of more and more bills to the circulation the decline was marked. In 1780 Congress acknowledged the depreciation of Continental paper by making provision for its acceptance in lieu of silver at the rate of 40 to 1, but this probably does not indicate the true rate of depreciation; in 1781 paper ceased to pass as currency and became chiefly a commodity in the hands of speculators.

Various methods were employed in an effort to maintain the value of the paper money but with little or no result. The States generally enacted legal tender laws to the effect that a refusal to accept the bills constituted an extinguishment of the debt. The effect of this was to discourage all credit transactions and probably much of the cash trading as well. Meanwhile resolutions were passed in Congress denouncing all persons who refused to receive the bills. Still other methods were used to give value to the paper, such as regulation of prices, the denouncing of monopolizers and engrossers, and punishment by fine or otherwise of persons who advanced the prices of commodities. Debtors demanded the enactment of "stay laws" which delayed the collection of debts, or of "tender laws" which permitted the debtor to offer goods at stated prices in discharge of his debts.

68. The Effects of the Issue of Paper Money.—In some respects, paper money acted as a disguised system of taxation and as such accomplished the purpose of liquidating many of the debts of the Revolution. The money depreciated as it passed from hand to hand, each holder in

varying degrees suffering a loss in purchasing power equivalent to the decline of the money while in his possession. One writer said in this connection: "Though the bills of credit operated as a partial tax on the monied interest, and ruined many individuals, yet it was productive of great national benefits by enabling the popular leaders to carry on a necessary defensive war. . . ." But on the other hand, declining value of the paper money caused a rise of prices which disturbed every element in the population. The Government itself was sorely burdened because rising prices made it more difficult to carry on the war, and in the end greatly increased the war debts. Moreover, trading of every description was rendered uncertain; farmers hesitated about bringing commodities to market, not knowing what prices they would obtain; the industry of merchants and manufacturers was likewise discouraged. In many instances it was safer to resort to barter with all its inconveniences than to use paper money as a medium of exchange. The uncertain state of the money offered a harvest for speculators. Thus it was said that many bold adventurers made fortunes in a short time by running into debt beyond their abilities. Prudence ceased to be a virtue, and rashness usurped its place. The warm friends of America, who never despaired of their country, and who cheerfully risked their fortunes in its support, lost their property; while the timid, who looked forward to the reëstablishment of British government, not only saved their former possessions but often increased them.

The issue of paper money by the States after the War only added to the confusion. Congress had no power over this policy. The unsettled state of the currency was thus one of the greatest deterrents to the establishment of a sound economic order which was necessary before prosperity could return. The wretched money conditions and

the uncertainty and unrest that grew out of them were some of the causes of the hard times that prevailed over the country after the Revolution. Conditions similar to those at Newport could probably be found in most of the cities and towns of the country. "Since the peace everything is changed," said a traveler describing Newport; "the reign of solitude is only interrupted by groups of idle men, standing with folded arms at the corners of the streets; houses falling to ruin; miserable shops, which present nothing but a few coarse stuffs, or baskets of apples, and other articles of little value; grass growing in the public square in front of the court of justice; rags stuffed in the windows, or hung upon hideous women and lean, unquiet children."

69. Conflicting Regulations of the States.—Added to the unsettled condition of the currency as a factor retarding the return of prosperity, were the confusing foreign and domestic commercial policies of the States. Since there was no compelling central authority, each State legislated for its own interest without reference to the interests of its neighbors and sometimes consciously to their detriment. When Massachusetts, for example, proposed to pass laws for the protection of its merchants and shipowners, other nearby States adopted measures to obtain some of the commerce that might be turned away from Massachusetts. If Pennsylvania imposed a duty on goods imported from abroad, it was to the advantage of New Jersey to admit the goods free. Thus the measures of one State which sought to protect itself from foreign competition were largely nullified by the action of other States. In the midst of these conflicting regulations it was impossible to obtain a consistent foreign policy, and consequently no pressure could be brought to bear on Great Britain or other countries to secure favorable treatment for American commerce. Thus there was a measure of justice in the reply of the Duke of Dorset in 1785 to the American com-

missioners who sought to negotiate a commercial treaty: "The apparent determination of the respective States to regulate their own separate interests," he said, "renders it absolutely necessary, towards forming a permanent system of commerce, that my court should be informed how far the commissioners can be duly authorized to enter into any engagement with Great Britain which it may not be in the power of any one of the States to render totally useless and inefficient."

The dealings of the States with each other were no more happily adjusted than their relations with foreign countries. Retaliation was a measure that one State employed against another, just as if it had been a foreign country. Not only did the States levy duties on goods imported from the others, but used the tariff policy to build up their trade and manufactures against these industries in other parts of America. Such policies were, of course, a great handicap to the development both of the foreign and domestic trade of the country. One of the benefits which a strong central government could bestow was uniform foreign relations and the elimination of troublesome State charges on domestic commerce.

70. Other Results of the Revolution.—Although the independent States were now free to regulate their own commerce, they suffered the loss of many advantages of being attached to the British Empire. While within the Empire they enjoyed the rights of trade with other British Dominions; as outsiders they were subject to such regulations as Britain chose to impose on foreign countries. The loss of the West India trade was a blow to portions of New England, which depended on this part of the world as a source of important raw materials and as a market for products. For a time the English Ministry seemed disposed to make a favorable commercial treaty, but in 1783 an Order in Council cut off the Americans from the West

India trade, and it was not until 1818 that they recovered it again. The fisheries were of great importance to the New Englanders, and Adams at the time of the negotiation of the treaty of peace carried his point that the right of fishing should be distinctly stated.

To some extent the loss of English bounties was an unfavorable outcome of the Revolution, but on the other hand, American industries were now freed from English restrictions. If the war disturbed shipping and caused great loss to merchant traders, it stimulated the investment of such savings as the colonists could make in domestic industries and thereby gave initial encouragement to the introduction of home manufactures. The wars and political troubles in Europe during the next decade or more hampered European trading and prolonged the period of self-sufficiency in the United States and further encouraged the establishment of domestic industries. The financial ruin of many well-to-do persons in the Eastern States was an unfortunate incident; but it tended to remove many of the industrial leaders whose chief interest had been in foreign commerce and made way for new leaders whose principal thought was the upbuilding of the new American manufactures. The prolonged hard times in the East during and after the Revolution was one of the causes involved in the early westward movement, which sent out many able persons who founded industries in the new country, and whose enterprise was shortly to encourage thousands of others to migrate.

71. **Economic Provisions of the Constitution.**—The prospective benefits of the Revolution were many, but in 1787 these benefits were only in prospect. There was a great domestic market looming before home merchants and manufacturers, if only the appropriate conditions could be obtained for its development. Some of these conditions were the establishment of a stable government which would

have exclusive power to legislate on all matters relating to the general welfare of the country, which could prevent the States from levying duties on the commerce of the others, and which could take over the whole matter of regulating the foreign trade policy of the country. Thereby there would be created a great free market, unhampered by tariffs or duties, and subject only to such laws as the general government saw fit to enact. Another requisite was that this government should have power to establish uniform conditions of trade, including standards of weights and measures, currency laws, monetary standards of value, and laws governing the granting of patents and copyrights.

Another prospective benefit of stable government under the Constitution lay in the development of the vast unsettled domain. If the land now claimed by the States could be transferred to the Federal Government and used to promote settlement and exploitation, a great stream of commodities would soon begin to flow into domestic and foreign markets, stimulating all forms of home industry and inviting foreign trade.

And another benefit of great moment would result from the development of the general resources of the country. Timber among the forest products, iron, copper, and coal among the minerals, and the exploitation of a number of agricultural staples and their manufactures, would shortly provide the country with a long list of important industries. All these advantages were in prospect when the framers of the new Constitution were urging its adoption. Hamilton might argue that government under the Constitution would secure the "good-will of most men of property in the several States, who wish a government of the Union able to protect them against domestic violence," and that the proposed Constitution would enlist the "good-will of the commercial interest throughout the States, which will

give all its efforts to the establishment of a government capable of regulating, protecting, and extending the commerce of the Union," and he might add that under the Constitution creditors who would expect the new government to pay its debts would be among its most loyal supporters; still the fact remained that the chief outcome of such a government would be the establishment of a sound economic and political order under which all classes could settle down to the work of developing the great natural resources of the country. This they could not do under the Confederation. The economic importance of the Constitution, therefore, lies in the fact that it provided the conditions under which the country could expand both politically and economically.

The new document gave Congress the following powers:

1. To lay and collect Taxes, Duties, Imposts and Excises, to pay the Debts and provide for the common Defense and general Welfare of the United States; but all Duties, Imposts and Excises shall be uniform throughout the United States;

2. To borrow Money on the credit of the United States;

3. To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes;

4. To coin Money, regulate the Value thereof, and of foreign Coin, and fix the Standard of Weights and Measures.

5. To establish Post Offices and Post Roads;

6. To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries;

And of course another important provision was added, namely, the right

7. To make all Laws which shall be necessary and proper for carrying into execution the foregoing powers. . . .

In addition certain things were prohibited:

1. No Capitation, or other direct, Tax shall be laid, unless in Proportion to the Census or Enumeration herein before directed to be taken;

2. No Tax or Duty shall be laid on Articles exported from any State;

3. No Preference shall be given by any Regulation of Commerce or Revenue to the Ports of one State over those of another; nor shall Vessels bound to, or from, one State, be obliged to enter, clear, or pay Duties in another.

The States were prohibited from coining money, emitting bills of credit, and from making anything but gold and silver coin a tender in the payment of debts; nor could they pass any law impairing the obligation of contracts. The Constitution contains many other provisions of interest to the student of political science, but the above are the principal ones relating to economic affairs.

The provisions relating to taxation have both a direct and an indirect bearing on industry, for in one way or another the income which supports the government must result from the producing power of the nation's enterprises. Moreover taxation may be used either to promote or to destroy. It has been very sparingly used for the latter purpose in the United States, but in the form of our protective tariffs we have used the taxing power to stimulate the growth of many desirable domestic industries, including manufactures and raw materials. Persons who advocate protection offer a long list of arguments favoring the use of taxation to defend the nation's industries against foreign competition. Even where the tariff in the United States has been used largely for revenue purposes, it has frequently had a promotive effect.

Not only has the taxing power of Congress been applied to incoming commerce, but in various ways to domestic industries, as where revenue was raised on liquor and tobacco, or at certain times on a great number of domestic products.

Corporation taxes, income taxes, and excess profits taxes are of recent origin in the United States. On the whole, the taxing power of Congress has been wisely employed, but if the imposts at times have been heavy, the great vitality of American industries growing under the stimulus of enormous natural resources and managed with great skill enabled our enterprises to support the increasing burden of taxation without perceptible detrimental effects.

It should be added that the taxing powers may affect industry in another way. A considerable portion of the income is frequently used to promote general industrial development; this is the case where sums are expended for the improvement of roads, rivers, and harbors, for coast surveys, for the erection of light houses, for geological surveys, and for the development of postal or other service; or where in recent years large amounts have been expended in commercial and industrial research, in the promotion of education, and in the establishment of departments or commissions for the promotion and protection of industry.

Great controversies once raged over the clause which empowered Congress to "Establish Post Offices and Post Roads," for it was under the authority of this provision that advocates of internal improvements sought large appropriations from the Government for the building of roads, the improving of rivers, and the construction of canals and early railroads. By virtue of the authority contained in this clause, the Government has been enabled to extend promptly post office facilities to all parts of the country, including distant sections where the cost was greater than the income, as with California and Oregon in the early days of settlement.

It is needless to say that uniform standards of weights and measures, of coinage, and of monetary units have greatly facilitated the movement of trade. These benefits have become more important with the widening of the do-

main of the United States and with the extension of domestic markets; thereby an ever increasing area has been brought under uniform conditions of trade.

One of the most important provisions of the Constitution is the so-called "Commerce Clause" which gives Congress power to regulate commerce with foreign nations and among the several States. The framers of the Constitution could have had no conception of the vast significance of this provision, at least as it applied to domestic relations, because in 1787 the inland commerce of the United States was relatively small, and the men of the times had no idea of the epoch-making inventions that were shortly to revolutionize land and water transportation. Domestic commerce was then chiefly coastwise or by river, and this was of relatively small importance. Interstate trade formed a very small proportion of the total domestic commercial transactions. But with the development of railroads and with the establishment of telegraphs and telephones among other means of communication interstate commerce came to predominate The trade, therefore, which Congress was empowered to regulate became very largely the trade of the United States. The framers of the Constitution could have had no conception of such enactments as the Interstate Commerce Act, the Sherman Anti-Trust Law, the Clayton Act, and the Federal Trade Commission Act, and yet these are now comprehended in the authority to regulate commerce. The effect of the development of means of communication, therefore, was greatly to enlarge the scope of Congressional powers.

To sum up, the Constitution has been the means of securing freedom of trade in the largest single market area in the world; it made possible uniform conditions of trade throughout this vast area, and withal, it provided a strong Government which was able to enforce both regulative and promotive measures. These have been among the under-

lying conditions for the growth of wealth and prosperity in this country.

72. **The Formation of the New Government.**—One of the first tasks before Congress was the creation of the executive departments. In the early years, with few exceptions, the economic work of these departments was small, but in the course of time, with the growth of the country, functions of this description were gradually added until at present some of the great executive departments are concerned exclusively with economic matters, and all the departments now have some work of this description.

Five administrative divisions were created, State, Treasury, War, Justice, and the Post Office. On July 27, 1789, the Departments of Home and Foreign Affairs were combined into a Department of State. The Treasury Department was established by an act of September 2, 1789, the chief executive being the Secretary of the Treasury whose duties included the administration of national income and national debt and matters relating to coinage and currency. Miscellaneous duties of an economic character were added in time. With the inauguration of the National Banking System in 1863, with the enactment of the Silver Purchase Laws and of numerous Currency Acts, and finally with the creation of the Federal Reserve System, the economic functions of this department have grown enormously; the activities of the Treasury Department are now closely interwoven with the industrial life of the country.

Postal service of some description came into existence shortly after the founding of the earliest settlements. As early as 1692 William and Mary granted a patent as Postmaster General of the Colonies to Thomas Neale. Before this time it had been the custom to deposit letters in coffee houses whence they were received by those to whom they were directed or carried by neighbors to their destination. In 1672 there was a monthly post between Boston and New

York. Shortly after its formation the Continental Congress established a post route from Falmouth, Maine, to Savannah, Georgia, and authorized the appointment of postmasters along the route. In 1774, Benjamin Franklin was deprived of his office of Postmaster General of the Colonies because of his opposition to the course of Parliament, but the following year the Continental Congress created a Constitutional Post Office with Franklin as Postmaster General. The Federal Congress continued the old post office arrangements until 1794 when the Post Office Department was put on a permanent basis. In the early years the bulk of the mail matter was composed of personal letters and newspapers, but, as trade began to pass beyond the limited confines of towns and cities, communications more and more took on a business character. At present by far the largest amount of the mail matter is concerned with business.

Provision was made for the office of Attorney-General by an Act of 1789. It was not until 1814, however, that this officer was given a seat in the Cabinet. For many years his duties were light, and it was not until 1858 that he was provided with an assistant. The functions of the Department have greatly increased, particularly since 1890. An increasing volume of business growing out of trust and other regulative legislation now passes through the Attorney-General's office.

Other executive departments have been added from time to time, but the discussion of these belongs in later chapters.

73. **Financial Matters.**—Other tasks confronting the new Government were the organization of the debts of the country, provision of revenue, the establishment of a coinage system, and the creation of a bank which could be of assistance in collecting and dispersing income, and which if necessary could lend to the Government.

It was a part of Hamilton's plan that the United States

should pay in full both domestic and foreign debts. He urged further that the Federal Government should assume the debts of the States since these had been incurred in the defense of the Union. He deemed this to be the wise policy not only because it would establish the credit of the new Government, but because it would provide the occasion for the exercise of Federal authority which was necessary for the firm establishment of the central Government. According to Hamilton's estimate, the foreign debt amounted to about $11,710,000, including principal and unpaid interest, and the domestic debt was about $27,383,000 with an additional $13,030,000 as accrued interest. There was no opposition to the payment of obligations owed abroad, but as to the domestic debt the question arose as to how much should be paid to present holders of securities. Since government stock had greatly depreciated, and since many persons had purchased at a low figure, there was a doubt as to the justice of payment in full. Madison urged that present holders should receive only what they paid and that the difference between this and par should go to the original subscribers, if they could be found. Hamilton carried his point that present owners should be paid in full. With reference to the assumption of the debts of the States, a compromise was effected by which the Federal Government was authorized to assume $21,500,000. Thus the new nation began its history with a debt of upwards of $75,000,000.

The next step was to obtain an income to pay interest, principal, and current expenses. The chief source was to be customs duties, although internal duties and income from the sale of public lands yielded certain amounts. Shortly after the organization of the House of Representatives, Madison introduced a measure to obtain the necessary revenue. It was expected at the time that import duties should afford some protection, but there was much

discussion as to which articles should receive the benefit and how much they should receive. Conflicts of interest appeared. Representatives from Pennsylvania, for example, wished protection for iron and steel which had become a great industry in that State; but Southern representatives objected that such a duty would raise the price of iron and steel products and would thus be a burden on agriculture. Hemp producers of the Ohio Valley asked protection, but the shipbuilders of New England complained that this would handicap their industry. Producers of liquors, glass, leather, beaver hats, among others, wished protection. The Act of July 4, 1789, provided for "specific duties on over thirty kinds of commodities; for *ad valorem* rates varying from 7½ to 15 per cent on a few specified articles, and for a 5 per cent duty on all articles not enumerated."[1] Among the commodities upon which duties were placed were iron and steel, glass and chinaware, tarred and untarred cordage, hemp, sugar, tea, coffee, molasses, and spirits of various kinds; duties were also placed on boots and shoes, candles, woolen and cotton cards, soap, manufactures of tobacco and snuff, and a number of other articles. The average rate of duty estimated on an *ad valorem* basis was not over 8½ per cent. Although this rate seems very low, it does not indicate the extent to which foreign competitors were handicapped in American markets because of the high cost of ocean freight.

A question which once disturbed our lawmakers was whether it was the intention of Congress to give protective character to this first tariff. If the question could be answered in the affirmative, weight of authority could be placed behind the protective principle, because a number of members of Congress had also been members of the Convention which framed the Constitution and moreover, for the same reason, something could be gained in favor of

[1] Dewey, *Financial History of the United States*, p. 81.

the argument that a protective tariff was Constitutional, a matter which at one time disturbed our lawmakers. It is undoubtedly true that revenue was the pressing need of the new Government, and that the majority of the people were opposed to internal duties as a source of Government income; on the other hand, the debates on the bill made clear that the intention of many members was to secure protection for chosen commodities; Hamilton and his followers favored the protective principle; the prior legislation of the States had been protective, and finally, the eagerness of England to gain the monopoly of the carrying trade, and her unwillingness to negotiate liberal commercial treaties with the United States had shaken many Americans out of their former free-trade ideas. Thus there is good reason to believe that it was the intention to give this tariff act a protective character.

The Tariff of 1789 did not yield revenue enough, and the rates were raised in 1791 and in 1792. In addition Hamilton urged the imposition of certain excise duties. By an Act of 1791 a tax was placed on spirits distilled from molasses, sugar, and other foreign materials, amounting from 11 to 30 cents a gallon; and on spirits distilled from domestic articles, as whiskey from grain, from 9 to 25 cents per gallon. In 1794 taxes were placed on carriages, sales of certain liquors, on the manufacture of snuff, the refining of sugar, and on auction sales.

74. **The First United States Bank.**—The financing of the new Government would have been difficult without the aid of a large reliable bank upon which the Treasury could depend in times of need. Government revenue was obtained only at stated times during the year, while the expenditures were a constant outgo; the income that piled up at certain periods required a place of deposit; a bank could best perform the function of depository, for, if money were withdrawn from circulation, the business of the country

would have been denied the use of a considerable portion of the circulating medium. Moreover, in the early years of the Government, before the Department had learned to estimate expenses, it was not certain that the revenue laws would provide the requisite amounts; in case of emergency the Government would have to borrow; a great bank, therefore, could render an important service. It could be of use also in collecting Government income in distant and widely separated places and in paying Government debts in such places. Thereby it would be necessary to transfer only the minimum of coin. To the growing business of the country a great bank would also be of material aid; it could accumulate savings for investment, it could discount merchants' notes, and, as with Government collections and payments, it could facilitate transactions with distant places with relatively small transfer of specie, particularly if the bank were permitted to establish branches. These benefits were among the advantages foreseen by Hamilton in urging the charter of a bank by the United States.

Other reasons were involved. The paper money of the Revolution had passed out of circulation, and there was now a shortage of the medium of exchange. Hamilton was not in favor of the Government providing such a circulation for, according to his view: "The emitting of paper money by the authority of Government is wisely prohibited to the individual States by the national Constitution, and the spirit of that prohibition ought not to be disregarded by the Government of the United States." He admitted that "in times of tranquillity, it might have no ill consequence; it might even perhaps be managed in a way to be productive of good, but, in great and trying emergencies, there is almost a moral certainty of its becoming mischievous. The stamping of paper is an operation so much easier than the laying of taxes, that a government in the practice of paper emissions, would rarely fail, in any such

emergency, to indulge itself too far in the employment of that resource, to avoid as much as possible one less auspicious to present popularity." Thus, the issue of paper circulation should be left to the bank rather than to the Government.

At this time, moreover, there were very few banks in the United States. Of the three mentioned by Hamilton, the Bank of North America in Philadelphia was the only one that approached the needs of the situation, but there were objections to this institution. Although it had originated in a resolution of Congress in 1781 and had been of great assistance to the Government, there were certain circumstances which now militated against it. Thus, said Hamilton: "The directors of this bank, on behalf of their constituents, have *accepted* and *acted* under a new charter from the State of Pennsylvania, materially variant from their original one, and which so narrows the foundation of the institution, as to render it an incompetent basis for the extensive purposes of a national bank." According to Hamilton, the weight of argument was in favor of the establishment of a bank chartered by the United States.

The opposition to such a charter was not based on the denial of Hamilton's arguments, but on the old dislike and fear of monopoly, for many professed to believe that the bank would soon absorb the bulk of the banking business of the country and as a result would become a menace to the public. However, the bank was chartered in 1791 for twenty years. It had a capital of $10,000,000 of which the Government took one-fifth; the remainder was subscribed by the public with the provision that one-fourth was to be paid in specie and three-fourths in Government stock bearing six per cent. The bank was permitted to issue notes under the provision that all debts should not exceed deposits by more than $10,000,000; the bank was also permitted to establish branches. The central bank

was located in Philadelphia, and branches were opened in Boston, New York, Baltimore, Washington, Norfolk, Charleston, Savannah, and New Orleans. Owing to the pressure of financial needs, the Government was obliged to dispose of its stock and by 1802 had ceased to be a stockholder. The sales "showed a profit, yielding a premium of $671,860. In addition the Government during its ownership received dividends of $1,101,720, or about 8⅜ per cent annually. As compared to the payments made by the Government to the bank for its loan, the original investment netted a handsome profit."[2]

The bank abundantly fulfilled the expectations of its founders, not only serving the United States in the ways cited above, but providing merchants with splendid banking facilities at a time when the country was poorly provided with credit institutions.

75. **Coinage Laws.**—The Mint Act of April 2, 1792, laid the foundation of the coinage system of the United States. As with banking, it was necessary to bring order out of the confusion that existed at the time of the adoption of the Constitution. Otherwise, both business transactions and financial operations of the Government would have been handicapped. The money medium of the time contained a great variety of coins, including those of English, French, and Spanish mintage. Some parts of the country were more familiar with one kind than another, and consequently accounts were frequently kept in the money which was most familiar. There was no uniform standard of value for the whole country. To make matters worse, different values were given to similar coins in different parts of the country, and clipping and division of coins added to the confusion. In 1785 Jefferson advocated the adoption of the dollar as the unit and urged a decimal ratio. Until the Constitution was adopted, however, the right of

[2] Dewey, *Ibid.*, p. 101.

coinage was retained by the States. By the authority of the new document this right was vested exclusively in the United States. Accepting the suggestion of Hamilton, Congress passed the Act of 1792 which provided a bimetallic system with gold and silver at the ratio of 15 to 1; that is, the monetary unit was to consist of 24¾ grains of pure gold and 371¼ grains of pure silver, this being the ascertained ratio in the market of the two metals. There was to be free and unlimited coinage, and both metals were made full legal tender.

A mint was established at Philadelphia, but for many years very little metal was coined. Indeed, during the next fifty years the United States produced only small quantities of the precious metals, foreign trade providing most of the metal for coinage and circulation. The estimated average production of gold in this country for the decade ending with 1810 was only $2,460, for the decade ending 1820 only $73,100, and for that ending 1830 only $564,900. The total production of silver in this country from 1834 to 1844 was only $253,400. Not until the discovery of gold in California were large amounts brought in for coinage. Another difficulty retarded the coinage of either one metal or the other according to circumstances. A change in the market ratio was a deciding factor as to which metal should be sent to the Mint. As it happened after 1792, the value of a given weight of gold was greater than 15 times the same weight of silver, with the result that the tendency was to bring in silver rather than gold, although small amounts of gold were coined. Most of this, however, was eventually melted down or exported and the country reduced to a silver standard.

Other acts of economic significance were passed by Congress at this time, but the discussion of these belongs to later chapters.

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CHAPTER VII

GROWTH OF POPULATION AND EXTENSION OF THE NATIONAL DOMAIN

The Constitution of the United States provided for the taking of a census of population. This was made necessary by the provision that representatives[1] should be "apportioned among the several States which may be included within this Union, according to their respective numbers. . . ." Article 1, Section 2, of the Constitution, reads: "The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten Years, in such Manner as they shall by Law direct." The first census, taken in 1790, related solely to population. From this very meager beginning have developed the extensive enumerations of the present census which include not only population in its various aspects, but at least decennial reports of agriculture and manufactures, and for some lines quinquennial, biennial, annual, and even quarterly and monthly inquiries. In addition, the Bureau of the Census now makes investigation of many subjects, such as wealth, debt, taxation, and fisheries. The reports are of great advantage not only to students of social and economic affairs, but to business men who are learning to use the census material in many ways in the development of their enterprises.

76. The Population in 1790.—The population of the United States in 1790 was 3,929,214. Numbers were al-

[1] The section reads "Representatives and direct Taxes," etc.

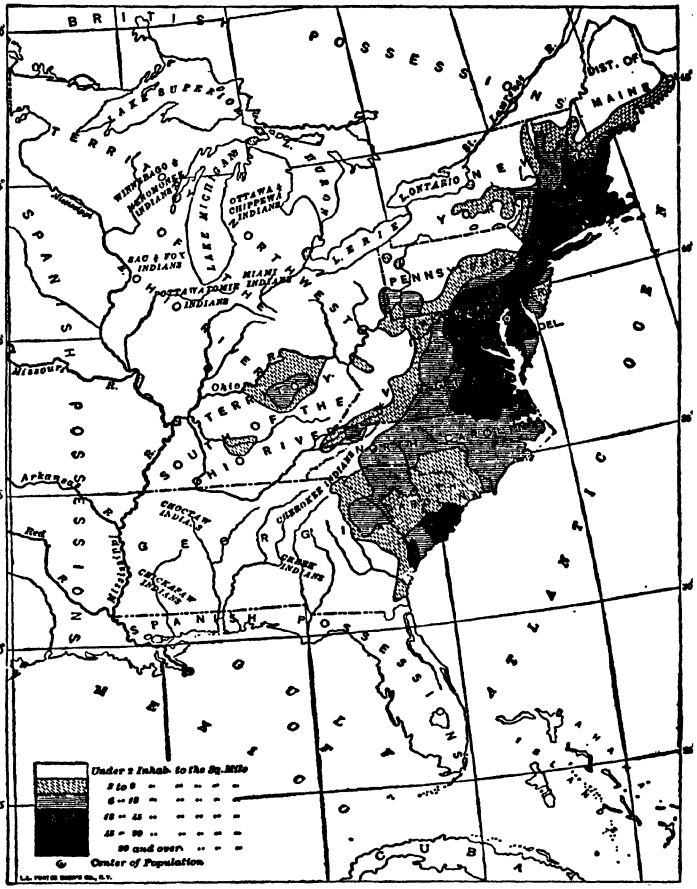
most equally divided between the North and South. In fact, the region south of Pennsylvania contained 1,961,100 persons, and that north of Maryland 1,968,040. Only two States in the New West were enumerated, Kentucky which had a population of 73,677, and Tennessee with 35,691. The country north of the Ohio, however, was not entirely devoid of white settlers. The new village of Cincinnati, originally called Losantville, came into existence in 1788, and in the country west of this point, both north and south of the Ohio, was found a scattering of settlements, including backwoodsmen, fur traders, and remnants of old French and Spanish villages. Certain sections west of the Mississippi had already attracted the attention of the white man. This region was still in the possession of Spain, but it was the scene of not a little industrial activity. The total population of Louisiana in 1769 was estimated at 13,230; from that year to 1803 numbers increased to a total of about 49,000. The largest population was in southern Louisiana, but there was a scattering of settlements in many parts of this vast domain. New Orleans had grown from 3,190 in 1769, to 8,050 in 1803, and Upper Louisiana from less than 1,000 to about 6,000. The region of densest settlement was along the Mississippi River on either side of New Orleans. In a report to Congress in 1803 the status of this country was described as follows: "Except on the point just below the Iberville, the country from New Orleans is settled the whole way along the river, and presents a scene of uninterrupted plantations in sight of each other, whose fronts to the Mississippi are all cleared, and occupy on that river from five to twenty-five acres, with a depth of forty; so that a plantation of five acres in front contains two hundred."

St. Louis, which came into existence in 1764, numbered about 925 in 1799. It was already the center from which radiated several lines of travel which were soon to develop

into some of the most important trade routes of the country. Already enterprising traders had begun to look to the Southwest, in the direction of Santa Fe, although trade with that town did not actually begin until about 1821. Traders were pushing their way up the Missouri and were bringing down furs the annual value of which in 1803 was estimated at $203,750, and communication had been established with towns on the Ohio as far east as Pittsburgh.

77. **The Distribution of Population, 1790.**—In 1790 the negro population of the United States numbered 757,200, which was 19.3 per cent of the total, the largest proportion ever reported by our census. Negroes were resident in all the Northern States but by far the largest numbers were found in the section south of Pennsylvania. In South Carolina they formed about 43 per cent of the total, in Virginia about 40 per cent, in Georgia about 36 per cent, and in North Carolina about 27 per cent. The significance of this large negro population will be discussed presently. As to the whites, it has been estimated that in 1790 over 85 per cent were of English stock, and this percentage was probably maintained until after 1840 when the growing immigration from Continental Europe began to change the composition of our population.

The population of the United States was still largely concentrated along the Atlantic seaboard from Maine to Georgia; but settlements were moving into the interior along all the streams which fell into the Atlantic. Virginia was the most populous State with 747,610, followed by Pennsylvania with 434,373, by North Carolina with 393,751, by Massachusetts with 378,787, and by New York with 340,120. The center of population at the time of the first census was 23 miles east of Baltimore, Maryland; during the next seventy years it moved westward more than 356 miles to a point about 20 miles south of Chillicothe, Ohio.



DISTRIBUTION OF POPULATION OF THE UNITED STATES, 1790

Agriculture in 1790 probably occupied the attention of more than 95 per cent of the population; at any rate, only 3.3 per cent of the people lived in places numbering 8,000 or more. Considering the country as a whole, the little communities were largely self-sufficing, sustaining themselves by farming and by household industries; they produced almost everything they needed; there was very little surplus, and as a result very little inland commerce. The great handicap of the times was the absence of means of communication; only those communities that lived on the Coast, or along the rivers, had constant access to the outside world. The imports of the interior communities were confined to a few commodities which possessed high value in small bulk, including a few of the finer articles of dry goods, coloring materials, coffee, tea, sugar, lead, powder, and salt. The population of the seaboard cities enjoyed a larger assortment, but at best this was not large.

The chief industry in the cities was commerce. Merchants were interested in bringing down from their tributary inland a limited quantity of agricultural products either for export or for consumption in the cities, and in importing from abroad goods for local consumption, for further export, or for distribution into the regions of the interior. New York, Philadelphia, and Baltimore were the chief distributing centers. Their era of rapid growth, however, was as yet some years in the future. At this time they enjoyed some trade with the distant interior, consisting chiefly of outfitting Indian traders destined for the regions about the Ohio and the Great Lakes. Charleston and New Orleans also enjoyed some of this trade. Subsequently, with the introduction of the steamboat, and with the opening of canals and roads, these cities were to become the chief marts of America. New Orleans was shortly to feel the stimulus of the new commerce which was to move down the Mississippi in such large volumes that her

merchants could scarcely handle it. At this time it was fast beginning to feel a new life.

The factory system, which was the greatest of all the forces leading to the concentration of population, had scarcely made its appearance in 1790. Not a city in the country numbered 50,000. New York was the largest with 49,400, and others in order of their rank were Philadelphia 28,522, Boston 18,320, and Baltimore 13,503.

78. **The Growth of Population.**—From less than four millions in 1790 the population of the country grew to more than thirty-one millions in 1860. This increase was more largely the result of the native birth rate than of immigration; in fact, the latter cause accounts for less than one-third of the growth. The total immigration into the United States during the years from 1820 to 1860 was 5,062,400. The growth of population by ten-year periods is shown in the following table:

POPULATION OF THE UNITED STATES 1790 TO 1860

1790	3,929,214	1830	12,866,020
1800	5,308,483	1840	17,069,453
1810	7,239,881	1850	23,191,876
1820	9,638,453	1860	31,443,321

Great changes occurred in the distribution of population during the seventy years from 1790 to 1860. New York had become the largest State, and the Middle Atlantic division composed of New York, Pennsylvania, and New Jersey, had become the most populous area. Pennsylvania with a population of 2,906,215 now ranked second, Ohio with 2,339,511, third, and Illinois with 1,711,951, fourth. The growth of the two States last named was remarkable since the rise to their respective positions was from almost nothing in 1790; it was an indication not only of the rapidity of growth of numbers in the United States, but of the speed with which the areas of density changed. Virginia,

which ranked first in 1790, dropped to fifth place in 1860, and the South Atlantic division, including among others, Virginia, North Carolina, South Carolina, Georgia, and Florida, dropped from first place to third. Another remarkable shift was the great movement into the country west of the Mississippi. From less than 50,000 in 1790 the population of this section grew to 4,536,475 in 1860; in other words, in the latter year, about 14.4 per cent of our people were living west of the Mississippi River. The Pacific States, including California, Oregon, and Washington, increased from 105,891 in 1850 to 444,053 in 1860.

79. **The Causes for Changes in Distribution of Population.**—At least four features stand out prominently in the history of distribution of population in this country to 1860: (*a*) the growth of the States north of the Ohio; (*b*) the settlement of the Mountain and Pacific divisions; (*c*) the change in rank of the sections north and south of the Potomac; (*d*) the growing concentration of population in the cities.

The most powerful of all the forces affecting the distribution of population was the vast unsettled domain which was rich in many kinds of resources. Settlers were encouraged to claim the land by the liberal land laws of the country. At first the claimants were chiefly Americans, who moved into the new country to avail themselves of its advantages; but after 1820 the movement continually received recruits from the immigrants. There is no way of learning what proportion of the immigrants took up farming, but the number was large; during the years from 1820 to 1860 over 764,000 immigrants gave their occupation as farmers; in addition, thousands of immigrants settled in the new towns because of the great opportunities. The development of internal improvements facilitated the populating of the new country by making it more accessible not only to foreigners but to Americans who wished to migrate,

and by providing a cheap means of conveying products to market.

The introduction of steam power, notably after 1820, and the development of the factory system wrought great changes in the distribution of population. Settlers were now drawn to regions which possessed manufacturing resources. Among the greatest of these were iron, coal, and timber. The development of agriculture also provided important materials for the new factories in the form of grain for milling, and livestock which contributed materials for packing houses, tanneries, manufactures of boots and shoes and harness. The States north of the Ohio were large beneficiaries of these resources. In the case of the far Western States, the existence of mineral resources was the chief force attracting settlement.

As between the North and South, the nature of the industries was the leading element making for differences in the rate of growth of population. The section south of the Ohio and Potomac continued to concentrate attention on agriculture with cotton as the chief commercial crop; the Northern States, on the other hand, not only gave attention to farming, but in an increasing degree to manufactures. The varied industries of this section held out great opportunities for laborers of all descriptions. The demand was great, wages were high, and the thrifty, ambitious, resourceful individual enjoyed advantages which he could find in no other part of the country. This applied particularly to immigrants who came to America to better their conditions. There were, moreover, special reasons why foreigners settled in the Northern rather than in the Southern States. The fact that the greatest ocean ports were in the North, and that these were the foci of the great steamship lines, directed the growing stream of immigrants to Northern ports. In addition, from this part of the country it was much easier to obtain transportation

into the interior because of the superior advantages of canals and railroads. To a large degree the plantation system, with slavery as its outstanding characteristic, inhibited the settlement of immigrants in the South for the reason that in many occupations the newcomer encountered either direct or indirect competition with the negro slave. Moreover, it probably required more capital to start as a farmer in the South; this was certainly the case if the immigrant intended to cultivate cotton. Taking all things into account the chances for success for the foreigner were decidedly less south of the Ohio and Potomac than north of those streams. Climatic conditions also tended to repel immigrants, and possibly there was a feeling that the stigma attached to work, or to small scale industries, militated against success. The effect of these causes on the distribution of immigrants is shown in the accompanying table. It will be observed that the per cent of foreign born in the Southern divisions is decidedly smaller than in the Northern.

PER CENT OF FOREIGN BORN IN THE TOTAL POPULATION IN 1860

New England	15.0	South Atlantic	3.0
Middle Atlantic	20.8	East South Central	2.5
East North Central	17.3	West South Central	7 3
West North Central	16.0	Mountain	13.8
		Pacific	34.9

Another significant fact in the distribution of population was the growth of cities. The rapid development of commerce required the concentration of large numbers of laborers in the important collecting and distributing centers, but in addition, the enormous growth of the factory system had become a factor of first moment in drawing people to urban communities. As already indicated, in 1790 there were only six cities in the United States with a population of over 8,000; by 1860 the number had grown to 141; to-

gether they contained over 5,072,000 inhabitants, or about 16.1 per cent of the total population of the United States. This concentration was rapidly becoming one of the remarkable features in the development of the country, and it was destined to raise some serious problems. New York with a population of 1,174,700 was the only city numbering over a million; but there were six others with a population of over 100,000. The nearest competitor was Philadelphia with 565,520; Chicago had begun its era of rapid growth, increasing from 4,470 in 1840 to 109,260 in 1860. Baltimore was the largest of the Southern cities with 212,400, and New Orleans followed with 168,670.

80. **Immigration.**—The arrival of passengers from abroad was first officially recorded in 1819, and since that date more or less accurate records have been kept of immigration. Our sources of information prior to 1819 were chiefly scattered notices in shipping lists. During the whole period from 1776 to 1820 immigration was small. It has been estimated on good authority that aliens arriving in this country from 1789 to 1800 numbered about 50,000, from the latter date to 1810 about 70,000, and during the following decade about 114,000. In other words, the average annual immigration during these thirty years amounted to a little more than 7,700.

Conditions throughout these years were decidedly against a large inflow. Disturbances during the Revolution, hard times during the subsequent critical period, European wars, hazards of ocean travel, and our own War of 1812 tended to discourage the movement. But with the revival of business after the panic of 1819 conditions in this country became very favorable for immigration. At that time the United States entered upon one of the most prosperous eras of its history, broken only by the panic of 1837 and by the hard times that followed. The opening of farms, the building of canals and railways, and the growth of

commerce and manufactures created a demand for labor which even the swelling tide of foreigners could not adequately supply. Wages were high, and opportunities were great for artisans of every kind. The abundance of cheap land was a particularly encouraging feature. Meanwhile, improvements in ocean transportation, which reduced the time and cost of travel, and the development of internal improvements in this country, which both facilitated travel and the marketing of commodities, offered further advantages. Abroad, occasional famines, hard times, wars, and political disturbances induced many to emigrate. Political unrest and revolution in Germany sent over 2,300,000 to this country from 1840 to 1860, and famine and hard times in Ireland sent out over 740,000 in the years from 1850 to 1860.

During the years from 1820 to 1860 the British Islands contributed the largest quota of emigrants, amounting to over 54 per cent of the total; Germany sent the next largest amounting to nearly 30 per cent. Ireland contributed the largest numbers from the British Islands, 967,000 in all; upwards of 302,000 came from England. Scotland and Wales sent only small numbers. The total immigration into the United States from 1820 to 1860 is given by decades in the accompanying table:

IMMIGRATION INTO THE UNITED STATES 1820 TO 1860

1821–1830	151,824	1841–1850	1,713,251
1831–1840	599,125	1851–1860	2,598,214

These immigrants were a most important factor in the industrial upbuilding of the country. Coming at a time when there was the most urgent demand for labor, they performed indispensable work in building canals and railroads, in opening up the new country, and in adding to the necessary labor supply of the new factories. The

largest number were undoubtedly unskilled laborers, but workmen of this kind were sorely needed in the new country where there was much hard work to be done. But thousands were artisans of all descriptions, including mechanics, manufacturers, musicians, painters, engineers, and these contributed new knowledge and skill which was greatly needed in the development of industries.

81. The Westward Movement.—The movement of population in this country has always been in the direction of the unsettled domain. Sometimes this carried the settlers northward into upper New England, New York, and Michigan; sometimes southward into Georgia, Alabama, and Florida. There was a great southwestward movement. Expansion has taken place all around the rim of the United States. In fact, migrations have been in the direction of all the cardinal points except, of course, to the east; but, due to the great breadth of the country, the movement has been generally to the westward.

The beginning of these migrations can be traced to early Colonial days when farmers from Massachusetts Bay moved over into the Connecticut valley; similar migrations took place on a small scale in New York, Pennsylvania, and Virginia. But the great migration which wrought enormous changes in the industrial growth of the country began about the close of the Revolution. It was one of the most significant features in our history, accomplishing numerous important industrial results which are sometimes grouped by writers under the caption of "winning the continent." It constantly provided an outlet for the increasing population; it resulted in the opening of boundless farming and mineral resources; it affected all the great political and economic issues, and withal, it was the most important of all the general factors promoting the growth of wealth and prosperity. If national power is based on the growth of industries, the basis of our national

strength can be traced largely to the results of the westward movement.

During the latter part of the British régime handicaps were thrown around the migration of people into the interior. By a Proclamation of 1763, Colonial governors were directed not to make grant of land beyond the sources of rivers flowing into the Atlantic. All persons who had settled in forbidden territory were enjoined to move forthwith. It seems to have been the policy of Great Britain to devote the interior, at least for a time, to the Indian trade; there was the added reason of avoiding Indian troubles, and perhaps there was a fear that England could not control unruly, distant settlements, particularly if these should grow in size.

But no law could keep the settlers out of this country. "The temptation to escape from the rented lands of the old Provinces to the free lands bordering on the 'western waters' was too strong." About this time, the glowing accounts brought back by John Filson, Daniel Boone, and others aroused interest and stimulated migration. There is some indication that Great Britain, about 1770, began to look with greater favor on Western settlement. In 1768 the Six Nations were prevailed upon to cede their title to lands between the Ohio and Tennessee Rivers, and in 1773, the Lords Commissioners of Trade and Plantations recommended the grant of a tract comprising nearly the present State of West Virginia and the adjacent part of Kentucky. The successful termination of the Revolution, however, left the whole matter of land policy in the hands of the new governments.

The policy adopted was to promote settlement. The Ordinance of 1787, which cleared up the future political status of the country north of the Ohio, was the deciding factor for a number of New Englanders who had contemplated settlement. Among other things the Ordinance

provided for the organization of this region into territories, for the elevation of these into States, prohibited slavery, and provided for the protection of civil and religious liberties. But many other factors combined to start the westward movement. In face of the many opportunities which the New West was known to offer, the East could not continue to attract those who were not satisfied with their industrial conditions. Unsatisfactory conditions had been created for many during the unsettled times of the critical period. Debts, hard times, losses of fortunes, and industrial unrest brought many to the resolution to move. Meanwhile, in some parts of the East it was becoming increasingly difficult to obtain land. Referring to Massachusetts one writer stated that "so rapidly were the unoccupied lands settled by the emigrants from the older towns that in 1790 most of the territory of the State had already been formed into incorporated towns." Other causes for emigration might be added. Speculators, soldiers with land script, holders of shares in land companies were most active promoters of emigration. And adventurers, traders, and travelers played their part in advertising the unbounded wealth of the country beyond the mountains. Within the new country the great abundance of fertile land which could be had for a mere song was an attractive feature. Once established, the settlers became active propagandists sounding the virtues of the new country with great force. To them further immigration brought near-by markets for products, increased values of land, and general prosperity.

82. The Growth of the Westward Movement.—Before 1790 several hundred thousand persons had emigrated to the interior of the country. Gilbert Imlay, who had examined much of this region, was of the opinion that no less than twelve thousand persons immigrated to Kentucky in 1783 and 1784, and he estimated the numbers on "west-

ern waters" about 1790 as four hundred thousand. The country from Redstone to Pittsburgh, a distance of about fifty miles by river, was well settled. It was one of the oldest settlements, made shortly after the taking of Fort Duquesne. "Near Pittsburgh," said Imlay, "the country is well peopled, and there, as well as at Redstone, all the comforts of life are in the greatest abundance. Flour is manufactured in as good a style as in any part of America, and butter, cheese, bacon, and every kind of provisions can be had in the greatest quantity." F. A. Michaux, who traveled through a portion of the interior about 1802, was amazed at the rapidity of growth. "Until 1796 and 1797," said Michaux, "the banks of the Ohio were so thinly peopled that there were not more than twenty-five or thirty families in a space of four hundred miles, but since that time, emigrants, who have come for the most part from the mountainous districts of Pennsylvania and Virginia, have flocked in great numbers to these fertile banks and the plantations have increased so much, that, at present, they are not more than from one to three miles asunder, and some of them were always within sight from the middle of the river."

In the course of time other causes began to operate. Among these were increased security due to the Indian treaties and to the gradual removal of the tribes, improved means of communication, greater facilities for obtaining food along the routes of travel, and the numerous encouraging reports of the emigrants. The movement grew in intensity until checked temporarily by the panic of 1819. So rapid was the migration that at times the roads to the West were congested. "Missouri and Illinois," said the *Niles Register* on November 30, 1816, "exhibit an interesting spectacle at this time. A stranger to witness the scene would imagine that Virginia, Kentucky, Tennessee, and the Carolinas had made an agreement to introduce

them (the immigrants) into the bosom of the American family. Every ferry on the river is daily occupied in passing families, carriages and wagons, negroes, carts, etc." And a Cincinnati paper wrote in 1817: "We learn from travelers who just crossed the mountains that it is no unusual thing to pass one hundred families a day all steering to the first navigable waters of the Ohio River and its branches. The *Albany Argus* estimates the number that have passed the Great Western Turnpike through that part of the country since the first of September at 500 a week, one hundred and twenty in one company, with their pastor at their head, passed that place from one town in the District of Maine bound for Indiana." No wonder that those who stayed at home in the East should be alarmed over the loss of population. "Great exertions have been made for some time past in New England," said a Western paper, "to check this tide of emigration. The Governor of Connecticut lays great stress on this subject in his last message to the legislature, and advises the adoption of some means of keeping the enterprising population at home."

Indiana, which in 1810 numbered only 24,520, began to receive large additions after this date; Illinois received its earliest great additions after 1830, Michigan after 1830, and Wisconsin after 1840. Louisiana, which had been sparsely settled during the domination of France and Spain, began to feel the effects of the migration about 1830, and Arkansas between 1840 and 1850.

By 1860 the frontier line had pushed north and west crossing central Michigan and Wisconsin, then southward, bulging beyond the 97th meridian in portions of Kansas and Texas. From this Western boundary to the eastern rim of the Mississippi Valley the country in 1860 contained about 15,000,000 persons, having increased from about 4,000,000 in 1830. The effect of the Erie Canal on the

growth of the Lake region is seen not only in the growing density of population, but in the rise of cities. Chicago, which numbered about 4,400 in 1840, increased to 109,200 in 1860; Cleveland from about 6,070 to 43,400, and Buffalo from 18,200 to 81,100. This simple statement contains implications of great importance for commerce and manufactures. It suggests the rise of land values, a growing demand for a variety of products, the production of an increasing volume of goods for export, and a demand for more imports. It implies also a great demand for internal improvements of all kinds. The expansion of population may be presented in tabular form as follows:[2]

POPULATION OF CERTAIN DIVISIONS AT GIVEN PERIODS 1810 TO 1860

Division	1810	1830	1860
East North Central	272,324	1,470,018	6,926,884
West North Central	19,783	140,455	2,169,832
West South Central	77,618	246,127	1,747,667
Mountain			174,923
Pacific			444,053

83. The Settlement of the Far West.—The Lewis and Clarke Expedition (1803–1806) was the first to establish overland connections between the Mississippi River and the Pacific Northwest. The encouraging reports of the explorers had the immediate effect of starting new trading ventures far up the Missouri River and its tributaries which led subsequently to the exploitation of all the country between the great bend of the Missouri and the Pacific.

[2] The East North Central division contains Ohio, Indiana, Illinois, Michigan, Wisconsin. The West North Central contains Minnesota, Iowa, Missouri, Nebraska, Kansas, the Dakotas. The West South Central, Arkansas, Louisiana, Oklahoma, Texas. The Pacific division contains, California, Oregon, Washington and the Mountain the West of Texas, Kansas, and Nebraska.

Although whalers had been busy in the waters of the northern Pacific for a number of years, the founding of Astoria in 1811 as a trading post was one of the first evidences of American enterprise in this part of the world. The traffic of the fur traders was of immense value for the future development of the country, not only because it contributed valuable articles to commerce, but because it made known the geography of this region and opened it for further exploration and development. Thus said H. M. Chittenden, author of the *Fur Trade of the Far West:*

> The cause of geographical knowledge owes a great deal to this company (The Rocky Mountain Fur Company). The whole country around the sources of the Platte, Green, Yellowstone, and Snake Rivers and the region around Great Salt Lake was opened up by them. . . . They discovered this lake and also South Pass. . . . They were the first to travel from Great Salt Lake southwesterly to southern California, the first to cross the Sierras and the deserts of Utah and Nevada between California and Great Salt Lake, and the first, so far as is known, to travel by land up the Pacific Coast from San Francisco to the Columbia. . . . But perhaps the most important service which the Company rendered its country was as a school for the education of those who were later to assist the Government in the exploration of the West. It was to the old members of the Rocky Mountain Fur Company that the Government looked mainly for its guides when it entered those regions for the first time.

Oregon was the first of the Pacific regions to receive the serious attention of settlers from the United States. Migrations into this country began to be of importance after the expedition of Nathaniel J. Wyeth in 1832. As with the central parts of the United States, the early settlers sent back glowing reports about the country which invited further emigration. The route of travel came to be known as the Oregon Trail, and in course of time this became a well established highway not only for emigrants but for

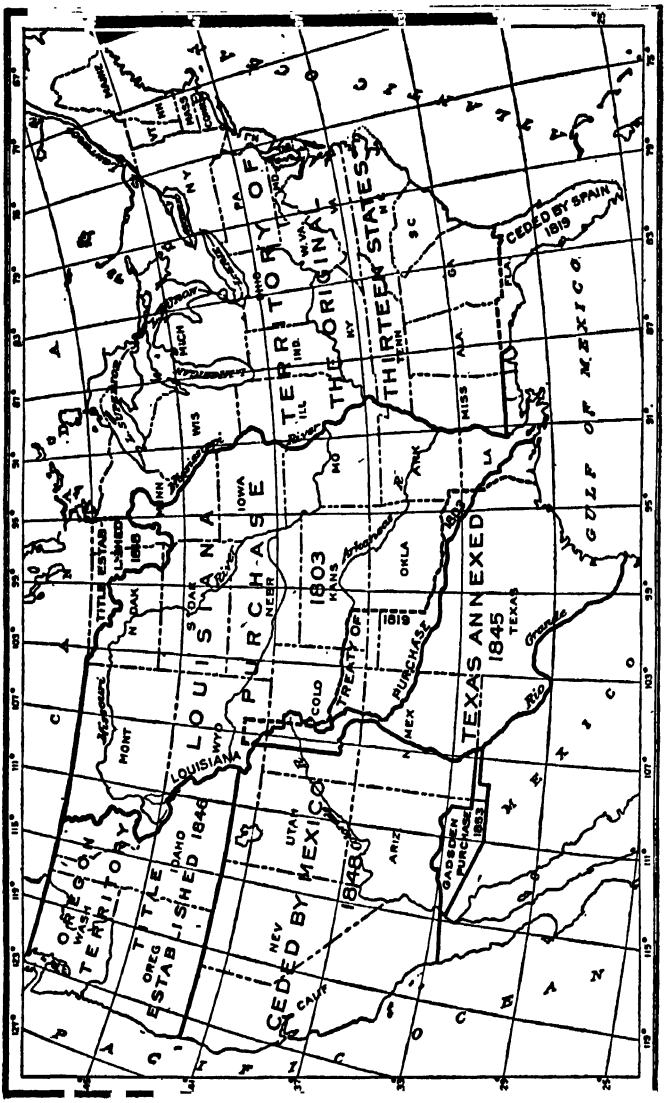
freighters and others destined for the Far Western settlements.

A small number of Americans had settled in the Pacific southwest before 1848. Trappers making their way from Santa Fe and from the Valley of the Rio Grande reached California before 1810; some twenty years later a lucrative trade began to grow between Boston and San Diego, San Pedro, Santa Barbara, and other places on the Pacific. With the discovery of gold in California in 1848, however, thousands of emigrants rushed to that region, crossing the continent by land or finding their way across the Isthmus, or by ocean through the Straits of Magellan. The Mexican Treaty of 1848 settled all questions as to the title of this country and paved the way for its peaceful settlement and organization by the United States.

Portions of the region lying between the Missouri and the Pacific had been settled before 1860. The Mormons who emigrated from Council Bluffs in 1847, took up their residence in Utah, developed farming with the aid of irrigation, put up saw and grist mills, and erected small establishments for the production of woolens and iron. The great stimulus to the settlement of the Rocky Mountain country, however, came with the discovery of gold in 1852 and of silver some eight years later. Emigrants rushed to this region as they had done to California a dozen years before. Denver sprang up almost over night as a place of deposit for commodities destined for the new mining camps; a great overland freight business sprang up from Leavenworth, Fort Scott, and Kansas City to the nascent town of Denver. The population of the Mountain and Pacific regions is given in the table on a former page.

84. The Growth of the National Domain.—At the time of the adoption of the Constitution the interior of the country was claimed by a number of States which based their title chiefly on old Colonial grants. The Virginia

claim covered not only the present States of Virginia and West Virginia but a large portion of the northeastern Mississippi Valley. Connecticut, Massachusetts, and New York claimed a part of the same territory, and North Carolina and Georgia asserted title to the back country as far as the Mississippi. Some of the smaller states had no claims; nevertheless they were interested in the question, because, if the claims were granted, the fortunate States could use the land for their exclusive benefit. This seemed unjust to other commonwealths which had shared the burden of winning the independence. Congress refused to be drawn into these disputes, but suggested that the domain should be ceded to the United States for the benefit of the country as a whole. New York was the first to adopt the suggestion, and one by one others followed until the Georgia cession in 1802 gave the United States jurisdiction over land formerly claimed by the States. This was a fortunate solution. It prevented serious conflicts among the States, gave them a common interest in the public domain, and thus tended to cement the Union, and put the Federal Government in possession of a valuable resource which could be used for the advancement of a number of important industrial and social projects. Congress adopted the policy of using the land to stimulate development; millions of acres have been granted to encourage the building of roads, canals, and railroads, to provide for the drainage of swamps, and the erection of salt works; likewise large donations were made to encourage the founding and maintenance of educational institutions; grants were made to persons who defended dangerous frontiers and to ex-soldiers and sailors; but by far the largest portion of the domain was disposed of on most liberal terms to farmers, a policy which has encouraged the rapid opening up of the country. This plan was applied not only to the original domain, but to the new territory that was added later.



ACCESSIONS OF TERRITORY, 1803 TO 1853

The territory of the United States in 1790 covered 892,133 square miles; it included the country from the Atlantic Ocean to the Mississippi River and from the St. Lawrence and Great Lakes to Spanish possessions in the Floridas. As the result of various cessions, the land area of the country increased to more than 3,026,000 square miles in 1860. A summary of the acquisitions is given in the accompanying table:

Accessions of Territory	Gross Area (square miles)
Territory in 1790	892,135
Louisiana Purchase (1803)	827,987
Florida (1819)	58,666
By treaty with Spain (1819)	13,435
Texas (1845)	389,166
Oregon (1846)	286,541
Mexican cession (1848)	529,189
Gadsden Purchase (1853)	29,670

The concentration of this vast domain under one political control has been one of the chief causes of its rapid development. It obviated the many difficulties resulting from rival political jurisdictions with the handicaps to trade and industry which such conflicts bring, including tariffs, differences in money standards, in units of weights and measures, and in political and industrial policy. The accessions gave the country the largest free market in the world; trade moves from one end to the other without impost or duty. Bold and enterprising men of all descriptions may exploit the resources without fear of being discriminated against as foreigners. One industrial policy may now be applied to the whole territory, which gives a certainty and definiteness to enterprises which could not be obtained under different nations. Moreover the possession of this great domain enabled Congress to use it not for the benefit of one section, but for that of the whole country; it has thus been possible to encourage farming,

mining, manufacturing, railway building, and immigration so that the beneficial results may accrue to every branch of industry and to every part of the United States. The regions beyond the Mississippi possess some of the best farming and grazing lands in the country and the greatest mineral resources, and the development of these has been a tremendous factor in the growth of industries east of the Mississippi. The economic growth of this domain, therefore, under one jurisdiction has been much more rapid than if portions of it had remained under different nations, including possibly France, Spain, and Mexico.

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CHAPTER VIII

PRODUCTS OF FIELD, FOREST, AND MINE, 1790–1860

To the ordinary observer in 1790 the conditions of agriculture were not such as to forecast any remarkable change in the immediate future, yet great forces were in the embryo which were soon to develop and make this one of the most notable periods of our history. Among the prime factors at work were the introduction of a number of epoch making inventions, the development of transportation, the introduction of steam power for numerous uses, the westward movement, and the gradual change of the attitude of farmers towards agricultural methods. Some of the prominent features were (*a*) the spread of pioneer farming, (*b*) the rise of cotton, (*c*) the establishment of farming in the New West, and (*d*) the contribution of a number of new devices in aid of agricultural development.

85. **Effects of the Revolution on Agriculture.**—The outlook at the close of the Revolution was not particularly bright. The progress of farming had been seriously affected by the enlistment of men in the army, by the depressing effect of depreciated currency, by the unrest of the times, and by the difficulties of restoring a stable political order. The interruption of trade with Europe and the loss of the West India trade were matters of considerable moment to sections of the country that looked abroad for a market.

In addition an enormous task was just now confronting thousands of pioneers who began to reduce the Western

wilderness to cultivation. Forests were to be cleared, means of communication introduced, and markets opened for the volume of products which increased so rapidly as to tax the consuming power of domestic markets. The difficulties in selling farm products were retarding factors at one time or another for every community, and it was not until relieved by a canal or a railroad that conditions began to improve. Commenting on these conditions a Western editor wrote: "The farmer thinks it unnecessary to plant more grain than can be disposed of at home; thus part of his time passes in inactive languor; but once point to him a market where he may have a sure sale for his produce, and every nerve is exerted in the cause of industry."

86. Pioneer Farming.—The first great feature of this period was the prominence of pioneer farming. A large part of the country was in the pioneer period throughout the years from 1790 to 1860. The westward movement revealed a number of migrations taking place within the interior itself. Early historians were wont to compare these changes to incoming waves of the ocean. For many persons migration had almost become a habit, and as long as this spirit prevailed little could be expected of farming progress. "Hundreds of persons can be found," said an early Western writer, "who have moved for the fourth, fifth, or sixth time on a new spot. To sell out and remove only a few miles makes up a portion of the variety of backwoods life and manners."

To a certain extent the population of each wave had a form of industry peculiar to it, and in view of later growth, performed a function of more or less importance. First came the backwoodsman, "the real pioneer." In the earliest years of settlement he drove back the Indians and made the country a safe place to live in. He made small clearings and did the preliminary work of preparing the country for settlement. Pioneers of this stage depended for

subsistence chiefly on the natural growth of vegetation, called the "range," and on the proceeds of hunting. The men of the family roamed the woods with dog and gun for deer, raccoon, and squirrels for fresh meat. They bartered the skins at the nearest store for tea, coffee, powder, shot, and coloring materials. On their clearings of a few acres they cultivated corn, beans, potatoes, pumpkins, and cabbages. They made no effort to produce for the market, and since they had little to sell they purchased little, and their demands, therefore, contributed very little to the building up of commerce or manufactures. The frontiersman was a jack-of-all-trades. Besides clearing his land, he built cabins, stocked plows, made carts, leather, harness, straps, boots, furniture, and clothing. The first settlers in the woodlands adopted the Indian method of girdling the trees and planting grain in the midst of the standing deadwood. While this method appeared shiftless, it served an important purpose, since it saved time and labor, and enabled the pioneer to sow his first crop immediately.

The typical backwoodsman, however, did not remain long in any locality. When the range was somewhat subdued and hunting precarious, he sold out or abandoned his holding and, to use his own figure, "broke for the high timbers." Another wave rolled in which brought a more progressive and settled class of farmers. They cleared roads, built bridges, erected mills and schoolhouses, and "exhibited the picture of plain, frugal, civilized life." They replaced the pioneers' log cabins with houses of hewn or manufactured timber. They were less dependent on wild game. They devoted more attention to agriculture, and a great number of them remained in the midst of the growing population. They cultivated corn, wheat, oats, rye, barley, and sometimes tobacco. Occasionally small patches of cotton, hemp, and flax were added for the sup-

ply of domestic manufactures. The newcomers enlarged the clearings of their predecessors. Corn continued to be the principal crop, but new uses were found for it; the article was taken to the local still and converted into whiskey, or at the proper season was fed to swine. Thus appeared two new industries, the production of whiskey and the growing of livestock.

Those of migratory habits were not content to live even in these improved surroundings. By selling out in several years they made a profit on their land and with the proceeds purchased a larger tract further west. Thus a third wave rolled in. Men of capital and enterprise appeared. The settler who moved became himself in time a man of some means and ultimately became a permanent part of some community. The "small village rises to the spacious town or city. Substantial edifices of brick, extensive fields, orchards, gardens, colleges, and churches were seen. Broadcloths, silks, leghorns, crapes, and all the refinements, luxuries, elegancies, frivolities, and fashions are in vogue." Most of the country between Pittsburgh and the Mississippi, at one time or another before 1860, was rising through one or more of these stages.

The process was modified to some extent in the Southern cotton States. The conquest of the country was very largely in the hands of the planter and his slaves. As in other parts of the country, the trees were girdled. "The smaller trees were at once cut down and burned, and the ground broken up and planted. In a few seasons the wind would blow down the deadened trees, which would then be rolled together in log heaps and also burned. Usually a few crops of Indian corn or wheat would be taken off the land before the field was ready for cotton."[1]

Farmers on the prairies encountered handicaps peculiar

[1] M. B. Hammond, *The Cotton Industry*, publications of the American Economic Association, new series, No. 1, p. 76.

to the treeless country, which caused these regions to be shunned for a time by the first settlers. The principal reasons for avoiding the prairies were the following:[2] (*a*) "The absence of trees was thought to mean that they were infertile; (*b*) timber was imperatively needed for buildings, fences, and fuel; (*c*) they did not afford running water for stock or mills, while the lack of fuel left steam mills out of the question; (*d*) there was no protection from the bitter winds of winter, which, above all else, made that season disagreeable. Men and cattle had even been known to perish in storm on the open prairies; (*e*) to the farmer, the prairies with their tough sod and matted roots constituted a new and altogether unknown problem. Men were for a time helpless before this problem, and the prairies were generally regarded as 'uninhabitable for an age!'" For some years, therefore, these regions inhibited settlement, and it was not until the building of railroads made possible the transportation of timber, and until the cultivation of the edges of the prairies revealed the truth about their fertility, that they began to be populated.

87. Invention of the Cotton Gin.—The second outstanding feature of this period was the rise of cotton. The plant had been grown to some extent in the United States, but in a small way to supply household producers. Manufacturers on this continent had imported supplies from the Dutch settlements in Surinam, from Jamaica and other parts of the West Indies, but the quantities were always small. In England, as late as 1760, the manufacture of cottons was rated as "amongst the humblest of domestic arts." Wool, flax, and hemp provided the chief textile materials. But the possibility of using cotton on a large scale was fully realized. The greatest difficulty in the way was the slow, laborious process required to eliminate the

[2] H. H. Barrows, *Geography of the Middle Illinois Valley*, Illinoi State Geological Survey, Bulletin No. 15, p. 77.

seed. This was notably the case with Upland cotton which adhered closely to the seed. The roller gin which had been used for some time with the Sea Island variety could not be used here. Separation had to be done by hand, and even a rapid worker was fortunate to clean more than a pound a day. However, with the invention of textile machinery in England, and with the growing use of steam power, it became all the more necessary to find some device for cleaning the fibre quickly. Men's thoughts were, therefore, directed to this particular problem. Thus Whitney related that while in the South "there were a number of very respectable Gentlemen at Mrs. Greene's who all agreed that if a machine could be invented which would clean the cotton with expedition, it would be a great thing both to the Country and to the inventor." This conversation seems to have afforded Whitney the inspiration for his discovery. At any rate, he set to work, and so far succeeded, to use his own words, that "I made one before I came away which required the labor of one man to turn it and with which one man could clean ten times as much cotton as he can in any other way before known and also cleanse it much better than in the usual mode. This machine may be turned by water or with a horse, with the greatest ease, and one man and a horse will do more than fifty men with the old machines. It makes the labor fifty times less, without throwing any class of People out of business."

The cotton gin was invented in 1793. It was destined to work far reaching changes in life and industry in the South, as well as to influence industrial development elsewhere in the United States and in Europe. As early as 1775, the first Provincial Congress in South Carolina urged the inhabitants to grow cotton, but with little or no result. Some eight years later the people of Georgia began to raise the commodity for export, and before long atten-

tion was given to the short staple, or Upland, variety. By 1790 1,500,000 pounds of both kinds were produced, the largest portion in South Carolina and the remainder in Georgia. One of the first results of Whitney's invention, therefore, was to encourage production greatly. The growing use of the new textile machinery added a further stimulus. Before 1805, cotton had replaced tobacco as a ranking export from this country.

The introduction of the cotton gin was largely responsible for the following results: (*a*) cotton became the largest commercial crop of the South and largely the basis of its prosperity; (*b*) cotton became the greatest single export of the United States, a position which it held for many years; (*c*) the revival of interest in slavery, which, in turn, was the potent cause of years of political strife; (*d*) cotton became the great factor in promoting the movement of population into the Southwest, which was also a cause of political trouble; (*e*) it stimulated the manufacture of cottons in the United States; (*f*) it greatly encouraged the further improvement of textile machinery.

88. **The Production and Export of Cotton.**—From about 4,000 bales of 500 pounds each, the production of cotton in the United States increased to over 3,841,000 bales in 1860. This development is shown by decades in the accompanying table.

PRODUCTION OF COTTON IN THE UNITED STATES
(*Bales of 500 Pounds*)

Year	Bales	Year	Bales
1790	4,000	1830	732,218
1800	73,222	1840	1,347,640
1810	177,824	1850	2,136,063
1820	334,728	1860	3,841,416

Meanwhile the export of cotton rose rapidly from about seventeen million pounds in 1800 to more than one bil-

lion seven hundred million pounds in 1860. In 1810 cotton constituted about 22 per cent of the value of the total exports of the country. It rose to about 32 per cent in 1820, to 41 per cent in 1830, and to a little over 57 per cent in 1860. The relative importance of cotton as an export is shown in tabulated form in the accompanying table.

RELATION OF EXPORT OF COTTON TO TOTAL EXPORTS

Year	Cotton Exported Pounds	Cotton Exported Value	Total Exports United States Value
1800	17,789,803	$5,000,000	$70,971,780
1810	93,261,462	15,108,000	66,757,970
1820	127,860,152	22,308,667	69,691,669
1830	298,459,102	29,674,883	71,670,735
1840	743,941,061	63,870,307	123,668,932
1850	635,381,604	71,984,616	144,375,726
1860	1,767,686,338	191,806,555	333,576,057

89. The Westward Movement of Cotton Culture.— From the seaboard of South Carolina and Georgia the cultivation of cotton moved to the uplands of the Southern States, and thence to the Gulf plains. The opinion that cotton was a staple of the uplands only was soon learned to be erroneous, for experience showed that the plant prospered on the prairies and river bottoms. Cotton had been cultivated to a small extent in Louisiana under Spanish régime, but it remained for American planters to put the crop on a commercial basis. Shortly after 1830 cultivation in the central Gulf States began to increase by leaps and bounds, and before 1840 planters were moving across the Mississippi in large numbers into Arkansas, Louisiana, and Texas.

The insatiable demand for the product, together with the rapidity with which the soil was exhausted under current

methods of cultivation, made it necessary for the planter to be continually on the move. Without transportation, however, it would have been impossible to develop the interior. Fortunately, long before this need was felt, the steamboat had become the customary means of conveyance on the Western rivers. The building of railroads in the Southern States afforded additional outlets.

In 1820 South Carolina and Georgia, in the order named, were the ranking states in the production of cotton. Before 1835 Alabama and Mississippi forged to the front, and in 1860 Mississippi was in the first place, followed in order by Alabama, Louisiana, Georgia, and Texas. The appended table makes clear the quantity of cotton ginned in 1860.

QUANTITY OF COTTON GINNED, 1850 AND 1860

State	1850		1860	
	Bales	Rank	Bales	Rank
Alabama	564,429	1	997,978	2
Georgia	499,091	2	701,840	4
Mississippi	484,292	3	1,195,699	1
South Carolina	300,901	4	353,413	7
Tennessee	194,532	5	227,450	8
Louisiana	178,737	6	722,218	3
Arkansas	65,344	7	367,485	6
Texas	58,072	8	405,100	5

90. **Growth of Cotton Markets.**—The westward movement of cotton wrought great changes in the market. Charleston and Savannah declined in importance, and New Orleans and Mobile rose to the first place. The extent to which the cotton trade of New Orleans was stimulated by the migration is indicated by the fact that receipts from regions tributary to this city increased fourfold in the years from 1830 to 1850. Memphis owed her growth as a

cotton market largely to the building of railroads which made possible the exploitation of the inland country. More than three-fourths of the receipts of this city in 1859 came by rail. Most of this cotton, however, ultimately found its way to New Orleans. A portion of the crop produced in the northern cotton States supplied factories at St. Louis and a few cities on the Ohio river, notably Pittsburgh, Cincinnati, and Cannelton, Indiana. In 1860 factories in these cities produced cotton materials valued at $2,600,000.

The average annual exports of cotton from New Orleans were about 206,000 bales during the years from 1822 to 1830; they were about 553,000 bales during the next decade, about 952,000 bales for the decade ending with 1850, and 1,579,000 for that ending 1860. New Orleans not only received more cotton than any other city in the United States, but at times, after 1840, more than all the other places combined. The amount of cotton destined for the various collecting points depended on weather and shipping conditions. If the East was favored as compared with the West, Charleston and Savannah received the advantages. Taking these conditions into account, the imports into New Orleans during the decade ending 1860 were a little short of fifty per cent of the total crop of the United States. Out of a total export of 3,127,000 bales for the year ending August 31, 1861, New Orleans sent out 1,783,000 bales; Mobile 456,000 bales; Savannah 302,000 bales, and Charleston 214,000 bales. Small quantities were exported from other places. Since cotton exported from New Orleans came from up-river it is evident that the cotton trade was a large factor in the commercial relations of this city with the interior. In fact, out of a total of imports into New Orleans from the interior, estimated at $185,211,000 for 1860, imports of cotton contributed $109,389,000.

91. Growth of Slavery.—The labor problem was one of the most serious the Southern planter had to solve. Not only was labor needed in cultivating the crop and preparing it for market, but in clearing forests to make room for further cultivation. None of these processes could be done readily by machinery; in fact, machinery was little used in the South. Due to the lack of labor saving devices the work fell almost entirely on hand labor. As we have seen, the existence of slavery tended to prohibit the settlement of foreign immigrants in the cotton States, and thus this region had to depend principally on the native increase of population to supply its growing needs. The slave population of the United States increased from 697,890 in 1790 to 2,009,040 in 1830, and to 3,953,580 in 1860. The rate of increase was notably less than that for the country as a whole. During the decades from 1800 to 1860 it lagged from 3 to 12 per cent behind the general rate of growth. If the labor supply in the North, aided by immigration, was not adequate to its needs, it is evident that the South which depended on slave labor for the cultivation of its great staple, unaided by machinery, was even more poorly supplied. This fact is registered in the advancing price of slaves. In 1815 the value of a good slave for cotton culture was about $250; by 1840 the value had more than doubled, and in 1860 first-class black laborers commanded from $1,500 to $2,000.

This increase of price was a growing burden on the planter, since it made necessary the investment of larger sums in slaves. Such investments, together with those in land to provide for present and future needs, combined to make the growing of cotton more precarious. The investment was in the nature of a fixed charge from which there was no escape when the price of cotton declined. With planters who had borrowed heavily this was serious.

There were other defects in the system. Cotton was the

life of the plantation. The work of the farm was organized and laborers trained largely for this end, and it was difficult to direct organization and labor force into other channels. In consequence, there was great friction in shifting from crop to crop with a change of market conditions. Farming in the South has been criticized on the ground that it was a one-crop system; the statement is subject to limitations, but to the extent that it was true, planters were following a sound principle in devoting attention to the crop in which nature, and perhaps the market, gave them advantages. The true criticism against the system was that the organization of the plantation, for which slavery was largely responsible, was inelastic, that it could not be readily readjusted to suit changing conditions.

Slavery was responsible for other shortcomings. It was difficult to introduce improved machinery, to rotate crops, and to make changes in methods, where laborers were ignorant and unskilled. The weakness of the system, however, was not alone in the character of its labor, but also in the quality of its management. Planters, as a rule, gave little thought to what we call nowadays, problems of management. It is unfair, however, to charge that Southern agriculture was "unscientific," because in 1860 that term applied as well to farming everywhere in the United States. It was not until a more recent period, with the introduction of agricultural schools and experiment stations, and with the growth of agricultural literature, that questions of farm management have emerged as separate problems and have been attacked as such. Cotton, moreover, labored under greater difficulties than the grain crops for, whereas great inventions have revolutionized methods of preparing and cultivating the fields, which may be applied both to grains and cotton, the problem of harvesting cotton was much more difficult to solve than in the case of grains.

Great progress was made in methods of gathering and threshing cereals before 1860, but although inventors had attacked the problem of picking cotton, they met with little or no success, and to-day this problem largely thwarts the genius of the inventor.

92. **Agricultural Methods in the South.**—Little or no machinery was used in cultivating the cotton crop. One writer says:[3]

> The tools employed were usually the work of the neighborhood blacksmith, or were made on the plantation "in a style which was the excess of bungling." Such were the "scooter" or "bull tongue," a strip of four-inch bar iron, pointed and bent, used for opening the furrow in which the seed was sown; the "sweep," an implement having two wide cutting blades forming two sides of a triangle, and used for cleaning the grass or weeds from the rows; and the "scraper," used for covering the furrow in which the seed had been sown. These tools, together with the clumsy all-iron breaking plows and turning plows, and the hoe, "the rudest, the least effective, and the most exhaustive to strength and patience of any tool largely used," were about the only implements that were in use on the Southern plantations before the war.

Little or no effort was made to fertilize the soil. Planters continued to grow cotton until the field refused to yield a profitable crop, when the land was abandoned "to grow up to briars, sassafras, and scrub pines."

93. **Other Southern Crops.**—The commercial crops of the South were not limited to cotton. Louisiana produced large quantities of sugar, Kentucky was noted for hemp, North and South Carolina, Georgia, and Louisiana produced rice, and almost every State grew tobacco.

Sugar ranked second among the Southern crops which provided New Orleans with a valuable export. Cane had been grown on a limited scale since 1751. But planters

[3] Hammond, *op. cit.*, pp. 78, 81.

showed no interest in the experiment because indigo and tobacco were still affording valuable exports. The destruction of the indigo crop by insects in 1793 and 1794 compelled the farmers to renew their experiments with sugar. Even before the Louisiana Purchase the United States was importing sugar from Louisiana. Over 773,500 pounds were imported in 1799 and 1,576,000 in 1802.

At least eight Southern States in 1860 produced sugar, but in none, with the exception of Louisiana, did the crop much exceed five thousand hogsheads. The average annual production by decades from 1820 to 1860 was 52,000 hogsheads, 78,000 hogsheads, 182,000 hogsheads, and 280,000 hogsheads. The value of sugar imported into New Orleans from the interior in 1859 was $24,998,000, and in 1860, $18,190,000. A portion of the Louisiana product supplied refineries at New Orleans, Cincinnati, and St. Louis. A large establishment was erected at the place last named in 1840. Cheap transportation up river, and the saving of freight, insurance, and interest on the product which otherwise might have been obtained from New York and Boston, were the chief advantages in prospect for the new manufacturers. Three refineries in St. Louis in 1850 produced sugar valued at $1,213,000. Sugar refined at Cincinnati in 1859 was valued at $750,000. The surplus of the Louisiana product, except the up-river shipments, was exported to Eastern cities of the United States, New York taking the largest quantity, followed by Philadelphia and Baltimore. The growing of the sugar beet began at a later period, as will appear in our subsequent discussions.

94. *Tobacco.*—Tobacco was a third important commercial crop of the South. Planters moving west from Virginia and North Carolina brought the knowledge and skill required to grow the crop. Tobacco was introduced by the earliest pioneers into Tennessee and Kentucky, and

after 1830 farmers who crossed the Mississippi into southern Missouri planted the crop in that section. The abundance of raw material laid the foundation for a great manufacturing industry at St. Louis and Louisville which continues to-day. Five Southern States in 1860, as indicated in the accompanying table, produced over 72 per cent of the tobacco of the United States.

TOBACCO PRODUCED IN THE UNITED STATES, 1860

State	Pounds
Virginia	123,967,757
Kentucky	108,102,433
Tennessee	38,931,277
Maryland	38,410,965
North Carolina	32,853,250
All others	87,099,069
Total	429,364,751

95. *Rice.*—Rice was grown in South Carolina and Georgia throughout this period, but the output remained relatively stationary. The production of the leading States is shown in the following table:

PRODUCTION OF RICE IN THE UNITED STATES, 1850 AND 1860

State	1850 Pounds	1860 Pounds
South Carolina	159,930,613	119,100,528
Georgia	38,950,691	52,507,652
North Carolina	5,465,868	7,593,976
Louisiana	4,425,349	6,455,017
All others	6,540,976	1,483,000
Total	215,313,497	187,140,173

In addition to the commercial crops, the Southern States produced large quantities of certain other agricultural

commodities to supply local needs. These included sweet potatoes—Georgia in 1860, being the largest producer in the Union, followed in order by North Carolina, Alabama, Mississippi, and South Carolina—peas and beans, Mississippi reporting the largest quantities, followed by North Carolina, Georgia, and South Carolina. Of Indian corn, the five leading cotton States in 1860 produced somewhat less than half the amount grown in the five States north of the Ohio, and even a smaller proportion of wheat. In case of livestock, the value in the five Northern States just referred to was $245,012,000 in 1860, and in the five leading cotton States, $199,324,000.

96. **The Rise of Agriculture North of the Ohio.**—A third notable feature of this period was the development of agriculture in the region north of the Ohio River. In 1790 this country was a wilderness inhabited only by Indians, fur traders, and a few French farmers. The westward movement brought into this region farmers who opened its resources and before 1860 made it the most important grain and stock raising area in the United States. The history of farming in this region is a record of the progress of the pioneer's achievements, discussed on a former page, the development of internal improvments, the rise of marketing and manufacturing centers along the Ohio and Mississipi rivers, and the development of the Lake trade in grain and other commodities. Pioneers began to cross the Mississippi in large numbers after 1830 and turned the rich fertility of the soil to good account in the production of cereals and livestock. Competition of the Western grain fields, after the opening of the Erie Canal, began to put a check upon the development of Eastern cereal crops; with the growth of railroad building this result was further emphasized. In the decade from 1850 to 1860, the production of wheat declined in the Middle Atlantic States, while corn and oats registered only slight

gains. On the other hand, the output of wheat in the Western grain States increased more than 120 per cent, while the production of corn increased about 75 per cent and that of oats about 60 per cent.

In the accompanying table is summarized the number of bushels of wheat, corn, and oats grown in Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, and Iowa, as reported in the censuses of 1840, 1850, and 1860.

PRODUCTION OF WHEAT, CORN AND OATS IN GIVEN STATES

Crop	1840	1850	1860
Wheat	26,480,000	40,860,000	90,434,000
Oats	28,099,000	37,050,000	59,106,000
Corn	88,520,000	185,993,000	325,621,000

Although corn as shown by this table was the greatest crop, only small quantities were sent out of the region. On the average, not much more than seven and a half million bushels reached Buffalo annually in the decade before 1860, and even smaller quantities were sent out by way of New Orleans. Corn was consumed principally on the farm. Indeed, the ability of the States just named to maintain a large number of animals for power and food purposes, and for export, either as livestock, or as pork, lard, butter, cheese, and leather, depended on their capacity for the production of corn and forage. The corn crop, moreover, contributed to the manufacture of whiskey, which at that time was a characteristic manufacture both for local consumption and for export.

Wheat, on the other hand, was largely exported either as grain or flour. Some of the supply was delivered to country millers, who, after the introduction of steam-power, were able to manufacture cheaply and sell to city merchants. Another portion of the grain was shipped to manufacturers chiefly at Cincinnati, Louisville, and St. Louis, who pro-

duced flour for local consumption and for export. The remainder of the crop arriving at collecting points on lakes and rivers was exported as grain. Before the building of railroads, the chief outlets were through Buffalo, Pittsburgh, and New Orleans. A statement of receipts at Buffalo and New Orleans will give some idea of the growth of the grain trade of the interior. Receipts at Buffalo increased from an annual average of 761,000 bushels during the years from 1836 to 1840, to 3,334,000 for the decade ending with 1850, and to 8,187,000 for that ending 1860. The average annual receipts of flour during the same periods were 286,000 barrels, 1,084,000 barrels, and 1,126,000 barrels. The receipts of flour at New Orleans by decades from 1830 to 1860 were 320,000 barrels, 726,000 barrels, and 1,022,000 barrels; and of wheat during the two decades before 1860, 209,000 and 250,000 barrels and sacks.

The great collecting points on the Lakes were Chicago, Buffalo, Cleveland, Toledo, and Milwaukee. Buffalo enjoyed the advantage of being the focal point for most of the Western commodities destined for the Hudson River by way of the Erie Canal. Meanwhile, the canals of Ohio stimulated the trade of two of her Lake cities; and Chicago, after 1848, received increasing quantities of grain by the Illinois and Michigan Canal; the building of railroads to the Missouri widened her tributary area and increased her trade. From a small export of about 10,000 bushels in 1840, shipments from Chicago grew to nearly sixteen million bushels in 1860. Ohio began to ship breadstuffs and provisions by way of the Lakes in small quantities about 1835.

The effect of this growing supply of grain was to stimulate the manufacture of flour. In 1850 the Middle Atlantic States, with New York and Pennsylvania as the principal producers, still manufactured more than any other section. But by 1860 the premier place passed to the Western

States, with Ohio, Illinois, Indiana, Missouri, Michigan, and Wisconsin, in the order named, as the largest Western producers. New York, however, still manufactured more flour than any other State. The total increase in production in the Western States from 1850 to 1860 was about 125 per cent, while in the Middle Atlantic States it was only 15.5 per cent. The amount of flour manufactured in the different divisions in 1850 and 1860 is shown in the accompanying table.

FLOUR AND MEAL PRODUCED IN THE UNITED STATES, 1850 AND 1860

Division	1850	1860
	Value of product	Value of product
New England	$ 6,320,486	$11,155,445
Middle States	68,433,179	79,086,411
Western States	42,673,992	96,038,794
Southern States	16,581,817	30,767,457
Pacific States	1,888,332	6,096,262

The milling center, therefore, like many others moved westward with the flow of population. It was to move further in the Northwest, but this occurred at a later period. The supremacy enjoyed by the mills of the Brandywine and Patapsco about the time of the Revolution passed to Rochester with the opening of the Erie Canal. Shortly many little millers along the streams of New England enjoyed an ephemeral prosperity owing to the cheap receipt of grain from the interior. But these also suffered from competition with the growing industry at Cincinnati, Chicago, Louisville, and St. Louis, among others. Milling was even more firmly established in the West during the next period.

The export trade in grain and flour also felt the effect of the growth of wheat production in the grain States.

Shortly after the opening of the Erie Canal Western flour was marketed down the Atlantic Coast as far as Raleigh, North Carolina. The repeal of the English Corn Laws in 1846 afforded some stimulus to American farmers and millers, but the effects of foreign demand were not felt strongly until after 1866.

97. **Meat Packing.**—An inevitable result of the opening of the farm lands of the New West was the development of stock raising and the founding of meat packing and related industries. The method of disposing of livestock varied according to conditions. Before the inauguration of meat packing, many farmers in sections bordering on the great roads leading to the East drove hogs and cattle to Baltimore, or Philadelphia, or to some Southern market. The drive from Ohio in 1810 was estimated at over 40,000 animals. As late as 1835 stock valued at $1,698,000 was sent to the East over one road leading out of Kentucky.

In course of time the business of preparing animal products for the market evolved through a number of stages. In sections where farmers were on or near the Ohio and its tributaries, they did their own slaughtering and curing and conveyed their own product to market. But occasionally, even in the early days of settlement, a country storekeeper, or someone else interested in the business, bought enough meat to load a flat boat and sent the cargo to some down-river market. Among the conditions which aided the growth of meat packing were first, the growth of banking facilities; this was a necessary aid, due to the custom established at the beginning of the business of paying cash to the farmer for livestock. Second, sufficient development of the country surrounding packing centers to provide a continuous supply of animals. Third, fairly reliable knowledge of distant market conditions. And finally adequate transportation; thus the introduction of the steam-

boat on the Ohio in 1811 was a necessary condition for the successful pursuit of the business.

Meat packing as a separate industry came into existence at Cincinnati about 1818. With the progress of settlement many other places on the Ohio and Mississippi became interested; about 1850 some twenty-five towns in Ohio, 35 in Indiana, and 50 in Illinois were engaging in the business. Some idea of the growth of the packing industry may be obtained from the statement that during the season 1842–1843 over 675,000 hogs were slaughtered in this section; the number for 1851–1852 was 1,183,000, and for the season 1861–1862, about 2,893,000.

For many years Cincinnati was foremost in the business, from 1840 to 1850 something less than 30 per cent of the Western business being concentrated there. Her success was due to her large supply of skilled labor, to her facilities for consuming the by-product, to her superior banking facilities, and to the extensive development of the farming country tributary to the city.

The packing industry was necessarily localized in places where labor and capital were abundant. Even before 1860, with the westward movement of the corn belt, Chicago became a competitor of Cincinnati and took the ranking position about 1861 with the expansion of railroads and the development within the city of adequate banking. Although beef was prepared for the market from the earliest years of settlement, this branch was of relatively small importance until the introduction of methods of refrigeration and transportation in the period after 1866. The growth of the packing industry stimulated many others which became a feature of Western industrial organization. Among the industries that were thus stimulated were the manufacture of salt, cooperage, lard, lard-oil, soap, candles, glue, fertilizers, and leather goods and boots and shoes.

98. The Land Policy of the United States.—Although the land system of the country has been open to criticism on many counts, it has afforded one of the strongest of all stimulants to agricultural expansion. Even where land was granted in aid of internal improvement and the development of schools, the benefits accrued either directly or indirectly to agriculture. Throughout the greater part of our history the policy of the United States has been to dispose of the domain for the conscious purpose of fostering industrial development.

Before the States ceded their claims to the United States, they had adopted a policy which was even more liberal than that subsequently adopted by the United States. In 1779 Virginia permitted Kentucky pioneers to take up plots of 400 acres at the rate of $2.50 a hundred, provided they put up a house and planted corn within the year. About 1778 North Carolina permitted settlers to claim 640 acres on their own account with an added one hundred for their wives, and one hundred for each child. The rate was $10.00 per hundred acres. For many men payment was exceedingly easy, since the debt might be discharged in depreciated paper, or credited against military service. Connecticut offered her land in the "Western Reserve" at 40 cents an acre, Pennsylvania made liberal disposition of her charter lands, and Massachusetts, in order to check Western emigration, reduced the price of her Maine lands to 50 cents an acre.

The policy of the United States evolved through several stages. At first the "Western lands were looked upon by all financiers of this period as an asset to be cashed at once for payment of current expenses of Government and extinguishment of the national debt." Considering the whole history of the United States, however, the public domain has been a source of outgo rather than of income. Up to 1860 the total receipts from sales amounted to about

$176,630,000. On the other hand, charges amounting to about $80,957,000 had been incurred in the acquisition of land by various cessions, large sums had been paid for the quieting and purchasing occupancy-titles of the Indians, and millions added for administrative and other expenses.

Prior to 1798 the United States had disposed of a number of large tracts; among others, to John Cleves Symmes, between the Great and Little Miami Rivers, in Ohio, near the present city of Cincinnati. The tract now in Erie County, Pennsylvania, was sold to the State of the same name. A part of the payment for the Symmes and Pennsylvania purchase was made in military land warrants "each acre in such warrants being received in payment for one acre and a half of land."

In 1796 Congress passed an Act which was largely to form the basis of the land policy for the next twenty-five years. "The spirit of the Act, like all early legislation on the subject of the disposition of the public lands, was to hurry their sales and get the cash into the Treasury." This Act, with its later amendments, provided for the division of the country west of the Muskingum into sections of 640 acres, and into half-sections of 320 acres. The sale price was to be not less than $2.00 an acre. A credit feature was attached by which the purchaser could pay a certain amount down and the balance in four annual installments.

By the Act of 1820 the credit feature was abandoned and a new policy adopted of disposing of land to actual settlers. The purchase price now became $1.25, and the smallest tract to be sold to an individual was 80 acres. There was considerable resistance to the inauguration of this policy on the part of Eastern representatives, partly because it would stimulate emigration which was already seriously disturbing the Eastern States, partly because it would result in lowering the price of Eastern lands, and

partly because the effect of competition of Western agriculture on the prosperity of Eastern farmers was already foreseen. The policy, however, commended itself to the poorer elements in the community, who appreciated the opportunities it offered.

These opportunities were vividly portrayed by a well-known Western writer in the following terms:

> In any of the States west of the Ohio River a laborer can earn 75 cents a day, and if his living be supposed to cost 25 cents a day, which in this plentiful country is a large estimate, he can, by the labor of one hundred days, or about four months, purchase a farm. . . . All kinds of stock can be raised in this country with facility, and at little cost. A good working horse is worth fifty dollars, a cow from five to ten dollars, a fat steer from ten to twenty, and hogs from two to five dollars per hundred pounds. A man can purchase forty acres of land by the sale of a horse, or from four to six head of cattle, or ten hogs. . . . Let it be further taken into consideration, that the extensive public works now in progress under the general and state governments, furnish employment, and high wages, to laborers and mechanics, and supply a circulating medium, and it will be seen that any industrious man may buy a farm.

The land policy was further extended by the adoption of a general preëmption act in 1830, which was extended from time to time until finally enacted into a permanent law in 1841. The next great step was taken with the passage of the Homestead Act; a discussion of this measure, however, belongs in a chapter dealing with the later period of our history.

It may be said against our land policy that it scattered settlements, that it promoted speculation, that it was a conspicuous cause of the wasteful methods of farmers, that it promoted the rapid extinction of some of our best resources, and that it caused great hardships to many Eastern farmers; on the other hand, it fostered the rapid ex-

tension of farming, covered the country with internal improvements, and opened unlimited opportunities to thrifty men of all classes.

99. **Labor-Saving Machinery.**—The immense amount of work which fell to the lot of farmers afforded inventors an opportunity both to enrich themselves and to render most useful service to agriculture. Once the minds of the geniuses of the country were directed to the discovery of more effective methods of breaking and cultivating the soil, and of harvesting the crop and preparing it for market, inventions followed in rapid succession. The great improvements, however, did not come until after 1830. Until then hand labor was the chief force available for performing numerous farm operations. Describing the condition of agriculture in 1833, Professor Carver says:[4] "Small grain was still sown broadcast and reaped either with a cradle or the still more primitive sickle. The cradle, however, was a relatively new invention, being a modification of the scythe, which had been used for centuries in mowing grass. . . . Grain was still threshed with a flail in 1833, or trodden out by horses and oxen, as it had been in ancient Egypt and Babylonia. Hay was mown with a scythe and raked and pitched by hand. Corn was planted and covered by hand and cultivated with a hoe. *By 1866 every one of these operations was done by machinery driven by horse power,* except in the more backward sections of the country."

The improvements included mowers, reapers, cultivators, threshers, drills, seed throwers, etc. The operation of threshing seems to have attracted more thought from the inventors than any other. The first patent for such a device was granted in 1791, and the number increased from year to year until in 1830 thirty-four patents were granted, and in 1831 thirty-eight patents, which at that time was the

[4] T. N. Carver, *Principles of Rural Economics.*

greatest number ever granted in a single year. That the problem of threshing by mechanical means was being mastered is shown by the fact that at the Paris Exposition of 1855 Pitt's American thresher outdistanced all others by threshing in a half-hour 740 litres of wheat, as compared with 60 litres threshed by six men with flails. Shortly before 1860 steam power had been employed to drive the thresher. Cyrus McCormick was granted his first patent for a reaper in 1835. The substance of all these improvements was not only to manifold human labor power and to speed up the work of the farms, but to perform many tasks much better than could be done previously by hand labor.

100. **Livestock.**—Shortly after 1830 farmers began to give greater attention to the improvement of breeds of livestock, the purpose being, in case of cattle, to increase weight, improve the quality of the beef, to hasten maturity, and to increase the quantity and quality of milk. To these ends foreign stock, including Devons, Durhams, Herefords, and long-horns, were imported and crossed with common cattle. Improvements were made in saddle and draft horses, the latter becoming more necessary with the introduction of machinery operated by horse power. Merino sheep had been imported into the United States as early as 1793. In 1860 Ohio ranked first among the States growing sheep; others in order of rank were New York, Indiana, Pennsylvania, and Michigan. The gradual development of agricultural societies which often provided for exhibits, contests, and prizes, and the appearance of agricultural literature, exerted a wholesome effect on the progress of American farming. The total value of livestock on the farms of the United States in 1850 was $542,067,000, and in 1860 it was $1,098,862,000.

101. **The Product of Mines.**—The most important minerals exploited during this period were iron, coal, copper,

lead, and gold. The addition of coal, gold, and copper to the list after 1790 is one of the features in the mineral history of the country. Lead continued to be obtained chiefly from resources in southeast Missouri, where the industry was inaugurated about 1720, and from northwest Illinois and adjacent regions in Wisconsin and Iowa. Development of the latter resources on an important scale began shortly after the War of 1812. Lead was used principally in the manufacture of lead sheet and pipe and in the production of shot and white lead. Manufactories of these commodities were located chiefly in the States of the Mississippi Valley, although considerable quantities of lead were sent to the Eastern cities of the United States and to Europe for manufacture. During the years from 1800 to 1854 upwards of 121,000 long tons of lead were delivered from mines in Missouri, and from 1822 to 1851 over 316,000 long tons were shipped from Galena, Illinois, the collecting point for most of the product mined in the upper-Mississippi region.

The opening of the copper resources of Michigan about 1846, when small quantities were taken from Cliff mine, in Keweenaw County, marked the beginning of a period when the United States was not only to produce metal enough for its own consumption, but an abundance for export. At this time copper was consumed chiefly in the production of stills, kettles, as an alloy in brass, and in shipbuilding for fastening and sheeting. Hitherto, this country had not been able to provide for its own manufactures and supplies were imported from Chile and later from both Chile and Cuba. As late as 1845 only 100 long tons of copper were produced in this country. Excepting Michigan, the largest producers in 1860 were Tennessee, North Carolina, Virginia, and Maryland, but in none of these was the output greater than 2,500 tons. In 1850 Michigan produced 570 tons, and in 1860, 5,300 tons, which was 74.8 per cent of

the total for the United States. Production had not yet begun in the Far Western states.

102. *Iron Ore.*—One of the most important results of the pioneer's efforts in opening the country was the discovery of the greater resources of iron. The largest deposits are in the interior, and these remained closed until the westward movement revealed their location and resulted in a rough appraisal of their value. The growth of transportation gradually made their exploitation profitable. An important event of this period, in fact one of the greatest events in the industrial history of the United States, was the discovery of iron deposits in northern Michigan. The exploitation of these and of the resources in the near-by regions in the years after 1860 made the United States the world's chief producer of both ore and finished iron. These discoveries, moreover, were great forces drawing the iron industry westward, just as the opening of the rich farm land of the interior attracted agriculture and the manufactures that largely depend upon it.

The existence of iron on the southern border of Lake Superior was known to traders as early as 1830, but the commercial value was not appreciated until about 1845. The first shipment from Marquette mines for commercial purposes was in 1853. After that date the output of the Lake Superior district greatly increased. Michigan produced only 3,000 long tons in 1854; by 1860 the output had grown to 114,000 long tons. Pennsylvania, however, was still the ranking iron state, retaining the position she had gained in the latter part of the Colonial period. The product of iron ore in this State in 1860 amounted to 1,706,400 tons. Iron resources in Ohio, Kentucky, and Tennessee were drawn upon by the early settlers first to supply local wants for pots, kettles, flatirons, and ovens, and later, in some instances, to supply the growing industries in Cincinnati, Louisville, Pittsburgh, and other places

along the Ohio. Small deposits in southeast Missouri after 1840 supplied St. Louis and afforded a surplus for shipment to points on the Ohio for the purpose of mixing with other ores. About 1825 the discovery of iron in the Hanging Rock region, including portions of southeast Ohio and adjacent regions in Kentucky, for some time engaged the attention of iron makers. As the country was opened by transportation, the competition of more productive distant resources gradually drove the little local establishments out of business; with the development of the Lake Superior resources this elimination process compelled the closing of many mines which had been for years the mainstay of the iron industry in a number of parts of the country. Thus there was a strong tendency to concentrate production at the most productive mines.

The Eastern States continued to produce small quantities of ore throughout this period. In 1860 Massachusetts produced 25,000 tons, Connecticut 20,700 tons, New Jersey 57,800 tons, and New York 176,300 tons. Ohio, with 228,700 tons ranked second. The total amount of iron ore produced in this country in 1860 was 2,514,200 tons.

103. *Coal.*—Coal, in the United States, first became a commercial commodity in the period from 1790 to 1860. The causes were: (*a*) the increasing demand for fuel other than wood due to the clearing of the forests; (*b*) the demand for coal or coke in the smelting of iron; with the exhaustion of the timber supply around the furnaces it became necessary to find some other fuel; (*c*) the growth of cities which required coal as a fuel and as a material for the production of gas; (*d*) the introduction of the steam engine and the growth of the factory system; (*e*) the opening of the bituminous coal resources of the interior as a result of the westward movement. As with all industrial nations, coal in the United States has been a great factor in the localization of population and manufactures.

Anthracite was discovered by pioneers in the Wyoming district of Pennsylvania, near the present city of Wilkesbarre, in 1762; and discoveries were made in the Lehigh region near Mauch Chunk in 1791. But difficulties in mining and transportation and the belief that anthracite would not burn delayed its general introduction. These difficulties, however, were solved in time. Although shipments had been made to Philadelphia as early as 1805, the permanent founding of the coal trade was not effected until about 1820. Subsequently, not only Philadelphia and Baltimore, but all the Eastern cities obtained supplies from the Pennsylvania resources. Anthracite was first used in the generation of steam about 1825, and for smelting iron about 1837. The output in 1815 was only 50 tons; in 1820 it was 450 tons; in 1830, 215,200 tons, and in 1860, 10,488,000 tons.

Bituminous coal came into use for manufacturing purposes in Pittsburgh and the surrounding industrial district shortly before 1800. The demand increased rapidly after the introduction of steam power in that city in 1794. Other manufacturing towns on the Ohio began to look to Pittsburgh for a supply. From this small beginning grew the coal trade of the Ohio which became in later years an important branch of commerce of that stream. The consumption of coal in Pittsburgh in 1855 was estimated at about 22,000,000 bushels; the export trade took about 14,000,000 bushels. Cargoes were sent by river in flat boats carrying from eight to twelve thousand bushels to Cincinnati, Louisville, St. Louis, and to river towns as far south as New Orleans. During the year ending August 31, 1852, 850,000 barrels of "western coal" valued at $425,000 were received at this city from the interior. The receipts in 1860 amounted to 2,900,000 barrels. In the meantime, the Lake cities were importing coal by canals from the interior of Ohio and Pennsylvania.

The consumption of coal for the production of gas began in Pittsburgh about 1837, in Louisville in 1839, and in New Orleans in 1834. With the rising price of wood the household use was gradually added to that of the industries. Some idea of the extent to which bituminous coal was now entering into consumption may be obtained from the following facts: in 1832 several boat loads were sent from Illinois to New Orleans, and about 1833 some 6,000 tons were mined in St. Clair County, Illinois, for consumption in St. Louis. The output of Illinois reached 16,900 tons in 1840 and 568,000 tons in 1860. Ohio produced 140,000 tons in 1840 and 1,133,500 in 1860. The coal resources of the other States of the interior were developed only to a small extent before 1860.

104. *Gold.*—The discovery of gold at Sutter's mill in California in 1848 by James Marshall was the first of the great discoveries of the nineteenth century. This metal was found in Australia in 1851, and later in the Bendigo gold fields, West Australia, in 1870, and in the Transvaal in 1868, and in the Klondike region in 1896. The stimulating effect of the new gold from California was one of the causes of the prosperous times before 1857. The production in California in 1849, one year after Marshall's discovery, was $5,000,000; the output increased rapidly year by year until 1853 when it amounted to nearly $60,000,000. Although the product declined in later years, California continued to be an important producer. Gold was discovered in Colorado in 1852, but the extensive development of the resources of this State did not begin until after 1860. The quest for precious metals was for many years one of the features of life in the Mountain States, adventurers making rushes from place to place as rumor told of greater finds in other regions. Farmers, merchants, and artisans were drawn to this country to supply miners who were glad to pay high prices for com-

modities and services, and in this way this section received its earliest stimulus to industrial growth.

105. **Timber Resources.**—Owing to the cost of transportation the development of timber resources was largely a local industry except for communities located on the larger stream. The saw mill was a necessary part of the equipment of every town; in every region it followed closely on the heels of the pioneer; thus there were hundreds of little mills scattered throughout the settled portion of the country. Supplies for the cities usually came by raft from some up-river source, and these cities, in turn, were markets for a more or less extended area. The growth of cities, which greatly increased demand, was one of the causes for the growth of the lumber trade. An unfortunate result of the rapid settlement of the country was the destruction of enormous amounts of splendid timber to make way for farming, and eventually even inland towns became dependent on the city lumber markets.

The Eastern markets were supplied from the up-river country, as in Colonial times. A notable feature of the period from 1790 to 1860, however, was the rise of the Western lumber trade. Added to the various building needs of the cities, were the demands of growing industries, of railroads, and after 1840 of the treeless or prairie country. For many years Pittsburgh was the chief lumber market of the interior. Great quantities came to this center for distribution from western New York until the exhaustion of the supply compelled a large portion of the interior to look to Michigan and Wisconsin. In 1857 it was estimated that the stock of lumber on hand at Pittsburgh was 72,000,000 feet, but even this amount was not enough to satisfy the demands upon that market. Over 175,000,000 feet were sent down the Alleghany in 1857. About this time, however, the supremacy as a lumber market was passing to Chicago, which drew upon vastly greater resources,

and which enjoyed equally good facilities for marketing. The receipts at Chicago increased steadily from about 32,000,000 in 1847 to 459,000,000 feet in 1857. Supplies came from Saginaw, Green Bay, Muskegon, Manistee, and other places. After the building of railroads a considerable portion of the Mississippi Valley looked to Chicago as a source of lumber. The Wisconsin forests also supplied communities on the Mississippi River. After 1840 timber was rafted to St. Louis where it was manufactured and supplied to a wide market. About this time also St. Louis began to receive large quantities of cypress from the lower Mississippi, poplar from Tennessee, and hardwoods from Missouri and other States.

106. **Summary of the Development of Resources.**—Far more was accomplished in the development of our resources in this period than in former years of our history. The growth was remarkable. The country from Pittsburgh to, and for some distance beyond, the Mississippi had been peopled and exploited. In the region north of the Ohio farmers built up a prosperous grain and livestock industry which competed seriously with similar industries in the Middle States. South of the Ohio they gave considerable attention to cotton; they were so successful that this commodity became the greatest single export of the country, and at times amounted to about half our exports. Some of the greater iron resources were tapped and manufactures of iron drawn westward. The mining of both anthracite and bituminous coal had been firmly established and an extensive trade developed. The country's gold supply was greatly increased as the result of mining in California. Meanwhile, the mineral resources of the Rocky Mountain States had been prospected, and this country was on the eve of intensive development. Copper was added to the list of metals extensively exploited. It goes without saying that the development of these resources stimulated the

growth of all branches of commerce, provided an enormous volume of raw materials for manufactures, and further stimulated manufactures through the demand for many finished commodities. A firm basis was thus laid for the even more remarkable growth in the period after 1866.

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CHAPTER IX

MANUFACTURES: 1790–1860

107. Factors in Manufacturing Development.—In a general way, the resources of a country determine the kind and character of its manufactures. This statement has some limitations, but it was more nearly true in a country like the United States from 1790 to 1860 where the people were versatile, thrifty, and fairly well provided with capital. In the last chapter we learned what raw materials were chiefly produced in the United States. One would expect to find that as a result of these resources this country was a large producer of flour, lumber, and its products, various wares of iron, textiles, meat products, and of commodities which are by-products of slaughtering and meat packing. Some of these were already among the most important industries when Hamilton made his report on manufactures in 1791. Gallatin's report of 1810 further illustrates the close relation of the growing manufactures to characteristic resources.

But there were other features in our manufacturing development not immediately related to resources. These may be summarized as follows: (*a*) the introduction of the steam engine and the increasing use of steam power; (*b*) the wide diffusion over the country of certain industries; (*c*) the contemporary existence of a number of industrial stages; (*d*) the development on a large scale of certain industries; (*e*) the introduction of a number of epoch-making inventions; (*f*) the application of the principle of protection to imports into the country, at least during a part

of this period. These features will be discussed presently; but first let us consider the industrial changes in England which affected economic development in the United States.

108. The Industrial Revolution.—While the Colonies were struggling with the mother country over the Acts to regulate trade, remarkable changes were taking place in manufacturing processes in England. Four spheres of development may be noted: (*a*) the invention of textile machinery; (*b*) the invention of the steam engine; (*c*) the application of steam to traction purposes; (*d*) other improvements in transportation. Changes of great moment occurred also in methods of manufacture of iron. These improvements were destined to affect manufactures not only directly by providing better implements of production, by increasing power for industrial purposes, and by causing great changes in business organization, but indirectly by widening markets and by affording an enormous stimulus for inventions in other lines.

The industrial use of steam had been known long before James Watt began work on the steam engine. As early as 1698 Savery discovered a means of raising water from mines by causing steam to condense in a cylinder so that atmospheric pressure could lift the water. Newcomen in 1705 improved on this device; the Newcomen engine, however, was operated only partly by steam, the piston being forced in one direction by the pressure of the atmosphere. This device was necessarily slow and uncertain. The latent possibilities of steam could not be fully realized until its power could be used to drive the piston in both directions, and until an automatic control could be invented to permit steam to enter and leave the cylinder at the proper moment. These improvements were the special contribution of Watt, whose work from 1763 to 1782 laid the foundation for the modern steam engine. It was first used for pumping water out of mines; but this alone was an important use since

it made possible a more extensive development of mining. But the steam engine was shortly employed for power purposes in factories, and about 1814, largely as the result of the genius of George Stephenson, for traction purposes. The steamboat was a contemporary development. Rapid transportation was thus made possible. The steam engine was one of the most important factors in the development of the factory system and in the localization of industries. Manufacturing could now be carried on away from the water courses, in regions which produced coal. The presence of this mineral, therefore, has been an important factor in the localization of industries.

Steam traction was not the only improvement made in transportation in England. The famous Bridgewater Canal, opened in 1761, permitted the conveyance of coal a short distance from Worseley to Manchester. The success of this enterprise led to others. "In 1766 a canal connected Manchester with Liverpool by way of Chester; in 1777 the Grand Junction Canal linked the Trent with the Mersey by way of the Cheshire salt district and the Potteries; other canals linked the Forth with the Clyde; the Humber with the Mersey, and both with the Severn at Bristol; and London with Oxford and the Midland coalfield. Towards the close of the century there was quite a mania for speculation in canal construction, and much foolish work was done."[1] It is quite clear from this description what the source was of much of the inspiration and argument for canal building in the United States.

Improvements were not confined to water communication. Roads in England were notably bad almost to the end of the eighteenth century. Some improvement was made in the main highways after 1750 when it gradually became possible to travel between the larger towns in coaches, and when wagons for freight conveyance began to replace pack-

[1] F. W. Tickner, *Social and Industrial History of England*, p. 525.

horses. But it remained for Telford, after 1802, and Macadam about 1815 to teach the art of surfacing and draining roads.

In the case of the textile industries, the first great improvements applied to the manufacture of cotton goods, which at that time were of less importance than woolens. In the field of weaving John Kay in 1733 invented a "flying shuttle," a device which could be thrown from one side of the frame and back again by one operator. The result of this invention was not only to lessen the labor of weaving, and increase the speed, but to enable a single weaver to produce cloth of greater width. The next task was for spinners to produce yarn enough for weavers who could now quicken their pace. Three notable inventions made this result possible. In 1764 James Hargreaves, a Blackburn carpenter, is said to have obtained an idea for improving the spinning process from seeing his wife's overturned spinning wheel still revolving on the floor with the spindle in an upright position. He devised a machine with eight spindles which could be operated from a single source of power. Subsequently the number attached to a single machine was greatly increased. Approaching the problem of spinning from a different angle, Richard Arkwright, a barber of Preston, invented a process for passing carded cotton between sets of rollers, each successive set revolving at a greater velocity than the one that preceded it. Thereby the fibres were drawn out and twisted on revolving spindles, and thus was produced a thread of greater fineness. "Its great advantage over the spinning-jenny was that it produced a yarn strong enough to be be used as warp, and thus made the manufacture of purely cotton goods a commercial possibility."[2] The invention of Samuel Crompton in 1779 combined the water-frame of Arkwright and the jenny, producing a machine which could

p. 517.

spin a finer and much stronger yarn. Inventions in spinning had now outstripped those in weaving and, in consequence, the attention of the inventors was now directed to the latter industry. The first power-loom was devised in 1785 by Edmund Cartwright, a Kentish clergyman; it was subsequently improved and came into general use after 1813.

Other inventors were working in fields related to the textile industries. "Paul had invented a system of carding or straightening out the cotton fibre by machinery as early as 1748. Cartwright and others made machines to replace the corresponding hand-combing of wool. In 1783 the invention of a Scotchman named Bell superseded the old method of printing calicoes by handblocks, and increased the rate of production a hundredfold; the new cotton machines were adapted to the linen and woolen trades; improvements were made in the hosiery manufacture and in 1808 Joseph Heathcoat patented a machine for the making of lace."[3]

In a brief period, therefore, processes which for ages had been performed only by hand came to be accomplished by machinery. The steam engine became the source of power. The old system of domestic industry was soon to pass out of existence, to be replaced by the factory system, characterized by an increasing use of machinery, by the assembling of a large number of men under one roof and under one direction, and by the separation of capital and labor as factors of production. The scene was cleared for the appearance of a new type of leader who was much more a man of affairs than the merchant prince. He was to be called the "captain of industry," and it was to become his function to take the lead in all industrial matters, to be on the look-out for business opportunities, to assume the risks of management, to forecast consumer's demands, to promote enterprises, and to assemble laborers and capital

[3] *Ibid.*, pp. 517–518.

under one direction. The inventions ushered in a new form of industrial organization which is now the dominant form in all the leading industrial countries. Because the changes were so far reaching and so rapid they were called the Industrial Revolution. The student of economic history, however, is aware of the fact that the accomplishments of the years from 1763 to 1800 were only an introduction to what was to come. Many marvelous inventions have been made since that time, and their effects have been to produce just as radical changes as those resulting from the new textile machinery and the introduction of steam power. In fact, every year witnesses epoch-making inventions, but society has become so accustomed to such changes that the movement is no longer thought of as a revolution.

109. The Effect of English Improvements on Manufacturing in the United States.—English machinery was not immediately available for use in the United States. Lest industries should arise in this country to compete with those of England, rigid restrictions were placed on the export of machinery, and great care was taken that drawings and other aids should not leave the country. This, however, did not prevent the knowledge of the new devices from reaching the United States, nor even in some instances, machines themselves. Samuel Slater who emigrated from England and set up an establishment at Pawtucket, Rhode Island, in 1789, memorized the parts of Arkwright's machine and made machinery for a mill on arriving in this country. Within six years he had a number of men working for him, and in addition he set up a school for the training of workers. Slater, therefore, was of considerable influence in introducing the new methods into this country. In 1787, a cotton factory, said to have been the first in the United States, was established at Beverly, Massachusetts, and it was not long before others were put up in Pennsylvania and in New York. Knowledge of other branches of the

textile industries was introduced into this country from England, including power carding, spinning and weaving of woolens, and calico printing from cylinders. In the case of manufactures of iron, we obtained from abroad knowledge of the puddling-furnace, the rolling mill, and the hot-blast furnace, and later the Bessemer process for the manufacture of steel.

Development in England and on the Continent affected manufacturing growth in the United States in another way. Foreign improvements were always a source of inspiration and knowledge, and invariably American inventors were found working along the same lines of those in Europe; frequently they accomplished valuable results without aid or suggestions from abroad. Sometimes they were in advance of their foreign coworkers and it not infrequently happened that American ideas taken to Europe and worked up into a perfected device were later brought back to this country. European progress in mechanical invention helped this country in another way. The immigration of artisans of all kinds constantly added most useful knowledge and skill to new enterprises. These various foreign aids, however, merely supplemented our own. American inventors were constantly at work solving numerous technical problems that confronted growing industries, and their inventions ranked among the greatest of the times.

110. **The Advantages of the United States for Manufacturing.**—Abundance and variety of resources were among the most important advantages possessed by this country. At times these features were almost a handicap since they caused labor and capital to be scattered over so many fields as to retard intensive development of any one. Agriculture, holding out the advantages of independent labor and increment of wealth due to rise in value of land, was always a serious competitor of manufacture for both labor

and capital. A second advantage was in the character of our population. Characterized by thrift, versatility, and inventiveness, we were able to master difficulties which would have overwhelmed a less resourceful people. In a large measure Americans were able to overcome the disadvantages of lack of labor and capital by the invention of labor-saving devices and by saving. Their business instincts usually directed industrial endeavor into the most productive channels. The character of the Government afforded another great advantage. From the beginning the greatest freedom was given to individuals to exploit opportunities in their own way without interference. On the other hand, both the Federal and State Governments sought to promote economic progress in numerous helpful ways. Freedom from burdensome taxes and the absence of tolls and imposts on domestic commerce was an enormous advantage both for commerce and manufacturing industries. A fourth advantage was distance from the manufacturing centers of Europe. While this did not prevent knowledge of improvements from reaching this country, it did put handicaps on the importation of commodities. The increased cost of European goods during the early period of our manufactures, due to high ocean freights, has been estimated at 25 per cent of the value of the goods. This cost was both a protection for new manufactures and a cause for their introduction and growth.

111. **The Effect of the War of the Revolution.**—The period of the Revolution did more to retard than to stimulate the growth of manufactures. As with agriculture, the uncertainties of the times, troubles with depreciated currency, and the restriction of the markets were discouragements. The non-importation agreements, on the other hand, and enforced non-intercourse during the war, both encouraged the growth of manufactures and tended to popularize domestic goods. Military demands, moreover,

helped some industries and the risks of shipping tended to divert capital and enterprise from ventures on the sea to home manufactures. Again, the flight and ruin of the Loyalists, who were interested chiefly in commerce, cleared the field for the stressing of the enterprise of the new artisan-manufacturing classes. Some of these results, however, were promptly neutralized on the return of peace by the competition of English goods which flooded the markets. The most significant outcome of the Revolution, as indicated on a former page, was the establishment of political independence which enabled the new country to direct its industrial policies without interference from abroad.

112. **The Introduction of Steam Power.**—The application of steam was the greatest of all improvements that ushered in the new era. Before this time the chief sources of power had been wind, water, and animals. Wind power was often used to drive the machinery of saw and grist mills, but it was impossible to depend on this uncertain element. Water was a far more useful agent, but it confined the location of establishments to the water courses, and the amount of force available was limited compared with steam. In the interior of the country millers often employed horse power to turn machinery. In all these cases, however, the source of power was limited and its application restricted. The introduction of the steam engine freed industries from the handicaps of the former methods.

The first experimental steam engine in this country was set up in Philadelphia in 1773 by Christopher Colles. Within twenty years steam power came into rather general use in the largest establishments along the seaboard, and it was shortly to be introduced for steam navigation. Oliver Evans applied it in dredging the Delaware and Schuylkill. Western manufacturing communities began their industrial growth with the use of steam. The success of the

first engine at Pittsburgh in 1794 led to the use of others. In 1815 there were six engines in the establishments of Lexington, Kentucky; two constructed on the Evans' plan, three on that of Watt and Bolton, and one on a model devised by a resident of Lexington. Steam power was in use at Cincinnati as early as 1814, and in St. Louis in 1819. In 1826 there were about 25 steam engines in the factories of Cincinnati and over 35 in Pittsburgh. Scattered throughout the agricultural regions small steam engines were coming into general use for milling purposes. An establishment could be put up at small expense with machinery obtained from Pittsburgh, Cincinnati, or Louisville; the abundance of both wood and coal afforded cheap fuel. In Illinois in 1835 there were upwards of 50 mills employing steam power, about 40 in Indiana, and 35 in Missouri.

The steam engine exerted a great influence on every phase of manufacturing development. It made possible the extensive use of power machinery, which, in turn, caused the assembling of a large number of men under one roof to work with such machinery; it transferred to the machine many operations formerly done by man and thus released human effort for other necessary work; it greatly manifolded the power of men working with machines; it brought the United States into full possession of two of its greatest resources, coal and iron; and it laid the basis for the growth of a great machine manufacturing industry. In 1920 foundry and machine-shop products ranked fourth among our industries in the value of the product, and third in the number of wage earners employed.

113. The Wide Diffusion of Certain Industries.—With the introduction of steam power it was no longer necessary to establish manufactures at the water sources. Thus, as population scattered over the country, manufactures of some description were founded in many places, usually to supply interior communities with certain bulky commodi-

ties which were burdened with heavy freight charges, or to work up bulky raw materials into a form which was relatively cheap to transport. Just as distance from Europe encouraged manufacturing among the seaboard communities of the United States, so distance from the older parts of the country often compelled new communities to supply themselves with a number of necessary commodities. Means of transportation could not keep pace with the rapid migrations, and the cost of freighting long distances over bad roads or unimproved streams acted like a protective tariff in defending new communities against severe competition with manufactures established in the older parts of the country. Thus, in addition to machine shops and the usual list of customs workers, every nascent settlement was soon provided with establishments for the manufacture of flour, lumber, liquors, tobacco, agricultural implements, carriages and wagons, furniture, leather, harness and boots and shoes. These industries were found in almost every part of the country.

As an illustration of this statement, in 1840 there were 1,937 tanneries scattered through Ohio, Indiana, Illinois, Missouri, and Kentucky. In Missouri, 43 Counties reported such establishments; in Illinois, 55 Counties; in Ohio, 73 Counties, and in Indiana, 71 Counties. The same condition characterized most of the other industries mentioned in the last paragraph.

114. The Industrial Stages in the United States.—Another impressive feature of our industrial growth was the contemporary existence of a number of industrial stages. As late as 1860 one could find in this country the fur trader, the precursor of all pioneers, the backwoodsman, the immediate forerunner of the farmer, settled farmers plying various branches of their industry, and in the case of manufactures, there existed contemporaneously household industries, domestic industries, and the factory system.

These conditions were an incident to the opening of a new country where communities were widely scattered and not well supplied with means of communication. The following quotation illustrates an evolution that occurred many times and with many industries:[4]

Itinerant shoemakers and weavers plodded from house to house, making shoes and clothing for families from home-tanned leather and home-spun yarn. Later, perhaps the same artisans established themselves in small shops, where they did custom-work for neighbors and finally accumulated capital to make goods for general sale. Journeymen in the full sense of the word thus became settled men and masters, and from this they grew, in some instances, to be merchants of the goods they made. Wherever population grew dense and money more abundant, journeymen found their first employment under master mechanics instead of in family service. Shops thereupon acquired more elaborate equipment and their operations were differentiated. Productive capacity rose until it exceeded the requirements of work made to order and even oversupplied local mercantile demands. The proportion of wage-earners relatively to self-employing artisans increased, and nascent industrial capital was engaged during slack seasons to keep men at work making goods against times of active trade. Thereafter followed an inevitable development of either the technical or the mechanical side of the shop's operations. It grew into a mill, and ultimately into a larger plant or factory, or else it was embraced by merchant employers as a subordinate unit in a wider system of commercial production.

115. **The Growth of Manufactures.**—At the Census of 1810 an attempt was made for the first time to collect industrial statistics; the work was in the hands of the marshals' assistants who collected the data in connection with their canvass of population. The Census of 1820 covered industrial matters in somewhat greater detail. The

[4] Victor Clark, *History of Manufactures in the United States*, p. 143.

enumeration of 1830 related solely to population, but in 1840 and in 1850, particularly in the latter, an effort was made to obtain as complete a view as possible of manufacturing enterprises. The Census of 1810 set down the value of the manufactures of the country as $198,613,000. The figures were, of course, inaccurate, but they probably convey a fairly good general idea of the extent of our industries.

Another view of our industries in 1810 was given by Albert Gallatin, at that time Secretary of the Treasury. Gallatin's report was made in response to a resolution of Congress inquiring as to the state of American manufactures. Among the industries which were "carried on to an extent which may be considered adequate to the consumption of the United States" were the following: manufactures of wood, or of which wood is the principal material, leather and manufactures of leather, soap, tallow candles, spermaceti oil and candles, flaxseed oil, refined sugar, coarse earthen ware, snuff, chocolate, hair powder, and mustard. And among the branches which were firmly established "supplying, in several instances, the greater, and, in all, a considerable, part of the consumption of the United States" were iron and the manufactures of iron, manufactures of cotton, wool, and flax, printing types, paper, printed books, playing cards, spirituous and malt liquors, several manufactures of hemp, gunpowder, window glass, jewelry, clocks, several manufactures of lead, straw bonnets and hats, and wax candles. At the same time, some progress had been made in the establishment of other industries, including paints and colors, some drugs and chemicals, salt, copper, and brass ware, calico printing, queens and other earthen ware.

In the course of time most of these manufactures grew in size and spread over the country, following the migration of population. Improvements and inventions con-

stantly added to the list. The industries of this country, however, were yet to receive serious set-backs and powerful encouragements before they could strike the steady pace of growth. European wars, the Embargo (1807), and the Non-Intercourse Act (1809), and the War of 1812, all of which greatly diminished trading with Europe, released the new industries from competition from abroad. The return of peace, however, after the War of 1812, brought a trying time. Pent-up English manufactures were delivered in our markets in such large quantities as to threaten the life of many new enterprises. Many British merchants were no doubt eager to glut the American market so as to "stifle in the cradle those rising manufactures in the United States which the war had forced into existence contrary to the natural course of things." Imports into this country, which had been relatively small from 1808 to 1813, rose suddenly to large amounts. In round numbers they amounted to $77,000,000 in 1812, dropped to $22,000,000 in 1813 and to $12,000,000 in 1814, and then rose suddenly to $113,000,000 in 1815, and to $147,000,000 in 1816, the largest quantities hitherto imported in a single year. Manufacturers in all parts of the country became alarmed and petitioned Congress for protection and were able to secure the passage of the Tariff Act of 1816.

Another trying time followed close on the heels of the one just described. The panic of 1819 was due in a measure to the abnormal growth of industries during the period of restricted European imports. The great importations of the years 1815 to 1819 were also causes of trouble, and to these were added misfortunes due to speculation and bad banking. The panic was the first suffered by the country since the organization of the Government in 1789. Most parts of the country, except those far inland, felt the unusual distress of such events. Laborers were thrown out of employment, prices fell, and manufacturing was discour-

aged. With the revival of business, about 1823, the country entered upon a period of prosperity which extended to 1837, when business was again beset by panic and hard times. On this occasion over-investment in internal improvements was an important cause, but speculation in manufactures and other enterprises also played a part, and bad banking again came in for a share of the blame. An immediate cause of the panic was the Specie Circular of the Treasury in 1836 which directed agents to receive only specie and notes of specie paying banks in payment of public land. Speculation in land was checked forthwith, many banks were forced to curtail their operations, and alarm began to spread over the country. Failures of banks in Great Britain in 1836 also added to American troubles; English creditors were forced to call their loans, which in turn hampered American banking. At the same time, financial depression in England caused a decline in the demand for cotton which affected not only Southern planters, but banks in New Orleans which had extended loans on the basis of cotton, and indirectly banks of New York which had relations with institutions in the Southern city. Meanwhile crop failures in the United States in 1835 and 1837 diminished purchasing power and affected the credit of both farmers and manufacturers.

The prolonged depression following this panic put a check upon the expansion of manufactures. With the revival of business, however, the country entered on a period of unprecedented growth. The gradual rise of prices, later accelerated by the discovery of gold in California, stimulated business ventures; many new industries were founded, and older ones became firmly established; railroad building was taken up in earnest, and farms were developed rapidly. Workmen of every description were able to find employment at good wages; the scale of living rose for people in every walk of life.

A number of factors combined to produce these happy results. The following were some of the most important: the increase of population, now largely augmented by immigration; the rapid growth of domestic markets due to the demands of the growing population; the development of lake and river trade; the opening of farms and of resources of iron, coal, and copper; the discovery of gold in California; the rise of the overland trade to the Southwest and to the Rocky Mountain States; the introduction of many new inventions, railroad building, and the rapid growth of foreign commerce. These activities called for enlargements of enterprises of all kinds. The number of persons engaged in manufactures increased about fourfold during the years from 1820 to 1860, and the value of manufactured products probably more than eightfold. Thus the number of men engaged in manufactures having an output of $500 or more a year increased from 349,000 in 1820, to 791,000 in 1840, and to 1,311,000 in 1860. According to the Census of 1840, the total value of manufactured products was $483,278,000; it was $1,019,106,000 in 1850, and $1,885,861,000 in 1860.

116. **Patents and Inventions.**—The Constitution gave Congress power to grant exclusive rights to authors and inventors for the purpose of promoting the progress of science and the useful arts. Although it is impossible to estimate the influence of this provision, it has undoubtedly afforded immense encouragement to persons to bend their thoughts to mechanical improvements with the hope of protection and monopoly rewards which result from the grant; otherwise it is difficult to understand why inventors take the pains to have their discoveries patented.

Exercising the authority granted by the Constitution, Congress enacted a law, approved April 10, 1790, which secured to authors and inventors exclusive rights to the use of their productions for fourteen years. The law was

amended from time to time, and finally, in 1836, a new law was passed which laid the foundation of the modern patent system. Among other things, the Act required a preliminary examination of the novelty and patentability of the invention; this was intended to correct an evil which existed under the old laws of making grants to practically any applicant without an examination of the merits of the discovery, which resulted in fraudulent patents and in endless litigation. In addition to the above provision, the inventor was permitted to file a caveat, which acted as a bar to other applicants respecting the same invention until the inventor had perfected his device. A bureau of patents was established in the Department of State in charge of a Commissioner of Patents; and under certain conditions an extension of the patent right beyond the fourteen-year period was permitted. From 276 in the decade from 1790 to 1800, the number of patents issued increased to about 6,480 for the decade from 1840 to 1850, and to 25,200 for the following decade. This statement gives only a rough estimate of the application of new ideas to industry. Many ideas which were of immense value were not patentable, and this applies as well to improved forms of business organization and management. Frequently the discovery took the form of a new resource, or a new opportunity to exploit. In any event, the result in most cases was to improve mechanical processes, to widen the scope of industry, and to increase production.

Some of the great inventions of the times were the sewing machine (1846), the rotary printing press (1847), and the magnetic telegraph (1835). These inventions, as was the case with hundreds of others, resulted in the founding of new industries and exerted the powerful influence of their demands on many others; they usually created a need for new kinds of skill and opened new occupations for thousands of workers. They greatly increased the demand

for all raw materials. To illustrate from the invention of the sewing machine:[5]

> It has opened avenues of profitable and healthful industry for thousands of industrious females to whom the labors of the needle had become wholly unremunerative and injurious in their effects. Like all automatic powers, it has enhanced the comforts of every class by cheapening the process of manufacture of numerous articles of prime necessity, without permanently subtracting from the average means of support of any portion of the community. It has added a positive increment to the permanent wealth of the country by creating larger and more varied applications of capital and skill in the several branches to which it is auxiliary. The manufacture of machines has itself become one of considerable magnitude.

The sewing machine was used not only in the home, but was applied promptly to the factory manufacture of men's and women's clothing, and was shortly adapted to the manufacture of boots and shoes, greatly adding to the progress of all these industries.

117. **The Decline of Home-Made Manufactures.**—It has been estimated that household production of textiles in 1820 constituted more than two-thirds the total of manufactures of this kind. The rapid introduction of factory processes of spinning and weaving, however, soon diminished the importance of home production. But in the newer parts of the country home-made manufactures continued to occupy the people until these regions were opened to trade and until the growing wealth of the rural population made possible the purchase of shop and factory commodities. The value of home-made goods was hard to estimate, and the census enumerations are probably inaccurate, but they show a tendency. Taking the census figures as a basis for comparison, home industry was most impor-

[5] *Preliminary Report*, Eighth Census (1860) of the United States, p. 64.

tant during the latter part of this period in the Southern States, of less importance in the States north of the Ohio, and of still less significance in the Northern seaboard region. In Massachusetts in 1860 the *per capita* value of home-made products was only about 20 cents; it was about 18 cents in both New York and Pennsylvania. A decline in all regions attended the gradual introduction of the factory system. The accompanying table will illustrate this matter for the States north of the Ohio during the years from 1840 to 1860.

VALUE OF HOME-MADE MANUFACTURES

State	Value of the Product			Per Capita Production		
	1840	1850	1860	1840	1850	1860
Ohio	$1,853,937	$1,712,196	$ 596,197	$1.22	$ .87	$ .26
Kentucky	2,622,462	2,459,128	2,095,578	3.36	2.50	1.81
Indiana	1,289,802	1,631,039	986,393	1.88	1.65	.63
Illinois	993,567	1,155,902	923,220	2.09	1.35	.54
Missouri	1,149,544	1,674,705	1,984,262	2.99	2.45	1.59

118. **Manufactures of Flour and Lumber.**—In a large part of the country grains and timber were the most important raw materials. Since these could be manufactured to best advantage locally, and since there was always a large local demand for lumber for building purposes, the mill product, meaning by this term flour and lumber, formed a considerable part of the total manufactures of the country. In some sections, particularly in the States north of the Ohio River, these were not only the greatest industries, judged from the value of the product, but they contributed in some instances from 25 to 50 per cent of the total value of manufactured commodities. For the country as a whole, in 1850, this mill product, as defined above, constituted about 19 per cent of the total, and in 1860 about 17 per cent. But in some of the Eastern States, where

manufactures were more varied, and where there were great advantages for other industries, the percentage was much less. In New Jersey, for example, in 1860, it was only 12 per cent of the total, in New York a little less than 13 per cent, in Pennsylvania about 15 per cent, and in Massachusetts only about 4 per cent. In Ohio, however, as late as 1860, it was 25.3 per cent, and in Indiana the same year 50.9 per cent of the total value of manufactures. The importance of the manufactures of flour, meal, and lumber in the States north of the Ohio, where these commodities were the chief product of manufactures, is shown in the accompanying table.

VALUE OF FLOUR AND LUMBER MANUFACTURES

State	Product of Flour and Saw Mills		Total Value of Manufactured Product		Per cent Mill Product of Total	
	1840	1860	1840	1860	1840	1860
Ohio	$8,868,213	$30,841,280	$31,458,101	$121,691,148	28.2	25.3
Kentucky ...	2,437,937	9,726,841	13,221,958	37,931,240	18.4	34.9
Indiana	2,329,134	21,784,275	9,379,586	42,803,469	24.9	50.9
Illinois	2,417,826	23,866,432	8,021,582	57,580,886	30.1	41.5
Missouri	960,058	12,721,206	5,946,759	41,782,731	16.2	30.4

119. Textiles.—The textiles ranked second among the industries of the country in 1860. Among the advantages for the manufacture of cottons were an abundance of raw material supplied from the Southern States, a growing domestic market, and protection of the nascent industry. With the introduction of spinning machinery and of the power loom in 1814, American manufactures were well supplied with the mechanical aids for production. Considering the opportunities, it is not surprising that this country soon took rank among the leading producers of cottons. England retained the advantages of the momentum of an early start, of experience and skill in the

industry, of larger amounts of capital available for investment, and of a great domestic and foreign market. Her superior marketing and shipping facilities enabled her both to obtain raw cotton cheaply from our Southern States, and to sell her finished products abroad.

New England was the earliest home of cotton manufactures, and throughout this period that section remained the principal seat of the industry. The New England output constituted about 67 per cent of the total for the country in 1850, and about 69 per cent in 1860. The manufacture was localized chiefly in portions of Massachusetts, New Hampshire, Rhode Island, and Connecticut, but the State first named produced almost as much as the others combined. Of the Middle States, Pennsylvania and New York were the largest producers. The distribution of the industry in 1860 is shown in the accompanying table.

VALUE OF PRODUCT OF COTTON GOODS, VARIOUS SECTIONS, 1860

New England	$80,301,535	Southern States	$7,172,293
Middle States	26,272,111	Western States	1,391,987

In 1803 there were only four cotton mills in the country; the number increased to 15 in 1808 with 8,000 spindles. Some idea of the growth of the industry may be obtained from a statement of the number of spindles in factories and from the amount of cotton consumed. This is shown in the appended table.

MANUFACTURE OF COTTON

Year	Number of Spindles	Bales Consumed
1815	130,000	54,000
1830	1,246,000	155,500
1840	2,285,000	237,000
1850	3,998,000	575,000
1860	5,236,000	845,000

From the point of view of social progress, one of the most significant results of the introduction of factory production was the decline in price of cotton products. The experience of England was repeated in this country. In that country, for example, the price of No. 100 yarn declined from an equivalent of $9.50 a pound in 1787 to $7.50 in 1791, and to $2.35 in 1800. Prices of cotton cloth also declined after the introduction of power weaving. In the United States the price of ordinary cloth for sheeting produced by the family weaver in 1815 was about 40 cents a yard; in 1830 it was about 8 cents a yard.

In the case of woolens, the United States was not as fortunate as to supplies of raw material as with cottons. Although this country was an important producer of wool, the domestic supply was rarely adequate to the needs of home consumption, and manufacturers usually found the tariff on the imported product something of a handicap. Home manufacture was widespread before the introduction of the factory system. According to the Census of 1810, more than 9,528,000 yards were produced in this country, chiefly the result of workers in homes. The enumeration of only 24 factories probably understated the number of establishments, but at least the number was not large. Establishments increased in number after that date, but it is impossible to trace the growth by periods owing to inadequate census enumerations. Prior to 1823, 16 manufacturing companies had been incorporated in New York alone, in addition to the inauguration of numerous private and unincorporated factories. According to the Census of 1840 there were 1,420 woolen factories in the country with a total product valued at $20,696,000. Most of these, however, were small establishments. In 1860 the value of the product was a little over $68,000,000. As with cottons, the chief seat of the manufacture was New England, with Massachusetts producing almost as much as all the other

States combined. In the Middle States the industry was localized chiefly in a few places in Pennsylvania and New York. The distribution of the industry by sections may be shown in tabular form as follows:

PRODUCTION OF WOOLEN GOODS, INCLUDING CARDING, FULLING, AND MIXED GOODS, 1860

New England	$38,509,000	Western States	$3,718,000
Middle States	24,100,000	Pacific States	235,000
Southern States	2,303,000		

120. **Iron.**—A country with ample resources of iron possesses immense advantages for progress in manufactures, since this element is the chief raw material for the production of machinery, tools, hardware, agricultural implements, and railway iron of various kinds. In varying degrees it enters into the manufacture of almost every vehicle of commerce; it is an essential element in the construction of buildings and in the supply of many household wares. The American iron industry has thus been favored by at least two factors necessary to growth, immense resources and a growing domestic market. Many changes occurred in the process of manufacture during the course of development. As long as wood was abundant in iron producing regions, charcoal was the chief material for smelting; the clearing of the forests temporarily checked the growth of the Eastern iron industry, but the introduction of anthracite for smelting about 1840 more than restored the former prosperity. Coke from bituminous coal, and even raw coal itself, had been used to a limited extent in Western Pennsylvania and Eastern Ohio before 1840, but extensive use of these materials dates from after 1860. The substitution of steam for water power in blowing furnaces, and the use of the gases which escaped from the furnace for heating the blast were important innovations. Possibly the protection afforded by the early tar-

iffs was a cause of growth by defending the nascent industries from foreign competition; but it might be said, on the other hand, that protection retarded the introduction of improvements already in use in Europe and thus deprived the industry of a necessary stimulus to development. The production of steel was of relatively small importance during this period. Indeed, as late as 1867 only 19,640 long tons were produced. The history of this branch of the industry belongs to the period following 1860.

Some idea of the growth of the iron industry may be obtained from a statement of the amount of pig produced. A brief statement of the amount produced is given in the accompanying table.

PRODUCTION OF PIG IRON IN THE UNITED STATES, LONG TONS

1810	53,908	1850	563,700
1830	165,000	1860	821,200
1840	286,900		

The total value of the products of iron in 1860, including pig, bar, sheets, wire, castings, and car wheels, among others, was about $97,000,000. Pennsylvania held the first place throughout this period, but New York, New Jersey, and Massachusetts manufactured large quantities of iron products. With the opening of the resources of the interior, western Pennsylvania, with the commercial center at Pittsburgh, and portions of Ohio, Kentucky, and Tennessee became manufacturers of finished forms of iron. The manufacture of machinery was widely distributed, industries arising in many places to supply local demands; raw materials or partly finished products for such manufactures were obtained from the ore-producing regions. In 1860 almost every State in the Union reported the production of machinery, but the leading States were Pennsylvania, New York, Massachusetts, Ohio, and New Jersey.

121. **The Distribution of Manufactures.**—One of the most remarkable features of this period was the rise of manufactures in the States west of Pittsburgh; the section along the Ohio River from that city to Louisville was one of the most important industrial regions in the country. The important products of this section included not only flour and lumber, but agricultural implements, carriages and wagons, cooperage, furniture, pork, lard, soap and candles, leather, malt and distilled liquors, printing and wrapping paper, cordage, cotton bagging, and many others. Pittsburgh, Cincinnati, and Louisville were large producers of machinery of various descriptions. In these cities were built most of the steamboats which carried the freight of the Ohio and Mississippi Rivers. Cincinnati and Louisville were noted for their production of clothing, and Pittsburgh for the production of many forms of iron. Boots and shoes were manufactured by the factory method in all these cities. The value of manufactures in various sections in 1860 is shown in the accompanying table.

TOTAL VALUE OF MANUFACTURES IN VARIOUS DIVISIONS, 1860

New England	$ 468,599,287
Middle States	802,338,392
Western States	384,606,530
Southern States	155,531,281
Pacific States	71,229,989
Territories	3,556,197
Total	$1,885,861,676

The table indicates that New England and the Middle States comprehended the most important manufacturing section of the United States. But, in fact, manufactures were concentrated in an even more limited area. Nearly half the products of the country were fashioned within a relatively narrow belt extending from Lowell, Massachusetts, to Hartford, Connecticut, including portions of

Rhode Island, and from New York City to Wilmington, Delaware. This section, with the country immediately tributary to it, was the largest domestic market in the country; it was more abundantly supplied with labor and capital than any other region; it enjoyed the best facilities for inland transportation and possessed an outlet to the sea; it therefore had advantages for the receipt of raw materials which it did not produce, and for the distribution either inland or by ocean of finished products. These factors combined to concentrate a large part of the manufacturing of the country in this area.

In addition to the products named in former paragraphs as characteristic of this section, the output included boots and shoes, clothing, men's furnishing goods, cutlery, manufactures of brass, edge tools, glass ware, India rubber goods, millinery, silk products, pottery, silver ware, and musical instruments, among many others.

The list of manufactures, therefore, had expanded far beyond the narrow limits indicated in Gallatin's report. Industries had not only grown in size but had become far more varied. A decided turn towards the factory system in certain industries occurred during the good times from 1823 to 1837, and the movement became a special feature of the period from 1844 to 1857. In 1860, the average amount of capital per establishment was about $7,200, and the average number of men about 8. But even at this time there were many factories in which both the capital invested and the men employed greatly exceeded these figures. The country possessed a number of establishments with capital of over $1,000,000. Production with the aid of machinery had become typical of the country's industries. Moreover, there was observed the tendency among manufacturers to engage in business under the corporate form and to further increase the scale of production. Following the lead of New York, a number of States made liberal

provisions for the incorporation of companies. The corporation form had been employed hitherto principally in the case of banks, turnpikes, and railroads, where it was necessary both to raise large amounts of capital and to limit the risks of the investors. Changes of the description just mentioned, however, were more particularly a characteristic of the period after 1860 than of the one before that date.

122. **The Tariff Policy.**—Three periods may be distinguished in the tariff history of the United States before 1861. The first covered the years from 1789 to 1816. Although the principle of protection had been applied the rates were low, compared with those subsequently imposed. Considering the tariff policy of these years as a whole the need of revenue outweighed that of protection. The second period extended from 1816 to 1833. Rates were steadily raised, the principle of protection was extended, and an effort was made to employ protection to promote the growth of industries. The third period dates from 1833 to 1861; the tendency of rates, on the whole, was downward.

The growth of industries from 1808 to 1816, the emergency created by the large importations beginning about 1815, and the development after 1816 of a strong national sentiment produced a change of attitude with respect to the tariff. Arguments were now put forth favoring protection as a means of defending infant industries, of fostering the growth of the home market, of encouraging the investment in this country of foreign capital, of stimulating immigration, and of the development of a well rounded industrial system, including the exploitation of the varied resources of the country. Most of these arguments had been presented at an earlier date by Hamilton, but the occasion had arrived when they were to be used with telling force. The large importations of English goods threatened many American manufactures with destruction. Some

of the leading statesmen of the day took the broad view that this outcome would be a misfortune not only for the manufactures involved but for the country as a whole. The Act of 1816, therefore, received a large amount of support from every section of the country; the measure even received votes of Southern representatives who a few years later began to regard protection as a detriment. A duty of 25 per cent on cotton and woolen was to prevail until June 30, 1819, and 20 per cent after that date; in addition the minimum principle was introduced to apply to cottons, to the effect that all cotton cloths whose original cost was less than 25 cents a square yard were to pay duty as if worth that amount. An *ad valorem* duty of 30 per cent was to apply to certain articles, including leather, paper, hats, carriages, cabinet wares, and manufactured wood, and a specific duty of 3 cents a pound was placed on sugar.

123. The Acts of 1824 and 1833.—Both the need of revenue and the desire for more protection led to further tariff changes. An Act of 1818 increased the protection for iron, and extended the 25 per cent duty on cottons and woolens until 1826. In the general revision of 1824 additional protection was given to manufactures of wool, hemp, lead, glass, and iron. Wool growers, who now became a factor in tariff making, were granted a specific duty on wool. The minimum principle was extended to include woolens, and the minimum valuation of cottons was raised in order to protect some of the finer grades. Hemp manufactures were protected to the extent of 25 per cent. Sectional interests now began to play an important part in the tariff controversy. Southern representatives were beginning to feel that protection injured their section; commercial regions, as a rule, stood out against the policy. On the other hand, the iron interests of Pennsylvania, the wool growers of Ohio and of the Middle States, the hemp grow-

ers of Kentucky, and the farmers in many sections, attracted by the home-market argument, favored protection.

The woolen interests, after 1824, came to the front and led an agitation for higher rates. The politicians of the times saw in the situation an opportunity to embarrass Adams and Clay who were candidates for the presidency. "The plot was to report a bill protective in character but carrying such high duties on raw materials that it would be extremely burdensome to the manufacturers of New England; the dissatisfied elements were then expected to join with the South, which was opposed to protection in any form, and their combined effort could prevent the passage of any bill. Thus the prestige of Adams and Clay would be weakened and Jackson would not be committed."[6] The unfortunate features of the bill became a part of the Tariff Act in 1828, and thus came into existence the "tariff of abominations." It was on the statute books for only a brief period but this was long enough to create a reaction in favor of lower duties, and to lead to serious political complications.

The Act of 1832 removed many of the "abominations" of the former Act, and, in a general way, placed the protective system back on the basis of 1824. Even this, however, did not satisfy a portion of the country. The Nullification Ordinance of South Carolina which contained the following provision created a serious condition: "that the tariff law of 1828, and the amendment of the same in 1832, are null and void and no law, nor binding upon this State, its officers and citizens." The compromise tariff of 1833 was the outcome. This Act provided for a biennial reduction of the rates from 1834 to 1842 until at the latter date the level was to be 20 per cent.

124. The Tariff Acts of 1842 and 1857.—The reductions provided for by the compromise Tariff were finally

[6] Dewey, *Financial History of the United States*, p. 178.

accomplished in 1842. Meanwhile the public revenue declined after the panic of 1837; for several years the Government faced a deficit. Protectionists now urged that the tariff did not provide revenue enough to supply the Treasury and that the rates were too low to afford adequate protection. They were able to secure the passage of the Act of 1842 which for a brief period restored the high protective duties. But the Act of 1846, passed after the return of the Democrats to power, again put the tariff on a low basis. The Walker tariff of 1846 provided for the division of commodities into classes A, B, C, D, etc. On class A, including brandy, spirits, etc., the rate was 100 per cent; on class B, including spices, cigars, snuff, and manufactured tobacco, the rate was 40 per cent; on classes C, D, E, and F, which contained most of the commercial products, the rates were 30, 25, and 20 per cent, respectively. Among other features the Act provided for a change from specific to *ad valorem* duties, for the introduction of the warehousing system for the storing of imported goods until the duty was paid, and for a change in the method of appraising commodities whereby (by the Act of 1846 as subsequently modified in 1851) the value was based on market or wholesale price at the time of exportation to the United States; to this were added costs of packing, commissions, wharf dues, and other foreign charges. In 1857 it became necessary to relieve the Treasury of redundant revenues; the method employed was to reduce the rates on various classes mentioned in the Act of 1846, a reduction of about 5 per cent from the tariff of 1846. Meanwhile, the free list was enlarged. These changes met with little or no opposition.

125. The Labor Movement.—The development of the factory system produced radical changes in the relation of laborers to industry. They were no longer home workers, or small merchant-producers, owning the implements of

production; they lost control over the production and distribution of goods; these matters now passed into the hands of the employing classes. Hours, wages, and conditions of work were determined by factory managers. Meanwhile, the congregation of workers in industrial centers afforded an opportunity for contact and discussion. United action against various disagreeable features of the factory system now became possible. Out of these conditions gradually evolved the labor movement. For years it was necessarily weak, unorganized, and without principles or philosophy; but in time some of these unifying elements were gradually supplied.

An association of journeymen shoemakers existed in Philadelphia as early as 1792, and in 1795 the tailors of Baltimore formed an organization. In November, 1803, the sailors in New York quit their jobs and paraded the streets demanding an increase in wages. Occurrences of this kind became more frequent during the next two decades. But organization was hampered by lack of experience, by the absence of united purpose, and probably by the attitude of the courts which looked upon organizations of laborers as conspiracies. The unions of this time were small local affairs; they were often formed for some particular purpose and when this was accomplished they fell to pieces.

The good times from 1823 to 1837, especially the latter part of the period, witnessed a lively interest of laborers in organizations. The rapid advance of prices after 1832 made some form of union necessary to maintain living standards. Long hours, in many instances from sunrise to sunset, had long been a grievance. A large number of local unions sprang up suddenly; in some instances these were formed into city federations, and an attempt was made to bring all organized workers into a national federation. But the crisis of 1837 brought the movement to an

end. The agitation was confined largely to the Eastern States. A writer in Pittsburgh in 1836 maintained that the only striking in that city was "striking lawfully with the hammer." Higher wages and lower food prices in the Western country relieved the workers of the hardships encountered in the East.

Although trade unions were formed during the next twenty years, and although at least one national union, the printers' union, came into existence, conditions, on the whole, were unfavorable to an extensive development of the labor movement. The anti-slavery controversy more and more absorbed the attention of the public; but what was of more significance, the rapid opening of the country and the enormous expansion of industries so increased the demand for labor that wages rose more rapidly than prices. Farming, or higher wages in the new country, afforded an outlet for the dissatisfied workers in older parts of the United States. Laborers, therefore, who were partaking to an unusual extent in the prosperity of the times found no particular advantage in organization, nor could organization be permanent where men were constantly on the move.

126. The Humanitarian Movement.—The communistic and socialistic experiments of the years from 1825 to 1860 probably drew very little response from the laboring classes, but they both attracted the attention and enlisted the support of some leading thinkers of the times.

In 1825 Robert Owen visited this country and was able to create a great deal of interest in his ideas of social reform. Owen was the founder and part owner of an establishment in New Lanark, Scotland. He had devoted a considerable part of his life and consumed much of his fortune in work of social betterment. He advocated the abolition of child labor, shortening the working day, the establishment of schools, and the general uplift of the working classes. Since his experiments encountered opposition in

Britain, he decided to come to America where he expected to find conditions more favorable. A tract of 30,000 acres was purchased at New Harmony, Indiana, and an invitation extended to the "industrious and well-disposed of all nations" to come to the settlement. This experiment, with most of the others of the kind, failed. According to Owen, failure was due to lack of mutual confidence, to inexperience in settlements of this description, and to conflict of interest and views among members of the society.

Social reform on the model of Charles Fourier, a French writer, met with no better success. The plan suggested by Fourier was to organize society into groups or phalanxes; these groups were to live together in a common dwelling; they were to devote themselves to occupations which suited their liking, and in the event that an occupation became irksome the workers were to seek variety in others; idlers were to be eliminated, and members of the society were to work for the common good. From the gains of the phalanx at least enough was to be set aside to provide a minimum of subsistence for every member, but provision was made for the reward of superior skill and talent. Some thirty or forty of these societies were formed in the United States but they were soon abandoned. The Brook Farm experiment, begun in 1841, which counted among its members a number of noted persons in Boston and the vicinity, was broken up about 1847 and with this Fourierism in America came to an end.

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CHAPTER X

COMMERCIAL EXPANSION

On a number of occasions in previous chapters we have referred to the influence of banking and transportation on the growth of industries. It goes without saying that this country could have made very little progress if settlements had remained isolated as in Colonial days and in the early pioneer period. Before farms and factories could develop, transportation facilities were required, middlemen were needed to assume the burden and responsibility of collecting products for the markets, and agencies of some kind were demanded to provide money and credit. Industry could make but little progress without these; on the other hand, when such means were provided they became a great stimulus to industrial expansion in every field. The character of the commercial industries, as was the case with farming and manufacturing, was molded largely by the economic conditions of the times. Pioneering occurred in the commercial field, as in every other. Hence for some years, the commercial branches struggled against adverse conditions, without knowledge or experience, and only in time, with the training that comes from experience, were they put on a stable basis. Many of the evils of bad banking and the excesses during the rage for internal improvements were largely products of pioneer conditions. The following are the principal topics for discussion in this chapter: (*a*) development in money and banking; (*b*) growth of means of communication; and (*c*) the growth of foreign and domestic commerce.

127. **The Second United States Bank.**—After the termination of the first United States Bank the field was soon occupied by an increasing number of State institutions, the number increasing from 88 to 246 in the years from 1811 to 1816. In many instances the persons who engaged in this business were not bankers; they had no adequate conception of sound banking principles and no way to learn except by experience. Along with pioneers in other lines they made mistakes. To many of these bankers money, no doubt, meant capital, and they were under the impression that they were increasing the capital of the community when they enlarged their circulation. They did not distinguish between loans for commercial and investment purposes; consequently, accommodations were granted not only to merchants, but to purchasers of land, and to founders of shops and factories. Thus the resources of these banks were often involved in investments which could not readily be converted into cash. Moreover, the banks of the times were large buyers of Government loans, and such securities were sometimes a source of embarrassment because they could not at all times be converted promptly into money. Loans were extended freely to all kinds of enterprises, usually in the form of notes. From 1812 to 1817 circulation increased from $45,000,000 to $100,000,000. These notes were in all states of depreciation, varying from 10 per cent in New York State to upwards of 50 per cent in some of the Western States.

When the first United States Bank came to an end, more than $7,000,000 due foreign stockholders was exported in the form of specie. This was a serious loss; in 1814, at a critical period during the war, most of the banks except those in New England, suspended specie payment. Due to these various causes, at the conclusion of the war, the finances of the country were in a state of disorder. The Government was in need of an institution in which it could

have confidence, and to which it could entrust the administration of its funds. Secretary of the Treasury Dallas, therefore, urged the creation of another United States Bank. In his opinion it would render two important services; first, it would supply financial aid to the Government; and second, it would aid in the restoration of the currency.

The Bank was chartered in 1816 for twenty years. The amount of capital was $35,000,000, of which the Government took one-fifth. The remaining $28,000,000 was to be purchased by the public, with the provision that $21,000,000 was to be subscribed in funded government debt. The Bank was permitted to issue notes to the amount of its capital, and these were receivable in all payments to the United States. Five of the 25 directors were to be appointed by the President. As with the first Bank, the new institution was permitted to establish branches and subsequently about 25 were founded. It was expected that the Bank would render various useful services to the Government; the purchase of United States securities by prospective stockholders would tend to raise their price; the institution was to be a depository of public funds, unless the Secretary of the Treasury elected to make other disposition, and in that event he was required to submit his reasons to Congress; and the Bank was to transfer Government funds from place to place without charge. The institution, of course, would lend to the Government in cases of emergency. In 1817 Congress provided that "all dues to the Government should be paid in legal currency, Treasury notes, notes of the Bank of the United States, and in notes of banks which are payable and paid on demand in the said currency of the United States." It was expected that this provision would compel State banks to limit their issues and maintain their convertibility.

During the first three years the Bank was badly managed and narrowly escaped bankruptcy. A portion of the

stock had been paid in the personal notes of the subscribers, and the Bank failed to obtain by subscription the full amount of specie required by its charter. Its own notes were issued in excess; it loaned freely without adequate security; instead of checking reckless banking its own measures did much to promote it. Because of oppressive measures it obtained the ill-will of State banks almost from the start. In 1819 its affairs were reorganized, a new president was appointed, and from that time until the end of its career its business was well managed.

The hostility of the State banks continued. In performing its function as a regulator of the currency the national institution kept alive the ill-will of the banks, particularly in the South and West. Subsequently it encountered the opposition of Andrew Jackson. The Bank was charged with using its funds for political purposes, and in the eyes of Jackson it was a dangerous monopoly. Failing to have its charter renewed, it became an institution under the laws of Pennsylvania. It was later involved in speculation and forced to suspend during the crisis of 1837, and in 1841 it was again forced to suspend and went into liquidation.

128. **Banking Development.**—The field was now occupied chiefly by State banks. From 1836 to 1860 noteworthy progress was made in correcting some of the evils of bad banking. The following purposes were involved in reform: (*a*) to check excessive issues of bank notes, and to provide for their prompt redemption; (*b*) to provide means for the protection of creditors of banks, particularly note holders and depositors; (*c*) to get rid of incorporation by special charter and thus open the field of banking to any group of persons who conformed to a set legal routine in applying for incorporation. Some of the leading features of this period were the development of the Suffolk Bank system in New England, of the Safety Fund and Free Banking

systems of New York, the spread of free banking to other States, experiments with banking by a number of States and the inauguration of the independent Treasury system.

129. The Suffolk Bank System.—One of the great evils of the time was the excessive issue of bank notes. These declined in value. The notes of weak banks tended to drive those of strong banks out of circulation. In addition, with so many banks issuing notes, it was impossible for either banks or merchants to keep track of the numerous issues and to know with certainty the standing of the issuing institutions. Counterfeiters took advantage of the situation and flooded the country with spurious bills. The Suffolk Bank system was designed to remedy some of these evils. The plan originated with the Suffolk Bank of Boston. Shortly after its incorporation in 1818 this bank adopted the policy of collecting notes of country banks and returning them for redemption in specie. In 1824 other Boston banks joined the Suffolk, contributing sufficient funds to enable it to extend its operation throughout New England. Country banks were asked to make a "permanent deposit with the Suffolk of $2,000 or upwards, according to the amount of (their) capital, and such additional sum as might be necessary to redeem all (their) notes that should come to Boston."[1] If they failed to comply, the policy was to return their notes for collection; but in case they agreed, the Suffolk Bank would receive their notes at par. Thus "the Suffolk Bank became a clearing house for the notes of New England banks in Boston, balancing them against each other every day. When the notes were sorted and redeemed they were placed in packages and held subject to the order of the issuing bank." In 1845 Massachusetts required by law that banks should pay only their own notes over their counters. This compelled the institutions which received notes of other banks to send them to the

[1] Horace White, *Money and Banking*, p. 295.

Suffolk for redemption. This arrangement continued until the enactment of the National Bank Act.

130. The Safety Fund System.—During these years, New York made two contributions to banking development. The Safety Fund plan, or "mutual insurance of circulating notes," [2] adopted in New York in 1829, required "every bank whose charter should be granted or extended thereafter" to contribute annually an amount equal to ½ of 1 per cent of its capital each year until the payments amounted to 3 per cent of the capital. In case of failure, after the bank had exhausted its other resources, this fund was to be used to pay the debts of the bank, exclusive of capital stock. Failures in 1841–1842 taxed the system severely; its subsequent development was checked by the growth of free banking. The system was adopted by our neighbor, Canada, in 1890.

131. The Free Bank System.—Prior to 1838 banks in New York came into existence under special charter. "Nobody could get a charter without a special act of the legislature, and nobody could invest even $100 in a new bank without the consent of the bank commissioners of the State. When a charter was granted, these officials parceled out, as a matter of favoritism and partisan spoils, the right to subscribe for shares. Contention and heart burning were the necessary consequence." [3]

In substance, the free banking law of 1838 in New York provided that any person or association of persons might deposit certain kinds of security with the state comptroller, and might receive in return circulating notes. Originally the security included stock of the United States, of the State of New York, or of other States approved by the comptroller; mortgages, also, on improved and productive real estate worth double the amount of the mortgage might

[2] *Ibid.*, p. 303.

[3] White, *Money and Banking*, p. 311.

be deposited. In case of failure of a bank, the comptroller was to sell the security and use the proceeds to pay the notes. Unfortunately, mortgages and securities other than stock of New York and the Federal Government proved to be an insufficient protection for notes, and subsequently the law was amended to limit the deposit to stocks of the United States and of New York State. There were other shortcomings. Notes were sometimes issued in distant, or interior, towns so as to delay their repayment; thus, in 1840, the law was amended to require redemption in Albany or New York City at a discount not exceeding ½ of 1 per cent, and, since a loop-hole was still left open, another amendment of 1844 provided that no one should conduct banking business except at the place of his actual residence. Further amendment in 1846 made stockholders liable not only for the amount invested in the bank, but for an additional amount equal to their shares.

The development of banking under the laws of New York not only affected banking in other States, but contributed to that of the United States, the New York laws, in fact, forecasting the national banking system.

132. Free Banking in Other States.—If the development of free banking in New York showed how the system might be successfully revised so as to be of real service to the community, the experience of many other States demonstrated what would happen if free rein were given to the nascent bankers. The principles involved in free banking found enthusiastic supporters in many Western and Southern States where restrictions of any kind were burdensome, and where the great desideratum was an abundance of money. In all about 16 States adopted the system in whole or in part; among others, Illinois in 1851, Indiana in 1852, and Wisconsin in 1853. Some States enacted special editions of the system to enlarge upon its freedom. Hundreds of banks came into existence without paid-in capital of any

amount; they issued notes freely, paid out nothing but paper, and where inspection was provided by the laws, managed by skilful methods to evade bank examiners. They were banks of issue only. If banks in larger towns or cities attempted to do a legitimate banking business, they soon found that their own notes were returned promptly for payment while those of the worthless institutions continued to circulate. In many cases it was difficult, if not impossible, to find the issuing "bank." Many of these institutions "were located in the depths of the forests where there were few human habitations, but plenty of wild cats. Thus they came to be known as the 'wild-cat banks.' "[4]

To make matters worse counterfeiting was widely and successfully practiced. Owing to the great variety of paper money in circulation it was possible even for an unskilled counterfeiter to "doctor" the notes; he could alter genuine notes from lower to higher denominations, insert the name of solvent banks on the notes of failed banks, put into circulation notes bearing the names of banks that had never been in existence, and so on. Publications under the title of "Counterfeit Detector" and "Bank-note Reporter" were circulated for the benefit of bankers and merchants who sought to learn something about the countless variety of paper. Banking in many parts of the country was not rescued from this chaos until the formation of the national banking system. In fact, one of the strongest arguments in favor of a national law was the hopeless confusion of the currency; experience had already revealed some of the necessary provisions of the prospective law.

133. State-Owned Banks.—State-owned banks were established in a number of commonwealths and met with varying success. Indiana founded such an establishment in 1834, modeled largely on the Bank of the United States. In 1845 Ohio established a bank which incorporated both

[4] , p. 327.

the principles of the safety fund and bond-secured currency. And Louisiana in 1842 founded a State-owned bank. These institutions issued bank notes, for it was held by our Supreme Court that these notes were not bills of credit. State-owned banks in Mississippi, Arkansas, Florida, and Kentucky, among others, were a failure.

134. The Independent Treasury System.—When the second United States Bank came to an end, two courses were open to the Government in disposing of its funds: to deposit in selected State banks, or to establish a Treasury system of its own. Temporarily, the former plan was adopted; but this was open to the objection that it led to favoritism, that political influence was apt to be brought to bear in the selection of depository banks, and that in the event of failure the Government would be a loser. In 1840 Congress passed a law establishing an independent Treasury, but in 1841, when the Whigs were in power, the system was abolished. However, it was reëstablished in 1846 on the return of the Democrats. By this system the Government Treasury and subtreasuries are depositories for Federal funds. Until the Civil War collections and disbursements of the Government's funds were made entirely in specie.

135. Coinage.—Only small quantities of gold were produced in the United States prior to 1848. Hard money was usually scarce, and this was always the case in the newer parts of the country. In these sections the immigrant trade was the chief source of metal, but this was soon collected by merchants for export to the East to pay their debts. Fractional money was obtained by cutting larger pieces into halves, quarters, and eighths. In a measure, this practice of dividing the coins tended to keep the fractions in circulation because banks were loath to accept cut pieces.

Under the Coinage Act of 1792 the ratio between gold

and silver had been 15 to 1. Gold was undervalued and very little was brought in for coinage. In the hope of restoring gold to circulation, Congress in 1834 reduced the weight of the eagle to 232 grains of pure gold; the fineness was changed in 1837 to $\frac{9}{10}$ for both gold and silver coins. With this change the weight of the eagle was 232.2 fine gold, and the mint ratio between gold and silver about 16 to 1. This undervalued silver which was now worth more as bullion than as coin. With the discovery of gold in California the relative market value of gold and silver departed still further from the mint ratio, and it became even more difficult to keep silver in circulation. In time, the effect was felt on the fractional currency which began to disappear from circulation. It was necessary to revise the coinage laws to meet this situation. Thus the Act of 1853 reduced the weight of new fractional coins about 7 per cent and provided that they should no longer be legal tender for more than $5.00. Minor coins were now minted only from bullion purchased by the Government at the market price, and free and unlimited coinage of these pieces was abandoned.

136. Means of Communication.—By 1860, as the result of numerous experiments, banking in some parts of the country had been placed upon a sound foundation. The leading principles were clearly understood, and the evils of bad banking were fully appreciated. A foundation had been laid for the establishment of a sound banking system for the entire country. The development of transportation experienced a similar history. Thus the general features were many ill-advised experiments, mistakes, and shifts from one kind of improvement to another, until finally railroads demonstrated their superiority over other means of transportation. However, it required more than half a century after the founding of our Government to reach this goal.

137. **The Backward State of Improvements.**—Water transportation was the earliest important means of freight conveyance in the United States, except perhaps in the country west of the Mississippi River where the shallowness and uncertainty of the streams made land carriage on a large scale necessary. Considering the country as a whole, the waterways either natural or artificial, continued to be the most important means of transportation until after 1860.

In the case of improvements made by man, the order of introduction was improved roads and turnpikes, canals and improved rivers, and railroads. Each of these, in turn, was a dominant form, and thus the transportation periods have taken their name from the form that most attracted public interest at the time. On the rivers the earliest means of conveyance were canoes and piroques, used largely by Indians and fur traders; before the introduction of steamboats the early pioneers used flat and keel boats, the latter chiefly for up-river transportation; this was the second stage in the growth of river commerce. The steamboat inaugurated the third and most important stage; this means of transportation, as will appear presently, was one of the great factors in the industrial growth of the country.

With few exceptions, roads in the older parts of the country were in a wretched state even for some years after the formation of the Government of the United States. As late as 1768 roads between "the two principal trading cities of North America, Philadelphia and New York, were seldom passable without danger of difficulty."[5] In New England in 1784 there were no bridges over the great rivers, and "roads were bad, and all journeys were made on horseback or in stage-coaches or in boats."[6] If this was the state of

[5] Meyer, MacGill, *et al.*, *History of Transportation in the United States before 1860*, p. 54.

transportation in one of the oldest sections of the country, one can imagine what it must have been elsewhere. In the newer regions, highways were not much more than trails, in many instances following the routes formerly taken by Indians and traders and developing in time into bridle-paths, and later into rough wagon roads. Conveyance of freight, except limited quantities which could be carried on horseback, was out of the question. Roads everywhere, at this time, therefore, were used chiefly for passenger travel.

The delay in covering the country with good roads was due to a number of causes. One of the most important was the splendid inland communication afforded by the rivers. Waterways, in fact, largely controlled the location of settlements because pioneers usually took up sites along the rivers which afforded the only immediate access to the outside world. Where the stream provided such an outlet there was no pressing need for roads, at least for long-distance travel. Moreover, the great cost involved in road building was a discouragement. It was necessary to clear trees and underbrush, to bridge streams, to level the surface, and frequently to cut passageways in rocks and hillsides, and in some parts of the country the nature of the soil made it impossible to maintain a road in good condition.

Further, when population began to scatter over the country, the task of providing the communities with roads was overwhelming. Settlements were often far apart, important markets were distant, the cost of building was great, and both labor and funds for the work scarce. Even where the work was undertaken by State or Federal Governments, the best that could be done was to construct a few great highways and leave the task of building local roads to the communities themselves. But on the other hand, the demand for improvements was urgent. Highways of some description were needed to facilitate the movement of emi-

grants, to distribute mails, to provide transportation for some goods urgently needed by all settlements, and to provide a quick means for the movement of troops. And, in addition, there was always the need of binding the country together politically. Farmers knew that improvements would widen markets, increase immigration, bring ready money into the community, increase the value of land, and promote prosperity; hence their influence was always in favor of such work.

138. Turnpikes.—No doubt, illustrations could be given of some very good roads in the United States before 1790, but these were the exception rather than the rule. "Roads similar to the macadamized roads had been made in Pennsylvania long before they were laid in England and had been tested. As Macadam went to England from America in 1783, he doubtless only followed methods he had seen used with success in the latter country in constructing the roads called after his name in England. Not to speak of others, 'the Salem and Boston Turnpike, the Essex Turnpike between Salem and Andover, and the Newburyport Turnpike, all macadamized roads, were in successful operation before Telford and Macadam had perfected their systems.' "[7]

Shortly after the close of the Revolution the States began to take an active interest in internal improvements, and this developed into something of a mania. The Middle States, with a large back country to develop, with an increasing number of frontier settlements to provide for, and with the need of building up seaboard cities against rival cities in other States, were among the first to make extensive provisions for improvements. As early as 1785 Pennsylvania enacted a law providing for the opening of roads to the interior. The Lancaster Turnpike, 62 miles long, from Lancaster to Philadelphia, was begun in 1792

[7] *Ibid.*, p. 52.

and completed in 1794 at a cost of $465,000. From 1792 to 1822 about 86 turnpike companies had been chartered in Pennsylvania, and during the next ten years about 140 were added to the list. These companies constructed about 2,200 miles of roads at a cost varying from $900 to $7,000 a mile, depending on the character of the country. "The roads, particularly such as lead through a populous country, are constructed of stone, others are of earth, all made upon plans which would not now (1831) be approved, but which nevertheless enable the traveler drawn in a coach by four horses to travel from Philadelphia to Pittsburgh, a distance of 303 miles, in 60 hours, and on shorter journies at the rate of from 6 to 7 miles the hour."[8] As early as 1789 a freight road had been opened to the Monongahela, and connections thus established by way of this road and the Monongahela River with the Ohio country.

Roadbuilding was taken up by other States. Prior to 1811, more than 135 companies had been chartered in New York with a combined capital of over $7,500,000. These companies were authorized to build about 4,500 miles of roads, and by 1810 had constructed about 1,500 miles. In New England upwards of 180 companies had been chartered before 1810.

139. Gallatin's Plan.—Numerous appeals to the Federal Government for aid led to a resolution in the Senate of the United States calling upon Albert Gallatin, Secretary of the Treasury, to make a survey and report on the question of internal improvements. This report was made on April 4, 1808, and gives a good summary view of the numerous works then in prospect, which Gallatin suggested might be combined into a national system. The War of 1812 put an end temporarily to work of this description, and Gallatin's plan was never carried out, but portions of his scheme were later brought into existence, in some instances with

[8] *Gazetteer of the State of Pennsylvania (1832)*, p. 35.

Lake Champlain; and there was to be a system of roads embracing links between Pittsburgh, Detroit, St. Louis, and New Orleans. The total cost was estimated at $20,000,000.

140. The Cumberland Road.—By 1800 the population of the region immediately tributary to the Ohio was probably more than 400,000; immigrants were moving in at the rate of more than 50,000 a year, and yet there was no satisfactory means of communication between the East and West. The immigrants had followed three or four well established routes, but in most instances these were circuitous, and in all cases the roads were in a bad condition. What was most urgently needed was a highway which could be kept in good condition, running by the shortest and most direct route from East to West. This was needed to reduce the cost and hardships of emigration, to hasten the delivery of mails, to enable Eastern merchants to communicate quickly with agents or factors in the new country, and to facilitate speedy communication between local Federal officers and the Government at Washington. This road would also make possible the freighting of the more expensive articles of dry goods and groceries destined for consumption in the West, but it would be of small importance for the delivery in the East of Western products. The Cumberland Road was designed to accomplish the purposes named above.

When Ohio was admitted to the Union in 1803, a provision was made to set aside 5 per cent of the net proceeds of the sale of public land within that State for the building of roads; 3 per cent to be expended within Ohio under the direction of the legislature, and 2 per cent under the authority of Congress for the construction of roads to and through the State. Nothing was done until March 29, 1806, when Congress provided for the appointment of three commissioners to lay out the road, and made certain provisions with regard to methods of construction. Although

work was begun shortly after, the road was not opened for traffic to Wheeling on the Ohio until 1818. This highway was continued from time to time until 1838, the route extending through Zanesville, Columbus, and Indianapolis, to Vandalia, Illinois. At this date the building of railroads had become the absorbing interest, and it was evident that the country would be much better served by steam transportation than by roads. In all, the Federal Government spent on construction and maintenance about $6,821,200.

Some of the results of the road may be summarized as follows:

Immediately after being opened to the Ohio River, the Cumberland Road became one of the chief avenues to the West. A flow of traffic swept over the great highway immediately upon its completion. It enabled goods to be hauled from Baltimore to the Ohio at a considerable reduction in the cost of transportation and thus enabled that city to increase her trade in the western country, somewhat at the expense of Philadelphia. Wheeling, too, was much benefited for a time. It was said that in 1822 a single one of the five commission houses at Wheeling unloaded 1,081 wagons, and paid for the freightage of goods the sum of $90,000. In addition to the old taverns where the road followed former routes, there sprang up many new taverns, and all were crowded with travelers. Its greatest utility was, however, in the transmission of the mails. For this purpose speed was the first desideratum, and the solid road-bed and low grades, as well as the direct route of the Cumberland Road, made it the natural avenue for the transportation of the great Western mail from Washington City.[9]

141. The Canal Period.—The cost of carriage over even an improved road prohibited long-distance traffic for the bulky articles of the farm. It was estimated that flour would not stand the cost of freighting 150 miles. The charge for carrying goods from Baltimore to Pittsburgh in

[9] *History of Transportation in the United States before 1860*, p. 18.

1803 was about $4.50 per hundred pounds, and from Philadelphia about $5.00. To Lexington, Kentucky, the cost was from $7.00 to $8.00. The time required for delivery at this place from Philadelphia was from 35 to 40 days. Rates varied with the season of the year and with the volume of east- and west-bound traffic, but they were never low enough over the roads to permit extensive development of east-bound freight business. In case of New York, according to a report to the legislature in 1817, the cost of shipping from Buffalo to New York prior to 1817 had been about $100 a ton, which, according to this report, was more than three times the usual market value of wheat, six times that of corn, and twelve times that of oats.

Owing to the prohibitive freight charges, trade with western New York sought the cheapest route, down the Susquehanna to Baltimore, and New York City was deprived of an extensive market lying within the borders of the State. This in itself was a potent reason for desiring water communication with the West, but there were other reasons, as will appear presently. In the last analysis the enthusiasm for canals lay in the belief that they offered the cheapest known means of transportation. All other benefits flowed from this.

A number of short canals had been constructed before the mania beset this country shortly after the close of the War of 1812. Among others, the Schuylkill and Susquehanna Canal in Pennsylvania was commenced in 1791; and in 1794 one of the western sections four miles long was opened for traffic. But in that year work was suspended and not resumed again until 1816. The Santee Canal, which connected Charleston with the Santee River, was completed in 1802 at a cost of $700,000. Various improvements which were later incorporated in the Erie Canal had been discussed seriously in New York during the latter part of the Colonial period. But prior to the beginning of

the Erie no great work had been attempted. The States seemed to have been awaiting the outcome of the experiment in New York before launching similar enterprises. But with the success of the Erie Canal there was a mad rush among other States to begin similar works.

The Erie Canal was not only the greatest work of its kind, but one of the greatest single factors promoting the industrial growth of the country. The wisdom of the projectors was more than verified; the work not only fulfilled their expectations, but produced benefits which they had not foreseen and had not intended. The significance of the Canal lay not only in the fact that it afforded a splendid outlet for the bulky products of the interior, but that it upset many old trade relations, gave the advantages to New York City, raised the rivalry of the Eastern ports to a higher plane, and tremendously stimulated the promotions of canals elsewhere. It made possible the extensive development of the country surrounding the Great Lakes, stimulated the commercial and industrial growth of a number of Lakes cities, as well as those along the Canal in New York, widened the market for agricultural products and increased their price, and diminished prices of commodities imported into the interior. Meanwhile, it increased the value of land, stimulated farmers and merchants everywhere by the thought of gain, and brought an era of great prosperity to a large portion of the United States.

The Erie Canal had a long history before the plans culminated in the work of the years 1817 to 1825. In the well known arguments of P. B. Porter, at one time member of Congress from New York, the advantages were emphasized from both the political and economic points of view. This work, according to Porter, was "indispensable to the preservation of the integrity of this Government"; it would "unlock the internal resources of the State"; and the regions of the interior would be enabled to exchange

surplus products and raw materials for the merchandise and manufactured articles of the Eastern States. "We should not count the expense," said Porter, "since the rise in values and the increase in trade will compensate that." Robert Fulton had already stated in a letter to Albert Gallatin, dated December 7, 1807, that transportation by canal was much cheaper than that by land. No argument was wanting, therefore, but that of experience in construction and operation, and that necessary test was soon to be given.

The completion of the Erie Canal in 1825 was the signal for an outburst of enthusiasm not only for canals but for other forms of improvement. This time, the Western States, which had grown in population, and which were badly in need of means of communication, became interested. The demand for internal improvements became one of the greatest issues of the day. In the first Constitution of Missouri in 1820 it was stated that "Internal improvements shall forever be encouraged by the government of this State, and it shall be the duty of the General Assembly, as soon as may be, to make provision by law for ascertaining the most proper objects of improvement in relation to both roads and navigable rivers." The Constitution of Michigan in 1835, and that of Arkansas in 1836 contain similar provisions.

With the prospect of obtaining a cheap outlet by way of the Great Lakes and Erie Canal several of the Western States entered upon a period of canal building. In 1825, Ohio contracted her first debt for this purpose, and eventually constructed two waterways running the length of the State, to say nothing of branches. The main line included the Ohio and Erie works from Portsmouth to Cleveland, and the Miami Canal from Cincinnati to Defiance, where the waterway joined with the Wabash and Erie improvement, originating in Indiana. The State just named

projected, in addition, the Whitewater and Central Canals, and pledged over $21,000,000 for public works. Illinois constructed the Illinois and Michigan Canal to join the Illinois River with Lake Michigan at Chicago; and a short canal was constructed around the falls of the Ohio at Louisville.

A number of Eastern States took up the movement but for a different reason. The Erie Canal gave to New York the preponderance of advantages of trade with the West. Since canals were still the most approved means of communication, it was necessary for Philadelphia and Baltimore to be provided with similar inland communications if they were to hold their own in their race with New York. In February, 1825, the legislature of Pennsylvania authorized the construction of a trunk line made up partly of canals and partly of portage railways from Philadelphia to Pittsburgh. Work was begun in July of the same year, and the improvements completed in 1834. The Pennsylvania works, however, failed to achieve the results credited to the Erie Canal, partly because of the transhipments required by this route, and partly because the country which the improvements tapped was not as productive as that served by the Erie Canal. But these improvements enabled Philadelphia to retain some of the trade that otherwise would have been lost. Works projected from Baltimore were not completed because of insuperable difficulties involved in construction, and the proposal to extend a canal from Boston to the Hudson River was abandoned as impracticable.

The magnitude of these various improvements is indicated by the fact that from 1820 to 1838 the States contracted debts aggregating $157,000,000 of which over $110,000,000 was for canals, roads, and railroads. In 1838, only eight States had not contracted debts for these purposes. The mileage of canals in the United States in

1830 was estimated at 1,270, at 3,320 in 1840, and at 3,700 in 1850.

142. **The Effect of the Crisis of 1837.**—Many of the public works had been started in an era of enthusiasm without careful study of difficulties of construction, of probable income, and of the prospective ability of the States to pay interest and principal. Many of the improvements were unnecessary. Waste was inevitable. As with other enterprises of the time, speculation entered into the planning and execution of the work. When the crisis of 1837 came, it was necessary to suspend work; most of the States were unable to pay interest, and reorganization, and sometimes repudiation, followed. In the midst of this distress some States agitated the proposition of having the Federal Government assume the debts, but nothing was done. Subsequently, a number of States sold their improvements and retired from the business of aiding public works; others reorganized their finances and made an effort to complete necessary enterprises. Before good times were restored after the crisis, public interest had shifted largely to railroad building.

143. **Early Era of the Railroads.**—The railroads offered a solution to the traffic problem which was not available for communities living away from the navigable water courses. Railway construction was not confined to the neighborhood of streams, nor was it rigidly restricted by the lay of the land. Tracks could be laid in every part of the country; they could even be brought into sheds and factories; numerous transhipments were not necessary, at least after the railroads had been combined into continuous lines; thus railroads overcame one of the great difficulties of canal transportation. Moreover, trains could be operated at all seasons, which of course was an advantage over canals, which were sometimes closed by ice or drought. The benefits of railroad building could, therefore, be obtained by all

sections. When the railway era began, the competitive area was greatly enlarged, and seaboard and inland cities which formerly had no opportunity to enter the contest now became active competitors for trade. This condition afforded one of the strongest incentives for rapid railroad building.

144. The First Railroads.—On July 4, 1828, Charles Carroll of Carrollton, Maryland, the last surviving signer of the Declaration of Independence, laid the cornerstone of the Baltimore and Ohio, the first railroad in the modern sense built in the United States. The charter had been granted the year before. The first division, 13 miles long, was opened in 1830, and the line was completed to Frederick, a distance of 70 miles, in 1831. Connection was established with Washington in August, 1835, and with New York City four years later.

The problems confronting early railway builders were entirely new, and to them, at times, almost insuperable. From time to time persons were sent to Europe to learn how similar situations were being met, but conditions in the United States were so different that the engineers were thrown back largely on their own resources. Among the early problems were those of suitable motive power, track construction, grading, gauge, effect of friction of drive-wheels in enabling the locomotive to pull the load, and the surmounting of hills. In addition, there were questions regarding sources of funds for railroad building. The early railways encountered the opposition of plank-road, turnpike and canal companies which regarded the newcomer not only as a competitor for financial resources, but for traffic. Thus turnpike and canal companies were often able by litigation to delay the construction of railroads. Sometimes railroad financiers were looked upon as stock-jobbers, and as such, encountered public opposition. The Baltimore and Ohio had to overcome the opposition of the

Chesapeake and Ohio Canal Company and of the Potomac Canal Company; and in New York, the railroads were not permitted to compete with the Erie Canal until almost 1860. The Canal was a State-owned enterprise and it was feared that railroad competition would diminish the income of the State. In many quarters the full possibilities of railroads were not realized, and it was thought that, at best, they could only become feeders of canals or rivers, or means of connecting interior towns with seaports or river cities.

Horse-power and sails were the first motive powers employed by the Baltimore and Ohio. Fortunately some important problems had been solved abroad before the United States took up steam traction. The particular requirements were "sufficient draft to keep up a hot fire, and a large heating surface in a small compass on which to apply it."[10] These conditions were met when the escape-steam blast was made to provide the draft, and the tubular boiler to afford the heating surface. These problems were solved before Americans began to build locomotives in 1830.

There were other difficulties. Early railroad builders did not think that the friction of the wheels on the rails was sufficient to prevent the train from skidding when climbing hills; hence the use of incline planes and cogs. The New York and Erie tried to solve the problem of overcoming grades by elevating the railroad on piles. Tracks at first consisted of straps of iron laid longitudinally on wood beams, or on granite slabs, preferably the former, because the greater elasticity of the wood diminished jolting and wear and tear on locomotives and cars.

Shortly after the beginning of the Baltimore and Ohio, railroads were projected in many parts of the country. The Mohawk and Hudson, the earliest forerunner of the New York Central, was chartered in 1826, and construction was begun in 1830. Subsequently, a number of short lines

[10] Hadley, *Railroad Transportation*, p. 10.

RAILROADS AND CANALS IN OPERATION IN 1840

built by various companies stretched towards Buffalo, reaching that place in 1842; by this time lines had been built from New York and Boston to Albany. Chartering of railroads in Massachusetts began in 1830. In Pennsylvania the Columbia road, connecting Philadelphia with the Susquehanna, was completed in 1834, being the first link in the present Pennsylvania system. In the South the Charleston and Hamburg, chartered in 1829, had 137 miles in operation in 1834, at that time the longest line in the United States. The Western States had begun to project railroads during the craze for internal improvements previous to 1837. In 1840 upwards of 130 miles had been built in Michigan, 70 in Ohio, 95 in Indiana, and 26 in Kentucky.

The seaboard cities saw unlimited opportunities in the new system of transportation. Railroad building had become the order of the day, and Boston, Charleston, Savannah, Mobile, and New Orleans, all of which had been formerly excluded from the race began to evolve plans to obtain an increasing share of the trade of the country. Illustrating the new spirit which dominated this enterprise a Western paper said in 1837: "Every city on the coast has its plans, and the States to which they belong have pledged gigantic means, stretching far beyond the wealth of former days." The New York plan was to construct the New York and Erie from Tappan on the Hudson to Dunkirk on Lake Erie, thence by way of Toledo to Chicago, and ultimately to the Mississippi River at Galena, Illinois, thereby tapping the traffic of that stream and that of the Great Lakes. This had the advantage not only of obtaining a harbor on Lake Erie which would be open earlier than Buffalo, but of tapping one of the greatest traffic producing areas in the country. According to the Pennsylvania plan, a railroad was to connect Philadelphia with Pittsburgh, thence to the Lakes at Cleveland. Baltimore sought to reach the interior by way of Wheeling, and to

RAILROADS AND CANALS IN OPERATION IN 1860

encourage the building of railroads thence to the Lakes. This city hoped to secure great advantages over her competitors because "her geographical position brings her nearer the Ohio Valley, while her southern latitude leaves her less exposed to the difficulties of winter navigation." Charleston and Savannah projected railroads to reach the Mississippi, and, later, Mobile evolved a plan to tap the Ohio and thus attract part of the trade that moved down-river to New Orleans; the last named city, in self-defense, was compelled to plan a system of roads stretching to the North, and westward into Texas. These various projects had been so far successful that by 1860 roads had been built radiating from Lakes Erie and Michigan touching the Mississippi at ten places and the Ohio at eight. Meanwhile the Baltimore and Ohio reached Wheeling in 1853, the New York and Erie was constructed to Dunkirk in 1851, and the Pennsylvania began to run through trains to Pittsburgh in 1852; the first goal had almost been attained. With the movement of population beyond the Mississippi, the goal migrated further west. This, however, is a matter of later history.

145. Financing the Railroads.—The raising of funds for these vast enterprises was a problem in itself. Many of the proposed lines had yet to demonstrate their ability to earn an income; in many cases the purchase of stock was looked upon as rank speculation, with certain loss confronting the investor. Railroads, moreover, were compelled to compete for funds with other enterprises, and since all kinds of industries were expanding rapidly, due largely to the very stimulus afforded by the railroads, American capital was not adequate to the burden of supply, and foreign investors were relied upon to an increasing extent. In some cases the States themselves built the first railroads, obtaining the funds from the sale of bonds; in others, the States only aided the roads by subscriptions to stock, or

perhaps, by guaranteeing their securities in whole or in part. Cities and counties could sometimes be counted on for subscriptions, and farmers along the proposed line frequently subscribed, because a railroad meant an outlet for their products and the rise in value of their land; their loss would not be complete even if the railroad later became insolvent. Meanwhile Eastern investors were becoming more and more confident of railway stocks, and thus increasing sums were obtained from individuals. Congressional grants of land, begun in 1850 when the grant was made to the Illinois Central, became an important source of income, particularly after 1860. The estimated mileage of railways in the United States in 1830 was 73 miles, in 1840 2,800 miles, in 1850 9,020 miles, and in 1860 30,600 miles. The largest mileage was in the New England and Middle States.

146. **Telegraphs.**—The introduction of the telegraph and express, and the expansion of the postal service afforded other means of communication. In 1844, nine years after the invention of the telegraph, Congress appropriated $30,000 for the construction of a line from Washington to Baltimore. Although the invention had failed to interest promoters at once, they were quick to see the value of the telegraph after its success had been demonstrated. Problems of construction were few compared with railroad building, and the cost per mile was small; private companies could undertake the work without aid from the Government, except perhaps, in constructing lines from the Mississippi to the Pacific. As a result, within twenty years after the first line was stretched the country was fairly well supplied with telegraph service. In 1845 a line was run from New York to Philadelphia; in 1846–1847, New York and Boston, New York and Albany, and Albany and Buffalo were connected by telegraph. The following year Ezra Cornell extended lines from New York to Chicago by

way of Cleveland, Toledo, and Detroit. Construction and operation between the Mississippi and the Pacific encountered difficulties not met with in the country to the east, and for a time builders considered the advisability of putting the line beneath the surface of the earth. Provisions had to be made for protection against wind and storm on the plains, and possibly against damage by Indians and buffaloes. An important consideration was the cost of operating a line across thousands of miles of uninhabited country. However, both for political and economic reasons speedy communication with the Pacific was necessary. Thus the Government was willing to offer a subsidy to the company that constructed the line. Under this stimulus, the Western Union extended lines to the Pacific in 1861.

147. Express Service.—In 1839 William F. Harnsden conceived the idea of carrying valuable packages under special protection. At first he was his own messenger, plying his business between New York and Boston. The service was shortly expanded to include Albany and Philadelphia. Henry Wells, who was the agent at Albany, wished to extend the express to Buffalo, but Harnsden would not venture, and another company was formed for this work. In 1845 Wells and Fargo extended the service to Chicago, Cincinnati, and St. Louis. Meanwhile Harnsden branched out by extending his business to Europe, establishing offices in Liverpool, Paris, and Havre for the purpose not only of transferring packages, but of caring for emigrants destined for the United States. In 1854 the business formerly conducted by Harnsden and others was merged in the new Adams Express Company. Two years before Wells and Fargo sold out to the American Express and moved to California where they developed the business between the Atlantic and Pacific, and in the mining camps throughout the mountains. Subsequently they extended their enterprise through the Far Western coun-

try, ultimately taking over a large part of the overland stage business developed since 1858, when a stage route was first established between St. Louis and San Diego by way of Santa Fe.

148. The Postal Service.—During a considerable part of the period from 1789 to 1860 the rate of postage was determined by distance. Until 1816, when the postal charges were lowered, the charge for 40 miles and under had been 8 cents, under 90 miles 10 cents, under 150 miles 12½ cents, etc. Although a reduction was made in 1816 the charges were still so high that letters were often sent by express in preference to mail. For ten years prior to 1845 a reduction of rates had been agitated, and in that year 5 cents for a letter not exceeding one-half ounce became the charge for 300 miles, and beyond that distance 10 cents. The charge increased with the weight of the letter. By a law of 1851 the rate on a letter of one-half ounce or less sent under 3,000 miles was 3 cents if prepaid, and 5 cents if not prepaid; for 3,000 and over the charge was 6 and 12 cents. If these charges seem high compared with those of the present, it must be remembered that the Government was under the burden of dispatching letters to settlements scattered through the vast domain, and the method of delivery by stage coach, packman, etc., was always expensive. Although distant routes paid the heavier charges, they were usually operated at a great loss, and the deficit was made up as far as possible on the short routes in the populous parts of the country. The costly systems of delivery were gradually abolished with the extension of railroads, and it became possible to lower the postage rates. By an Act of 1838 Congress declared every railroad to be a mail route. The number of post offices in the United States increased from 903 in 1800 to about 28,490 in 1860, and the extent of post routes from 20,800 miles at the former date to 240,500 at the latter. In 1847 Congress authorized the use

of postage stamps, the denominations being 5 and 10 cents. The law of 1851 added the 1, 3, and 12 cent issues. In 1850 only 1,540,000 ordinary postage stamps were issued; the number in 1860 was 216,370,000. Since many letters were stamped by the old method until after 1850, the figures above give an exaggerated idea of the growth of the postal business. Another view of the expansion of the post office service is contained in a statement of income and expenses of the Post Office Department. This is given below.

POST OFFICE DEPARTMENT

Year	Gross Revenue	Gross Expenditure
1800	$ 280,806	$ 213,994
1830	1,919,314	1,932,708
1860	8,518,067	19,170,610

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CHAPTER XI

FOREIGN AND DOMESTIC COMMERCE

It goes without saying that the remarkable expansion in means of communication described in the last chapter paved the way for an enormous expansion of commerce. The two developments went hand in hand, the growth of trade and the development of transportation being synchronous phenomena.

149. Domestic Commerce.—Before the construction of internal improvements the inland markets, because of their isolation, were of little importance, and for want of satisfactory inland communication, the trade of even the seaboard cities was small. Rivers were practically the only means of transportation; the growth of seaport markets, therefore, as far as this was related to inland trade, depended on the extent of inland water communication and on the state of development of the country tributary to the streams. In 1791 New York, which was shortly to become the greatest market of the country, sent out goods worth only $2,505,400, and this included reëxports of foreign commodities and goods assembled from other places up and down the Atlantic Coast. The most favorable conditions for trade were found in the country served by the Hudson, Mohawk, Delaware, Susquehanna, and Potomac; but these regions provided the down-river ports with only a small volume of commodities for export. The Mississippi with 20,000 miles or more of navigable communication promised great traffic prospects, but the growth of trade along this stream and the rise of New Orleans as a mar-

ket had to await the opening of Western and Southern farms.

A significant result of internal improvements was that they extended the area tributary to the seaports and laid the foundation for a growing export trade in domestic commodities. Improved roads did this to some extent, but the most important instruments were canals and railroads, particularly the latter, which, as we have seen, possessed a number of advantages over canals. Thus, as these improvements penetrated deeper into the country, a great stimulus was given to productive enterprises of all kinds with the result that an ever increasing volume of commodities moved down to the seaboard markets. Of course all the new commodities did not move to coast cities for export; local commerce, made up of trading among places within the country, probably increased more rapidly than the foreign trade in domestic goods; but at least the export of home commodities gives some idea of the stimulating effect of the new means of communication. In 1820 the exports of domestic products amounted to only $51,683,000; by 1840 this branch of trade had grown to $113,895,000, and by 1860 to $316,242,000.

Inland freight moved in largest volume to New York whence it was exported. The shipments from this city, however, did not all originate along the Erie Canal and other inland channels leading to that city. Commodities were gathered in by coastwise trade from Maine to Louisiana. Nevertheless the Erie Canal and its Western connections, which tapped the largest traffic-producing area in the country, contributed large amounts to the export trade of New York. The accompanying table contains a statement of the domestic exports from four of the principal districts in the United States.[1]

[1] These figures are taken from Senate Reports, 2d Session, 53d Congress (1893–1894), Vols. I and II, *Imports and Exports*, pp. *ff.*

DOMESTIC EXPORTS TO FOREIGN COUNTRIES FROM GIVEN DISTRICTS

Year	Massachusetts	New York	Pennsylvania	Maryland
1820...	$3,861,430	$8,250,670	$2,948,870	$4,681,590
1830...	3,599,950	13,618,270	2,924,450	3,075,980
1840...	6,268,150	22,676,600	5,736,450	5,495,020
1850...	8,253,470	41,502,800	4,049,460	6,589,480
1860...	12,747,940	80,047,970	5,526,960	8,940,100

In 1859 the total through tonnage on the five great east and west traffic arteries [2] amounted to over 7,552,000 tons, and most of this probably represents commerce made possible by canals and railroads. The tonnage on all the New York canals, east and west, was 1,310,800 in 1836; it was 2,977,500 tons in 1845, and 4,022,600 tons in 1855; most of this also originated in regions which had little or no trade before the opening of the canals.

In time New Orleans became the most important outlet for the products of the Mississippi Valley. Until the Great Lakes and Ohio River were tapped by canals and railroads, all but a small percentage of the surplus of this region sought a market in the Eastern cities and abroad through this city. The opening of the farming country north of the Ohio and the westward movement of cotton planting were the chief factors in the growth of the export commerce of New Orleans. Meanwhile the introduction of the steamboat on Western rivers in 1811 stimulated river traffic in about the same way that the internal improvements promoted trade in the Northeast. Due to these causes, the export trade of New Orleans grew rapidly after 1830.

DOMESTIC EXPORTS TO FOREIGN COUNTRIES FROM LOUISIANA

1810	$1,753,970	1840	$32,998,050
1820	7,242,410	1850	37,698,270
1830	13,042,740	1860	107,812,506

[2] That is, the New York canals, New York Central, New York and Erie, the Pennsylvania, and the Baltimore and Ohio.

The Effect of Canals and Railroads on the Course of Internal Commerce.—The building of the new lines of communication was destined in time to work profound changes on the direction of the internal currents of trade. The commerce of even the Susquehanna and Delaware, as of other Eastern rivers, was more and more diverted into the new channels, and a similar change took place in the case of river trade of the upper Mississippi Valley. For many years the cities that commanded the traffic of these streams felt secure in the belief that trade could not be diverted. This feeling of confidence prevailed until about 1850, when actual experience showed that the commerce of the interior was flowing in larger volumes direct to the East instead of to the South by the Ohio and Mississippi as of old. According to a Government Report in 1852: "Three-fourths of the flour and grain (of Ohio) are exported through the Lake ports, but more than three-fourths of the pork, lard, and whiskey through the ports of the Ohio River"; and "two-thirds of the coffee and six-sevenths of the lumber passing over the public works for consumption in Ohio are imported through the Lake ports. . . . Three-fourths of the sugar and molasses, and nearly all the tobacco, are imported through the river ports. Sugar and molasses, the products of Louisiana, are distributed from Cincinnati through the Northwest, even to the shores of the Lakes." In case of the Illinois and Michigan Canal the report said: "The causal fluctuations in the market prices at Chicago and St. Louis frequently determine the course by which inland domestic produce is shipped to the seaboard, whether by the Lakes or the Mississippi." Imported dry-goods and groceries were also brought into the Mississippi Valley by the canal and lake route, instead of by way of the Mississippi, as was the case before the opening of the New York improvements. Thus referring to commerce over the Illinois and Michigan Canal, the Report contained the fol-

lowing: "Besides large quantities of rich and costly goods, all sorts of ready-made clothing, hats, caps, boots and shoes for the St. Louis market, are imported through Chicago, and by canal and river to their destination." The lead trade of the upper Mississippi which was once an important item in the commerce of St. Louis began to move East over the Illinois Canal, or by the Chicago and Galena Railroad. Another matter of great moment to the cities on the Mississippi was that the extension of railroads to and beyond that stream from Chicago threatened to divert the growing trade of the Missouri River and of the Far West to Chicago. This would deprive St. Louis of trade in a territory it had regarded as its own from the founding of the city in 1764.

The effect of the opening of new channels of trade, therefore, was to create intense commercial rivalry between St. Louis and Chicago, and to a smaller extent between Memphis and New Orleans. There were two ways open to the river cities to retain their commerce, namely, to urge the building of railroads, particularly into the Far West, and to advocate the improvement of the rivers. Both policies were adopted. Thus, as with the seaboard cities, competition stimulated the rapid extension of railroads into the country west of the Mississippi.

The New Orleans plan was to tap the Far West with railroads and to make an effort to retain the commerce of the Mississippi by urging the improvement of that stream and by constructing new port facilities at New Orleans. One of the leading projects was the New Orleans and Nashville Railroad designed to reach the central Mississippi Valley and to form connections with various railroads then building in the South and West. Another project was the New Orleans and Opelousas Railroad, the ultimate object of which was to form a trunk for two great lines, one extending into Texas, which would ultimately be carried to

the Pacific, and the other to the North through Arkansas, and ultimately to St. Louis.

After the completion of a railroad to the Mississippi River, the further plan of Chicago was to extend this line to secure not only the trade of Iowa, Nebraska, and Kansas, and to monopolize the prospective trade of the Union Pacific, but to secure a portion of the mountain trade. All this had formerly come to St. Louis. To meet these new conditions, merchants and capitalists interested in St. Louis, after long delay, inaugurated an extensive system of railroad building. In general, the purpose was to construct lines to the Southeast to meet the railroad projected from New Orleans, to the Northeast to tap lines building west from Chicago, and into the Far West and Southwest to obtain a share of the mountain and Southwestern trade.

151. **The Commerce of the Lakes.**—With the opening of the Erie Canal in 1825 the country surrounding the Great Lakes was opened for immigration and trade. Later the building of canals and railroads to these waterways enlarged the area that looked to the Lakes as an outlet for surplus products. Lake towns, which soon became focal points for commodities moving in all directions to an ultimate market, began to grow forthwith. Chicago, which numbered scarcely 4,500 in 1840, became a city of 109,260 in 1860. Within these twenty years it had developed from a mere place of debarkation for immigrants to a market for their surplus and a source of supply for almost everything they were able to purchase. Large quantities of lumber, dry-goods, groceries, and products of iron were distributed from this place. Detroit grew from 2,220 in 1830 to 45,610 in 1860, Cleveland from 1,070 in 1830 to 43,410 in 1860, and Milwaukee from 1,710 in 1840 to 45,240 in 1860.

The introduction of the steamboat on the Lakes added to the facilities of transportation. The first vessel, the *Walk-in-the-Water,* was launched at Buffalo in 1819. Sailing

vessels, however, continued to be an important part of the equipment of Lake shipping. Of the 242 vessels owned at Buffalo in 1859, for example, 129 were schooners, 28 barks and brigs, 10 were steamers, and 50 were propellers. Previous to 1825 the commerce of the Lakes was made up chiefly of furs brought down from the Northwest, of merchandise destined for the Indian trade, and of Government stores moving to the various posts on or near the Lakes. The settlement of the country changed the whole character of east and west bound commerce. The bulk of the trade became farm products which moved to the East and merchandise which moved westward for distribution in the interior. In the course of time a large local traffic developed among the Lake ports made up largely of lumber, coal, and products of iron.

With the development of enterprise in the country west of Mackinaw it became necessary to improve the connections between Lake Superior and the waters to the east. Thus Michigan in 1855 opened a canal at Sault Ste. Marie; this was later transferred to the United States, and in 1881 a larger canal was built parallel to the old one. In 1860 the tonnage of vessels passing through this waterway amounted to 403,650 tons. In recent years this tonnage developed into the millions, giving this canal first rank among the artificial channels of the world in the amount of transient tonnage. The Welland Canal, between Lake Erie and Lake Ontario, was constructed by the Canadian Government in 1833 to provide a passage around the falls and rapids of the Niagara.

No records have been kept of the growing value of Lake commerce, but on a number of occasions Government investigators have ventured upon estimates after careful study of the conditions of trade. In 1852 Israel D. Andrews estimated the total commerce of the Lakes at $312,000,000. Commenting upon his study, Andrews said:

"Taking the lowest estimate, the actual money value of the coastwise exports of these Lakes is $132,000,000, in round numbers, being the mere value of property passing over the Lakes, without including passage money, passengers carried, cost of vessels, expense of crews, or anything in the least degree extraneous." He arrived at the largest figure given above by combining the value of exports and imports.

Omitting the question of value, a fair idea of the increasing volume of Lake trade may be obtained from a statement of tonnage on these waters. The figures given in the accompanying table have been compiled from Government Reports on Commerce and Navigation.

TONNAGE OF THE GREAT LAKES AT VARIOUS PERIODS

Year	Tonnage	Year	Tonnage
1829	5,890	1850	184,430
1834	18,240	1855	334,590
1840	47,060	1860	436,550
1845	84,610		

152. The Commerce of the Mississippi and its Tributaries.—Because of the high cost of freighting by land, the exports of the Mississippi Valley could move to distant markets only by the river routes. In 1800 it was said that the only Western commodity that could pay the cost of land carriage from Kentucky to the East was ginseng. The principal method of down-river conveyance was the flat-boat; but before 1800 certain Western merchants learned that by building ocean-going vessels they could accomplish a number of desirable results. In the first place the sale of the vessel would be a source of profit. Boats could be built cheaply, owing to the abundance of timber near the water's edge; the foundries of Pittsburgh and the rope-walks of Lexington and other places would supply necessary materials, and the ship itself could carry a cargo

to market and thus provide an outlet for some of the surplus of the locality. The fact that freight would not need to be transferred at New Orleans to other vessels added to the prospective advantages. According to F. A. Michaux, a Western traveler, "The inhabitants of Marietta (Ohio) were the first who conceived the idea of exporting the products of the country directly to the Antilles by a vessel constructed in their own town, which they sent to Jamaica. The success which crowned this first attempt produced such an emulation among the inhabitants of this part of the Western country, that new vessels were launched at Pittsburgh and Louisville and sent immediately to the West Indies, or to New York and Philadelphia." Before 1812, seven ships, eleven brigs, six schooners, and two gunboats were built at Marietta, and a number of vessels were launched from other places on the upper Ohio.

Ocean-going vessels and flatboats could not return upstream. North-bound commerce was carried in long narrow vessels, called keel-boats, carrying only a few tons. These were dragged up river by cords drawn around trees, or in shallow water, pushed by long poles. To avoid the swift current at the bends it was necessary to cross the river frequently, upwards of 390 crossings being required on the route from New Orleans to St. Louis. Thereby the journey was lengthened by more than 400 miles. Obviously no great amount of commerce could be carried by this method. Because of the difficulty and expense the rates by water from New Orleans to the towns on the Ohio and upper Mississippi were often higher than those by land from Philadelphia to Pittsburgh. From 1786 to 1811 passengers from New Orleans to Pittsburgh paid $160, and freight about $6.75 a hundred. Previous to 1817 the trade between Louisville and Pittsburgh was carried in about 150 keel-boats of 30 tons each, making the round trip in about two months. On the Mississippi some

twenty barges sufficed for the inland commerce from New Orleans.

In view of the enormous difficulties involved in navigating the streams it can be understood that the steamboat came as a great boon to sections of the country which were dependent on this slow and laborious system of navigation. John Fitch, James Rumsey, and John Stevens had experimented with steam navigation before Robert Fulton met with success. In August, 1807, Fulton's boat, the *Clermont*, made her successful trip up the Hudson to Albany, and thus inaugurated steamboat transportation in the United States. Before the outbreak of the War of 1812 six steamboats built under the direction of Fulton and Livingston were in use on the Hudson or for ferrying at New York.

In 1811 Fulton and Livingston, who had established a shipyard at Pittsburgh, built the *New Orleans* which descended the Ohio and Mississippi in the winter of 1812. This boat was unable to return against the swift current of the upper Mississippi, but was employed in trade between New Orleans and Natchez until 1814, when it was wrecked by a snag near Baton Rouge. In May, 1815, the *Enterprise*, the fourth of the Western steamboats, reached Louisville from New Orleans after a trip of twenty-five days, being the first to make the north-bound trip to this point. The following year Captain Henry M. Shreve, who had made a number of improvements both in the style of vessel and in the character of the machinery, built the *Washington*, which was also able to ascend the River. Thereby the success of up-river navigation was proved beyond a doubt. Livingston, after a critical examination of boat and machinery, is said to have remarked to Shreve: "You deserve well of your country, young man; but we (referring to Fulton's and Livingston's monopoly) shall be compelled to beat you if we can." The monopoly just referred to was a charter granted to Fulton and Living-

ston bestowing the exclusive right of navigation by steam vessels through the territory of Orleans. For a time this monopoly tended to keep other boat builders out of the business, which possibly accounts for the fact that only seven steamboats were built in the west from 1811 to 1817. Fulton's claim was finally denied by a Louisiana court, and the general question was settled in 1824 by the Supreme Court of the United States in the case of Gibbons *vs.* Ogden, in which it was held that the regulation of commerce with the States came within the purview of the general Government. Seven steamboats were built on Western waters in 1817, twenty-five in 1818, thirty-four in 1819, and ten in 1820. In 1825 it was estimated that there were upwards of 125 steamboats plying the waters of the Mississippi and Ohio.

Western writers have spoken with great enthusiasm of the contribution of the steamboat. It was said that "without its aid, the Mississippi Valley would have remained long a rich wonder"; and that it "has contributed more than any single cause, perhaps more than all other causes which have grown out of human skill combined, to advance the prosperity of the West." An analysis of this statement will show that it contains a large measure of truth. The steamboat increased the speed and convenience of communication and greatly reduced the cost. In consequence the sale of farm products was no longer restricted to a narrow local market; these commodities now sought distant markets where prices were higher and where there was less danger of a glut. Perishable articles, too, could now be disposed of at a distance. As a rule, everything the farmer had to sell commanded a higher price, and the things he bought were obtained at lower prices. His labor yielded a larger return of desirable things, and this stimulated enterprise. Likewise the steamboat encouraged westward migration, which led to fur-

ther development of farming and to the founding of shops and factories; it caused the building up of an important Western machine industry; steamboat building itself became a great new industry, and its demands promoted the growth of the manufacture of rope and cordage, articles of brass, cabinet work, etc. As with other great inventions, therefore, the steamboat not only contributed a new convenience, but led to the founding and development of other industries, and acted as a general industrial stimulant.

Some idea of the growing volume of the through commerce of the Mississippi River system may be obtained from a statement of imports into New Orleans from the interior. These facts are given in the accompanying table.

VALUE OF IMPORTS INTO NEW ORLEANS FROM THE INTERIOR

1814–15	$8,779,000	1839–40	$49,763,000
1819–20	12,637,000	1844–45	57,199,000
1824–25	19,044,000	1849–50	96,897,000
1829–30	22,065,000	1854–55	117,106,000
1834–35	37,566,000	1859–60	185,211,000

It should be remembered that this table shows only the amount of commerce arriving at New Orleans. All the River cities were receiving imports from the surrounding country, and the aggregate of this was much greater than the receipts at New Orleans. Eliminating duplications which arise from exports of one place being counted as imports of another, Andrews, in the Government Report already cited, estimated the total commerce of the Mississippi and its tributaries in 1852 at $339,502,000; adding this to the value of Lake commerce he obtained $653,976,000 as the total amount of commerce of the Mississippi Valley in 1852. Since this was a growth from almost nothing in 1790, it is a truly remarkable record of commercial development.

153. **River Improvement.**—Removal of snags and bars, the deepening of the channels of the rivers, and the construction of safe and convenient harbors were some of the important needs resulting from the introduction of steamboat navigation. River improvement, therefore, became an important element in the general plan for internal improvements agitated for many years in this country. Long delays to navigation at low water, due largely to the presence of bars across the streams, and the increasing loss of steamboats, due to collisions with snags, were serious matters for Western shippers. These difficulties became particularly trying when the new canals and railroads began to divert commerce away from the rivers. A report to Congress in 1848 contains a record of loss of more than 600 steamboats during the years from 1811 to 1848. Losses for one year ending June 30, 1851, were estimated at $1,144,000, and for 1860 at over $2,000,000. Much of this destruction of property could have been avoided, if the rivers had been maintained in proper condition for navigation. Hence the continual demand for river improvement.

As early as February, 1819, Congress enacted a law providing for the survey of the water courses north and west of the Ohio, and tributary to and west of the Mississippi. For the purpose of learning the most practical mode of improvement, an Act of April 14, 1820, provided for a survey of the Ohio from Louisville to Cairo, and of the Mississippi thence to the Gulf. A law of May 24, 1824, appropriated $75,000 for the betterment of the two streams. Before 1832 the total sum appropriated for the Ohio and Mississippi amounted to $495,000, and small amounts were devoted to other rivers. This was the beginning of a work which in later years became one of the large claimants for Government funds. Against the argument that the States should improve the rivers at their own expense it was urged that such work benefitted commerce in general and was,

therefore, of national concern, that the resources of the Federal Government were vastly greater than those of the States, and that the work would be done more systematically by the United States. All the while, the advocates of river improvements affirmed the doctrine that Congress had the Constitutional power to do such work. With the growing importance of river commerce after 1830 it became necessary to appropriate larger sums for improvements. The total appropriations for the Mississippi, Ohio, Missouri, and Arkansas from 1822 to 1860 amounted to about $3,154,000. The expenditures were small compared with appropriations after 1860.

154. The Commerce of the Plains.—One of the significant features of the period from 1790 to 1860 was the opening of the country west of the Mississippi for trade. As in other fields, fur traders were the forerunners of established commercial intercourse. After 1820 there was added to this Far Western field the trade with the old Spanish town of Santa Fe, which ultimately extended far down into Mexico and to the Pacific Coast; there was added, also, trade with the settlements in Utah, and, shortly before 1860, with the new mining camps in the Rocky Mountains. For many years, commerce with this Far Western country focused at St. Louis, but gradually the towns which began to rise on the Missouri became the immediate sources of supply, and after the building of railroads to the Mississippi, Chicago competed with St. Louis in this trade.

155. The Fur Trade.—Encouraged by the reports of Lewis and Clarke, fur traders from St. Louis pushed far up towards the sources of the Missouri. Shortly after 1820 the field was further broadened by the exploration of the Rocky Mountain country. During the years from 1822 to 1826 General William Ashley, who was one of the first pioneers in this region, sent furs to St. Louis said to have been valued at $250,000. Ashley's successors pushed

through the mountains and across the divide to the Pacific. Meanwhile other trappers from St. Louis, taking advantage of Mexican independence to trap along the waters of the Rio Grande, penetrated further into the Far Southwest, and within a few years reached the Pacific from that direction. Before 1840, practically the whole country from the Mississippi to the Pacific which was known to possess valuable fur-bearing animals was being exploited. During the years from 1808 to 1847 the annual value of the fur business centering at St. Louis probably amounted to from $200,000 to $300,000. The annual average value of furs received at New Orleans from the interior from 1842 to 1860 was about $480,000, the largest receipts being in 1852 when the imports were valued at $1,000,000. The fur trade, as a pioneer enterprise, reached its peak about this time. The industry, however, is not a thing of the past. After a period of lethargy, from 1861 to 1880, it began to revive and now constitutes one of the great enterprises of St. Louis, the fur sales of the city running into millions of dollars annually. However it is no longer a frontier industry. Furs are received from almost every State in the Union and from other parts of the world, and the business is conducted by modern methods.

156. **The Overland Trade.**—This branch of commerce, like the Southwestern fur trade, owes its earliest success to the greater freedom given to American traders after Mexico gained her independence. During Spanish times traders had occasionally succeeded in crossing the plains from Santa Fe to the Missouri, and something had been learned about the route of travel. Between 1801 and 1821 several attempts were made to establish trade between Kaskaskia, or St. Louis, and Santa Fe, but the hostility of the Spanish Government proved an insurmountable difficulty. After the success of the traders in 1821 and 1822 an increasing number of adventurers crossed the plains,

with the result that trade between the Missouri River towns and Santa Fe became an established fact. It was estimated that from 1825 to 1845 the yearly average of this commerce was $250,000. About the time of the outbreak of war with Mexico both traders and emigrants began to cross the plains in larger numbers. In 1846 over 400 wagons left the Missouri River for Santa Fe.

Even in the earlier stages of growth trade was not confined to Santa Fe. American traders "proceeded down the river to the Passo del Norte; some to the mines of Chihuahua and Durango, in the province of New Biscay; some to Sonora and Sinaloa, on the Gulf of California"[3] seeking new means of communication with the Pacific. About 1845 traders pushed further south to San Juan, some eight hundred miles south of Chihuahua, and nearly fourteen hundred miles beyond Santa Fe. Commerce with the Mexicans wrought important changes in their attitude towards the Americans and did much to prepare the way for peaceful occupation. It was stated in 1832 that "Santa Fe may be considered, in some sense an American town, the stores being filled with American goods, and the streets with American people."

After 1848 the business of supplying the Mormon settlements in Utah and the new mining camps in Colorado widened the domain of the overland trade. The discovery of the Gregory Lode in 1859 removed all doubts as to the value of the new mineral resources. Denver, Boulder, and Fountain City sprang up within a year. The growth of the first named city was amazing, "whole streets have been built up in less than twelve months with brick and frame edifices," said a journal of the time, "and filled from roof to cellar with every production of Anglo-American industry that can possibly be demanded in that market." In 1860 the total investment in the commerce of the plains,

[3] Debates of Congress, 2d Session, 18th Congress, pp. 109, 110.

including wagons, teams, wages of men, but excluding merchandise, was estimated at $5,545,000. In that year the merchandise shipped west of the Missouri River was valued at $10,500,000, distributed as follows: New Mexican trade, $3,000,000; Pike's Peak gold region, $6,000,000; Utah trade, $500,000; and the Indian trade, $1,000,000. Kansas City enjoyed the largest share of this commerce, but found competitors in Leavenworth, Atchinson, Nebraska City, St. Joseph, and Omaha. Goods were imported into these cities by way of the Missouri River. The building of the Pacific railroads not only added to the commerce of these towns, but greatly stimulated trade with the mountains and with Santa Fe. This growing commerce was carried by the wagon freighters until the railroads penetrated the territories.

157. **Summary of Domestic Commerce.**—No period of equal duration has witnessed such a remarkable commercial development as the one from 1790 to 1860. In 1790 the commercial conquest of the Ohio Valley had just begun; the rise of trade on the Great Lakes dates from about 1825; from 1810 to 1860 the country west of the Mississippi was extensively exploited by the fur trader, who added region after region to his field of enterprise until the Pacific was reached. Meanwhile new branches were added to the overland trade, including the Santa Fe trade beginning about 1822, trade with Utah about 1850, and with Colorado about 1860. From a primeval waste the country between Pittsburgh and the Mississippi had developed into the most important agricultural region in the country, with many of its wants, and in some instances those of the seaboard, supplied by manufacturing industries within its own borders. By 1860 farmers had already claimed a large part of the country between the Mississippi and Missouri Rivers, and traders had established regular lines of business with the Far Western country. One of the greatest tasks

of the entrepreneurs of the next period was to develop the resources that had now been discovered and worked to some extent.

158. Foreign Commerce: Commercial Treaties.—As one of the results of the Revolution Americans hoped to enjoy freer commercial intercourse with the outside world. A treaty was negotiated with France in 1778, which, among other things, permitted Americans to trade with the French West Indies and granted France most favorable terms in trade with the United States. A treaty was negotiated with Prussia in 1785 making most liberal provisions for commercial relations. The Treaty with Spain in 1795 settled the troublesome question of the navigation of the Mississippi River. The Spanish policy had been to forbid all communication with the settlements up-river and the Spanish Colonies below. American vessels were stopped, and either heavy charges levied on their cargoes, or cargoes and vessels confiscated. Vigorous protests against this policy came especially from the people of Kentucky. Meeting in convention in 1788 they urged that their surplus would be far larger "did not a narrow policy shut up our navigation, and discourage industry." The country was split into a number of factions. Some desired independence from the United States; others wanted to become a part of the province of Louisiana; some desired war with Spain, and others, again, were in favor of urging France to obtain a retrocession of Louisiana, incidentally extending her protection to Kentucky; to many, however, the most feasible plan was to prevail on Congress by a show of war to obtain concessions from Madrid. The difficulties were finally settled by the Treaty of 1795 by which the Spanish Government not only agreed to permit citizens of the United States to navigate the Mississippi, but granted the right of deposit at New Orleans. This latter provision was essential, since commodities had to be tran-

shipped at that point from river crafts to ocean-going vessels. These privileges were withdrawn in 1802, but the purchase of Louisiana by the United States permanently solved the problem at issue.

Treaties were also concluded with Denmark, Sweden, and Portugal. But fortune did not favor us in negotiating with England. By an Order in Council in 1783, Americans were prohibited from trading with the British West Indies, and the importation into the Islands from the United States of fish, beef, and pork was prohibited even when the commodities were carried in British ships. By Jay's Treaty of 1794 some concessions were obtained, but these were not sufficient to make extensive trading profitable. American vessels of 70 tons or under were given access to the islands, but the traders were denied the right of carrying sugar, molasses, coffee, cotton, and cocoa to any part of the world.

159. Orders and Decrees.—The war between France and England, which began in 1793, brought other trying conditions. As neutrals the Americans hoped to gain great advantages in carrying a large share of the world's commerce. But all ocean commerce was hampered shortly by arbitrary rules and orders. France declared provisions contrabands of war and ordered the seizure of all vessels destined for British ports carrying such commodities. And England insisted on the right of stopping American vessels on the high seas to remove sailors supposed to be Englishmen. In spite of these difficulties, American shipowners succeeded in gaining a large share of the ocean-carrying trade, and our foreign commerce rapidly rose to the largest amounts in our history. The total foreign trade, including imports and exports, which in 1793 amounted to $56,000,000, increased to $162,000,000 in 1800, and to $205,000,000 in 1801. When peace was temporarily restored in 1802, England, France, and other countries re-

sumed their carrying trade, and American commerce fell off. In 1803 it dropped to $120,000,000. But with the renewal of the war in 1803 the trade fell back again into the hands of the Americans. Unfortunately more handicaps were thrown around ocean commerce. For a time, by indirect methods, Americans were still able to carry a large amount of trade. Although Great Britain refused to permit vessels of this country to carry products of Spanish and French West Indies directly to France and Spain, she permitted the landing of such goods at American ports and shipment thence to Europe. Due to the jealousy of English shipowners, who watched with concern the diversion of commerce to American vessels, the Government was prevailed upon to put an end to this trade. The Rule of 1756 was now vigorously enforced, to the effect that neutrals were denied trade in time of war which had been prohibited in times of peace. This practically excluded the Americans from the British West Indies.

With the progress of the war other restrictions were imposed. An Order in Council of May, 1806, declared a blockade of the coast of the Continent of Europe from Brest to the Elbe in reply to Napoleon's order closing the ports of Hamburg and Bremen to English trade. Napoleon retorted with the Berlin Decree of November 21, 1806, declaring the British Islands in the state of blockade. In January, 1807, a British Order in Council closed all Continental ports, except those not under French control, and in November of the same year ordered the seizure of vessels destined for these ports, unless they had previously put in at British ports.

160. The Embargo and Non-Intercourse Act.—Many American vessels were able to escape these regulations. Although the risks were great, the large profit in carrying freight made the chance worth while. Our foreign trade rose to $216,000,000 in 1805, to $231,000,000 in 1806, and

to $246,000,000 in 1807. Trade declined immediately as a result of a change in policy.

As early as April, 1806, Congress adopted a mild form of retaliation by prohibiting the importation of goods from Great Britain or from British Colonies, effective November 15 of that year; the time was subsequently extended to December, 1807; but before that date it was apparent that the measure would be ineffective, and instead, Jefferson recommended the adoption of an embargo. The Embargo Act was passed December, 1807. American vessels were prohibited from leaving for foreign ports, and foreign vessels could not sail except with the cargo actually on board. Only the coastwise trade remained. To prevent vessels which engaged in this trade from leaving for foreign ports, bond was required to assure subsequent landing at an American port. The export trade declined immediately. Goods sent out in 1807 were valued at $108,000,000, but in 1808 at only $22,000,000. The serious effect of this policy was felt more in the United States than abroad. It bore heavily on the South, where industries were not as diversified as in the North, and where prosperity depended largely on the export of tobacco and cotton. But the effects were felt in other parts of the country. Northern shipowners were heavy losers; thousands of seamen were thrown out of employment; and merchants in the seaboard towns suffered from the depression of industry. On the other hand, the Embargo did not cause Great Britain or France to relax their policy; in fact, Napoleon used it as an excuse for the Bayonne (1808) and later Rambouillet (1810) Decrees. The former directed the seizure of all American vessels, for, according to Napoleon's view, they could not legally sail the ocean; and the Rambouillet Decree directed the seizure of all vessels then in French hands. The Non-Intercourse Act in 1809, which was substituted for the Embargo, prohibited commerce with France

and Great Britain, but permitted trading with countries not under their control. The policy of peaceful resistance, however, failed, and the War of 1812 was the result.

161. Foreign Trade: 1815–1860.—The course of American industrial development after the War of 1812 tended to divert attention more and more from foreign trading to the promotion of domestic industries. The new manufacturing establishments and the opening of the country made possible by the extension of internal improvements caused many American business-men to seek profits at home rather than in foreign trading. The great profits which temporarily made ventures on the sea so attractive vanished, when shippers of European nations again occupied the field. Moreover our tariff laws from 1816 to 1842 tended to discourage both foreign commerce and shipbuilding by discouraging imports and by imposing tariff duties on shipbuilding materials.

162. Tonnage.—The tonnage of American vessels engaged in foreign commerce increased rapidly during the decade from 1790 to 1800, but thereafter, until about 1840, it remained relatively stationary. Foreign commerce, likewise, displayed no marked increase; in fact, it was not until about 1835 that the value of our foreign trade reached the high point of 1807. The tonnages of vessels engaged in the coastwise trade, however, grew from 301,000 tons in 1800, to 660,000 tons in 1820, to 1,280,000 tons in 1840, and to 2,807,000 tons in 1860.[4] This branch, however, particularly after 1817, enjoyed a protection which was not accorded vessels in the foreign trade.

With reference to tonnage laws, the United States followed a varying policy. By the Navigation Act of 1789, ships built and owned by Americans paid a duty of 6 cents a ton on hold capacity; if built in the United States and partly or wholly owned abroad they paid 30 cents; on

[4] Including tonnage in cod and mackerel fisheries.

vessels built and owned abroad the charge was 50 cents. In the case of the coastwise trade, foreign built and owned vessels carrying American products paid 50 cents a ton for each entry. These discriminating duties tended to stimulate American shipbuilding.

The Act of 1815 opened the way for the abolition of discriminating rates, but the condition was that foreign nations should abolish their discriminations against the United States. A treaty was negotiated with Great Britain that year providing for more liberal treatment of vessels of both countries, but since England refused to open her West Indian ports, this country levied new duties. The Act of 1817 closed the coasting trade to vessels of foreign countries. Meanwhile another effort was made in the provisions of this law to obtain concessions for our ships in foreign ports, and some success was obtained in negotiating treaties.

A marked increase in American vessels engaged in foreign trade began about 1840. With the coming of the era of great prosperity, which dated from about that time, a greater volume of commodities began to move both into and out of this country; hence the need for more ships. Increasing immigration, the discovery of gold in California which increased the trade with the Pacific, the temporary success of the clipper type of vessel, and the Crimean War of 1853 and 1856 which diverted vessels of some European countries from peace to war purposes, widened the field for American vessels. Our tonnage engaged in foreign trade amounted to only 670,000 tons in 1800, and to 899,000 in 1840; but by 1850 it had grown to 1,585,000, and by 1860 to 2,546,000 tons.[5] On the other hand, changes in shipbuilding were shortly to deprive builders of this country of former advantages. As long as wood was the chief material for construction, ships could be built in

[5] Including tonnage in the whale fisheries.

this country at as low a cost as abroad; but with the substitution of iron for wood, the advantages passed to England, and in the building of steam vessels England had the advantages. A new era in ocean navigation began in 1838 when the *Sirius* and the *Great Western* crossed the ocean under steam power.

163. The Composition of American Foreign Trade.— As was to be expected in a new country which was just beginning to develop manufactures, exports were composed largely of raw materials, and imports largely of finished manufactured goods. Raw products were taken from the earth more rapidly than the growing manufactures could consume them; hence the need of foreign markets for raw materials. The general classes of exports and imports are shown in the accompanying table:

PRINCIPAL CLASSES OF PERCENTAGES OF EXPORTS AND IMPORTS, 1820–1860

Year	Exports			Imports *
	Crude Materials for Use in Manufacturing, per cent	Manufactures for Further Use in Manufacturing, per cent	Manufactures Ready for Consumption, per cent	Manufactures Ready for Consumption, per cent
1820	60.4	9.4	5.6	56.8
1830	62.3	7.0	9.3	56.9
1840	67.6	4.3	9.4	45.0
1850	62.2	4.4	12.7	54.9
1860	68.3	3.9	11.3	48.6

* Including free and dutiable.

Cotton was by far the largest single export, but outgoing cargoes contained a wide range of other commodities,

including rice, wheat, tobacco, hides and leather, wool, naval stores, leather, and furs and skins.

164. The Largest Consumers of American Exports.— After the closing of the British West Indies to American vessels, shipowners of New England conceived the idea of direct trade with the Orient. It was expected that tea, coffee, nankeens, silks, spices, and other commodities from the Far East formerly imported by way of Europe could be carried in American vessels. Although prior to 1860 this branch of our commerce was never large, it often attracted the attention of our merchants and shipowners, and the prospective opportunities were held out as arguments in favor of developing land and, subsequently, railroad and telegraph communications with the Pacific. Throughout this period Great Britain was the largest consumer of American products. Our exports to that country were often more than 30 per cent of our total exports, and sometimes even more than 50 per cent. Other important consumers were the Hanse towns and ports of Germany, Netherlands, France, and Spain. Trade with South America at this time was confined largely to Argentine, Peru, Chile, and Brazil, particularly the two countries last named. Exports to South America in 1850 amounted to less than $6,000,000, and about half of this amount represented trade with Brazil. Exports to Central America rarely amounted to more than $150,000 a year.

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PART IV

EXPANSION OF NATIONAL INDUSTRIES 1860–1914

CHAPTER XII

GENERAL CHARACTERISTICS OF THE PERIOD

165. The Changes of the Last Half Century.—While the years from the formation of the Government to 1866 witnessed a remarkable expansion in all kinds of industrial activity, a still greater epoch was ahead. Indeed, the decade following the close of the Civil War marks the beginning of one of the greatest industrial eras of all times. Even the most enthusiastic word painters of former times failed to foresee the magnitude of coming economic achievements. With their limited vision it was not possible to forecast the rapid growth of population, the opening of many new resources, the appearance of hundreds of new industries, the unusual development of business enterprise, and the great increase of wealth. Nor was it possible to appreciate the significance of the powerful economic forces that lay beneath these changes.

It is difficult to estimate the accomplishments of the past half-century because our ideas are apt to be distorted by the fact that the products of all this wonderful development are a part of our everyday experience. But if we could obtain the view of the most progressive American of 1866, we would have an entirely new appreciation of what has happened. This man would not recognize the names of some of the most populous cities of the present, or at least would think of them as insignificant towns. The words "dynamo," "motor," "electric light," "electric railway," "telephone," "wireless," and, in fact, much of the vocabulary of electricity, which is so familiar to us,

would have to be explained to him. He would discover in a list of present industries many strange and unfamiliar names. He would be in utter ignorance of the hundreds of thousands of technical improvements which are largely responsible for the growth of our manufactures. He could not understand the modern methods of finance, nor could he grasp the significance of new methods of advertising and marketing. If he were called upon to manage a modern business of any considerable size, he would probably fail. And what is equally significant, he would probably find it difficult to grasp our present social point of view.

The record of the past half-century surpasses by far that of any previous period. So great have been the changes that it is worth while for the student who wishes to obtain a comprehensive survey of the period from 1866 to 1914 to study it in brief outline.

166. **The Results of the Civil War.**—We must observe, in the first place, that the Civil War itself introduced new elements into our industrial development. It was responsible for the abolition of enforced labor, for the destruction of the old plantation system, and for the disorganization of industry in the South. A new industrial order was to be established in a considerable part of the country. Congress planned at once for political reconstruction, but the important question of putting the South back on its feet industrially received little or no consideration. Indeed, political uncertainty and confusion incident to the restoration of the Southern governments greatly handicapped the economic rebuilding of the country.

Meanwhile new social and industrial problems of great moment were created for this part of the country. Planters were ruined, much of the basis of credit was destroyed, and millions of negroes just released from bondage were thrown largely on their own resources. Out of the old order grew the system that exists to-day, based on free la-

bor, with negroes slowly rising in the scale of intelligence and learning the art of self-support, and with new capital appearing in the South to exploit its varied resources.

Other results of the war should be added. The withdrawal from Congress of Southern representatives cleared the way for prompt development of the land and railway policy advocated by Northern Congressmen. The National Banking System was an outcome of the conflict. A high protective tariff, imposed by the financial needs of the War, prevails to-day. Greenbacks became a new, and at times, a troublesome element in our currency. Rising prices stimulated both agriculture and manufacture. Some of the important industries of to-day received their earliest stimulus during the War, and, in general, there was inaugurated a period of prosperity which continued almost for a decade, and which gave the industries of the country the trend they have followed largely to the present. Commenting on the business of the time, John Sherman wrote to his brother on November 14, 1863, of the "wonderful prosperity of all classes, especially laborers." Said Sherman: "We are only another example of a people growing rich in a great war. And this is not shown simply by inflated prices, but by increased production, new manufacturing establishments, new railroads, houses, etc. Indeed, every branch of business is active and hopeful. This is not a mere temporary inflation caused by paper money but is a steady progress and almost entirely on actual capital."

167. New Resources.—One of the most significant features of the period from 1866 to 1914 was the development of many new resources. Although the mining of iron ore had long been an important enterprise, the exploitation of the so-called Lake Superior deposits shortly after 1856 offered an unexcelled source of supply, one which thus far has never been surpassed in productivity in any part of the world. After 1870, the Birmingham, Alabama, dis-

trict became an important producer. Copper was not a new product. It had been mined on a limited scale in some of the seaboard States, and Michigan, after 1845, yielded considerable quantities; but the discovery of new sources in Montana, Arizona, Utah, and other Far Western States contributed greatly to the upbuilding of industries which depend on this metal. Lead, also, had been mined for years in eastern Missouri, and in portions of Wisconsin and Illinois, but new sources in southwestern Missouri were extensively developed after 1860, and other supplies were found in some of the Far Western States. This period was particularly noted for the development of great reserves of silver, gold, and zinc; for the beginning and rapid extension of the use of petroleum and natural gas; for the enormous draft on the coal and timber resources of the country; for rapid development in production of aluminum, fertilizers, and cement; for the much greater utilization of the quarry resources of the country; and for great increase in consumption of mineral waters. The result of this unexampled exploitation of mineral products has been to put the United States in the front rank as a producer of some of the most important raw materials. This is the case with coal, iron ore, petroleum, and natural gas, to name only the most important. The abundance of these essential products is one of the chief causes for our rapid rise to first place among the manufacturing nations.

No summary of nature's part would be complete without mention of the new agricultural resources brought under cultivation since 1860. The area west of the Mississippi has proved to be the most productive wheat region in the country. Certain portions afford unexcelled pasturage. This region also yields large quantities of other important farm products. Of no small importance for our development has been the growth of our dominions. These have

added considerably to our industrial resources and have provided a growing market for our manufactured commodities.

168. **The Human Element.**—The human factor in our development should not be overlooked. Man, also, has contributed wonderfully to economic progress through his ingenuity in devising new instruments of production, in working out new systems of organization for industry, in finding new methods of distributing goods, and in discovering new ways of creating wants. If this country has afforded an unusual opportunity for the exercise of human ingenuity, man has responded handsomely by contributing in the ways just named to the evolution and growth of industry.

169. **Economic Institutions.**—The expansion since 1860 of both public and private institutions is another feature of our industrial growth. Governments, State and Federal, have taken an increasing interest in economic life. This has been notable in two directions: first, in the intervention of all grades of Governments in industrial activity; and second, in the great increase in promotion, or beneficial, work. Several new Departments have been added to the Federal Government. A Bureau of Agriculture was authorized by the Act of May 15, 1862; in 1889, this was raised to the dignity of a Department, with its executive head entitled to a seat in the Cabinet. In numerous ways this Department now renders valuable assistance to farmers. Through its divisions and bureaus, it investigates the relation of soils to climate and organic life, seeks to eliminate insects and diseases injurious to plant and animal life, promotes agricultural experiment and education, instructs farmers in methods of coöperation, in marketing and grading of products, seeks to improve the social life of the farmer, and in other ways endeavors to make agriculture a more attractive and productive enterprise. These activi-

ties have both increased the productivity of American farms and have prevented enormous wastes.

Since 1860 the Federal Government has rendered an ever increasing service to manufactures and commerce. The Department of Commerce and Labor was created by an Act of 1903. In 1913 the three bureaus concerned with labor administration were separated from this Department and another was created called the Department of Labor. To the Secretary of Labor was assigned the duty of "fostering, promoting, and developing the welfare of the wage earners of the United States, improving their working conditions, and advancing their opportunity of profitable employment." The work of the Department of Commerce extends into many fields. For example, the Bureau of Foreign and Domestic Commerce is especially concerned with the task of promoting foreign trade. Representatives of the Department are sent to all parts of the world to obtain information helpful to American enterprise. Publications of the Bureau give merchants and manufacturers a vast amount of information needed for the development of business. The work of the Bureaus of Census, Standards, Fisheries and Navigation is both directly and indirectly stimulative of business.

Some of the older Departments have taken on new functions. Examples of this are found in the development of rural delivery and the Parcel Post, under the Post Office Department, and the work of the Geological Survey and of the Bureau of Mines of the Department of the Interior. The growth of business together with the development of the banking system created new duties for the Secretary of the Treasury. And, of course, all the work connected with the regulation and control of business required the creation of new governmental functions. Much of the work of the Government has been in fields into which individual initiative would not go because of the expense,

or of the remoteness of the reward, or because the benefits were too remote. Nevertheless, such activity has afforded the country great opportunities for development.

The second characteristic named above is the growth of government regulation. Owing to the increasing dependence of man on man, and of industry on industry, it has become impossible to proceed under an unmodified let-alone policy. Public interest in economic affairs has greatly increased with the expansion of business which made the interruption of the supply of commodities or services and malpractices in business a much more critical matter than in former years. Hence, regulation has been an inevitable incident to industrial development. There was regulation before 1860, to be sure. Where corporations were chartered under State and Federal laws, such Governments exercised considerable care to see that these organizations conducted themselves in accordance with the terms of their charters. The growing public interest, for example, in turnpikes, canals, railroads, and a few financial institutions, demanded closer supervision by the State. But, before 1860, this control was relatively small. A new era of regulation, in which all grades of governments took part, began about 1870. In course of time, railroads, local public utilities, banks, insurance companies, big business, and ocean and inland shipping, were brought under some kind of supervision. The principal landmarks of this period were the National Banking Act of 1863, the Federal Reserve Act of 1913, the Sherman Anti-Trust Law of 1890, the Clayton Act and the Federal Trade Commission Acts of 1914, the Interstate Commerce Act of 1887, and the Act of September 7, 1916, authorizing the establishment of the Shipping Board. Most of these laws have been amended from time to time. In addition to the legislation named above, many of the States have created commissions for the regulation of various utilities. While such measures,

in a way, restrain individual initiative, in a broad sense, they work for the public good and thus promote wholesome economic growth.

170. **Other Economic Innovations.**—A notable feature of this period has been the adoption of new forms of business enterprise. Prior to 1860 industries were operated chiefly by individuals or partnerships. Exceptions were found in the case of turnpikes, canals, railroads, and occasionally banks. But by far and large the forms named above were typical of the times. Shortly after 1860 these simpler organizations began to give way to the corporation. This was particularly the case with large-scale enterprises where the corporation with its great facilities for raising capital, its provisions limiting the liability of its members, its continuity of life and policy, and its arrangements permitting many persons to delegate management to the few who actually directed its affairs, gave it great advantages over other kinds of organizations. But the evolution did not stop here. Pools existed among business units for some years before 1880, and about that date combinations began to take the form of legal trusts, and later of holding-companies and consolidations. The growth of big business, with its numerous problems, is one of the outstanding characteristics of our industrial development during the last half-century. Notwithstanding the many serious problems involved, it is an important cause of our industrial growth.

Credit institutions, also, have undergone great transformations since 1860. Except in a few instances banking before this date was largely unspecialized. The establishments of the day handled almost any kind of financial transactions, including provision of credit for the movement of goods between various grades of producers, or from producers to ultimate consumers, and of funds for long time, or capitalistic, purposes. Some of the bad banking before the Civil War was due to the fact that the insti-

tutions did not recognize the differences in the kinds of business they were called upon to transact. Much of this has changed. Both because of the enormous demands for financial facilities, and because of the strain upon the banks due to the rapid growth of business, such organizations have found it necessary to specialize. The field is now largely covered by commercial banks, savings banks, and trust companies, and also by investment bankers. Promotion and underwriting has become a characteristic operation of this period, and specialized institutions have developed for this purpose. In 1914 the Federal Farm Loan system was brought into existence to provide funds for agricultural purposes. The building and loan association is another type of organization peculiar to the period. Although there is considerable amount of overlapping, each of these classes of institutions devotes attention largely to the kind of business it is especially qualified to do. It is needless to say that this develops skill and facilities in the particular lines and hence promotes and encourages industrial growth.

In this connection it should be added that the rating companies, which first made their appearance as commercial enterprises after the panic of 1837, have taken on new functions and have greatly increased their services to the business world.

These changes have been accompanied by others of great significance for industrial progress. Shortcuts have been found in passing goods from producers to consumers. Systems of direct selling have come into vogue. The chain store, the mail-order house, and the great department store have evolved new methods of distribution, and advertising has been developed since 1860 as a powerful method of stimulating wants. The telephone, the interurban, the wireless, and the Parcel Post, and now the airplane are new and convenient methods of communication.

171. **A New Spirit of Enterprise.**—All the while this period has been continually characterized by sharper competition among men and among business organizations. The growth of business talent has been notable. In recent years there has been a tendency to improve such talent by study and training. The loose, easy-going methods of former years are no longer satisfactory. In thousands of instances in shops, offices, and schools instruction is given in business. Just as in former times it became the custom to educate men for medical and legal professions, so now many colleges have taken up the work of business education. Management has become an art with principles partly ascertained in the hard school of experience, and partly deduced from a theoretical study of the business world. Nor is this all. Scientific management has been developed to put certain industries on a firm basis with definitely established standards for materials, performance, and finished products, and to increase output and improve relations between managers and men.

172. **The New Social World.**—Profound changes in industrial relations have resulted from these developments. The separation of the management from the labor force in establishments has become a potent cause of misunderstanding. It is difficult for the two sides to obtain each other's point of view when administrative and employment problems are in different hands. Thus labor disputes more easily arise under the new than under the old system. Consequently machinery has been set up to bring employers and men together. Hence the growth of trade unions with policies and methods of their own and the federation of these unions into a great national organization, and hence the growth of similar organizations composed of employers. In many instances collective bargaining is taking the place of the old individual wage contract. Questions of wages, hours, and working conditions are now to the

fore. Employment problems, such as the careful selection of men, records of accomplishment, welfare work, and policies of preventing continuous labor turnover receive careful study. Of somewhat broader scope are questions of compensating workmen for injuries received during the performance of their duties, alleviating unemployment, health and old-age insurance, protection of employees from accidents when engaged around dangerous machinery, and the improvement of sanitary conditions in factories and homes. All the while the enormous aggregations of wealth have called forth discussions of the still larger question of the justice of the distribution of wealth. Thus income and excess profits taxes, methods of reaching the unearned increment, and the nationalization of some resources and industries have become problems of the day.

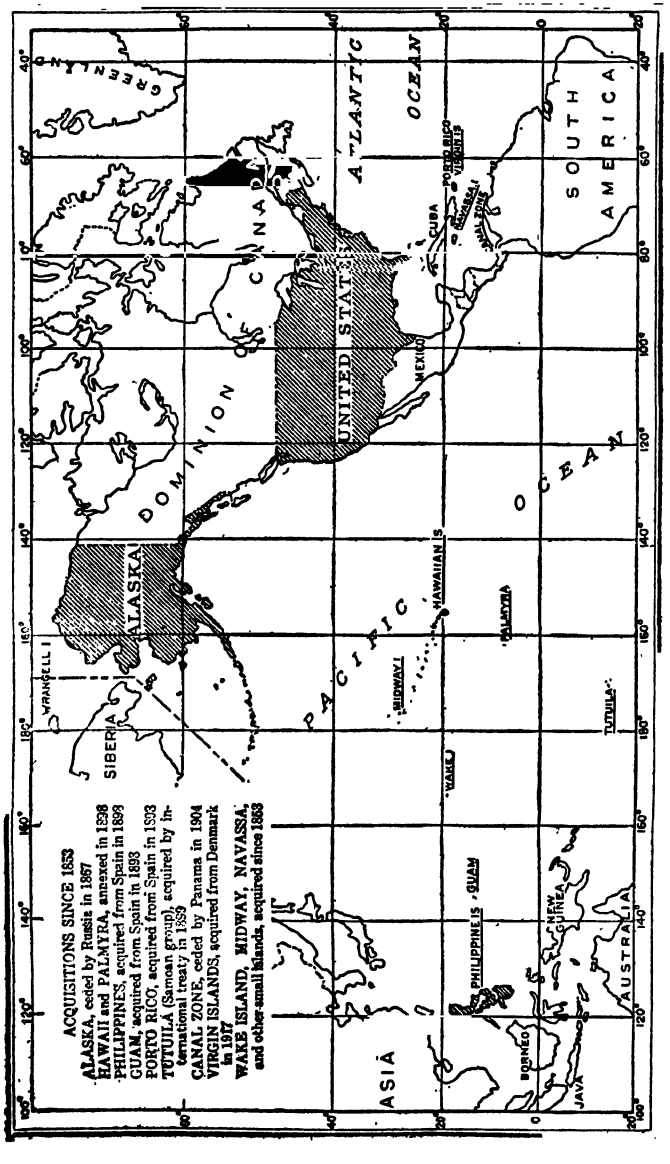
Rapid industrial growth has raised questions of another kind. On the one hand the enormous draft upon natural resources seriously threatens to diminish the supply of some important products and, on the other, competition often leads to wasteful exploitation. We have, therefore, been compelled to study such matters as the conservation of forest and mineral supplies, the protection of soil resources, the development of irrigation, flood control, protection of native animal life, improvement of the waterways, and, in general, the more careful use of all the gifts of nature. It is needless to say that most of these problems are entirely new since 1860, and that they are a direct result of industrial development since that time.

173. **New Industries.**—It would be impossible in a brief space to give a list of even the best known of the new manufactures. One thinks first of aluminum products, automobiles, bicycles, cash registers, calculating machines, motor cycles, moving pictures, typewriters, phonographs, airplanes, office furniture, and other new products of everyday experience. A longer list would include many prod-

ucts of wood, petroleum, cotton and cottonseed, rubber, a great variety of electrical products, many kinds of chemicals, and machinery and equipment of all descriptions. By comparing the list of 1860 with that of to-day one is impressed with the facts that many commodities formerly produced in the household have become factory manufactures, that the variety of goods now on the market is vastly greater than in 1860, that some of the most prized articles are new since that date, and that many of the new industries are engaged in manufacturing labor saving devices. All this signifies that present society is more amply supplied with goods and with less individual effort. New devices have greatly increased productivity, with the result that wealth is produced at a more rapid rate, and the opportunities both for consuming and saving are much greater than ever before. These are some of the important conditions of industrial progress.

174. **The Causes of Industrial Growth.**—No single factor is responsible for our industrial development. There has been a constant interaction of all the elements. Sometimes given elements are both cause and effect. The growth of manufactures, for example, put a great strain on the extractive industries to supply increasing amounts of raw materials. But on the other hand the discovery of new and greater resources, the improved methods of exploitation, and the development of transportation stimulated manufactures by increasing the supply of materials. Meanwhile the growth of the extractive industries and of manufactures promoted the development of credit institutions, because these were compelled to expand and to specialize in order to meet the new demands. But again, improved credit facilities reacted as a stimulus to manufactures and the extractive industries. The effect of modern methods of finance on the promotion of such industries is a clear illustration of this point. The growth of the

communication industries provided a general tonic. The building of railroads, for example, widened markets, lowered the cost of obtaining raw and finished products, and facilitated the localization of industries at certain favored places. But while this stimulant was administered by the railroads, the increasing volume of the traffic in turn encouraged further extensions of transportation and offered new business for the banks. It is obviously impossible to give a continuous picture of this development. Although it is described in parts, it is to be remembered that expansion is going on everywhere, and that growth in one field is usually both cause and effect of development in others. Our economic history since 1866 will be discused under the following captions: (*a*) Territorial Expansion; (*b*) The Growth of Population; (*c*) The Development of the Extractive Industries; (*d*) Manufactures; and (*e*) Commerce.



TERRITORIAL ACCESSIONS OF THE UNITED STATES SINCE 1860

CHAPTER XIII

TERRITORIAL EXPANSION

175. The Resources and Development of New Possessions.—During the period under discussion important additions were made to the territory under control of the United States. The first of these was Alaska, purchased in 1867, adding upwards of 590,800 square miles. A number of smaller acquisitions occurred in 1898 and shortly after. The Hawaiian Islands were acquired in the year just named; Guam, Porto Rico, and the Philippines in 1899; the Tutuila group in 1900; the Panama Canal Zone in 1904; and the Danish West Indies in 1917.

The significance of these additions is found in their industrial advantages. The accessions since 1898 have enlarged our dominions by scarcely 125,000 square miles, but they contain valuable resources; they bring under the control of this country harbors, coaling and cable stations, and sites for wireless; they afford new opportunities for investment, to say nothing of their strategic importance for foreign commercial development. It is of great importance, when our capital and enterprise go abroad, that these should be under the jurisdiction of the United States. Thereby investment is relieved of the uncertainties of foreign control and of other burdens which sometimes arise because of discriminations against aliens. Such control promotes development which, in turn, encourages the growth of commerce and manufactures both at home and in the new countries. Of no small significance is the fact that the resources of some of our possessions supplement our own.

176. Alaska.—The industrial value of Alaska was little appreciated at the time of purchase. Not a few persons looked upon the $7,200,000 we paid for it as so much money wasted. But Alaska in recent years has contributed many times that amount to the commerce of the United States. Unofficial reports of 1879 gave the imports into the Territory from this country as $312,000. The import trade of the Territory passed the million mark in 1887 and has never since fallen below that point. In fact, the flow of commerce has steadily increased. In 1914, the total imports into Alaska were valued at $23,029,000 of which all but $567,000 were credited to the United States. Exports that year were $22,941,000. In 1918 the total commerce of Alaska with the United States amounted to $131,767,000. The chief exports from the Territory were fish valued at $46,059,000, copper valued at $20,217,000, gold at $12,416,000, and various other commodities worth $6,030,000.

The principal resources from the point of view of present facilities for exploitation are fish, with salmon, cod, halibut, and herring as the ranking varieties; fur-bearing animals, with the seal, beaver, fox, lynx, marten, bear, otter, and wolf as some of the principal kinds; and minerals, with copper and gold of chief importance.

For many years the waters of Alaska have been visited in quest of seals. In 1786, Gerrasim Pribilof discovered as the breeding place of the animals the group of islands which bear his name. After the country came into possession of the United States the policy of granting exclusive leases to exploit this resource was followed. The islands were declared a special Government reservation. Grants were made first to the Alaska Commercial Company and later to the North American Commercial Company. Upon the expiration of the lease of the latter, about 1910, a law was passed by which the killing of seals was placed in immediate charge of the Secretary of Commerce and Labor.

Administration of this work is now in the hands of the Bureau of Fisheries of the Department of Commerce which exercises general oversight of the fur-seal herd. It has been estimated that from 1870 to 1910 the Pribilof Islands have supplied more than 3,000,000 skins. That the methods of sealing were resulting in rapid extermination is shown by the fact that from an annual return of 130,000 about 1890 the number declined to less than 13,000 in 1910. Under recent conservation measures, however, there is a fair promise that the numbers will again increase. In 1918, the seal herd resorting to Pribilof Islands was estimated at 530,000.

The total value of Alaska's mineral output from 1880 to 1912 was more than $225,000,000. Thus far only a small part of the country has been surveyed, but from what is known it is evident that the Territory is rich in certain minerals. Even before the purchase gold was known to exist. Considerable exploiting was done from 1880 to 1890, and in the latter year the output was about $762,000. The Klondike discovery in 1896 and that of Cape Nome in 1898 attracted thousands of gold seekers. The total production of the yellow metal in 1917 was about $20,000,000.

Copper is found in a number of parts of the country. The best known deposits are in the southeastern extremity of the Territory, north of Dixon Entrance, and in the vicinity of Prince William Sound and the Wrangell Mountains, from fifty to two hundred and fifty miles west of the Canadian border. The extent of these resources is little known, but they are "generally believed to contain ore in enormous quantity and of unusual richness."

Coal, also, constitutes a part of the mineral wealth of the Territory. According to a Government Report, "it is probably safe to say that the minimum estimate of Alaska's coal resources should be placed at 150,000,000,000 tons and that the actual tonnage may be many times that amount.

These figures indicate coal resources far in excess of the original coal supply of Pennsylvania."[1] About one-half the coal deposits is estimated to be lignite, a little over one-fifth anthracite and high-grade bituminous, and the remainder bituminous and sub-bituminous. Other mineral resources worked to some extent are tin, marble, gypsum, lead, antimony, and silver.

The present agricultural possibilities are not great compared with the size of the country. Possibly not more than 30,000 square miles are suitable for grazing and farming. The growing season is shorter than in regions farther south, but some compensation is found in the fact that there are a greater number of hours of sunshine during the summer months. It is probable that scientific studies in the relations of soil and climate to crops may greatly increase farming opportunities.

Alaska's timber resources are considerable, but under present conditions there is little encouragement for the lumberman. While, as a rule, the timber is not of superior quality, the supply is often of local value for piling, salmon cases, rough dimension lumber, and for fire wood. More than 27 per cent of the territory is woodland, but as far as is known, not more than 20,000,000 acres contain timber of sufficient size or density to make commercial exploitation worth while.

One of the most imperative needs of the Territory is means of transportation. The principal industrial opportunities are found in the latent supplies of raw materials, but these are bulky and expensive to ship. In order that development may take place, building materials, machinery, and supplies must be hauled long distances, and of course, the rough extracted product must be brought out,

[1] *"Commerce and Industries of Alaska, Hawaii, Porto Rico, and the Philippines,"* Bureau of Foreign and Domestic Commerce, Special Agent Series, No. 67, p. 12.

and before this can be done, cheap and fairly rapid communication must be provided. Only a meager beginning has been made in thus opening the Territory. In 1914 something less than 460 miles of railway were in operation. An Act of Congress in 1905 provided a Board of Road Commissioners to work under the direction of the Secretary of War. On June 30, 1918, the mileage constructed by the Commission was 1,006 miles of wagon road, 2,346 miles of trail and 673 of sled road. Another Act of Congress in 1914 authorized the creation of an Alaskan Engineering Commission with authority to locate, construct, or lease railroads to connect the interior with one or more navigable ports. Still another step was taken in 1915, when the Alaska Railroad Act was passed. It provided for surveys and for the building of a line over the Susitna or Seward route from Seward on Resurrection Bay to Fairbanks on the Tanana River, some 470 miles inland. This includes the Alaska Northern Railroad, purchased for $1,150,000, running from Seward through the Kenai Peninsula in the direction of Knik. Eventually the road may be extended to the Yukon.

Except for the canning and preserving of fish Alaska has no manufactures of any great importance. In 1920 about $39,161,000 out of a total of $41,495,000 for manufactures was for fish products. A number of small industries were engaged in the production of wagons, lumber and timber products, tobacco, malt liquor, confectionery, and in printing and publishing. All in all 147 establishments represented 24 different industries. Except for the supply of a few local wants there is little likelihood that manufactures will develop to any considerable extent for many years. The population is small, numbering 55,030 in 1920, labor is scarce, and such commodities as could be produced would be bulky and expensive to transport, and markets are very distant. Thus manufacturing will of necessity be

confined to the supplying of a few of the immediate needs of the people and to primary treatment of some of the great raw materials. The canning of fish is, of course, a promising industry.

177. The Philippine Islands.—The commerce of these Islands has increased remarkably since the restoration of stable conditions after the Spanish War and notably during the past decade. In 1910 the value of the external trade was $34,150,000, divided about equally between imports and exports. The total commerce in 1917 was $161,401,000 of which $100,855,000 was with the United States. The ranking exports are hemp, tobacco, sugar, copra, and cocoanut oil. A considerable number of other products find a foreign market. The value of hemp exported in 1916 was $26,692,000, and in 1917, $46,807,000; of sugar in 1917, $12,277,000, and of tobacco products the same year, $7,150,000. Considerable quantities of the latter two commodities go to markets in the Far East, including Hongkong, China, and Japan. The products of cocoanuts have shown a remarkable increase in recent years. In 1913 5,010,000 kilos of cocoanut oil valued at $1,146,000 were exported; in 1917 the amount rose to 45,198,000 kilos valued at $11,409,000. In addition the value of copra exported during that year was $8,327,000. The United States enjoys the larger amount of the trade both in exports and imports, but the commerce of the Philippines with the Orient is increasing, and this movement has been stimulated by war conditions.

Although the Islands possess important timber and mineral resources, the preponderance of advantage lies with products of the field. So-called manila hemp grows wild. Indeed, this is almost the only place in the world where the plant has met with great success. The growing of this variety thus amounts to something like a monopoly. In recent years, however, the prosperity of the industry has

been affected by the competition of sisal grown in Yucatan and elsewhere. The latter product enjoys some advantage, being relatively near markets in the United States and Great Britain, which are among the largest consumers. But with the introduction of scientific methods hemp will probably be able to hold its own. It produces the best fibre for the manufacture of cordage and is extensively used in the Islands in producing materials for clothing and for other purposes. In the hands of skilful workmen it yields a beautiful product.

Sugar, at present, is most largely produced in the Visayan Islands, the middle group of the Archipelago. "While there is no question that, as a mere physical possibility, the output of the Islands can be greatly expanded, there are also forces that make most improbable and almost impossible any very rapid extension in the immediate future. Large capital is needed, the labor supply is quite insufficient, and laws prohibit the acquisition of plantations beyond a fixed area." Compared "with Cuban mills and the mills of Hawaii, the Philippine plants are small, but they are large enough for present purposes and will serve to increase the sugar output in quantity and, what is much more important, in quality."[2]

For many years tobacco has been a leading crop. Large amounts are consumed locally, smoking being almost a universal habit. The plant can be grown readily in all parts of the Islands, but the best quality is produced in northern Luzon, in the valley of the Cagayan River. Although the crop has increased in recent years, the Islands are far below their capacity for production. Conditions in the American markets, including tariff arrangements, as well as the demands of the Orient, affect the prosperity of the industry. In 1917 the United States took about three-fourths of the Philippine cigars, valued at $3,862,000.

[2] *Ibid.*, p. 81.

As in the case of hemp and tobacco soil and climatic conditions make possible a great extension of the cocoanut industry. The trees grow well throughout the Archipelago. Already, cocoanut products have a wide range of uses and the demands are increasing. Copra, which is the dried kernel of the cocoanut, is of growing commercial importance. Oil extracted from this substance is used in the production of soap and candles, for cooking and cooking compounds, as a lubricant, and for medical purposes. In the future the rising price of animal fats and oils may cause a further substitution of cocoanut oil in the manufacture of a number of commodities in which the animal product is now used. Cocoanut fibre, or coir, is also of commercial value. Prepared in various ways, it is used in the manufacture of brushes, for ropes, coarse thread, and matting. Coir ropes are particularly valuable because they are strong, elastic, and not readily affected by salt water. France was formerly the largest consumer of cocoanut oil, but in the last four or five years larger and larger quantities have been imported by the United States and Great Britain. In view of the promising future for the industry it is not surprising that Philippine producers have been stimulated to increased activity. New capital has recently been invested in the industry and a number of plants have been erected for the manufacture of oil.

Owing to the range of latitude and the altitude in the Islands, conditions are suitable for the growing of a great variety of fruits and vegetables. The cultivation of the cacao plant, the source of chocolate, is carried on to some extent; indigo has been profitably grown; long-staple cotton was once produced; pineapples are raised for fibre; and bananas, citron, mango, lemons, and oranges are among the products. Conditions are excellent for the growing of coffee. A few years ago rice was cultivated both for local consumption and export, but now the home supply is

largely imported. The decline of the industry is "attributed to the lack of the carabao, the work animals of the Islands, which have been slain by thousands by the rinderpest, to devastation of growing crops by locusts, to the disturbances caused by military operations, and to ravages of cholera epidemics." It is possible with improved agricultural methods, supplemented by scientific study of the evils that have beset the crop, that rice growing may again become an important industry.

Concerning the lumbering industry a recent Government Report contains the following summary: "The Philippine Islands have a very extensive timber area, which is generally held to be capable of supplying an annual output of four to ten times the present yield of about 100,000,000 board feet. At the same time it must be remembered that the best species are much more scattered than in forests of the Temperate Zone. This area is practically all owned by the Government, which sells, not the land, but the right to remove the timber. These forests contain about 400 tree species known in the market, of which, however, only 100 to 150 are of much importance, and not more than 15 or 20 are at present cut in large quantities." [3] Most Philippine woods are relatively hard and heavy. Some are very durable and beautiful in color and grain. Among the difficulties in extending exploitation are the scarcity of skilled labor, the distance of the forests from harbors or railway lines, and the fact that much of the timber land is thickly overgrown with vines, shrubs, and forest plants.

Relatively little is definitely known of the mineral resources of the Islands. Gold, silver, coal, iron, copper, and sulphur are worked to a limited extent. The coal-mining industry encounters this difficulty, that the strata are "usually folded or faulted as a result of earthquakes and

[3] "The Lumbering Industry of the Philippines," Bureau of Foreign and Domestic Commerce, Special Agent Series, No. 88, p. 19.

landslides, and the roofs of the seams are rarely firm enough to stand without timbering."

Fish occur in large numbers in Philippine waters. According to the Census of 1903, more than 500,000 long tons of fish were annually consumed in the Islands. Pearl oyster fishing is an important industry.

Among the manufactures, sugar, cigars and cigarettes, cocoanut oil, native cloths, cordage and hats are produced for export. Of native industries the production of cloth is the most ancient. Fibres of hemp and pineapple are among the important raw materials. Hats are produced from a number of fibres, including hemp and bamboo, and native grasses. Manufactures for domestic consumption include bakery products, boots and shoes, soap, lumber, carriages and wagons, candles, confectionery, furniture, leather, and some machine-shop products.

The attitude of the Filipino towards industry is apparently undergoing change. According to a recent Commerce Report: "The younger generation of Filipinos is looking with more favor on commerce and industry when choosing a career. There has been an almost universal disposition to regard trade as an occupation fit only for women, and Chinese and other foreigners, and to be engaged in by ambitious Filipino men only in case of urgent necessity. Recently, however, a new attitude toward trade has become noticeable, and during 1917 a number of young men of the very best type left Government service to engage in business." This new spirit of enterprise promises a more extensive development of commerce and industry.

178. The Hawaiian Islands.—Except for the abundant supply of fish, the resources of Hawaii are almost entirely agricultural. It is true that a considerable portion of the Islands is covered with forests, but aside from the fact that these protect the country by distributing rainfall they are of no great economic value. In 1911 there were some

631,000 acres of forest reserves maintained chiefly for the conservation of water sources.

Even in the case of much of the agriculture the work is done in face of natural handicaps. Notwithstanding the fact that there are fertile areas, some regions must be irrigated, and others fertilized to fit them for farming. Irrigation is an expensive process for the reason that water supply must both be pumped from artesian wells and distributed through canals and channels. With regard to sugar, the principal crop, it has been said that conditions are "clearly less favorable than they are in Cuba or in Java, and the planters have sought, quite successfully, to equalize these conditions by the use of extensive and costly irrigation systems and by artificial fertilizing." The planters' association wisely employs a staff of experts in chemistry, entomology, and scientific agriculture with the result that the return per acre is the highest in the world. The average annual yield is 4½ tons, but on irrigated lands it reaches 6 tons. A feature of Hawaiian agriculture is that farms are large, the average in 1910 being nearly 600 acres.

The value of the sugar product is much greater than that of all the others combined. During the decade from 1900 to 1910 the output increased almost 100 per cent. More than 1,111,000,000 pounds were produced in the latter year, and the yield has increased materially since that date. While some refining is done in the Islands, the bulk of the product comes to the United States as brown sugar to be manufactured in our own establishments. Importation in 1916 amounted to 1,110,000,000 pounds of brown and 27,025,000 of refined. As a rule from 85 to 90 per cent of the crop is grown on the Islands of Hawaii, Maui, Oahu, and Kauai, named in the order of importance.

Since the United States has long been the chief market for the sugar of the Islands, the prosperity of the indus-

try has depended in large measure on the kind of tariff treatment received from this country. The Reciprocity Treaty of 1876 admitted free of duty raw sugar and molasses, among other items, in return for free admission into the Islands of a number of commodities of this country. After the Annexation in 1898 planters were assured the freedom of American markets with the result that the industry was encouraged to expand.

The dangers of relying on one crop have been relieved to some extent by diversifying production. Cultivation of rice was introduced in 1860, and for a number of years it ranked second to sugar. There is some indication that the industry is declining. This may be due to the demand of the large Japanese population for the product of their own country. It is worth while noting, in this connection, that imports of rice from Japan in 1912 amounted to about $1,000,000 as compared with only $15,000 from the United States.

The pineapple industry is relatively new but has grown rapidly in importance. It provided raw materials for canning and preserving which rank third among the manufactures of the Islands. In 1905, the value of canned and preserved pineapples exported was $66,800; in 1912, $2,567,000, and in 1915, $5,986,000. The value of fruits and nuts exported in 1918, comprising chiefly the value of pineapples, was $8,640,000.

Coffee, for which natural conditions are favorable, has been grown for many years. At present the output is about 3,500,000 pounds, but competition from Brazil and Central America renders prospects somewhat uncertain.

Bananas are a profitable crop. Some success is met in producing sisal, but the product encounters competition from Yucatan, where there is a noticeable advantage in freight rates to the United States. Tobacco is produced to some extent, and recent experiments indicate that rub-

ber may become a profitable product. Sea-island cotton is a doubtful crop, but may be of future importance when methods of eradicating several insect pests which infect the plant are discovered. On the higher slopes, where field crops do not thrive readily, stock raising meets with success.

The nature of the manufactures of the Islands may be gleaned from our study of resources. Sugar refining ranked first in 1910, followed in order by the cleaning and polishing of rice, canning and preserving of pineapples, slaughtering and meat packing, and printing and publishing. There is, also, the list of usual industries which supply local needs, such as the production of confectionery, furniture, millinery, soap, paint, and a number of others. The total value of manufactured products in 1909 was $47,404,000, which was an increase of about 100 per cent since 1899.

The labor problem in Hawaii has in recent years been one of considerable moment. To take care of the increasing amount of work it has been necessary to invite foreigners. Immigration receives assistance. During the last few years the policy has been followed of introducing only Caucasians, and as far as possible, only agriculturalists with families. Foreigners brought in recently include Spanish, Portuguese, Russians, and Filipinos. In view of the nature of immigration the present population is necessarily mixed, with Hawaiians and part-Hawaiians in the minority. Out of a total population, in 1920, of 307,100, only 42,200 belong to the classes just named. The Japanese numbered 125,360 and the Chinese 24,500. Just now the population is said to be increasing more by natural increase than through immigration, due to the fact that recent immigration has been more largely of families from Europe than of adult males from the Orient.

The growth of commerce of the country has kept pace with the development of its industries. The total trade in

1900 amounted to $24,635,000; in 1910 to $71,635,000; in 1915 to $93,185,000; and in 1919 to $138,993,814. The United States takes all but a small part of Hawaiian exports; in 1915 this amounted to $64,438,000 out of the figures given above. In the import trade more than four-fifths of the commodities are received from this country.

179. **Porto Rico.**—As in the case of the Philippines industrial development in Porto Rico has been marked since the Spanish War. The total trade amounted to $9,562,000 in 1900; to $68,595,000 in 1910; to $83,241,000 in 1915; and to $137,683,000 in 1918. In 1915 about five-sixths of the export trade and nine-tenths of the import trade were with the United States. The leading exports in 1918 were sugar, valued at $41,362,000; tobacco, valued at $16,142,100; coffee, at $5,505,000; and fruits at $3,628,000.

Under American régime the course of Porto Rican industries has changed materially. Although the production of coffee has increased, sugar has become the ranking industry; meanwhile much greater interest has been taken in the production of tobacco and fruits. At the Agricultural Experiment Station "experiments are going on in many directions in an effort to introduce new types and improve old types. Among the products under trial at present, or hitherto, are strawberries, melons, vanilla, avocado, cacao, mango, banana, rubber, honey, and numerous others. In fact, as reported by the station, 'agriculture in Porto Rico since the American occupation has been pioneering.' This is almost as true of sugar, coffee, and tobacco as it is of strawberries, rubber, and cacao." The investment of American capital is partly responsible for the change, but the growing mutual interest between the United States and Porto Rico in each other's products is an important element.

The rise of the sugar industry is partly due to the change of political relationships. The acquisition of Porto

Rico not only afforded it a favored position in our market but gave it the benefit of American enterprise. By a law of 1901 the products of the island were permitted entrance into the United States free of duty. Shortly "factory methods were changed, new mills were erected, and plantings widely extended." During the years from 1850 to 1902 annual production ranged from about 25,000 to 75,000 tons. In 1912 shipments to the United States were 325,000 tons. At present most of the good land suitable for sugar production is under cultivation, and any future increase will depend on improved methods.

Prior to American occupation the most prosperous year in the production of coffee was 1898, when 58,659,000 pounds valued at $8,318,000 were exported. Such exports in 1918 were valued at $5,505,000. Even now, the prosperity of a considerable portion of the population is involved in the success of the crop. In a memorial to Congress in 1908, the planters stated that "one-half of the inhabitants of the island live in the interior and depend almost exclusively for their greater or lesser well-being on the favorable or unfavorable outcome of the coffee crop." Trees grow best on the hillsides of the interior where soil is suitable, but where conditions are usually not well suited for production of other crops. In a measure, the industry has been rendered uncertain by Brazilian competition, and by the loss of protected markets in Spain and Cuba. The hurricane of 1899 did great damage to the trees. One of the features of the industry is that Porto Rican coffee formerly found its chief markets in France and Cuba. Partly as a result of the better understanding of the value of the product, and partly because of efforts to develop American markets, the imports into this country have slowly increased. The growth from 1909 to 1916 was from 126,000 to 509,000 pounds.

Prior to American occupation relatively little attention

was given to the cultivation of tobacco. Shortly after 1900, however, American capitalists became interested both in growing the product and in the manufacture of cigars. The average shipments during 1902, 1903, and 1904 were about 66,000,000, and for 1910, 1911, and 1912 the average was 160,000,000. In 1916, upwards of 164,200,000 cigars, cigarettes, and cheroots, valued at $5,545,000 were exported. This tells nothing of the manufacture for local consumption and the export of unmanufactured tobacco. The soils best suited for the crop are somewhat limited in extent. As a rule they are confined to the valleys of the interior and the adjacent hills.

The growing of fruit on a commercial scale for export dates from about 1903. "Fruit raising," said the Governor's Report of 1912, "is rapidly becoming one of the principal industries of the Territory. The producers are cooperating to secure the highest efficiency in packing and marketing and are receiving the active assistance of the Porto Rican Commerce Commission in securing the recognition to which the quality of their products entitles them. The first community packing house was erected last year (1911) and is now in successful operation, giving its patrons every expert service required from the field to the market, including picking when desired by the owners." The total value of fruit shipments in 1902 was less than $300,000; in 1918 the value was more than $3,628,000. Shipments include oranges, grapefruit, pineapples, and cocoanuts.

Unlike Hawaii the area of farms is small. The average in 1910 was 36 acres. Over 35 per cent of the farms were not over four acres; 20 per cent were between 5 and 10 acres, 15 per cent from 20 to 50 acres, and about 13 per cent were large plantations, that is, of 500 acres and over.

While the waters of Porto Rico contain a number of excellent fish, these are exploited only for local consumption.

The island possesses very little commercial timber and no mineral of importance as far as present knowledge goes. The population in 1920 numbered 1,299,900.

180. The Resources of Other Possessions.—Guam and Samoa export small quantities of copra and cocoanuts. Tutuila is important principally because of the port of Pago-Pago which has one of the best harbors of the Pacific and is therefore of great value as a coaling station. The Panama Canal Zone exports large quantities of bananas, cocoanuts, balata, hides, manganese, vegetable ivory, ipecac root, sarsaparilla, and a considerable number of other products. The total value of the trade in 1917 was $28,771,000, the bulk of which was with this country.

The Danish West Indies were the latest acquisition. Some fifty islands compose the group, but only three are important enough to be known to any but geographers; these are St. Croix, famous as a source of Santa Cruz rum; St. Thomas, noted for the harbor of Charlotte Amalie; and St. John, which supplies the leaves of the bay tree used in the manufacture of bay rum.

From the point of view of quantity and variety or products very little is to be said in favor of the Islands. Their chief importance lies in the fact that they are a way station in commercial development, and are of importance for naval purposes. The location of St. Thomas "on a direct line of communication between European ports and the entrance of the Panama Canal, as well as in a direct line for vessels plying between the Atlantic ports of the two Americas or between the Atlantic and Pacific ports of these continents, makes it the logical distributing center for goods destined to any of the ports of the Lesser Antilles." The harbor of Charlotte Amalie is protected from the sea by an outer fringe of small islands and affords safe anchorage for a great fleet. Its situation may prove to be of very great future value. The harbor entrance is well lighted and

buoyed, coaling facilities are excellent, and oil may be delivered readily to oil-burning steamers.

181. The Economic Value of Island Possessions.—It is evident from the discussion of this chapter that not only do the outlying possessions supply this country with a great variety of products, but that they provide other facilities for commercial development. Their products are often doubly valuable because in many instances they cannot be produced in continental United States, or at least, not in quantities sufficient to satisfy the home demand. Under the stable government afforded by this country, and stimulated by the new spirit of enterprise which began to exploit their resources shortly after annexation, they have all developed rapidly in prosperity. The total commerce of the islands in 1918 was approximately $430,000,000 the bulk of which was with the United States. These regions take many American products, depending on the character of their markets. Exports from this country include agricultural implements, machinery of various descriptions, a considerable variety of iron and steel products, railway cars and supplies, automobiles, chemicals, cotton goods, manufactures of leather, and petroleum, meat, paper, lumber, and other products. The islands, therefore, not only supply us with many necessary raw materials, but afford a large market for our manufactures.

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CHAPTER XIV

GROWTH OF POPULATION

Men both demand and supply goods. All the instruments of commerce and industry are but means of increasing the effectiveness of labor, of getting commodities to market, and of bringing producers and consumers together. The growth of population, therefore, is related to all departments of industry. If the United States has the largest domestic market of any country in the world, it is because our numbers are so large and the productivity of our people so great. For the reasons just named the increase in population since 1860 has been a most potent cause of industrial development.

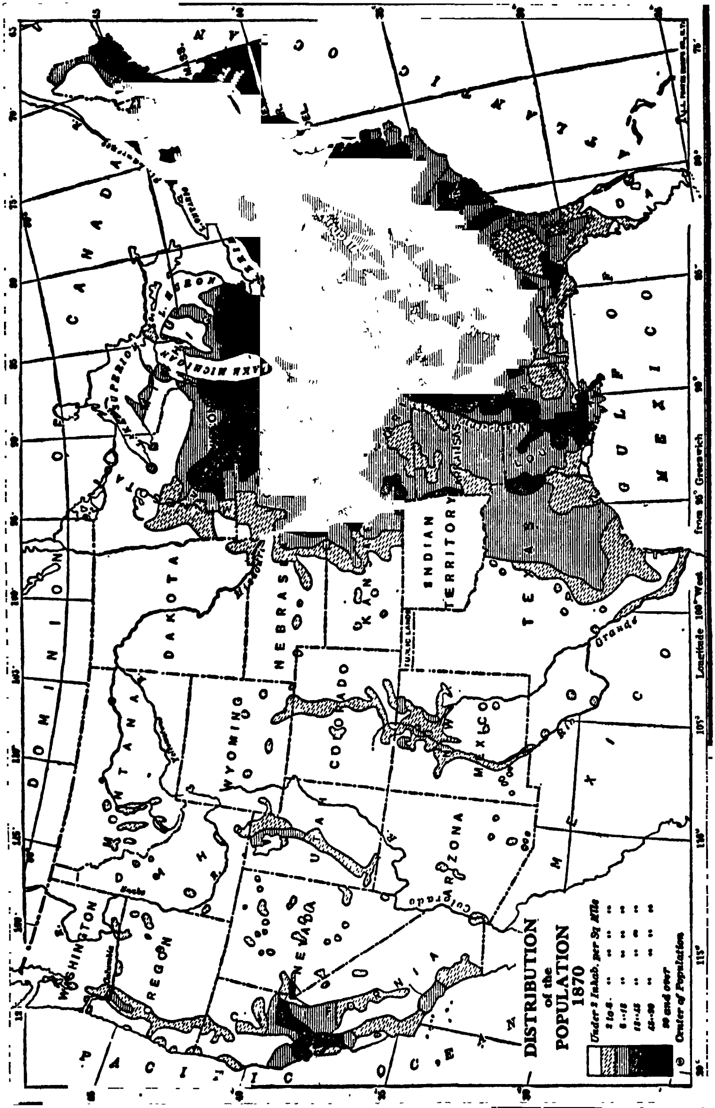
Some of the salient features under this caption are the further development and completion of the westward movement, the great increase in population, the growth of immigration, concentration in the industrial centers, and the rise of certain social problems.

182. The Westward Movement.—It is difficult to separate cause and effect in a discussion of the westward movement because of the many interactions of forces. The migration, for example, stimulated building of railways, but, on the other hand, improved means of communication facilitated the movement of people. This is as true for the growth of Lake and ocean transportation as for railroads. Low cost of hauling goods and cheap travel through the Great Lakes to the Northwest assisted the development of that region and thus encouraged settlement, but the prospect of increasing business was an encouragement for an

extension of lines of travel. So with ocean transportation which provided a relatively cheap means of communication between the Atlantic and Pacific Coasts. In addition to the factors just named, the liberal laws of the United States which permitted the acquisition of land and mineral and forest rights on easy terms, the great immigration to this country, and above all, the abundant and varied resources of the country west of the Mississippi which continually tempted the thrifty and enterprising were elements in the westward movement. Many minor factors were at work, such as improvements in farm machinery which both lowered the cost of producing crops and increased the amount that could be harvested, and technical improvements in mining which increased the productivity of that industry. The increase of surplus funds for investment, the growth of agricultural and geological knowledge, and the development of expert talent were factors of considerable moment.

By 1860 the frontier line had pushed north and west crossing central Michigan and Wisconsin to central Minnesota, thence southward bulging beyond the 97th meridian in portions of Kansas and Texas. In this year the first extension of settlements beyond the line of the Missouri was noted. The march of population up the slopes of the Great Plains had begun. Texas had filled up even more rapidly, its extreme settlements reaching the one hundredth meridian, while a number of former gaps had been filled. Incipient settlements about St. Paul, Minnesota, "had grown like Jonah's gourd, spreading in all directions, and forming a broad band of union with the main body of settlements down the Mississippi River." Population, meanwhile, had practically covered Iowa, and following the Missouri, passed beyond the eastern border of Nebraska.

A much larger portion of the country had been won before 1890. During the prior decade, numerous additions were made to the inhabited area within the Cordilleran re-


DISTRIBUTION
of the
POPULATION
1870
DOMINION OF CANADA
LAKE MICHIGAN
INDIAN TERRITORY
DAKOTA
NEBRASKA
WYOMING
COLORADO
MONTANA
TEXAS
ARIZONA
NEVADA
OREGON
WASHINGTON
GULF OF MEXICO
Rio Grande
Colorado

gion. New settlements joined the bodies formerly isolated in Colorado, forming almost a continuous line east of the Rocky Mountains. Practically all of Kansas was settled. The unclaimed portion of Nebraska had been reduced to one-third of what it was the decade before. Vacant regions in the Dakotas had been rapidly reduced. Settlements were extended in Montana, New Mexico, Idaho, and Wyoming. The unclaimed portion of Maine had been reduced from 12,000 to 4,000 square miles; that of Florida from 20,800 to 13,000 square miles. Thus expansion had been going on all around the rim of the United States. The westward movement was complete before 1900 and one of the most remarkable developments in our history was at an end.

What transpired during these years of migration may be learned concretely from a number of illustrations. Before 1860 the business of hunting and trapping was rapidly disappearing from the country between the Mississippi and the Pacific. Herdsmen followed, and from time to time in many places the raising of cattle was the leading industry. But the ranchman was pushed further west by the farmer, and gradually, as settlements became more dense, varied agriculture succeeded grazing. In time manufactures grew at certain favored places, and in consequence cities arose as the location of both manufacturing and commercial industries. Many sections of the new country experienced this evolution. The population beyond the Mississippi in 1860 numbered about 4,536,000; the figure for 1910 was 27,248,000. Thus, at the former date, about one-seventh of our people lived west of the Mississippi, and in 1910 between one-fourth and one-third. The growth of the States bordering on the Pacific was from 444,000 to 4,192,000, and of the Mountain States from 174,000 to 2,633,000.

This migration greatly affected all the centers; that is,

of population, of corn, wheat, and oats production, and of the value of farm property. The United States Census explains the method of obtaining the center of population as follows: "In locating the center of population it is first assumed to be approximately at a certain point. Through this point a parallel and a meridian are drawn, crossing the entire country." Then corrections are made to learn the true center by taking the "product of the population of a given area by its distance from the assumed parallel," called the north or the south moment, and the "product of the population of the area by its distance from the assumed meridian," called the east or west moment. When the figures are corrected, approximately equal numbers of people will be found east and west, and north and south of the dividing lines. The center of population is at the crossing of the lines. The result of the migration was to draw the center more and more to the West. In 1860 it was located about 20 miles south of Chillicothe, Ohio; in 1910 it was in the city of Bloomington, Indiana, having moved about 200 miles in 50 years. The center of the value of farm property moved from 60 miles east of Cincinnati, Ohio, in 1860, to about 39 miles west by northwest of Springfield, Illinois, in 1900; and that of wheat production from 18 miles north by east of Indianapolis, Indiana, to 70 miles west of Des Moines, Iowa, between the dates last named.

The westward movement has been one of the greatest causes involved in opening up the country west of the Mississippi. With the inflow of population farms were developed, mines were opened, manufactures founded, and lines of communication extended to satisfy new industrial needs. This region is now the source of the larger part of the food and mineral supplies of the country. Exploitation of forests, fields, and mines has not only enriched this section but has contributed to the upbuilding of industries in the older

sections, whose finished commodities are largely exchanged for the raw materials of the territory beyond the Mississippi.

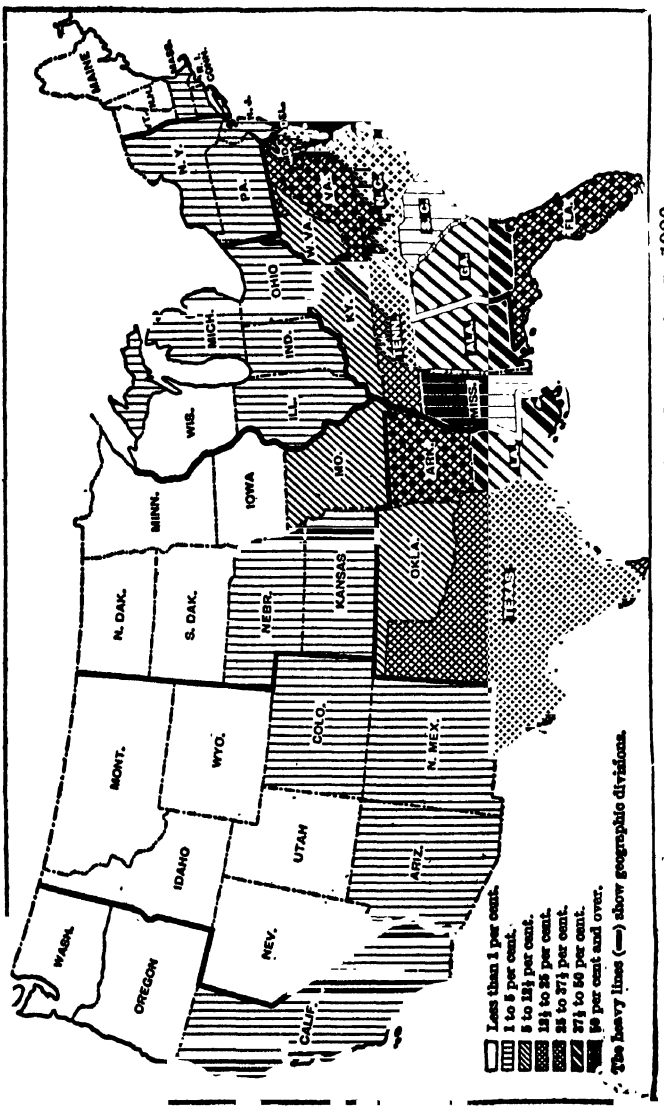
183. **The Growth of Population.**—Some idea of the increase in producing and consuming power since 1860 may be obtained from a study of the growth of population. The increase from 1860 to 1920 was from 31,443,321 to 105,710,620. This growth is shown in detail below:

INCREASE IN POPULATION FROM 1860 TO 1920

Census Year	Number				Per Cent		
	Total Population	White	Negro	Indians, Chinese, Japanese, and All Others	White	Negro	Others
1860	31,443,321	26,922,537	4,441,830	78,954	85.6	14.1	0.3
1870	39,818,449	34,337,292	5,392,172	88,985	86.2	13.5	0.2
1880	50,155,783	43,402,970	6,580,793	172,020	86.5	13.1	0.3
1890	62,947,714	55,101,258	7,188,676	357,780	87.5	11.9	0.6
1900	75,994,575	66,809,196	8,833,994	351,385	87 9	11.6	0.5
1910	91,972,266	81,731,957	9,827,763	412,546	88.9	10.7	0.4
1920	105,710,620	94,820,915	10,463,131	426,574	89.7	9.9	0.4

The region of densest population is the older part of the country, which is now largely engaged in manufacturing and commerce. This section includes a belt extending westward from Massachusetts and Connecticut through New York, New Jersey, and the eastern portion of Maryland, and through Pennsylvania and Ohio. Illinois is also included in this group. In 1910 the population per square mile in Rhode Island was 508.5, in Massachusetts 418.8, in New Jersey 337.7, in Connecticut 231.3, and in New York 191.2. With a few exceptions, in the States west of the Mississippi it ranges from less than 1 to about 75 to the square mile.

Population in the States east of the Mississippi and north of the Ohio and Potomac in 1910 was about 46,837,000, or

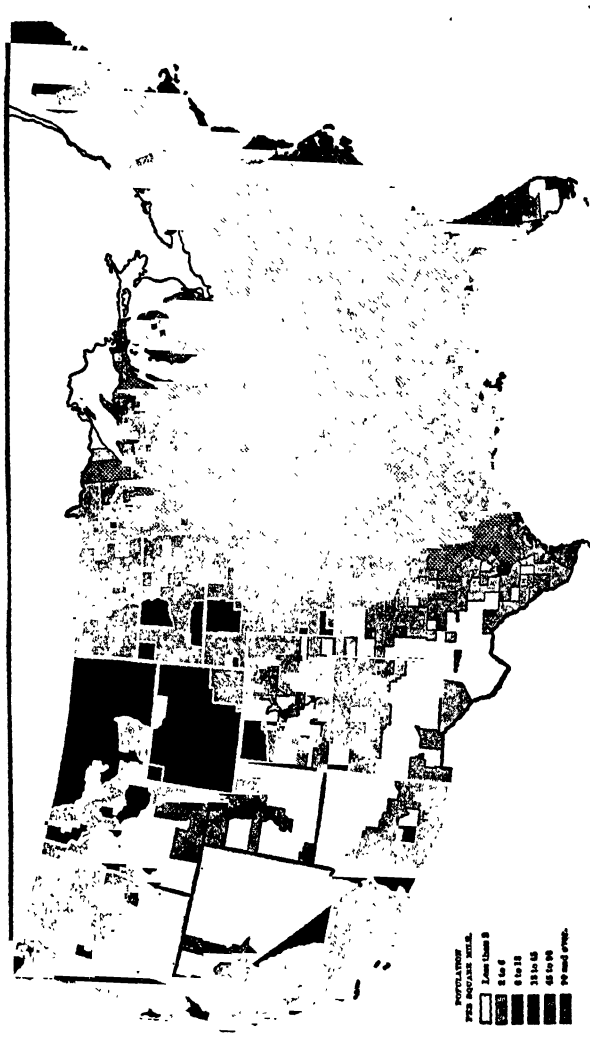


PER CENT OF NEGROES IN TOTAL POPULATION, BY STATES, 1920

(District of Columbia, 21.5 per cent, not shown separately.)

over half that of the entire country; the numbers in the region east of the Mississippi and south of the other rivers just named were 17,886,000, and west of the Mississippi, 27,248,000. It is evident from this that the greatest population, and presumably the highest producing and consuming power, is found in the section first named. Indeed, manufacturing and commerce are of first importance, while in the other two sections the agricultural industries hold the ranking position.

The change in character of our industries since 1860 is partly responsible for the concentration of population in urban centers. For various reasons both manufacturing and commercial pursuits require the assembling of large numbers of workers in limited areas. The number of wage earners engaged in manufactures in the United States increased from 1,311,000 in 1860 to 9,096,300 in 1920. When it is remembered that not only these men and women but their families have been drawn to the factory centers, some idea may be obtained of the extent of urban concentration. To a smaller degree, commercial development also has required concentration. But other forces are involved. The greater opportunities for industrial advancement and social advantages, such as better chances for obtaining an education and more diversions of all kinds have been factors in the movement. Recent immigration to this country works in the same direction, because the opportunities for the newcomer to find ready employment are greater in such localities, to say nothing of the facts that he chooses to settle among friends, that his training has often been in manufacturing industries of some kind, and that he prefers the kind of community he lived in at home. Indirectly, all the forces which have promoted the growth of commerce and manufactures are responsible for urban concentration. Development of means of communication work to the same end. This development is shown in the table below:



POPULATION PER SQUARE MILE, BY COUNTIES, 1910

THE GROWTH OF URBAN POPULATION IN THE UNITED STATES

Class	Population of the United States			
	1920	1900	1890	1880
Total number	105,710,620	75,994,575	62,947,714	50,155,783
Urban	54,304,603	30,797,185	22,720,223	14,772,438
Rural	51,406,017	45,197,390	40,227,491	35,383,345
Total per cent	100	100	100	100
Urban	51.3	40.5	36.1	29.5
Rural	48.7	59.5	63.9	70.5

In short, in 1920, 51.3 per cent of the population of the United States lived in urban territory; this was a very notable increase over 1880 when only 29.5 per cent lived in such regions. Another way of learning something of this concentration is to observe the growth of the number of cities. In 1860 there were only 141 places with a population of 8,000 or more; the number in 1920 was 924. In the latter year there were 68 cities with a population of over 100,000, while in 1860 only 9 cities were in this category. Of course concentration has been greatest in those centers which have enjoyed exceptional industrial advantages, such as Chicago which increased from 109,200 to 2,701,700, and New York which grew from 813,600 to 5,620,040. Some of the most remarkable cases of growth have been in the cities of the Pacific Coast which were either not enumerated at all in 1860, or existed only as small towns.

The growth of urban population is, of course, one of the outstanding features in our industrial history since 1860. It is significant because it is one of the indications of the growth of industry and of the change of its character; significant, also, because it has raised most serious social problems. The question of provisioning such centers is of greatest importance. A large part of the population now lives away from the places of food production, and welfare de-

MAINE
N. H.
VT.
MASS.
R. I.
CONN.
N. Y.
PA.
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MD.
W. VA.
VA.
N. C.
S. C.
GA.
FLA.
KY.
TENN.
ALA.
MISS.
LA.
ARK.
MO.
OKLA.
TEXAS
KANSAS
IOWA
ILL.
IND.
OHIO
MICH.
WIS.
MINN.
N. DAK.
S. DAK.
NEBR.
COLO.
N. MEX.
ARIZ.
UTAH
NEV.
IDAHO
WYO.
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OREGON
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pends absolutely on the steady flow of goods from farms to producing centers and thence to household consumers. Stoppage of transportation even for a brief period thus becomes a most serious matter. It can be readily understood that, under such conditions, railways are "affected with the public interest" in a sense which scarcely applied in 1860. Provision of light, water, urban transportation, and sanitary systems has become a question of prime importance. These are not merely matters of convenience, but of health and comfort, and of orderly procedure of business. A strike on a city transportation system in 1860 would not have seriously disturbed any one, because people usually lived near their places of work, and if compelled to walk, could have covered the distance in a short time. Such a strike now throws a city into great confusion. Matters of housing, recreation, social betterment, education, policing, and various moral questions are now more pressing than ever before largely because of the congestion of population. Problems of regularity of employment, poverty, charities, taxation, and sources of revenue for local purposes are more or less connected with the growth of cities, but these, as well as other problems named above, are closely interlinked with the growth of the factory system. Meanwhile all these matters have of necessity caused a change of attitude on the part of the public toward many great industries upon which social welfare depends.

184. **Immigration.**—Two factors account for the growth of population, namely, the "natural increase," which depends upon the birth and death rates, and immigration. While movements of population are constantly taking place across the boundaries of all countries, immigration has contributed more largely to the increase of population in the United States than is the case with any other country. Permanent additions depend on emigration as well as immigration, and there is no doubt that the exodus has been

great in recent years, but for want of careful records the number can only be estimated. The total immigration into the United States since 1861 is shown below:

IMMIGRATION TO THE UNITED STATES

1861 to 1870 *	2,314,824	1891 to 1900	3,844,420
1871 to 1880	2,812,191	1901 to 1910	8,795,386
1881 to 1890	5,246,613	1911 to 1920	5,735,911

* January 1, 1861, to June 30, 1870. Figures for the other years are for years ending June 30.

Thus the total immigration into the United States from 1861 to 1916 was 27,772,000; of this number 17,398,000 have come since 1880. This indicates that immigration has been increasing in recent years. In fact in the decade from 1901 to 1910 the total was 8,795,386, which is the largest for any ten years in our history. While these numbers are large, it must be remembered that hundreds of thousands of aliens have left this country since 1890. According to the Commissioner of Immigration, omitting the years 1896 and 1897 for which no figures are available, there departed from this country during the period from 1890 to 1907, 3,181,149 non-cabin passengers, or an annual average of about 200,000. In 1912, 1,017,155 immigrant and non-immigrant aliens were admitted, but the departures the same year were 615,292; in 1913, the year before the War, immigration amounted to 1,427,227 and emigration to 611,924. Thus the net gain in numbers is much less than is indicated in the table given above. It is worth while noting that hundreds of thousands of immigrants in this country have no intention of living here permanently. They are only a part of that transient labor supply that is moving from country to country. This floating population is a characteristic of present migrations.

185. The Causes of Immigration.—Exceptional industrial opportunities have been one of the chief causes of im-

migration to the United States. Included in this category are higher wages than could be obtained abroad, better opportunities to rise, relative freedom from class distinctions, and the easy acquisition of land because of the very liberal laws of this country. Some of these forces were operating strongly at the beginning of the period under discussion. The Homestead Act of 1862 permitted aliens who had declared their intention of becoming citizens to enjoy the provisions of the law. Meanwhile the great demand for labor during, and for some years after, the Civil War held out encouragements. Because enlistments in the army had reduced the industrial population of the United States by more than 1,000,000 men, it became a matter of highest importance that this loss should be restored. Thus a Congressional Committee at the time decided that this shortage could be supplied only by immigration, and President Lincoln on several occasions recommended this course. In his message of December 8, 1863, he said:

> Although this source of national wealth and strength (immigration) is again flowing with greater freedom than for several years before the insurrection occurred, there is still a great deficiency of laborers in every field of industry, especially in agriculture and in our mines, as well of iron and coal as of the precious metals. While the demand for labor is thus increased here, tens of thousands of persons destitute of remunerative occupations are thronging our foreign consulates and offering to emigrate to the United States if essential but very cheap assistance can be afforded them. It is very easy to see that under the sharp discipline of civil war the Nation is beginning a new life. This noble effort demands the aid and ought to receive the attention and support of the Government.

The needs of the time, therefore, led to the passage of the Act of 1864 which permitted agents of American industries to engage laborers abroad under rules established by a Commissioner of Immigration. By the terms of the law

the immigrant was permitted to pledge his wages for a term not to exceed 12 months to repay the expenses of bringing him over, and such contracts were held valid in law and might be enforced in the courts, and no "such contract could in any way be considered as creating a condition of slavery or servitude." The measure met with considerable opposition and was later vigorously attacked. It was repealed in 1868, but inasmuch as contracting for laborers was not actually prohibited until some years later, it still remained as a method of obtaining immigrants.

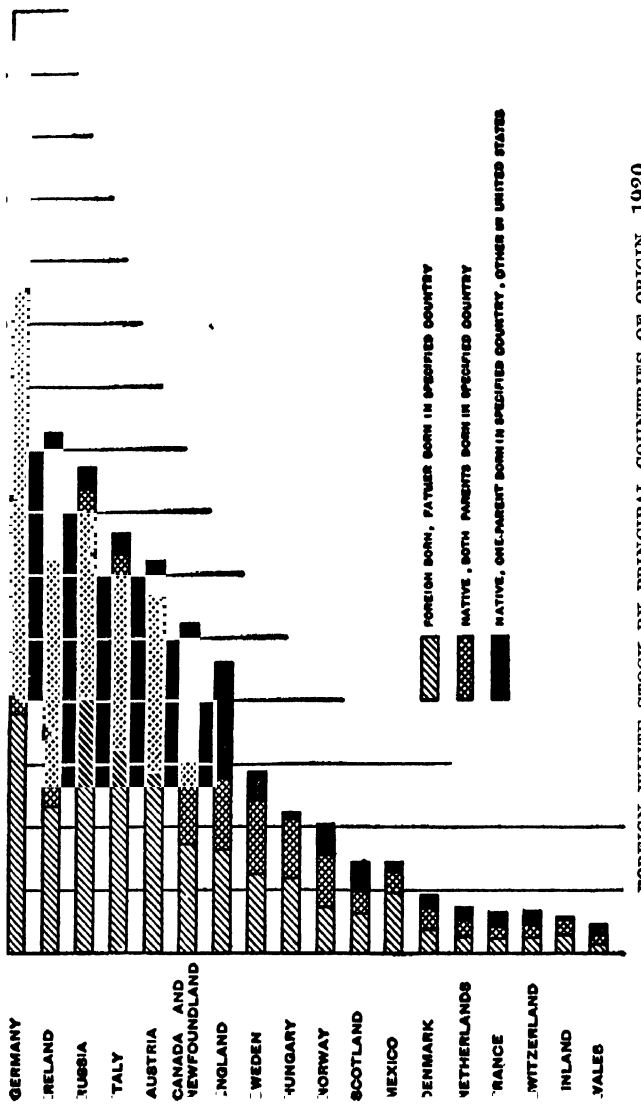
The padrone system, which arose about this time, was responsible for a considerable amount of immigration. Under the pressure of our laws, however, the character of the system has changed, but in one form or another it has existed throughout the period. Originally, the padrone was "an agent of the contractor or the manufacturer, and his business was to persuade his fellow countrymen to come to the United States under contract to his employer." In later days his chief occupation was to find work for those who could not speak English, or who otherwise found difficulty in becoming adjusted in this country. It is needless to say that he not only charged all he could for his services, but that he endeavored to keep the immigrant dependent upon him.

Throughout this period there was a great amount of "assisted" immigration. This took various forms: "By poor law authorities; by charitable societies and persons; by remittances and prepaid tickets from relatives and friends in this country, and by steamship agents and brokers who have made it a business to induce people to emigrate and have advanced money to them or paid their passages and collected the sum after their arrival. When we take all these together, we shall see that a very large percentage of the immigration is stimulated in various ways." To a very large extent the promotion of migration

has become a commercial enterprise. One illustration of this is found in the fact that many of the great modern steamships are built to carry a human cargo, hence various methods must be adopted to keep this cargo space filled. This involves the maintenance of a large number of agents abroad who advertise the opportunities of this country and otherwise offer encouragement to foreigners to migrate.

While many of the inducements to migration have arisen on this side of the Atlantic, on the other hand conditions in Europe have frequently afforded the stimulus; such conditions include hard times, low wages, wretched social conditions, and political and religious oppression. The movement is greatly affected by business conditions both in this country and abroad. Periods of prosperity, when wages are high and opportunities good for finding ready employment, are usually the times of greatest inflow; hard times both check the movement and induce emigration. Illustrations of this are found in the rise of immigration during the prosperous eras before the panics of 1873, 1884, 1893, and 1907, and the decline after these events when dull times set in. All the while it must be remembered that the rapid betterment since 1860 of means of communication has acted most favorably on the migrations. The ease with which intelligence is transmitted by newspapers, by letter, by telegraph, the facilities for transmitting funds, and above all, the cheapness of immigrant travel are among the great factors in this connection.

186. The Restriction of Immigration.—Our attitude toward immigration has changed materially since 1860. Very few persons now maintain the doctrine that America should be kept open as the "haven for the oppressed of all nations." In fact the general tendency of opinion is to favor more and more restrictions. In a measure this is due to the alarm caused by the great flood of aliens, and associated with this is the fear that competition of the new-



FOREIGN WHITE STOCK BY PRINCIPAL COUNTRIES OF ORIGIN, 1920

comers reduces wages and lowers the American standard of living, and that it is impossible to absorb and Americanize foreigners as rapidly as they have been coming. In a measure the evil practices connected with immigration are a cause for demanding limitation. Again, the change of opinion is due partly to the belief that industrial advantages are not as great as formerly, that most of the desirable land is now claimed by settlers, that the lot of those who come can scarcely be better than that of menial laborers, and that existing opportunities should be more and more protected for the benefit of present inhabitants. And finally, the change in character of immigration, particularly during the last three decades, affords a further argument for restriction. It is urged that the present stream flows largely from portions of Europe where institutions and people are so different from our own that great social damage would result without careful restriction. An illustration of this change in the source of immigrants is shown in the table below:

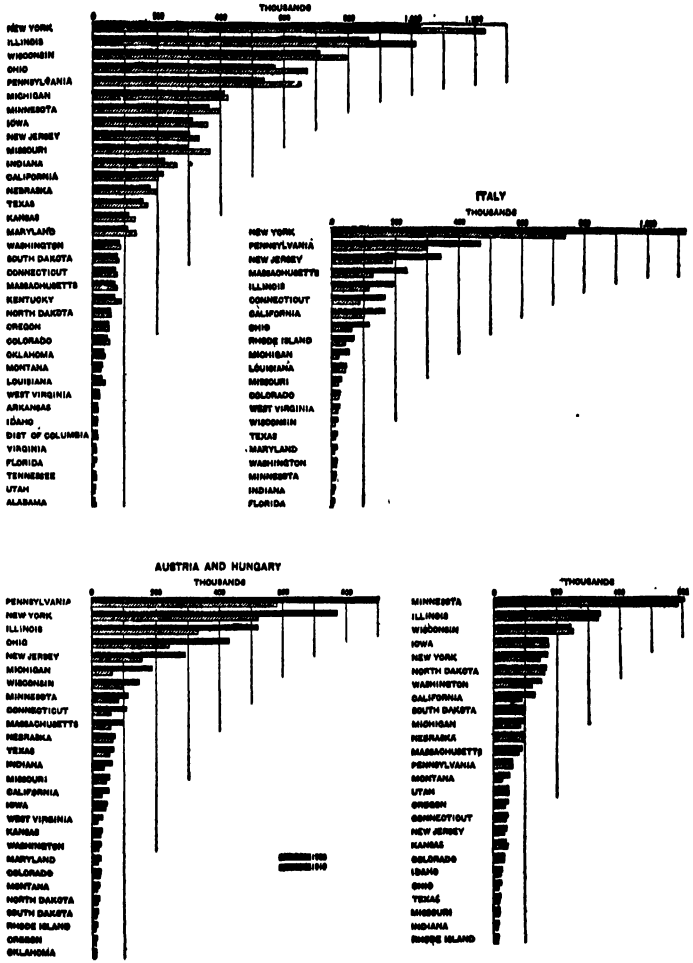
EMIGRATION FROM EUROPE TO THE UNITED STATES DURING THE DECADES 1871 TO 1880 AND 1901 TO 1910

Countries	1871 to 1880	1901 to 1910
United Kingdom	984,914	865,015
Scandinavia	243,016	505,324
Germany	718,182	341,498
France, Belgium, etc.	134,154	295,282
Total from western Europe	2,080,266	2,007,119
Austria-Hungary	72,969	2,145,266
Italy	55,759	2,045,877
Russia	52,254	1,597,306
Greece, Roumania, etc.	656	340,448
Total from southern and eastern Europe	181,638	6,128,897

Thus while immigration from western Europe was almost the same for the two decades, that from southern and eastern Europe increased from 181,000 to over six million. During the former period immigration from the latter portion constituted only about 9 per cent of the total from Europe, while in the period from 1901 to 1910 it was about 75 per cent.

We have referred to the law of 1864 designed to encourage immigration and to the repeal of this Act in 1868. Other Federal legislation was made necessary because of the action of the Supreme Court of the United States in 1876 in declaring unconstitutional the statutes of certain States which imposed on shipowners a tax, usually ranging from $1.50 to $2.50 a person, used to defray the expense of relief or temporary support of immigrants. At the Port of New York, for example, a considerable establishment had been built up since 1846 which was employed largely for the benefit of incoming aliens. At Castle Garden all information necessary for the future identification of immigrants was recorded in registers. "The names of those having money, friends, or letters awaiting them were called out, and they were put into immediate possession of their property or committed to their friends, whose credentials first were properly scrutinized. Clerks to write letters for them in European languages and a telegraph operator to forward their dispatches were at hand. The main railway lines had offices there. Brokers were admitted to exchange the foreign money of the immigrant. A physician was always in attendance, and a temporary hospital was located there." The decision of the Court threatened the abolition of this system. Discussions of the matter in Congress led to the passage of the Alien Passenger Act of 1882, which is one of the early landmarks in our immigration legislation.

This Act provided for the collection of a duty of 50 cents



DISTRIBUTION OF THE FOREIGN WHITE STOCK ORIGINATING IN SELECTED COUNTRIES AND GROUPS OF COUNTRIES, BY STATES, 1920 AND 1910

for each and every passenger not a citizen of the United States. This money was paid into the Treasury of the country and constituted an immigrant fund to be used "to defray the expense of regulating immigration, and for the care of immigrants arriving in the United States, for the relief of such as are in distress, and for the general purposes and expenses of carrying this Act into effect." The law also provided for the exclusion of convicts, lunatics, idiots, and of persons likely to become public charges.

As yet the working classes made no serious complaint against immigration. Indeed the ideals and practices of the Knights of Labor, the great organization of the time, were in conflict, for their principles "theoretically demanded that they extend welcome to all," but the members were moved in the other direction by information that land-grant companies, steamship companies, and manufacturers had agents in Europe advertising for laborers. Thus the issue of contract labor was brought to a focus. The Act of 1885 made it unlawful for any person to assist or encourage in any way the importation or immigration of foreigners into the United States under any kind of contract. This law was amended in 1887 and in 1888 to provide better means of enforcement. Administration of the contract labor laws has encountered many difficulties, but undoubtedly the existence of such laws has largely prevented the evils they were designed to remedy.

The large immigration in the years from 1884 to 1892, and the threatening business conditions of the latter year added something to the demand for more restrictions; both the great parties in 1892 favored more stringent laws. Subsequently the American Protective Association voiced its opposition to immigration; but a still more important factor was the growth of the American Federation of Labor which has been continually on the outlook for defects in the laws and for methods of betterment. The Acts of 1893,

1903, and 1907 provided for more careful methods of inspection, and for better information about the newcomers, particularly with regard to health, and economic and moral status. By the law of 1907 the list of excluded persons was greatly extended. In addition to those named in the Act of 1882, the new list excluded professional beggars, persons afflicted with dangerous or loathsome diseases, persons convicted of felony or other crime or misdemeanor "involving moral turpitude," polygamists, anarchists, prostitutes, contract laborers, and a number of other classes. The principal purpose of the Act of 1903 was to codify the laws passed since 1875. An important provision placed the administration of the immigration laws in the hands of the new Department of Commerce and Labor. Since the inauguration of the Department of Labor the administration of immigration laws has become the work of the Bureau of Immigration, a division of this Department. This Bureau is charged with the duty of investigating violations of the immigration, the Chinese-exclusion, and the contract labor laws, and of bringing evidence before the proper United States district attorney.

From time to time efforts have been made to pass laws requiring a literacy test. President Cleveland vetoed such a measure on March 2, 1897, saying that he did not believe our national peace and quiet would be saved from "imported turbulence and disorder" by such a law. President Wilson twice vetoed bills which limited immigration to persons able to read and write, but in 1917 a measure containing such provisions was passed over his veto. In explaining his veto, President Wilson said that the literacy qualification was not a test of character or of personal fitness, and that such a provision would only serve as a penalty for lack of opportunities in the country from which the immigrant came. The literacy qualification in the new law excludes from the United States all aliens over 16 years

of age who cannot read the English language, or some other language or dialect. Certain exceptions, however, are made in the case of illiterate relatives of immigrants who are not able to pass the test.

187. Chinese Immigration.—On the west coast of the United States demands for restriction are directed chiefly against Mexicans and Orientals. The immigration of Chinese, which was almost nil before 1850, was stimulated by the gold fever in California. Over 41,300 came to this country during the decade from 1851 to 1860; the maximum number in any one decade was in the period from 1871 to 1880, when 123,201 entered. The exclusion laws passed since that date put a severe check on further immigration. The enumeration of Japanese was not given separately before 1899; in the decade from 1901 to 1910 immigrants of this nation numbered 129,797.

Chinese immigration to California encountered no opposition in the early fifties. Indeed, for a time, Chinese labor was looked upon with favor because of its cheapness. Thousands of Orientals were employed in the construction of the Pacific Railway, but when they began to engage in mining, farming, and in domestic service there was an outcry against them. For some years California passed laws to regulate or prevent immigration, but these measures were declared unconstitutional by the Supreme Court of the United States. By the Burlingame Treaty of 1868, Chinese were permitted to emigrate to this country; in fact this Government declared at that time that "Chinese subjects visiting or residing in the United States shall enjoy the same privileges, immunities, and exemptions in respect to travel or residence as may be enjoyed by the citizens of subjects of the most favored nations." The right of naturalization, however, was denied them. The insistent demand of California for restriction led to the negotiation of the Treaty of 1880 by which China agreed that the United

States may "regulate, limit, or suspend such coming or residence, but may not absolutely prohibit it." But this arrangement was not satisfactory to the people of the Pacific Coast, and in 1882 the Chinese Exclusion Law was passed. Various treaties and acts followed. The acquisition by the United States of possessions in the Pacific further complicated the matter. By the Act of 1904, the force of former legislation directed against Chinese immigration was extended to the "insular possessions and Chinese immigration from these islands to the United States or from one island group to another was prohibited. although moving from island to island in the same group was allowed."

Opposition to the immigration of Japanese has been equally strong, but it was not to be expected that Japan, a strong nation, would accept the legislation applied to China, and it was necessary to find another solution. During 1906 the Japanese question was uppermost. The matter was adjusted in the passport provision of a law of 1907, sometimes known as the "California Compromise," by which Japan engaged to coöperate with the United States in restricting emigration of her subjects. Thus she agreed to "issue passports to continental United States only to such (of her) subjects as are non-laborers or are laborers who, in coming to the continent, seek to resume a formerly acquired domicile, to join a parent, wife, or children residing there, or to assume active control of an already possessed interest in a farming enterprise in this country."

188. **Economic Contributions of Immigrants.**—It is not to be assumed from this discussion about restriction that the immigrants have not made great contributions to the industrial development of this country. The fear and prejudice that lie at the basis of much of the discussion often obscure the facts. The net addition of something over twenty million ablebodied men and women has made possible a growth that could not have taken place without

them, and this service has been rendered in every department of industry. There is no question about the value of the skilled immigrant who brings new and valuable information of some trade, or who adds to the prosperity of the country because of his skill. But the unskilled man, also, has contributed a valuable labor service. Such men have helped to build our railroads, to improve highways, and they have supplied labor to farms, mines, and factories. Our natural resources have been largely developed by immigrants; this could readily be shown by a study of foreigners engaged in farming, mining, and forestry during the past fifty years. The tendency of native laborers, and of the older immigrants and their children, to rise to the class of skilled laborers, has left a vacuum at the bottom. For many years the immigrant has been needed to fill this void. All in all immigration, like the extension of the national dominions discussed in the last chapter, and like the development of the extractive industries to be discussed in the three chapters following, has been among the great forces promoting rapid industrial development in this country.

189. **Further Restrictions.**—After the close of the War the fear that the United States would be flooded with immigrants seeking to escape the wretched conditions in Europe led Congress to impose still more drastic regulations. Thus by the provisions of the Act of May, 1921, the annual immigration from any nation was limited to 3 per cent of the people from such countries resident in the United States in 1910. This law was regarded as an emergency measure, which was to terminate in 1924. In the latter year Congress enacted a new law which fixed the annual quota of any nationality resident in continental United States at 2 per cent and named 1890 as the year upon which the quotas were to be based. The immigration of Japanese, except a few specified classes, was prohibited. One effect

of this change of years (from 1910 to 1890) is to further limit the numbers which come from southern and eastern Europe. The new restrictions have cut down immigration into the United States. The inflow amounted to 805,200 in 1921, to 309,500 in 1922 and to 522,900 in 1923. Many persons have urged in favor of the new policy that (*a*) we are not as urgently in need of foreign labor as in former years because the large natural increase of population in the United States now largely satisfies the demand of growing industries; (*b*) that certain industries, such as coal mining, are overmanned and that the shift of surplus laborers from one occupation to another will add to the supply; (*c*) that foreign laborers are often the nucleus of labor unrest; (*d*) that the growing stabilization of industry resulting from improvements in banking and industrial methods diminishes the importance of the large periodic demands for labor.

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CHAPTER XV

EXTRACTIVE INDUSTRIES: MINING AND QUARRYING

190. Extractive Industries.—It is understood, of course, that the products supplied by nature are rarely in a form which suits the needs of final consumers. They must be removed from the earth and fashioned in various ways before they can be used as food, clothing, and shelter, or as buildings, tools, and machines. In short, they must pass through a series of stages of production. The industrial purpose of the extractive industries is to supply raw materials for manufactures. The extractive group includes mining and quarrying, forestry, and fishing. The prosperity of these industries depends partly on the abundance of nature, and partly on the skill of man in devising and improving ways of obtaining the natural product. To a large extent their development depends also upon improvements in manufacturing and commercial industries, because progress in these fields both increases the demand for raw materials and facilitates their movement to market. Thus the causes for the marvelous growth of the extractive industries during the past fifty years are to be found in the changes which have taken place in all departments of industry.

191. Development of the Mineral Industry.—With reference to the minerals some of the outstanding features of this period have been the rapid rise in importance of some substances which before 1860 were either not exploited at all or only to a very limited extent, and the tremendous increase in output of some of the older minerals. The de-

velopment of the resources of petroleum, natural gas, silver, of the materials which provide the raw materials for aluminum, cement, to say nothing of many less important substances, is practically new since 1860. Meanwhile the draft upon resources of coal, and upon iron, lead, zinc, and copper ores has enormously increased. The prime forces lying behind this growth are inventions, discoveries, improvements in technical methods, the development of the capitalistic methods of production, and the great increase in productivity involved in these changes. Education in mining and geology, training in mining engineering, and improved forms of industrial organization contributed to the same end. The westward movement also stimulated development of new mineral resources, and the building of railroads made possible the conveyance of crude and partly manufactured products to distant markets. By providing for scientific investigation of mineral deposits and by tabulating and disseminating information about our mineral reserves the Federal Government has added to this progress. An important step in this direction was taken in 1879 when the United States Geological Survey was organized. Thus, said one of the Census reports: "The general desire for information concerning the mineral resources of the country has been satisfied in part by systematic geological investigations in several of the States, beginning as early as 1823. At a still earlier period investigations were carried on by private enterprise, generally limited to minerals of well known market value, such as iron, gold, silver, copper, and coal. The need for information concerning the location, character, and extent of the deposits of these minerals was fully appreciated by the organization of the Geological Survey." By obtaining and making public this information, the Survey has promoted the exploitation of our minerals. The total value of mineral products by five-year periods since 1881 is shown on the next page.

AVERAGE ANNUAL PRODUCTION BY FIVE-YEAR PERIODS, 1881–1920

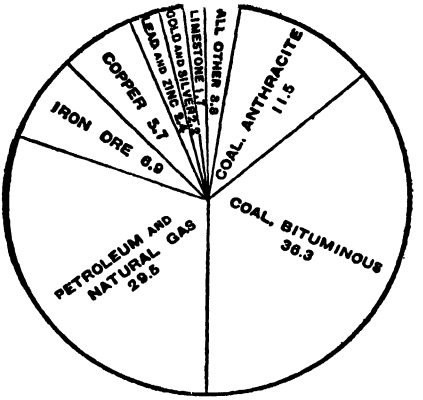
Period	Metallic	Nonmetallic	Unspecified	Total
1880 *	$187,880,800	$ 173,581,900	$6,000,000	$ 367,462,700
1881–1885	191,123,500	229,152,100	5,900,000	426,175,600
1886–1890	248,193,100	291,381,300	900,000	540,474,400
1891–1895	244,444,500	346,857,400	1,000,000	592,301,900
1896–1900	365,502,000	461,240,700	1,000,000	827,742,700
1901–1905	578,056,500	813,816,400	760,000	1,392,632,900
1906–1910	769,166,900	1,119,679,300	230,000	1,889,076,200
1911–1915	822,878,200	1,399,005,800	1,818,000	2,223,702,000
1916–1920	1,796,478,200	5,123,750,600	.....	6,920,228,800

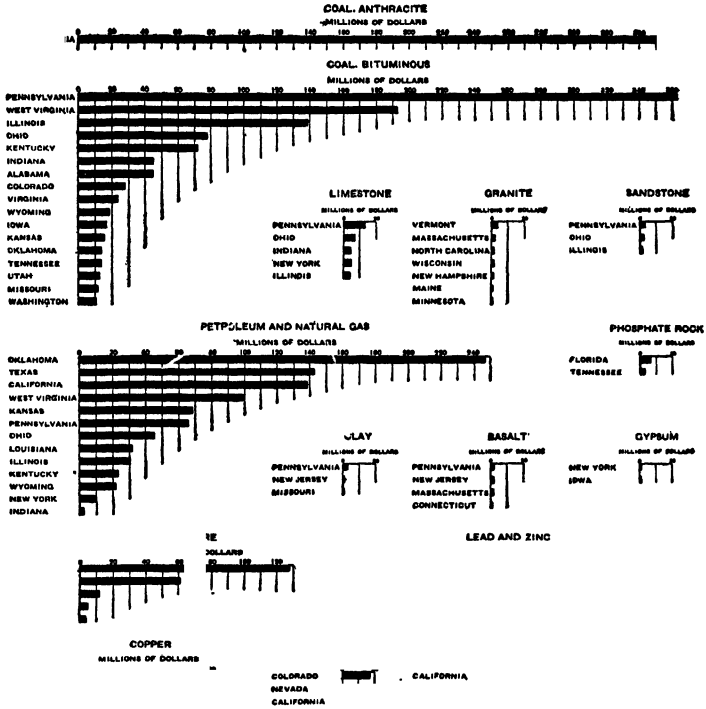
* Figure for 1880 only.

The total value of mineral products for the year 1920 was $6,981,340,000, and the total since the organization of the Geological Survey to and including 1915 was $65,420,469,000. It will be observed from the table given above that the output has increased very rapidly since 1895, the years from that date to the present constituting the period of most rapid economic growth of the country. The figures also convey some idea of the extent to which the mineral industries have contributed to the growth of manufactures and commerce.

192. **The Source of Leading Mineral Products.**—Because of her great coal resources Pennsylvania has for many years been the leading State in the Union in the production of minerals, and West Virginia, Illinois, and Ohio have enjoyed a high position. The rank of the principal States together with the leading commodities produced is indicated in the table on the opposite page.

Some notable changes have occurred in the source of minerals since 1860. With the exception of gold in California, the product of the Far Western States is an entirely new addition to our supplies. Opportunities for exploitation were greatly increased by the opening of the first transcontinental railroad in 1869, but even then considerable time elapsed before the construction of branch lines and wagon roads to the newly discovered resources. This





VALUE OF PRODUCTS, LEADING MINERAL INDUSTRIES, 1919, DISTRIBUTED BY INDUSTRIES (IN PERCENTAGES) AND BY STATES

MINERAL PRODUCTS OF THE UNITED STATES AND LEADING PRODUCING STATES IN 1921

Mineral	Principal producing States in order of value
Aluminum	New York, North Carolina, Tennessee.
Asphalt	California, Texas, Oklahoma, Illinois.
Bauxite	Arkansas, Georgia, Alabama, Tennessee.
Cement	Pennsylvania, Indiana, California, Michigan.
Clay:	
Products	Ohio, Pennsylvania, New Jersey, Illinois.
Raw	New Jersey, Missouri, Pennsylvania, Georgia.
Coal:	
Bituminous	Pennsylvania, West Virginia, Illinois, Kentucky.
Pennsylvania anthracite	Pennsylvania.
Copper	Arizona, Michigan, Alaska, Montana.
Gold	California, Alaska, Colorado, South Dakota.
Iron:	
Ore	Minnesota, Michigan, Alabama, New York.
Pig	Pennsylvania, Ohio, Indiana, Illinois.
Lead	Missouri, Idaho, Utah, Oklahoma.
Lime	Pennsylvania, Ohio, Massachusetts, Missouri.
Manganese Ore	Montana, Arkansas, Virginia, Colorado.
Natural gas	West Virginia, Pennsylvania, Oklahoma, Ohio.
Petroleum	California, Oklahoma, Texas, Kansas.
Phosphate rock	Florida, Tennessee, Kentucky, Idaho.
Salt	Michigan, New York, Ohio, Kansas.
Silver	Utah, Nevada, Montana, Idaho.
Sulphur	Texas, Louisiana, Nevada, Utah.
Zinc	Oklahoma, New Jersey, Kansas, Montana.

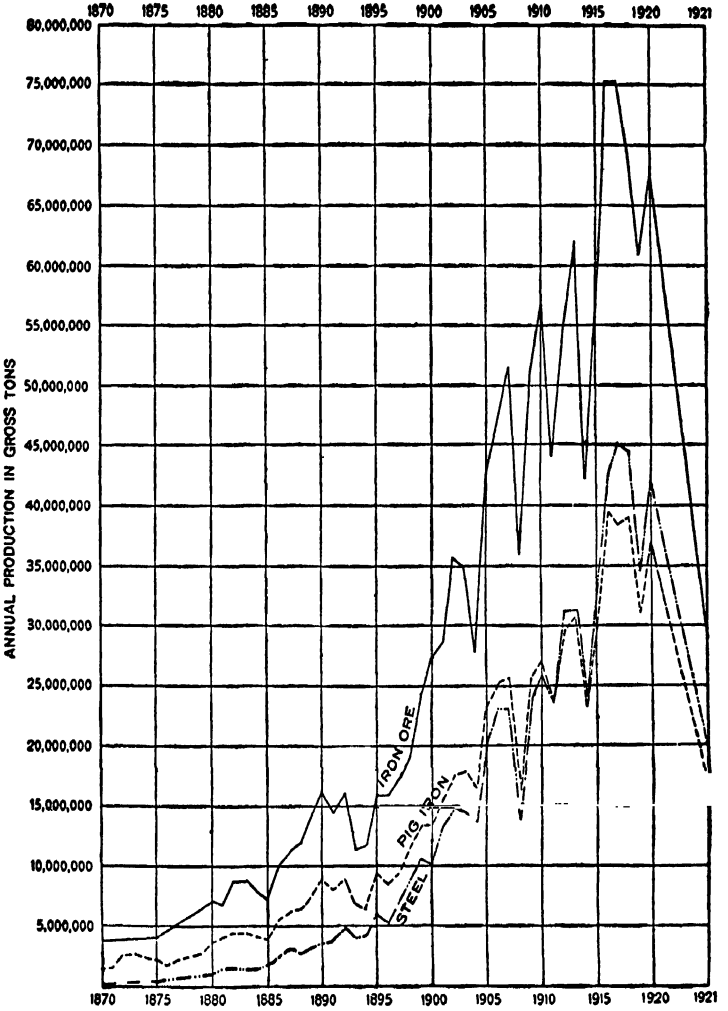
Western section has added enormously to our supplies of silver, gold, copper, petroleum, lead, and zinc, to say nothing of some other metals. Meanwhile another new source has been opened in the Southern States. In 1882, this group produced only 8 per cent of the mineral output of the country; in 1890, 14 per cent; in 1900, 16 per cent; in 1910, 19 per cent; and in 1914, 22 per cent. This section has contributed new supplies of iron ore, coal, petroleum, phosphate rock, bauxite (the mineral from which aluminum is produced), and sulphur. And finally the great sources of iron ore in Minnesota, and to a large extent those of Michigan, are new since 1860. Indeed, it might be said that this country has only come into its mineral inheritance since the date just named.

193. **Iron Ore.**—It should be understood from what has just been said that one of the features of the iron mining business in recent years has been the shift in the sources of supply. Until about 1880 Pennsylvania was the largest producer; but this State dropped to the third in rank in 1889, and to sixth place in 1902. Ohio, Kentucky, and Missouri occupied an important position in 1860, but now they are relatively unimportant. The total iron ore shipped from mines in the United States in 1914 was 39,714,000 gross tons, and in 1915, 55,493,000 gross tons. The value of the product in the latter year was $101,288,900. Minnesota is now by far the greatest producer with 32,545,200 gross tons to her credit in 1915. Other States which produce iron ore named in the order of importance are Michigan, Alabama, Wisconsin, and New York.

Another feature in the history of the industry is its enormous growth in recent years. The causes for this are found in conditions both of demand and supply. Every new industry increases the use of products of iron; thus our great industrial expansion has continually thrown greater burdens on our iron resources. On the other hand conditions affecting supply have been most favorable. The opening of the deposits of the Lake Superior region has afforded one of the richest sources in the world, and with the development of this has come great improvement in methods of production. As a rule, before 1860, ore was obtained from mines; the veins were often thin, and the ore was of relatively poor grade, requiring roasting, washing, and separating. This was notably the case with some of the leading ores of western Pennsylvania, Ohio, and Kentucky, which regions were the principal sources until the opening of the Lake Superior region. These new deposits have not only supplied ores which can be cheaply prepared, but have afforded great opportunities for the introduction of labor-saving devices. The ore produced about

Lake Superior is chiefly red hematite which seldom requires preliminary treatment, which is readily reduced, and which occurs "in large and well-defined lenses or bodies, permitting the exploitation of the deposits on a large scale by utilizing labor-saving appliances. The use of such appliances may extend from the winning of the ore at the mine to its delivery at the blast furnace." The increasing use of hematite is indicated by the fact that it constituted 31.5 per cent of the ore mined in 1880, 62.4 per cent in 1889, 85.9 per cent in 1902, and 94.1 per cent of the total in 1915.

A large percentage of the hematite of the Lake Superior region is never touched by hand. In many cases, in open-cut workings, it is dug by steam shovels which load the ore into standard railway cars. In case of underground mines much of the labor is confined to directing the ore into "mills" and chutes, which discharge into mine cars; these cars are elevated and automatically dumped into bins, and from thence the ore is loaded on to standard railway cars. The economies of producing and transporting iron ore from these sources is described in one of our census reports as follows: "Most of the ore mined in the Lake Superior region is carried in standard railroad dump cars to shipping docks, where it is dumped into bins, from which chutes convey it to the holds of vessels brought to the side of the docks. These vessels are unloaded by mechanical appliances, which deliver the ore either on to stock piles or into standard railroad cars, which carry it to the blast furnaces. At the blast furnaces there are equally satisfactory mechanical appliances, such as car dumpers, which empty a 100,000 pound car by reversing it, or traveling bridges, fitted with large buckets, which transfer to bins or to stock piles the ore dumped from the cars." Thus, when one considers the character of the mineral, and the economical methods of bringing it to market, it is easy to un



CURVES SHOWING ANNUAL PRODUCTION OF IRON ORE, PIG IRON, AND STEEL IN THE UNITED STATES, 1870–1921

derstand why the United States has become the chief ore producing country.

Another feature in the history of the iron industry has been the growth of the Birmingham district. Small quantities of ore had been produced in Alabama prior to 1860, and during the Civil War a number of new enterprises were started, but the industrial development of the region of which Birmingham is the center did not begin until about 1870. Production in Alabama rose from 1,570,300 tons in 1889 to 4,838,900 in 1914.

A fourth characteristic of this industry is the rise of an import business in iron ore. To some extent foreign ores are required for mixing with the domestic product; but the development of an iron industry along the Atlantic seaboard has made necessary the quest of an outside source of supply. In 1872 only 23,730 gross tons were imported into this country. Shipments rose to the high-water mark in 1923 when 2,768,000 gross tons were imported. The development of resources in Cuba and Chile provided one of the largest sources of outside supply. Ore shipped from the Province of Oriente (Santiago), Cuba, in 1913 amounted to 1,582,400 gross tons. The growth of iron mining in the United States since 1860 is shown in the following table:

PRODUCTION OF IRON ORE BY CENSUS YEARS, 1860–1919

Year	Long tons	Year	Long tons
1860	2,873,460	1902	35,567,410
1870	3,831,890	1909	51,947,120
1879	6,307,883	1919	61,173,250
1889	14,518,040		

194. Copper.—The discovery of new sources of copper particularly in Arizona, Montana, Utah, New Mexico, Nevada, and California, improved methods of extraction which have made possible production from lower grades

of ores, and the development of effective forms of business organization are among the causes for the growth of the copper industry. A factor of great importance is the demand for a great variety of manufactures of copper arising from the electrical industries which are new since 1860. The growth of the brass and automobile industries, the increasing use of the compounds of copper, and the ever growing export requirements are other elements. A number of the great manufacturing countries of Europe, which have uses similar to our own, depend largely on the United States for copper supplies.

From 1860 to 1880 Michigan was the principal producer of copper ore. As late as 1880 this State reported about 82 per cent of the total output, but in 1885 because of the development of copper mining, particularly in Montana and Arizona, the product of Michigan declined to about 44 per cent of the total. In 1914 the total amount of copper produced in this country was 1,148,431,000 pounds. Arizona ranked first with 393,017,000 pounds, Montana second with 233,229,000 pounds, Michigan third with 164,344,000 pounds, and Utah fourth with 152,034,000 pounds.

Prior to 1860 small quantities of copper were produced in southern New Mexico and Arizona and marketed through Galveston, Texas. In Arizona the Clifton-Morenci district, which later became a large producer, was discovered about 1865; the Bisbee district began to receive attention about 1879, and the Globe district about 1882. In Montana the city of Butte dates from the discovery of placer mines in Missoula Gulch in 1864, and production at the Anaconda mines dates from 1882. California first produced in excess of 20,000,000 pounds in 1899, and Utah in 1901, although both these States reported some output for the twenty years preceding. The opening of all these districts depended on transportation, and this, in a number of cases, was slow in developing.

Some idea of the growth of the export trade may be gleaned from the fact that in 1895 shipments from this country amounted to about 123,130,000 pounds; in 1913, the largest year, exports amounted to 926,241,000 pounds. Germany took the largest quantity, amounting to 307,150,700 pounds; the Netherlands took 178,940,200 pounds, France 160,000,300, and the United Kingdom 133,679,640 pounds.

Due to the causes above named the growth of the copper industry has been nothing short of marvelous. The production, which averaged annually about 9,710 tons for the decade from 1861 to 1870, increased to an annual average output of 382,882 tons in the decade ending with the year 1910.

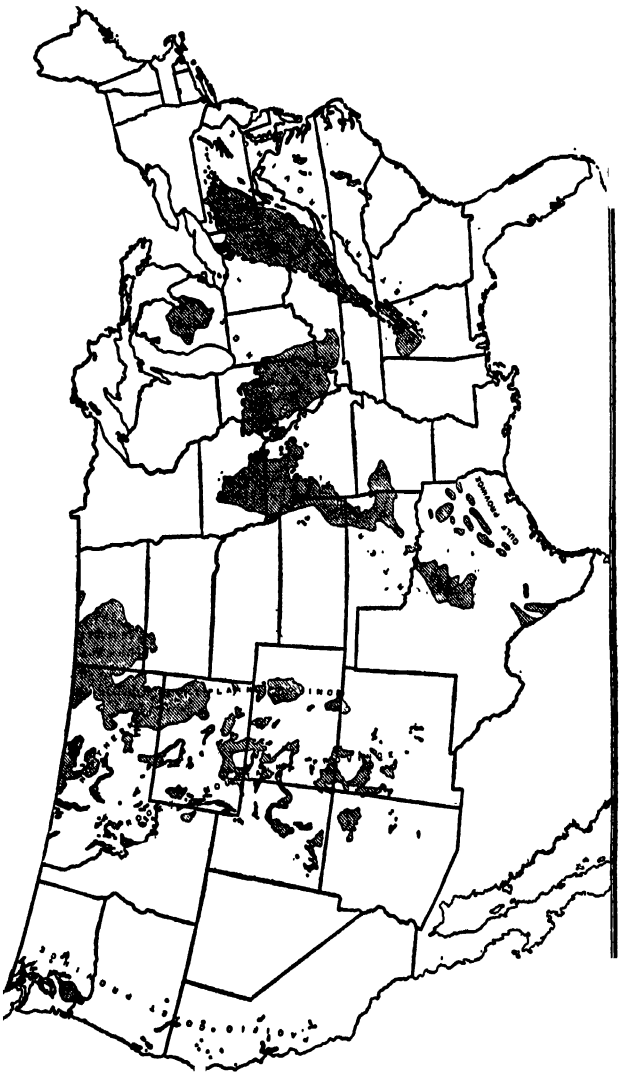
PRODUCTION OF COPPER IN THE UNITED STATES

Year	Production (pounds)	Value of Product	Year	Production (pounds)	Value of Product
1860	16,128,000	$ 3,709,000	1890	270,773,000	$ 40,123,000
1865	19,040,000	7,473,000	1895	380,613,400	49,726,000
1870	28,224,000	5,977,000	1900	606,117,200	100,615,000
1875	40,320,000	9,152,000	1905	888,784,200	138,650,000
1880	60,480,000	12,943,000	1910	1,080,159,000	137,180,000
1885	165,875,400	17,915,000	1923	1,435,350,000	220,945,000

195. Coal.—That the progress of this country as an industrial nation depends largely on the abundance of coal is axiomatic. For success in manufactures a cheap, near-by source of fuel is necessary. The rapid rise of manufactures is indicated partly by the increase in the *per capita* use of coal. Thus, in 1860, the consumption per person amounted to only .514 ton a year; from this it increased to 3.838 in 1902. Improvements in means of transportation both by water and rail, permitting cheap and easy distribution of the product are factors in the development. To this should be added economies in handling and storing.

But the great increase in demand is one of the principal causes of growth. The industrial uses of coal are complex. In addition to use as fuel in factories, the product is consumed in connection with the manufacture of iron and other metals, in producing gas for illumination and heat, for fuel of railway locomotives and for steamships, and as a raw material in producing a considerable variety of commodities. Coal gas was used for illuminating purposes before 1860, but the concentration of population in cities has greatly increased the demand for coal both for the production of gas and for household fuel consumption. In 1915 upwards of 122,000,000 net tons, or 28 per cent of the total, were consumed as railway fuel; about 9,245,000 tons were used for steamship-bunker fuel, about 4,563,000 tons in the manufacture of coal gas, about 71,336,000 tons in domestic use and for the small trades, and 143,765,000 tons, or 33 per cent of the total, for industrial steam coal.

Great improvements have taken place in production. These include methods of mine transportation, use of electric power, and more effective hoisting machinery. For some years attempts were made to obtain coal by removing the earth cover with scrapers, but the cost was prohibitive. The introduction of large steam shovels, however, bids fair to solve this problem for some localities. In 1915 3,953,000 tons were mined by this process. That coal can be mined "with steam shovels more cheaply than by underground methods is indicated by the fact that the average daily output per employee in the strip-pit operations is twice as great as the average for the respective States." This product, however, does not bring as high a price in the market as other grades. The large use of mechanical methods in this country is shown by the fact that in 1914 about 51 per cent of the output was produced by machines. The result of these many improvements is to increase the



COAL FIELDS OF THE UNITED STATES, 1919

GROWTH OF THE COAL INDUSTRY

Year	Bituminous	Total (net tons)	Year	Bituminous	Total (net tons)
1860	6,494,200	14,610,040	1890	111,302,300	157,770,900
1865	11,900,400	23,792,100	1895	135,118,190	193,117,500
1870	17,371,300	33,035,500	1900	212,316,100	269,684,020
1875	29,862,500	52,348,300	1905	315,062,700	392,722,600
1880	42,831,700	71,481,500	1910	417,111,100	501,596,300
1885	72,824,300	111,160,200	1920	568,666,600	618,665,100

yield per man. In 1890 the average tonnage per man per day in producing anthracite was 1.85 tons, and in 1914, 2.06 tons; in case of bituminous, it was 2.56 tons in the former year and 3.71 tons in the latter.

The westward movement of population and industries has, of course, tended to draw the coal business westward. A notable feature has been the rise of the industry in the Central and Southern States. Alabama produced only 10,200 net tons in 1860 and Tennessee only 165,300 tons. In 1914 the former State produced 15,593,000 tons and the latter 5,943,000 tons. While some coal is produced in the Rocky Mountain regions, this section is as yet too distant from the great consuming centers to receive any great stimulus.

Production in the United States has increased from about 14,610,000 net tons in 1860 to 513,619,400 in 1914. The story of this great growth is linked with the history of our industrial development between the dates just named. Pennsylvania, in 1914, ranked far ahead of any other State with a production of 147,983,000 tons of bituminous and 90,221,000 of anthracite; West Virginia was second with 71,707,000 tons; Illinois ranked third with 57,589,000 tons; and Kentucky fourth with 20,382,000 tons.

With the development of industry have come many refinements in the demand for coal. Specialized uses require particular kinds of product; thus questions are raised about

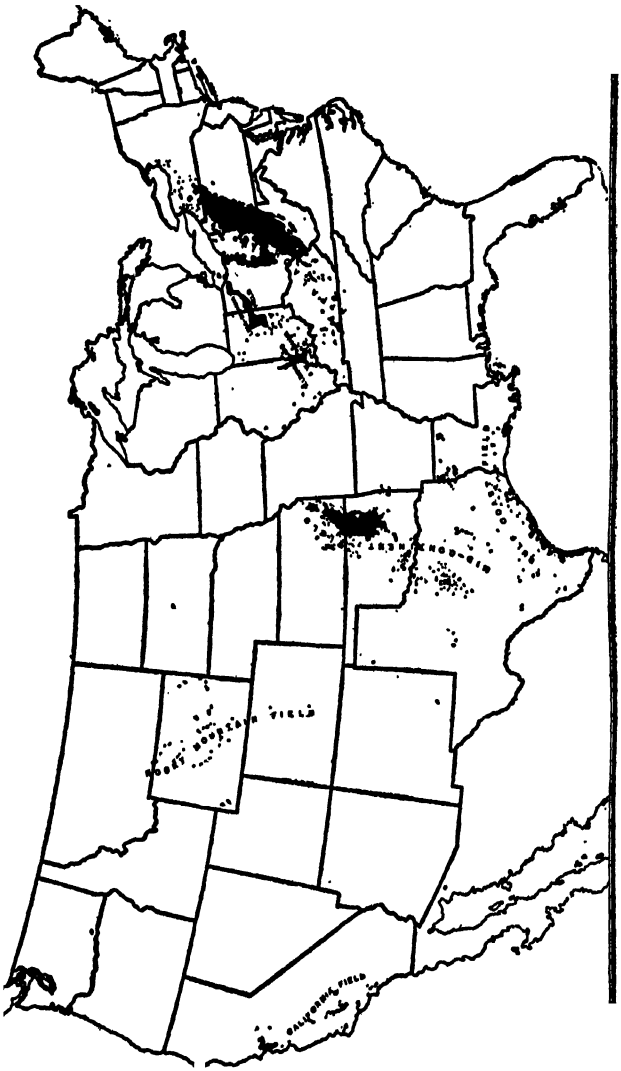
the content as to sulphur, ash, and water, and of the value of the commodity for coking and steam purposes. Household demand, also, requires various grades, with emphasis on size of the lump, cleanness, and relative freedom from smoke and ash.

196. **Petroleum.**—The success of E. L. Drake in sinking a well at Titusville in western Pennsylvania, in 1859, marks an event of great importance not only in the history of this industry but in the economic development of the country. Drake was an agent of a company organized in Boston to produce and refine petroleum. Previously experiments had been made to test the value of the substance for illuminating purposes and to reduce, if possible, the dangers from explosion when burned in lamps. With the success of this enterprise refiners were released from the necessity of distilling coal into petroleum before refining petroleum into kerosene; meanwhile the sources of oil were shown to be vastly greater than had been supposed. The discovery "stimulated consumers to increased use of lubricants and burning oils, and in this way rapidly increased the demand in the arts for the refined product. In even greater measure it encouraged the production of crude petroleum." Drake's enterprise was followed promptly by a rush to western Pennsylvania, and thus was inaugurated on a small scale a movement which has been characteristic of the successful "strike" in oil. Prospectors were followed by promoters and capitalists, and the new regions entered a period of boom. In 1865 the founders of what became the Standard Oil Company began to refine petroleum in a small way at Cleveland, Ohio.

Petroleum in various preparations became an article of commerce before 1825. Zadok Cramer observed philosophically in his *Navigator* of 1817 that "it is a wise plan of Nature to generally place an antidote where she has planted a poison." To compensate for the rheumatic sur-

roundings the settlers were given petroleum, which was found floating on many ponds and was easily collected by drawing a blanket over the surface. It sold as "Seneca," or "American," or "Rock-oil," and was a cure-all for many of the ills to which the pioneer was heir. Caleb Atwater, an Ohio historian, remarked in 1839 that the sale of petroleum afforded a considerable profit, and that it had begun to be used in lamps for workshops and factories. He ventured the prophecy that if it should fall into the hands of some "water-doctor," or some swami, a large fortune could be realized by the sale of it.

With Drake's discovery, Atwater's prophecy was on the eve of fulfilment. But many difficulties had to be overcome before the industry could be established on a large scale. One of these was transportation. Oil has frequently been discovered at a considerable distance from rivers and railroads. There was little chance for the industry to grow where the crude product had to be hauled by team over new roads. The pipe line was the solution to this problem. Frequently, these have only a limited mileage, extending to some storage area, or to some railway. But with the development of the industry the country has been covered with great pipe systems. Piping of brine water from salines to furnaces had been practised by pioneer salt makers, and possibly this experience suggested a similar method in transporting petroleum. At any rate in 1865 a short line was constructed in western Pennsylvania. By 1875 large organizations were chartered to pipe oil from the interior to the seaboard. Pipeline transportation demanded improved methods of pumping and of tightening valves. In time "massive pumps" were constructed which represent "the highest known mechanical efficiency, having triple-expansion engines, Corlis valves, condensers, air pumps, and efficient boilers." Better methods were also adopted for transportation on



PRINCIPAL PETROLEUM AND NATURAL GAS FIELDS OF THE UNITED STATES

railroads. About 1865, box cars were equipped with wooden tanks or tubs holding from 2,000 to 4,000 gallons, but the tank car, especially constructed for receiving, hauling, and discharging the product, replaced the old system. High profits and exceptional chances of gain have always attracted an abundance of capital; thus ample financial resources have been provided for producers to engage in experiments designed to find new commercial products, to reduce waste, and to lower the cost of production. Large-scale operation has been typical in this industry, and this brought numerous advantages of manufacture in large units. In exploiting foreign trade the oil producers have ranked among the first in enterprise; thus the export demand has been a great factor in the growth of the industry. The wide distribution of petroleum in the United States gives this country great advantages in shipping the products over the world. Distribution is facilitated by the modern tanker especially designed for this kind of transportation, and by the construction of great storage facilities conveniently located for commerce. In 1914 this country exported over 2,240,000,000 gallons of petroleum products valued at $139,900,000.

On the side of demand, the wide variety of uses of petroleum products gives the industry an advantage which few enjoy. Such commodities as illuminating oil, gasoline, naptha, benzine, paraffin, and lubricating oils are well known, but there are scores of by-products which contribute to development. "The introduction of the automobile, and particularly the later development of the low-priced car has resulted in a demand for gasoline and lubricating oils that has taxed the industry to its utmost and has at the same time created an interest and concern in that industry which is as vital as it is country-wide." The demand for fuel oil has been further increased by its use in operating locomotives and steamships. In 1914 over thirty-

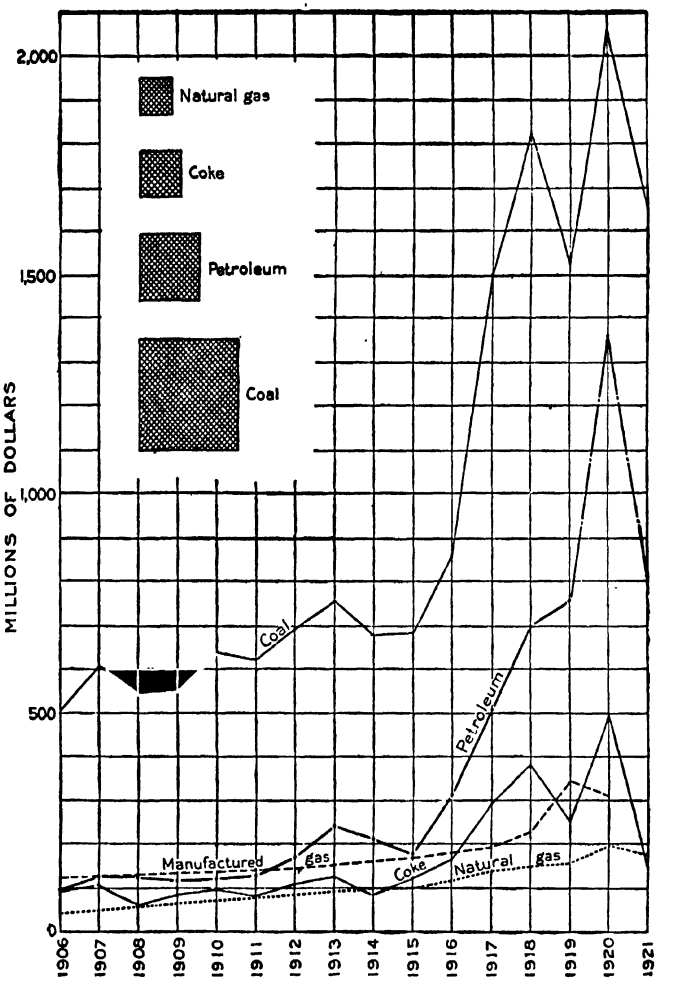
GROWTH OF THE PETROLEUM INDUSTRY: PETROLEUM MARKETED IN THE UNITED STATES, 1860–1923

Year	Barrels *	Value	Year	Barrels *	Value
1860	500,000	$ 4,800,000	1890	45,823,500	$ 35,365,100
1865	2,497,700	16,459,800	1895	52,892,200	57,632,200
1870	5,260,700	20,503,700	1900	63,620,500	75,989,300
1875	8,787,500	7,368,100	1905	134,717,500	84,157,300
1880	26,286,100	24,600,600	1910	209,557,200	127,899,600
1885	21,858,700	19,198,200	1923	733,260,000	930,760,000

* Of 42 gallons.

six million barrels were consumed by the railroads of the country, and the total mileage covered by oil-burning engines was over 124 million miles. Likewise the use of petroleum as a fuel in coastwise and ocean commerce is rapidly increasing.

The enormous draft on the wells results either in their rapid exhaustion, or in the reduction of their productivity to a point where they cannot compete with new sources. Thus the oil industry is constantly on the move. Until almost 1885 western Pennsylvania and New York were almost the only States that produced considerable quantities. About 1885 the Trenton Rock, or Lima district, in Ohio, began to receive serious consideration. For a few years after 1895 this State ranked first. Considerable production was reported from West Virginia in 1889, from California about 1895, from Texas about 1898, from Oklahoma about 1904, and from Illinois in 1906, although these States had produced oil before the dates named. In all these regions the industry has experienced various fortunes, but they are still among the largest producers. In 1914 California ranked first with 99,775,000 barrels, Oklahoma second with 73,631,000 barrels, Illinois third with 21,919,000 barrels, and Texas fourth with 20,068,000 barrels. The total quantity marketed in 1914 was 265,762,000 barrels. The position of the United States among the nations is shown by the fact that since 1857 this country produced a little over



VALUES OF THE MINERAL FUELS, 1906–1921

60 per cent of the world output. Russia ranked second in production.

197. **Natural Gas.**—The development of natural gas followed closely that of petroleum. It possesses a number of advantages for industrial and household purposes. Its heat value is "greater than that caused by any artificial combustion of carbon and hydrogen, and it is a perfect fuel as it issues from its original rock-sealed reservoirs. No preparation is necessary for its combustion, and no residue is left. It is not affected by ordinary temperature, and it is easily distributed by pipes to points of consumption. It is a most economical source of light and power and an ideal household fuel."

This gas has been used for a variety of purposes, including the manufacture of glass where a clean fuel is desirable, in the generation of steam, puddling iron, roasting ores, heating furnaces, in the manufacture of steel, as a source of power in gas engines, in drilling and operating oil and gas wells, in pumping oil, and in the production of lamp black.

Natural gas was said to have been employed in lighting the village of Fredonia, Chautauqua County, New York, as early as 1821, but its use on a large scale dates from about 1870. Before extensive consumption could take place, however, it was necessary to develop economical methods of storing and transportation. In 1914 a considerable number of communities in at least a dozen States were supplied with this product. The approximate value of the output increased from $10,012,000 in 1886 to $94,115,000 in 1914. Upwards of 75 per cent of this amount was consumed in West Virginia, Pennsylvania, and Ohio, named in the order of their rank.

198. **Lead and Zinc.**—Both of these metals have many uses. The result of the growth of industry, therefore, has been to increase demand. Zinc is employed in galvanizing

iron to protect it from the elements, as plates for electric batteries, and in the manufacture of alloys, such as brass, German silver, and various bronzes. Some of these uses have arisen in connection with the development of the electrical industries. Lead, also, is consumed in the electric arts. In addition it is demanded for the manufacture of pipe and sheets, pigments, type-metal and various alloys, to say nothing of industrial uses for many compounds. Some idea of the increasing demands for these metals may be obtained from the fact that production of lead increased from 15,600 short tons in 1860 to 543,840 short tons in 1923, and that of zinc from 23,200 short tons in 1880 to 508,300 in 1923. Missouri has long been the leading source of both lead and zinc, but a number of other States contribute something to the product. The rise of mining for these metals in some of the Far Western States is a feature of this period.

199. **Aluminum.**—This element offers a splendid illustration of how a new commodity may enter promptly into a variety of uses and thereby contribute to industrial progress. It has been estimated that more than 250 articles are now manufactured from the pure metal and as many more from its alloys and compounds and that the list is continually increasing. The element has a number of valuable properties which make it particularly useful in the industrial arts. Among these are lightness, comparative toughness, durability, and resistance to chemical erosion. Thus it is employed largely in the manufacture of cooking utensils where lightness and cleanness are prime requisites. It is used also in producing foil for wrapping foods and confectionery, in scientific instruments, blades for fans, vacuum cleaners, airplane parts, and bodies and parts for automobiles. Some of the advantages of aluminum in the industry last named are that bodies made from it are lighter than those made of other sheet metal and

have a rigid surface which will not dent easily when handled. Moreover they are safer in case of accident. Improvements in methods of casting have contributed to the use of aluminum in the manufacture of automobiles. Electric transmission lines are frequently made of this element; it is employed in equipment for the manufacture of varnish, soap, and sugar; explosives containing aluminum are particularly valuable because they are stable, have great power, and are free from noxious gasses. During the European War aluminum found extensive employment in the manufacture of cartridges for rifles, shells, helmets, grenades and, with soft iron, of shell fuses.

The element was first separated in 1824, but its use on a commercial scale did not occur until about 1887. At that date a pound was valued at about $5.00, but with the development of the processes of manufacture the price has been as low as 18 cents.

Aluminum in various compounds is widely distributed, but the great difficulty in separating it cheaply retarded for years its use in manufactures. The raw material chiefly used is bauxite, a substance which contains a considerable amount of aluminum along with other elements. Bauxite is obtained principally from Arkansas and Tennessee, but smaller quantities are produced in Georgia and Alabama. The output of the material from the Arkansas-Tennessee region rose from about 5,000 long tons in 1899 to 200,700 in 1914. These figures are a fair index of the growth of production of metallic aluminum and its increased use in industry.

PRODUCTION OF ALUMINUM, 1885–1923

Year	Pounds	Year	Pounds
1885	283	1905	11,347,000
1890	61,281	1910	47,734,000
1895	920,000	1915	16,280,000
1900	7,150,000	1923	28,305,000

200. **Cement.**—Although natural cement has been produced for many years, Portland cement is a new industry since 1860. During the years from 1870 to 1879 the output was only 82,000 barrels valued at $246,000. In 1923 production amounted to 137,460,000 valued at $240,556,000. The demand has been stimulated by the enormous growth of construction work, and the abundance of cheap materials for the production of the substance both promoted construction enterprises and widened the use of cement.

201. **Stone.**—The United States possesses a great variety of materials of this description. Usually they are not shipped to distant markets because of their small value in large bulk, but near-by consumption is frequently large. The kind of building stone demanded is frequently a resultant of changes of tastes, and this, in turn, depends on changes in style of architecture. The growth of wealth, bringing in its train diversified uses for building stones, is a factor in the development of the industry, but expansion of construction work of all kinds materially increased the demands. The value of stone produced in the United States in 1880 was $18,356,000; the amount in 1914 was $77,544,000. This includes building and monumental stones, and materials for paving, curbing, flagging, rubble, and some others.

202. **Gold and Silver.**—Prior to 1860 very little silver was produced in the United States; exploration of some of the Far Western States, beginning about 1860, revealed great stores of this metal; development was encouraged, and subsequently this country rose to the first place as a producer of the white metal. The rapid increase in supply, as we shall see later, seriously affected the course of monetary legislation. Gold was discovered near the mouth of Clear Creek in Colorado in 1852. Some six years later an expedition was organized to explore the country. Reports of success spread "like wildfire" and shortly there was a rush to

Pike's Peak and the Rockies. The present city of Denver is a product of the migrations of this and later years. In the early period of quest for precious metals in the Rockies there was much shifting of miners from place to place resulting from the stimulus of glowing reports from various sections; but in the course of time, mining became a stable industry in those regions where resources were most promising. The opening of the Western silver resources resulted immediately in a great increase in the output of this country. From $156,000 in 1860 the output increased to $11,642,000 in 1865 and to over twenty-three million dollars in 1871. The annual production has never fallen below that amount and at times has risen to over fifty-five million.

203. **Other Minerals.**—We have discussed the development of only the most important minerals, but there are many others which have witnessed rapid growth. While such materials are often produced in small quantities, their industrial significance is much greater than their value indicates, because they are "key materials" not only for a given industry but for others which are directly or indirectly dependent upon them. Tungsten is an illustration of this point. It enters into the manufacture of certain kinds of steel which are highly necessary for the growth of much of the iron and steel business. The same condition prevails, although to a smaller degree, with regard to the supply of manganese, mercury, antimony, bismuth, and some others. In fact, the demands of modern industry are so specialized and so complex that the shortage of small quantities of some minerals affects a considerable range of industries.

204. **The Concentration of Industry.**—In mining, as in other departments of economic activity, one of the great features of this period has been the growth of large-scale business. This has been particularly the case with the

great minerals. In all mining industries the corporation which is especially adapted to large-scale production, has become the dominant form of organization. Out of 19,915 operators in mines, quarries, and wells in 1909, 7,040, or 35.4 per cent, were corporations. The value of the product of such organizations was 91.4 per cent of the total. This form prevails, notably in the coal, copper, and iron industry. These figures, however, refer to form rather than to the number of persons engaged under a single management. In the iron-mining industry, in 1880, there were on the average of 38 wage earners per operator; by 1902 the number had increased to 117 per operator, and in 1909 to 277 wage earners per operator. If figures were available, a similar concentration could probably be shown for other mineral industries. At any rate, in 1909 in the iron industry 9 of a total of 173 operators employed 58 per cent of the men engaged. In the copper industry 12 of a total of 158 operators employed 75.8 per cent of the wage earners, and in the case of anthracite mining 18 of the 192 operators employed 84.8 per cent of the men. Although concentration is marked in the production of bituminous coal, lead, and zinc, and petroleum, it is not as great as in the other industries named. Although concentration makes for better division of labor and lower costs, it raises serious questions, such as the relation of management to men and the control over output and prices to the consumers.

205. **The Rank of the United States as a Producer of Mineral Products.**—In 1923 this country ranked first among the nations in the production of iron ore, copper, lead, zinc, coal, petroleum, and aluminum. These are the leading minerals required for the development of an industrial country. Their abundance has laid a broad foundation for our progress, but upon this foundation we have had to build with our thrift and enterprise. How well

we have performed this task is witnessed by the fact that we are now the leading manufacturing nation. Summarizing our progress during the thirty-three years prior to 1916 George Otis Smith, in the volume on *Mineral Resources of the United States, 1915,* observes: "The per capita production of iron ore increased 337 per cent; petroleum, 391 per cent; copper, 1,200 per cent; cement, 2,087 per cent. Gold and silver increased only 23 and 22 per cent, respectively, but lead increased 125 per cent and zinc 638 per cent."

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CHAPTER XVI

EXTRACTIVE INDUSTRIES: LUMBERING AND FISHERIES

As in the case of the mineral industries, the products of the forests supply a great number of manufactures and require the services of various commercial branches in financing and marketing the products. The growth of lumbering, therefore, is only one of the elements in the general industrial advance.

206. The Uses of Timber.—One thinks of building and fuel as the chief uses of timber; while these two demands are indeed the most important, on the other hand, the increasing consumption of brick, stone, concrete, steel, and tile for roofing has greatly reduced the draft on the forests below what it would have been had not these substitutions taken place. One of the fortunate results of this development, therefore, has been to shift some of the demand from timber, which is becoming relatively scarce, to other materials which are more abundant. It was estimated in 1914 that the use of steel, brick, and concrete in construction saved annually more than two billion seven hundred million board feet of timber, that the use of metal, tile, and slate shingles saved one billion four hundred million board feet, and that the substitution of fibres for wood in the manufacture of boxes saved about a billion board feet. Various other economies occur in the use of steel and concrete for fencing and posts and in the use of steel for wood in building railway cars. New methods of preserving materials of wood when exposed to the action of the elements have contributed in the same direction. But not-

withstanding all these savings the consumption of timber is increasing at an alarming rate.

It has been characteristic of the timber industries, as of most others, that growing refinements of taste on the part of consumers, and increasing specialization of industrial demands, have required a more careful selection with thought as to the adjustment of properties of materials to the needs of the trade. Thus questions of strength, durability, hardness, weight, color, texture, and ability to resist the destructive effects of atmosphere and organic life are considered in choosing timber for manufacturing purposes. In case of agricultural implements, for example, strength and durability are of first importance. Timber for furniture is chosen largely with reference to color, grain, and readiness for receiving a finish. When exported to hot, moist climates, the ability to resist the action of organic life is often one of the chief requisites. Wood for musical instruments is usually selected with reference to its beauty, strength, and rigidity.

Timber has been classified as to its general uses as follows: firewood, lumber and shingles, poles and posts, hewed cross ties, cooperage stock, pulp-wood, round mine timbers and distillation wood. These are named in the order of quantities consumed. The many uses of wood are so well known that further classification is unnecessary.

207. The Uses of By-Products.—In addition to the uses just named, the forests are the source of a number of other valuable substances. Some of the principal industries of this country which employ wood in the manufacture of by-products are the production by distillation of such commodities as wood spirits, turpentine, pine oil, tar oil and tar, the manufacture of wood pulp, and of tanning extracts. Spruce and hemlock are the principal pulp-woods of the United States, with poplar ranking third, but chestnut, gum, basswood, elm, birch, and long leaf pine, among others,

are employed to some extent. For tanning extracts, chestnut wood and the bark of the chestnut oak, black oak, and hemlock are used chiefly. A new feature of the industry has been the importation of considerable quantities of quebracho from South America and of mangrove from the East Indies. In 1909 over 147 million pounds of quebracho were consumed in this industry.

Among the by-products of smaller importance are ethyl alcohol, producers' gas, oxalic acid, and needle oils. In the manufacture of the last named substance the raw materials are leaves or small twigs of cedar, hemlock, spruce, fir, and pine. Upwards of 100,000 pounds of such oils are annually produced from leaves of white and black spruce. This commodity is employed in the manufacture of liniments, perfumes, and of deodorizers. Cedar-leaf oil is used as an insecticide and as floor dressings and polish, and eucalyptus oil is employed in the arts and in medicine.

208. The Shifting Source of Timber.—The forests of northeastern United States were for many years the chief sources of timber, but the westward movement bringing its great demand for lumber of all descriptions caused a shift first to the forests of the north central section, then to the Southern States, and finally to the Far Northwest. At the present time lumbering is pursued in many parts of the country where resources make the industry worth while. The enterprise is thus nation wide, rather than local or regional. Chicago had already become the great lumber market of the country before 1860, deriving its supplies from Michigan and Wisconsin. At the date just named the greater portion of the supply came from Saginaw, Green Bay, Muskegon, and Manistee, but considerable quantities were obtained from other places. In 1865 the receipts at Chicago were more that 647 million feet, increasing to over two billion feet in 1892. Before 1860 the pioneers, in their movement westward, encountered the

prairies, and for some years thereafter the migrations were into treeless country. Yet these settlements demanded lumber, and the occasion was offered for the development of a Western lumbering industry on a large scale. The north central forests were for a long time the chief sources of supply though large quantities of lumber were sold through St. Louis and Pittsburgh. St. Louis received its supplies both from the upper and lower Mississippi. The South supplied cypress from the lower Mississippi region; poplar was imported from Tennessee and cottonwood from southeastern Missouri. From the forests of Wisconsin logs were floated down the Mississippi to be sawed in local establishments, but mills were established later in the timber lands, and the manufactured products sent thence to market. Pittsburgh continued to receive supplies from western New York by way of the Alleghany River, but with the extension of railroads large quantities were obtained from the West and South. The golden age in lumbering in Michigan was reached about 1870; shortly after the peak of production was reached in Wisconsin; lumbering in the Saginaw Valley reached its climax about 1880. The industry had already begun to move into the Southern pineries, and Mobile and the ports of Florida were sending out large cargoes to market. And finally the forests of the Far West began to receive attention. During those years there were notable changes both in the leading sources of timber and the kind of lumber sent to market. In 1880 the Lake Group still ranked first, holding the place it had won shortly after 1860; the Northeastern group, the oldest producer in the country, ranked second, the Central group was third, and the Southern, fourth. Relatively small quantities were produced in the Pacific States at this time. In 1922 the Southern group ranked far ahead of all others, producing more than 45 per cent of the lumber supply of the country, and the Pacific group had risen to the second

place, producing about 19 per cent of the total. These changes in position are shown in the table below:

PRODUCTION OF LUMBER, 1880–1922

Group	1880	1890	1900	1922
Northeastern Group	3,982,231*	4,063,045	4,856,869	1,423,200
Lake Group	6,278,567	8,142,320	8,715,619	1,944,500
Southern Group	2,498,489	4,809,932	11,037,325	14,384,200
Central Group	3,014,988	2,814,572	5,129,474	1,762,300
Pacific Group	642,142	2,021,948	2,896,618	10,581,100
Miscellaneous Group	18,204	27,800	65,331	1,130,900
States not specified	1,652,735	1,615,236	2,079,277	45,000

* Thousand feet.

These changes in the sources of timber brought to the forefront the varieties of lumber for which the newer regions are noted. Thus yellow pine from the Southern States now ranks first of all timber produced, and Douglas fir of the Pacific States ranks second. Out of the total production in 1922 of 31,569,000 thousand feet, yellow pine contributed 11,501,000 thousand feet and Douglas fir 6,832,000 thousand feet.

209. **Organization and Mechanical Improvements.**— The industry could scarcely have met the great demands thrown upon it without great improvements in mechanical methods and without new forms of business organization. Here, as elsewhere, such changes have been designed to save labor, to reduce the cost of production, and to provide better methods of marketing. The opening of the country by the railroads contributed to the development of timber resources, for as long as the only outlet for logs and lumber was down the rivers, markets were confined largely to regions tributary to the streams. But manufactured timbers can now be distributed long distances and in all directions. In a general way it might be said that the westward movement brought a market to the forests. In some cases the presence of timber supply was the prime cause

for the building of some railroads. As a writer in a public document said recently: "The lumberman in many instances has been a pioneer railroad builder, and many common carriers of to-day were laid a few decades ago as part of a logging and saw mill enterprise." Much of the national domain granted to the railroads was covered with forests, and it was in the interest of the companies to dispose of this land to lumber companies because exploitation was the surest way of developing traffic at a time when farming could not be depended upon to provide any large amount of freight. On the other hand, as a result of the growth of railway transportation, markets are much better supplied both with variety and quantity of lumber, and thus manufacturing industries are much better served. Expansion of transportation, moreover, promoted the concentration of the lumber trade in great centers and was an important factor in the growth of large-scale business in all stages of the industry from forests to consumers.

Many improvements have been introduced in cutting, sawing, handling, marketing, and mill operation. For some products drying and preserving have become necessary, hence new methods to accomplish these ends. In former years, when timber was abundant, only the most serviceable varieties were utilized; but now with the exploitation of inferior qualities much of the product must be preserved with chemicals. By such process the life of cross ties, poles, and paving blocks is considerably increased.

Other important changes have occurred. The lumber camp has been more effectively organized to obtain advantages of better division of labor. Specialized duties are assigned to mechanics, road makers, choppers, sawyers, loaders, and teamsters. Some lumber camps have grown into communities of considerable size wherein are provided not only the mechanical requisites of the industry, but stores, schools, and churches for the benefit of the employees.

At the same time some of the larger businesses have been integrated, a feature which characterizes much of our industrial development during the past fifty years. The industry, therefore, does not stop with the felling of trees, but often includes planing mills equipped with high-speed power machines, turning out smooth surfaced lumber, moldings, and like products. In order to utilize material which would otherwise go to waste, establishments are frequently equipped for producing shingles and lath. The large organization which now characterizes the industry was inaugurated in the Lake States after 1860, and lumbering in the South and West has largely followed the system which was successfully developed in the pine regions of the North.

The dominance of large-scale business is shown by the fact that in the census year 1909 there were 888 mills that cut over 10,000,000 feet; 783 which cut from 5,000,000 to 10,000,000 feet; 5,443 which cut from 1,000,000 to 5,000,000 feet; 6,468 which cut from 500,000 to 1,000,000 feet; and 28,459 which cut from 50,000 to 500,000 feet. The small mill has by no means disappeared, but it is not usually the pioneer, as in former times; instead, it frequently follows the trail of the large establishment, "working on odds and ends of virgin stumpage, on the less valuable species which their larger predecessors may have utilized only in part, and as time elapses on second growth." In some parts of the United States, as in central New England, economic conditions have not favored the development of large enterprises; in such localities, when a good local market is available, the small mill meets with success.

The growth of large business both on the part of lumber producers and consumers led to the introduction of new methods of distribution. While much of the lumber on its way to market passes through two organizations, namely, the manufacturer who "combines stumpage ownership with

logging, milling, and wholesaling, and the retailer, who takes the product from the mill and distributes it to the consumer," on the other hand, many large consumers, like railroads and factories, buy direct from wholesaler or manufacturer; and a considerable amount of lumber is sold by yards which are directly connected with mills and form "the last link in a lumber enterprise which may extend from the ownership of standing timber to the sale of its manufactured products to the final user." In this manner marketing through middlemen, which characterized much of the industry of the past, is avoided, and direct contact is established between the producer, who integrates various stages in production, and the final consumer.

210. **Foreign Trade in Forest Products.**—Exports of domestic products have increased from $7,286,000 in 1861 to $90,362,000 in 1908; and imports in 1861 amounted to $7,084,000 and in 1908 to $97,773,000. The value of lumber exported increased from $2,817,000 in 1870 to $61,975,000 in 1913. In addition to lumber, the exports cover wood alcohol, wood pulp, and naval stores including tar, pitch, and turpentine. The large import trade in forest products is due to the fact that the United States is dependent on the outside world for many substances. Of the imports, rubber stands out conspicuously because of its great increase. In 1891 the value of all kinds of rubber imported amounted to $18,020,000 and in 1915 to nearly $80,000,000. The chief contributor to this growth has been the demand of the new automobile industry. Other imports are cinchona bark, cork, dye woods of several kinds, and gums including gum arabic, camphor, chicle, and copal.

211. **Our Forest Policy.**—Until a few decades ago, the forests of this country were exploited with little thought as to the future, but the rapid depletion of the timber supply directed attention to this problem and made it one of the greatest of the national issues. Possibly 45 per cent of the

United States was once covered with primeval forests, but due to clearing by the farmers, logging, fire, and waste of many kinds, this has been reduced to about 29 per cent covering more than 550,000,000 acres and including a stand of about 2,500,000,000,000 board feet. Timber serves the public good only when used; but wastefulness increases the drain on resources and thus threatens the future with shortage. Much of the annual loss due to fires, estimated at $25,000,000, could be prevented. Fires are due to the carelessness of campers, to lightning, and to sparks from locomotives, and live coals from the fire-box which start a conflagration along the railroad right of way. Forest fires are a misfortune not only because they destroy large quantities of commercial timber, but because they destroy also the young growth which is often of greater social value than the timber ready to be cut.

In addition to losses from causes just named, great wastes due both to uneconomical uses of the forests and of lumber in the processes of manufacture, constitute an additional drain on the timber supply. A large amount of merchantable timber is left in the woods either actually cut, or in dead trees, or in trees partly used, or less valuable kinds. Waste occurs, also, in long stumps and high tops, and in the failure to cut logs of such a length that the tree can be most profitably used. To this must be added loss in logging, breakage in felling, and the use of good timbers for temporary construction about the camp where inferior kinds would suit the purpose just as well. A more serious matter is the destruction of young timber by improper logging methods.

To these should be added wastes at the mill, estimated at from 30 to 70 per cent of the volume of timber contained in the logs. This includes loss in saw kerf, in edging and trimming, in seasoning and in accident. In the case of box factories, for example, the waste in cutting stock to

required sizes and the elimination of defects often amounts to 20 per cent, and in furniture manufacture to 25 per cent.

To some extent wasteful methods are due to lack of knowledge of economical forest practice. In part, they are due to the faulty land laws of the United States. Land has been acquired under the terms of various acts which were designed not to protect timber reserves, but to put the holdings in the hands of actual cultivators. The absence of laws specifically applying to the acquisition of forest lands has, in a large measure, prevented the Government from exercising wholesome control over methods of exploitation. The attempts that have been made by Congress to encourage reforestation have been largely a failure. The Timber Culture Act of March 3, 1873, for example, granted to settlers 160 acres of treeless land on condition that they plant and cultivate a certain number of forest trees, but this policy produced no notable results.

The problem of conservation is now receiving more adequate consideration both by State and Federal Governments. In addition, a number of colleges are offering courses in forestry, and in some instances schools of forestry have been established. The first of these was at Cornell University in 1898. In that year the legislature of New York State provided for such a school and also for the purchase of a school forest of some 30,000 acres for use as an experimental demonstration area where the principles and practice of scientific forestry could be learned. The observance of an annual Arbor Day, begun in one of the States in 1872 and later expanded into a national institution, has done something to create an interest in the forests.

The forest work of the United States Government began in 1876 with the appointment of an agent serving in the Bureau of Agriculture. His principal duty was to study forest conditions. The Division of Forestry was created in 1881, but because of meager appropriations it was unable

to do work of any real value. The Bureau of Forestry was authorized in 1901, and this, under the terms of the Act of 1905, became the Forest Service, under the jurisdiction of the Department of Agriculture. This Service is charged with the duty of administering the national forests, but in addition, to it also is entrusted the work of studying forest conditions, the best methods of utilizing forest resources, the study of physical and mechanical properties of woods, the processes employed in the manufacture of forest products, and the collection of information concerning the needs of the various wood-using industries. In order to prevent loss due to insects and diseases, the Service avails itself of the assistance of the Office of Forest Pathology, of the Bureau of Plant Industry, and of the branch of Insect Investigations in the Bureau of Entomology.

In administering the national forests the policy followed is not to prevent, but to conserve the use. Thus, the Forest Service protects timber from fires and other destructive agencies, builds roads, trails, telephone lines, conducts sales, and oversees the cutting of mature timber, regulates the grazing of livestock in the national reserves, issues permits for the development of water power, and for the construction of hotels, dwellings, stores, power transmission lines, and the like. Receipts from the national forests for the fiscal year ending June 30, 1915, amounted to about $2,500,000.

212. **Forest Reserves.**—The policy of setting aside land in reserves for forest purposes was inaugurated under the terms of the Act of March 3, 1891. The Act provided that "The President of the United States may, from time to time, set apart and reserve, in any State or Territory having public lands bearing trees, any part of the public lands wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reserves, and the President shall, by public proclamation, declare the

establishment of such reserves and the limits thereof." In 1915 the national forests of the country had grown to 162 in number, covering about 184,611,000 acres. Most of these reserves are in the mountains of the West, but others are in Michigan, Minnesota, Kansas, Nebraska, Arkansas, Florida, Alaska, and Porto Rico, and a beginning has been made in establishing similar reserves in some of the Eastern States.

In addition to timber reservations, there are a number of national parks which contain varying amounts of forests. One of the greatest of these is Yellowstone National Park, established by the Act of March 1, 1872, and located in Montana and Wyoming. Its area is about 2,142,720 acres. The Yosemite reservation was established by the Act of October 1, 1890, and contains 682,480 acres; Sequoia was established in 1890, and contains 160,000 acres. There are a number of other national parks of smaller area.

In addition to the work of the national Government, the States have in recent years taken an active interest in the appointment of forest commissions and in the establishment of reservations.

213. **Fisheries.**—The waters of the United States, inland as well as coastwise, abound with fish of many descriptions. Fishing of some kind, therefore, is an industry in every part of the country. One of the results of the westward movement was to open these new resources and to distribute the fishing industry over the country. The fisheries of the Pacific Coast, with salmon and halibut leading in importance, now rank among the first in the country; meanwhile greater attention has been given to the fisheries of the Great Lakes where whitefish, lake herring, lake trout, pike perch, and yellow perch are some of the most important kinds, and to the fisheries of the interior rivers which provide black bass, buffalo fish, carp, frogs, mussels, and shells. A considerable industry has grown up in recent years in

the manufacture of pearl buttons, using as raw materials shells found in the Mississippi and other rivers.

Some of the more important causes promoting development have been the growth of population which greatly augmented demand, the growth of the fish-canning industry which contributed in the same way, improved forms of business organization, and the inauguration of new methods of packing, preserving, and shipping. The work of fish culture and distribution by both Federal and State governments has given very material aid to the industry. The study, during the past few years, of fish which formerly were thought not to be suitable for human consumption promises to add new varieties to the market and, therefore, to benefit the business.

The establishment of the United States Fish Commission in 1871 was one indication that pioneer days in this industry were over, and that henceforth, in place of relying on natural abundance, measures would be necessary to promote fish culture and distribution. The Commission began artificial propagation of fish in 1872; from that year the work has constantly expanded. The task of administering the Government fisheries work is now in the hands of the Bureau of Fisheries which is a subdivision in the Department of Commerce. This Bureau makes provision for the propagation of useful varieties and for their distribution to suitable waters, studies the diseases of fish, makes investigation of fishing grounds of the United States, and, in general, performs other useful work favoring conservation of the supply. Some idea of the extent of the work of this Bureau may be obtained from the fact that in 1916 over 4,847,262,000 eggs, fry, fingerlings, yearlings, and adults were distributed.

Fish canning now constitutes an important branch of the business. In 1920 there were 410 establishments engaged in this work with an output valued at $77,284,400.

From the point of view of value of the product, salmon ranked first among canned fish, followed in order by sardines, oysters, shrimp, and tuna.

The present rank of the States in the fisheries industry is as follows: Massachusetts, with cod, haddock, and mackerel as the leading varieties; Virginia, with oysters, shad, menhaden, and clams; New York, with oysters, squeteague, bluefish, flounders, and clams; and Washington, with salmon and halibut.

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CHAPTER XVII

AGRICULTURE: I, GOVERNMENT ENCOURAGEMENT

214. The Relation of Agriculture to Manufactures.—As with other branches of the raw-material group, farming provides raw products for manufactures, and like the others also, it depends on commercial industries for financial and marketing facilities. Some products of the field, to be sure, are ready for final consumption and require only the assistance of railroads and merchants to put them in the hands of household users. This is the case with green groceries and with many fruits. Meat, and to a considerable extent, milk, and some fruits now go through processes which, because of the amount of manipulation required, cause them to be rated as raw materials. In fact meat packing and fruit canning are classified by our census as manufactures. With the few exceptions named above, however, the products of the field are supplied to factories of various kinds which put them in form for household consumption.

The close relation of agriculture to manufactures can best be shown by indicating the extent to which the latter draw upon the farms. More than a dozen of the twenty of the most important manufactures depend either directly or indirectly on agriculture for supplies. This is clearly the case with slaughtering and meat packing which, in 1909, ranked first among the manufactures, with flour and grist-mill products which ranked fifth, with cotton goods which ranked seventh, and with the production of men's and women's clothing, boots and shoes, woolen goods, to-

bacco products, bread and confectionery, malt liquors, sugar and cheese, and butter and condensed milk. A complete survey would reveal the fact that the bulk of raw materials is obtained from the farms. Success in agriculture, therefore, lies at the basis of progress in other branches. All the while, it must be remembered that farming provides a large volume of traffic for the railroads and affords business for all grades of middlemen. Thus it is no wonder that all industrial interests of the community keep a close watch over reports of crop conditions. Successful agriculture, moreover, means not only a large volume of goods coming to market, but a great amount of purchasing power in the hands of farmers, and this, in turn, increases the demand for products of factory industries.

215. The Growth of Agriculture.—The growth of agriculture is summarized in the increasing value of the products. The output of the farms amounted to $1,958,030,927 in 1870, and to $8,498,311,413 in 1910. The period of most rapid growth was during the twenty years from 1890 to 1920.

VALUE OF FARM PRODUCTS, 1870–1920

1870	$1,958,030,927	1900	$4,717,069,973
1880	2,212,540,927	1910	8,498,311,413
1890	2,460,107,454	1920	21,425,623,614

We have already conveyed some idea of the possibilities for agricultural development in our discussion of the movement of population. The new lands have afforded great opportunities for the growth of cereals, fruits, and livestock. One significant fact has been the great increase of the area under cultivation. In 1860 the improved land in farms amounted to only 163,110,720 acres; in 1880 it had grown to 284,771,042, and in 1920 to 503,073,000 acres. In 1860 only about 13 per cent of the cultivated land was

west of the Mississippi, but in 1910, due to the westward migration, it amounted to a little over 54 per cent. One of the most interesting, and, at the same time, one of the most important facts in our history has been the rapid conquest of this domain. It can be readily traced from decade to decade. In 1860 the five States immediately west of the Mississippi had only 15,286,000 acres in improved farm lands; this grew to over 50 million in 1880, and to more than 87 million in 1910. Except for New Mexico, which was the seat of one of the oldest settlements in North America, and for Utah, which had been populated to some extent by the Mormons during the prior decade, there was scarcely any land under cultivation in the Mountain States in 1860; in fact, the total, principally in New Mexico and Utah, was only 240,600 acres; by 1880 over 2,213,000 acres had been improved, and by 1910 over 15,915,000 acres. The three States along the Pacific Coast had only 3,446,000 acres in improved farm lands in 1860. This was chiefly in California which had been settled after 1848 as one of the results of the gold fever; the improved area in this section increased to over 13 million in 1880 and to more than 22 million in 1910. Equally rapid was the development into the Northwest and the Southwest.

The conquest of this domain did much more than increase farm output by bringing new lands under cultivation. It was the cause of a great amount of agricultural and manufacturing readjustment. With all the area of the country available for cultivation, specialization could take place in regions which were favorable for certain crops and for certain kinds of agricultural organization. In the course of time, particular kinds of farming came to be carried on in sections which offered peculiar advantages. This specialization was made possible by the development of transportation which enabled farmers to devote attention largely to the crops in which they had advantages, ex-

changing the proceeds of these for other desirable commodities. Thus, while it is true that diversified agriculture is pursued to some extent in all regions, each section has a dominant interest. In the South, including portions of Texas and Oklahoma, which have now become large producers, it is cotton; in the region extending from Pittsburgh to about the western border of Kansas and Nebraska it is corn and winter wheat; in Minnesota and the Dakotas it is largely spring wheat; and in the Mountain States, wool and livestock. Meanwhile, some of the States of the Atlantic seaboard which were once important producers of grain have either been forced to intensive methods of cultivation, or have abandoned the crops.

Under this new order the development of the country could scarcely have taken place without many improvements in farm machinery, and in new methods of grading, storing, transporting, and marketing of farm products. Thus another effect of the conquest of the national domain has been to stimulate invention. Devices were introduced not only as aids in planting and harvesting but in conveying products to market. Very great economies have been made in handling grain at the elevators whereby it is loaded and unloaded in bulk at a rapid rate. Like economies have occurred in baling, handling, and shipping cotton.

The localization of agricultural crops has compelled a similar localization of many manufactures which are dependent on the fields as sources of raw materials. This is notable in the case of flour milling, meat packing, and the canning and preserving of fruits and vegetables. Of more significance for industrial progress is the fact that the settling of the country, by setting up the chain just described, increased the productivity of the country. Without this result it would have been impossible to supply the ever increasing population and at the same time possess a surplus

for export. All the great staples experienced a notable growth, and meanwhile a number of new crops have been introduced. These matters will be discussed in the next chapter. It was inevitable that all these changes should react on the value of farm property. This is shown by the fact that such value in 1860 was $7,980,493,000 and $77,924,100,000 in 1920.

216. **The Causes of Growth.**—Some of the important causes involved in this growth may be inferred from what has just been said. The abundance of cultivable land has been a great factor. Much of this land, however, was settled originally not because there was an immediate prospect of marketing products, but largely for the reason that ownership gave the possessor the increment of value which resulted with improvements in communication and the growth of population. This process was helped by the land laws of the country which enabled farmers to take up a much larger area than they could cultivate. It has frequently been said that railroad building has been a great cause of agricultural development. This is true, but the effects are complex. Even the prospect of a railroad promoted land speculation and immigration. To the actual cultivator, railroads were a far greater stimulus to enterprise than canals or improved highways, because they afforded longer and more rapid hauls and lower rates. If they encouraged farming by widening markets, on the other hand, they enabled farmers to bring in cheaply implements, dry goods, and other necessaries. Other means of communication promoted development. The telegraph, for example, put the farmer, or his agent, in prompt contact with the great commodity markets and thus facilitated the sale of farm products; improved mail service promoted the distribution of literature of all kinds, and the introduction of the Parcel Post and the interurban put the rural population into more immediate communication with the great

producing and distributing centers. The development of farm literature has also been a cause.

Meanwhile the growth of domestic and foreign markets for farm products was a further stimulus. At times, to be sure, there was a glut, due largely to the fact that settlers were taking up land so rapidly that all their products could not be consumed; but in time, consumption not only increased to take up this surplus, but grew to such an extent, particularly since 1900, that the tendency of prices has been to rise. Other encouraging factors were the introduction of new crops which widened the scope of farming and increased the opportunities for profit, the growth of agricultural education, the application of business methods to farming, and the growing wealth of the farming classes which exerted a favorable influence in many directions. To these should be added the many aids of Federal and State governments. Irrigation has become an element of some importance in reclaiming land and in increasing output.

All the while, progress in manufactures reacted strongly on the growth of agriculture. Indeed, the development of the latter was inseparably connected with that of the former. Raw products of the field must be converted either by hand or mechanical effort into hundreds of commodities demanded by consumers. Inventions and improved forms of business organization, which have enabled factories to discharge this function rapidly and economically, made it possible to dispose of the ever increasing volume of agricultural raw materials. Without such improvements agriculture would have been hopelessly handicapped. Illustrations may be found in the effect on farming of the modern processes of flour milling, tanning, production of cotton and woolen goods, and canning and preserving.

Finally as a cause of agricultural progress we must include what is sometimes called the "spirit of the times."

It is characterized by the growth of enlightenment which manifests itself in an eagerness for knowledge as to the best methods of obtaining results, by a desire to learn ways of measuring and testing such results, and by a keener insight into business methods. This new spirit is to be largely attributed to the growth of agricultural education, although modern advertising and the development of periodical literature are contributing factors.

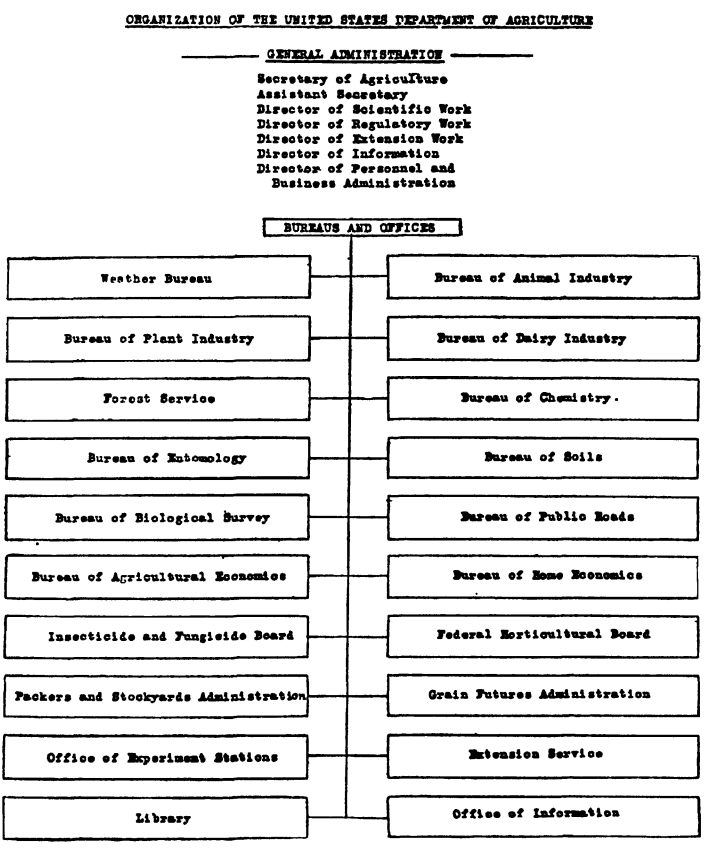
217. **Government Encouragement.**—The growing interest which Federal and State Governments have taken in agriculture since 1860 is one of the outstanding characteristics of the period. Governments have given aid by grants of land for agricultural colleges, by direct appropriation of funds, by the establishment of agricultural experiment stations whose functions are to make scientific studies of farming conditions, by the establishment of credit institutions designed especially for the needs of farmers, and often by direct personal advice to farmers.

There was scarcely a President from Washington's time to the present who did not urge government aid in some form to agriculture. But not until after 1860 were measurable results obtained. Such recommendations became increasingly numerous after the Civil War. President Hayes, for example, said in his annual Message of October 1, 1879: "There is no branch of industry in which labor, directed by scientific knowledge, yields such increased production in comparison with unskilled labor, and no branch of the public service to which the encouragement of liberal appropriations can be more appropriately extended. The omission to render such aid is not a wise economy, but, on the contrary, undoubtedly results in losses of immense sums annually that might be saved through well directed efforts by the Government to promote this vital interest." President Cleveland, in 1885, stated some of the reasons in favor of the establishment of a Department of Agriculture to be

the acquisition and diffusion of information, the collection of statistics, and testing and distributing new seeds and plants. This Department was established in 1889. Its work, however, has far outgrown the functions conceived by President Cleveland. New bureaus and divisions have constantly been added until at present the Department takes the lead, often in coöperation with the States, in promoting the varied interests of farming.

Some of the important subdivisions in the Department are the Bureaus of Animal Industry, Chemistry, Plant Industry, Soils, Crop Estimates, Entomology, Biological Survey, and the Weather Bureau. The function of these various organizations is to study the conditions under which crops may be grown most advantageously, to experiment with new crops, to study and map the soils of the United States and ascertain their value for the growing of various plants, to devise means of protection against insects and diseases, instruct the farmer as to the best methods of cultivation, and, in general, to render any service which may promote agricultural interests. The Department diffuses information on all these matters, but it does much more, for its agents are on hand to help the farmer in scores of ways in which help is needed.

The States, also, in recent years, have come to do a large amount of work for the control and improvement of agriculture. Sometimes the measures undertaken are regulatory, designed to protect farmers against practices which might be injurious to the general interest; sometimes their immediate purpose is promotion. In the former class are laws for the inspection of livestock to prevent the spread of infectious diseases, and for inspection of dairy products in the interest both of producers and consumers. With reference to promotive measures, some States have provided for the teaching of agricultural subjects in the grades, and for the diffusion of information about the farming re-



SIMPLIFIED CHART OF THE ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

sources of the State. Sometimes the work takes the form of promotion of some crop in which the community is particularly interested, as for instance, recent legislation in Louisiana for the establishment of experiment stations for scientific investigation of rice growing. Some States encourage thrift among farmers, promote coöperative enterprises, and make provisions for rural credit.

In 1915 under authority of the Smith-Lever Act passed the year before, the Secretary of Agriculture established the States Relations Service, partly for the purpose of carrying out the provisions of the Act, and partly to provide better means for coöperation between State and Federal governments. The upshot of this movement is to give a tremendous stimulus to the use of better farming methods, and to set the farming community to thinking over the many problems encountered.

218. **Agricultural Experiment Stations.**—The establishment of practical work in studying soil and climatic conditions in relation to crops has grown to be an important branch of Government promotion. A forerunner of such enterprise was found in experimental research in agriculture undertaken at the Agricultural High School, later the State College, of Pennsylvania, and at the Michigan and Maryland agricultural colleges between 1854 and 1858. Some of the colleges organized under the National Agricultural College Act of 1862 embarked on such work. But the first regularly organized experiment station in America was established at Wesleyan University at Middletown, Connecticut, in 1875. Shortly after, similar institutions were started in other States. The Federal Government began to give attention to such matters in 1887 when an act was passed providing an appropriation for experiment stations, and subsequently, notably by the Act of 1906, such appropriations were considerably enlarged. By the Act of that year the allotment for each State was increased by

$5,000, to be further increased annually by $2,000 until the total amounted to $15,000. More than 60 experiment stations were in operation in the United States in 1914, and similar institutions have been established in Alaska, Hawaii, Porto Rico, and Guam.

219. **Agricultural Education.**—A large amount of the work of the Department of Agriculture, and of the State organizations, is in effect educational, but both these grades of governments are approaching the question directly. The movement in favor of agricultural education antedated by a number of years the new work of the Department of Agriculture. In a broad sense, training of this description is only one aspect of the new movement for instruction in business matters. In recent years this has been manifest in the organization of schools of commerce and administration whose main purpose is to train students for commercial and manufacturing careers. The school education of engineers of various description is of earlier date. As in the case of experiment stations, State enterprise preceded that of the Federal Government. Considerable interest was shown in agricultural education before 1860, but activity on a large scale was of later date.

As early as 1857, Justin P. Morrill, at that time Chairman of the Committee on Agriculture in the House of Representatives, introduced a bill to appropriate to the several States a portion of the public domain to encourage education in agriculture and the mechanic arts. This bill was vetoed by President Buchanan, but was brought up again and passed in 1862. The law granted 30,000 acres to each State for each Senator and Representative in Congress. At least one college was to be established in each State wherein "all the needful sciences for the practical avocations of life" were to be taught, and where "agriculture, the foundation of all present and future prosperity, may look for troops of earnest friends studying its

familiar and recondite economies." The proceeds of the sale of the land were to remain in trust. Meanwhile, the States were to provide for all expenses of location, management, and taxation, and within five years after filing their acceptance of the terms of the Act were to provide the institution. This Act has been supplemented at various times, notably in 1866 when its provisions were extended to any Territory which may become a State, and in 1890 and in 1907 when new provisions afforded additional appropriations. Most of these institutions are now providing for resident teaching, for research, and for extension work. The scope of the latter was greatly extended by the Smith-Lever Extension Act of 1914. The sum of $480,000 was appropriated to be divided equally among the States; but in addition, there was a grant of $600,000, which was to be increased annually by $500,000 until 1923, when the total annual appropriation of the national Government will amount to $4,580,000. These sums, except the first, are to be allotted among the States in proportion to the rural population, and are dependent on an appropriation by each State of an amount equal to the gift of the Federal Government. The purpose of this law was to provide for diffusion among the people of useful and practical information relating to agriculture and home economics. In 1914 there were 69 State agricultural colleges in the United States with a total enrollment of over 115,000 students.

220. Agricultural Coöperation.—The tendency in modern manufacturing and commercial enterprises, as we shall see later, has been in the direction of closer organization. Such unity promotes progress by facilitating the exchange of ideas, by extending the possibilities of the division of labor, and by affording control over market conditions. Farming has been the last of the great branches of industry to catch up with this movement. Even now, although coöperation in some form has been urged for many years,

the majority of farmers conduct their business affairs as individuals. Agricultural coöperation includes chiefly organizations for buying farm supplies, for selling farm products, and for the securing of credit.

From 1866 to 1900 a number of organizations of farmers were formed. Their principal purpose was to secure legislation favorable to their interests, protection against the injustices encountered in marketing their products, and the promotion of the general interests of the members. These associations, as a rule, were a manifestation of agricultural unrest which was incident to the opening of the new country where farmers generally were burdened with debt and were unable to obtain profitable prices for their products. Among the organizations of the times were the Patrons of Husbandry, formed in 1867, the Agricultural Congress in 1870, the Farmers' Alliances about 1875, the Farmers' National Congress in 1880, and the Brothers of Freedom formed in the South in 1882, and a number of others, including the Farmers' Mutual Benefit Association, the Western Alliance, and the Farmers' Union. The People's Party, formed between 1880 and 1892, was designed to influence legislation and to urge the regulation of industries with which farmers had relations. Groups of this description have been active at one time or another in some of the great movements of the country, such as the Greenback and Free Silver agitation; they were influential in the passage of the Granger laws and the Interstate Commerce Act, and their pressure has been felt in the field of tariff legislation. However, they were not coöperative societies in the business sense of the word.

Organizations for coöperative marketing have developed in the selling of grain, fruit, milk, and, to a limited extent, of other commodities. This system has also been employed in the case of some irrigation projects and in the purchase of farmers' supplies. Coöperative elevator companies,

which are now a great factor in the marketing of grain, are the most important enterprises of this description.

For some years after the growth of the grain States, the purchase of wheat from farmers was in the hands of local buyers, usually representing some firm in the great primary markets. Competition became severe, with the result that dealers were either forced to combine, or were driven out of business. A period of control by large merchants followed, characterized by various abuses. The grain dealers' associations "coerced the commission merchants by refusing to ship to any merchant who handled grain for an independent track buyer; they obtained the coöperation of the railroads by securing a rule under which cars were refused to a shipper unless the grain was on the right of way of the railroad at the time the car was ordered. This rule prevented the shipment of grain by the independent track buyers and prevented the consignment of grain by the farmer as well. With the independent buyers eliminated, the grain dealers' associations in the principal grain growing States perfected their organization and dictated the price to be paid to the farmers each week by the dealers of their association." Other evils of control were connected with this system. Thus, while farmers were selling as individuals, they were confronted by purchasers combined into powerful associations. The formation of farmers' elevator companies was to meet this situation. The first was organized at Rockwell, Iowa, in 1889, but others soon came into existence. In 1910 there were more than 1,800 of these organizations in the United States, chiefly in Iowa, North Dakota, South Dakota, Minnesota, and Illinois.

221. The Federal Farm Loan System.—Although the system of agricultural credit has developed in Europe extensively since 1850 very little has been done in this direction in the United States. Yet there has long been a need of some kind of organization which would provide credit to

farmers at moderate terms both for long-time or capitalistic purposes, and for short-time uses, mainly to provide funds for planting and moving crops. Usually farmers cannot be accommodated at banks of the commercial type where the loan periods are 30, 60, and 90 days because they must borrow for a longer time. Between seed time, when funds are wanted, and harvest, when they are paid back, is often double the longest period named above. Thus the farmer's loan is not as liquid as that of the city merchant and frequently is not as desirable. These factors also enter into the rate of interest.

For many years the methods of obtaining credit have differed in various parts of the country, but for want of some institution specifically adapted to the credit needs of farmers, interest rates have usually been high, a situation which has been detrimental to agricultural progress. In course of time, after the Civil War, there grew up private institutions which loaned on farm mortgages; sometimes individuals having considerable financial responsibility were able to borrow large sums in the great centers and lend to farmers at higher rates; savings banks and trust companies have loaned on farm securities. In the Southern States, when cotton culture began to revive after the War, the system of lending by cotton factors was widely practiced; but with the breaking up of the plantations, and with the appearance of small tenant farmers, the country merchant, or storekeeper, came to the forefront as a lender. Loans were usually granted when crops were planted and repaid when the products were sold. This method of borrowing, however, put the farmer at great disadvantage, for he not only paid a high interest rate, but often engaged to buy his supplies from the merchant and to dispose of his products through the same agency. The storekeeper, of course, kept a close watch over the farmer, frequently deciding the kind of crop he was to plant. The merchant was

thus able to obtain high rates for his loan, high prices for his commodities, and to a large extent was able to determine the price to be paid for the crop.

Because of the lack of lending agencies suitable for farmers, and on account of the high rates of interest, there has been agitation in recent years favoring reform of the agricultural credit system. Great difficulties have been encountered, partly because of the migratory nature of much of the population for whose benefit such institutions were to be devised, partly because of the individualistic tendencies of American farmers, and partly because of the lack of experience in coöperation. But a beginning has been made. Some legislation of the States in behalf of agriculture includes provisions for rural credit banks. But the most important measure is the Federal Farm Loan Bank system inaugurated under authority of the Act of July 17, 1916. The organization includes the Federal Farm Loan Board which administers the system, the Federal Land Banks which conduct the lending business, and the Farm Loan Associations which are groups of borrowers. Two farm-mortgage systems are provided by the Act, one working through the Farm Land Banks, and the other through joint-stock land banks; but both are under control of the Farm Loan Board.

This body is composed of five members, including the Secretary of the Treasury, who is an ex-officio member, and four others appointed by the President by and with the advice and consent of the Senate. No member during his term of office is permitted to be an officer or director in any institution engaged in banking, or in the business of making land mortgage loans. Among the duties of the Board are to report to Congress concerning the operation of the system, to examine and report on the conditions of the land banks, to prepare and distribute literature explaining the advantages of such banks, and to instruct farmers how to

organize to obtain loans, and to provide for the administration of the system.

The act provides for the division of the country into twelve districts and for the establishment of a land bank in each. Such banks are now located in Springfield, Massachusetts; Baltimore; Columbia, South Carolina; Louisville; New Orleans; St. Louis; St. Paul; Omaha; Wichita, Kansas; Houston; Berkeley, California; Spokane, Washington, and Washington, D. C.

These banks, as are also the Farm Loan Associations, are corporations chartered under the terms of the Farm Loan Act. They are managed by a board of directors of nine members, six of whom are elected by the Farm Loan Associations and three appointed by the Farm Loan Board to represent the public. The initial capital of the Farm Loan Banks was $750,000, divided into shares of $5.00 par value. Permission to subscribe was given to individuals, firms, and corporations; but it was provided that if, after thirty days after the subscription books had been opened, this amount had not been subscribed, the balance should be taken by the Secretary of the Treasury and paid for out of the Treasury of the United States. In fact, according to the first annual report of the Federal Farm Loan Board, out of a total of $9,000,000 for the twelve banks, the United States subscribed for $8,891,270. The law requires that at least 25 per cent of the capital of the banks must consist in quick assets, including cash on hand or on deposit with member banks of the Federal Reserve system, or in securities which are readily marketable.

The National Farm Loan Associations are composed presumably of farmers who wish to borrow money. Ten or more natural persons who are owners, or about to become owners, of farm land qualified as security for mortgage may unite to form such an association. Shares have a par value of $5.00. Any person desiring to borrow makes ap-

plication for membership and subscribes $5.00 for each $100 he wishes to obtain. The associations are managed by a board of directors composed of five members. They choose a secretary-treasurer. His duties are to act as custodian of the funds of the association, to pay over to borrowers sums received on their account, to collect from members interest or other payments due the association, and to see that loans are applied to the purposes set forth by borrowers at the time loans were made.

The Federal Farm Loan Banks receive their funds chiefly from the sale of bonds secured by farm mortgages. Bonds are issued in various denominations and bear interest at not to exceed 6 per cent, exclusive of amortization payments. One person may borrow not more than $10,000 nor less than $100. Loans are not to exceed 50 per cent of the value of the land, and 20 per cent of the value of permanent improvements thereon. Some of the purposes for which farmers may obtain funds are to purchase land for agricultural purposes, to purchase equipment, fertilizers, livestock necessary for the operation of farms, buildings, and to pay up an indebtedness on the land existing at the time the loan was contracted. In order to facilitate payment, the Act provides that every mortgage shall contain an agreement providing for repayment on an amortization plan by means of a fixed number of annual or semi-annual installments sufficient to cover interest, cost of administration, and a fractional amount of the principal.

This Act will contribute to agricultural progress in a number of ways, but principally by providing a certain source of funds at a relatively low rate and by educating borrowers to make regular repayments on their obligations.

222. The Land Policy of the United States.—While the methods employed by the Federal Government in disposing of the public domain are open to many objections, nevertheless, both directly and indirectly such distribution has af-

forded a tremendous stimulus to progress. Land was disposed of not only to promote settlement, but in aid of various internal improvements, and to assist the development of colleges. But there were many persons in this country who wanted the Government to go much further and give land to deserving settlers. Homestead measures, providing for free homes in the national domain became a national question in 1852 when the Free Soil Democratic Party, meeting at Pittsburgh adopted a plank to the effect that, "The public lands of the United States belong to the people, and should not be sold to individuals, nor granted to corporations, but should be held as a sacred trust for the benefit of the people, and should be granted in limited quantities, free of cost, to landless settlers." This policy was urged also by many people out of a generous disposition to aid the oppressed in foreign countries who were disposed to emigrate. On several occasions a bill containing the provision of free grant passed the House of Representatives, but failed in the Senate where the weight of Southern votes prevailed. In 1860, however, a homestead bill was passed in both houses. It provided that "any person who is the head of a family and a citizen of the United States shall, from and after the passage of this Act, be entitled to enter one quarter-section of vacant and unappropriated public lands, or any less quantity, to be located in a body, in conformity with the legal subdivisions of the public lands, after the same shall have been surveyed." After five years the settler was to receive his patent, provided he was a *bona fide* cultivator. He was to pay twenty-five cents an acre.

This Act, however, was vetoed by President Buchanan. The President doubted whether Congress had the right to dispose of land in this manner. He also urged against the bill that it was unjust to the "old settlers" who had paid $1.25 an acre for their possessions and who had "con-

structed roads, established schools, and laid the foundation of prosperous Commonwealths." He maintained that it was class legislation because "the mechanic who emigrates to the West, and pursues his calling, must labor long before he can purchase a quarter-section of land; while the tiller of the soil who accompanies him obtains a farm at once by the bounty of the Government." In addition, the President thought the measure would "open one vast field for speculation," that it would reduce the public revenues, and that it would "lay the ax at the root of our present admirable land system." Said Buchanan: "The honest poor man, by frugality and industry can, in any part of our country, acquire a competence for himself and his family, and in doing this he feels that he eats the bread of independence. He desires no charity, either from the Government or from his neighbors."

The advocates of free disposition, however, received only a temporary check, for with the withdrawal of Southern Representatives at the outbreak of the war, a new homestead bill readily passed both houses and received the assent of President Lincoln in 1862. The Act granted a free homestead to actual settlers. Citizens of the United States, or those who had declared their intentions of becoming such, were eligible to take up land under the new law. But, as in the bill of 1860, five years' residence or cultivation was required to obtain title. In order to protect the settler against the loss of his holdings because of claims against him, the Act further provided that the homestead land should not be liable "to the satisfaction of any debt or debts contracted prior to the issuing of the patent." This measure was amended on several occasions. The Soldiers' and Sailors' Homestead Act of June 8, 1872, extended the privileges of taking up land under the terms of the act of 1862 to soldiers and sailors who had been honorably discharged, and permitted them to deduct their term of serv-

ice from the five years of residence required in the Homestead Law; but at least one year's residence and cultivation was necessary.

This policy has had many enthusiastic supporters and also many critics. It was claimed for the Act that it "stands as the concentrated wisdom of legislation for the settlement of the public lands. It protects the Government, it fills the States with homes, it builds up communities, and it lessens the chances of social and civil disorder by giving ownership of the soil in small tracts to the occupants thereof. It was copied from no other nation's system. It was originally and distinctly American, and remains a monument to its originators."

A more careful judgment, however, would subtract a great deal from this statement. The act did indeed promote immigration into the United States and stimulated the taking up of the national domain both by Americans and by foreigners; it was also a powerful factor in opening up and enriching the country. But frequently these results were not obtained in the manner the framers of the law anticipated. Much of the land was obtained in one way or another by persons who had no intention of cultivating permanently, but of selling to others at as high a price as their holdings would bring. Speculation of this description was against the interest of the real farmer. Moreover the homestead policy caused great hardships for farmers in the older parts of the country, for it was impossible to compete with men on new lands who "mined" the virgin fertility of the soil and who thus sold below the cost of production, if maintenance of fertility was considered a cost. In this way also the policy retarded the introduction of business-like methods. That the Homestead Act "lessened the chances of social and civil disorder" was hardly a true statement of the case when one considers the long period of agricultural unrest which was one of the direct

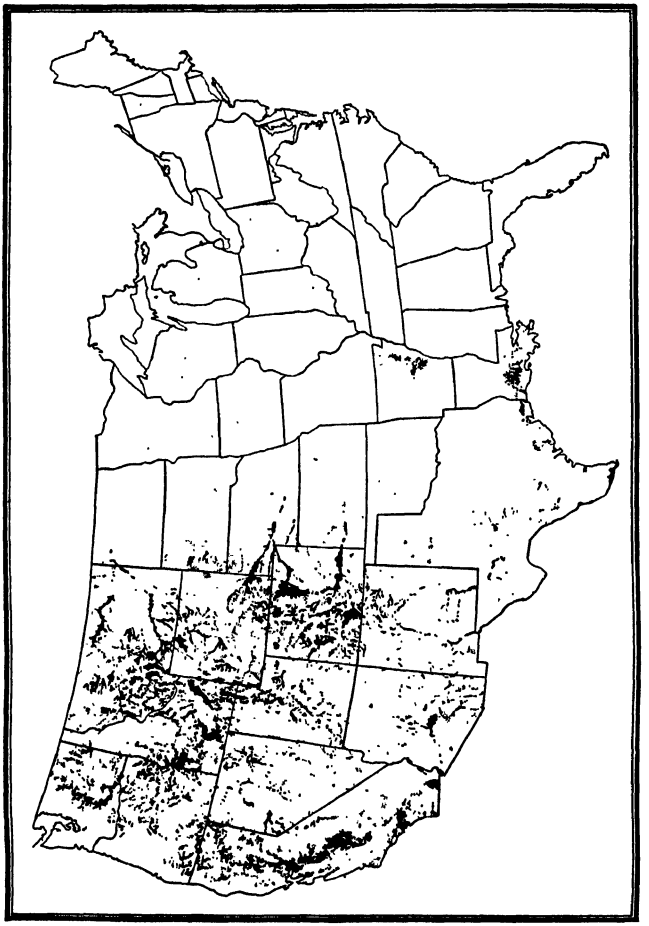
results of the law. To a large extent, the Act created a class of "occupiers" rather than "cultivators" of the soil. Even to-day, although most of the desirable land is claimed, a large part is yet unimproved. Finally, there was much truth in Buchanan's statement that "the public land is an inheritance of vast value to us and to our descendants." This birthright was largely consumed in one generation, and what remains is scarcely enough to satisfy the needs of those of the present who might wish to obtain desirable farm lands at reasonable prices.

223. **Irrigation.**—The westward movement brought settlers into contact with land which was splendidly adapted to farming, if only water was available. The possibility of utilizing such country led to the inauguration of irrigation projects. Cultivation with artificial water supply had been practiced on a small scale by the Mission Fathers of California and by the Mormons of Utah, among others, but large-scale enterprises are of more recent date. In 1870, there were probably not more than 20,000 acres of irrigated land in the United States. The Federal Government first began to give attention to the reclamation of arid land in 1877 when the Desert Land Act was passed. Permission was granted to enter upon 640 acres of arid land; within three years after date of filing holders were to provide water for their tract. They paid 25 cents an acre at the time of filing their application and made final payment of $1.00 any time within three years. The theory involved in this Act was that encouragement of irrigation required much larger tracts than a quarter-section. But the principle was wrong, because "general systems of irrigation are adapted for the distribution of water, which are equally as available to the owners of small tracts as of large ones." The Desert Land Act had little effect in forwarding the irrigation movement. In fact, entries were largely made for speculative purposes "in violation of the restrictions

of the Act, and in many instances upon lands naturally productive." In its practicable operation the law enabled land to be purchased without settlement, and in quantities in excess of the limit established by the settlement laws, thus resulting in the encouragement of large holdings rather than of reclamation. President Cleveland on several occasions called attention to the fact that the Act was not producing the desired results. In his annual Message of December 3, 1888, he said: "I cannot but think it perilous to suffer either these lands or the sources of their irrigation to fall into the hands of monopolies, which by such means may exercise lordship over the areas dependent on their treatment for productiveness."

The Carey Act of 1894 handled the problem of irrigation in a somewhat different manner. States in the arid region were permitted to appropriate 1,000,000 acres and to authorize the construction of irrigation works by private enterprise. A large amount of control was retained by the States, however, for the reason that plans for such works were to be submitted to the Land Commission, and that body decides upon the charges for water rights. The land is sold to settlers at 50 cents an acre, but this amount does not cover their total costs because water rights must be paid for, ranging from $30 to $40 an acre. These charges, however, may be divided into ten annual payments. The construction company retains the ownership of reservoirs, dams, etc., until payments are complete when possession passes to groups of water users. A considerable amount of irrigation was done under this Act, but due to the fact that great amounts of capital were often required, that the rewards were sometimes distant, and that the profits of many of the undertakings were not up to expectations, some further steps were necessary on the part of the Government to obtain greater results.

The National Reclamation Act of 1902 places the initia-



LOCATION AND EXTENT OF IRRIGATED AREAS IN THE UNITED STATES

tive for many of the greatest enterprises on the shoulders of the Federal Government. By the terms of this Act the receipts from the sale of public land in certain Western States, including among others Arizona, California, Colorado, Idaho, Kansas, Nebraska, Montana, and New Mexico, are to be set aside as a reclamation fund. This is to be used for examination of proposed projects, for surveys, and for construction and maintenance. General control under the Act is vested in the Secretary of the Interior who may withdraw from entry, except under the Homestead Law, any lands that may be used for irrigation works. If funds are available, he may let contracts for such works; he may limit the area for entry and control charges to be assessed against homesteaders. He also states the number of installments in which payments are to be made, except that these are not to exceed ten in number, and determines the time when payments are to begin. In fixing charges, the Secretary must keep in mind the restoration to the fund of the estimated cost of the works, for it is by this method that the fund is perpetuated. Enterprises constructed under this law are to be operated and maintained at public expense, but they may be turned over to the users of water for operation at their own expense; but in the latter case the conditions must be acceptable to the Secretary of the Interior.

Irrigation enterprises are now carried on under a variety of forms. Out of a total of 19,191,716 acres irrigated in 1920, over 6,848,000 were conducted by individuals and partnerships, that is, by individual farmers, or by groups of farmers associated without formal organization; these are mostly small enterprises involving relatively little labor and capital; indeed, the average cost per acre in 1909 of irrigation under this plan was only a little over $7.00. Over 6,581,400 acres were irrigated by coöperative groups. Organizations under the Carey Act of 1894 irrigated about

523,900 acres and more than 1,822,800 acres were watered by companies, usually in the corporate form, which, for a compensation, supplied persons who had no financial interest in the construction works. Farmers who thus obtained a supply paid for the right to receive water plus an annual charge based in some instances on the acreage irrigated and in others on the quantity of water received. Land irrigated by the United States Reclamation Service, under the Act of 1902, amounted to 1,254,500 acres. Such land is served by larger, more expensive, and more permanent works, and consequently the cost of such irrigation enterprises per acre is high. In 1909 it amounted to about $67.50. The distribution of irrigated land in 1919 is shown in the table below:

ACREAGE IRRIGATED IN 1919

State	Acres Irrigated
Arizona	467,565
California	4,219,040
Colorado	3,348,385
Idaho	2,488,806
Montana	1,681,729
Nevada	561,447
New Mexico	538,377
Oregon	986,162
Texas	586,120
Utah	1,371,651
Washington	529,899
Wyoming	1,207,982
All others	1,204,553
Total	19,191,716

The rapid development of irrigation in recent years is indicated by the fact that although the total acreage irrigated in 1880 was only about 1,000,000 acres, such lands increased to 3,631,381 in 1889, to 7,518,527 in 1899, and to 19,191,716 acres in 1919. The total capital invested in

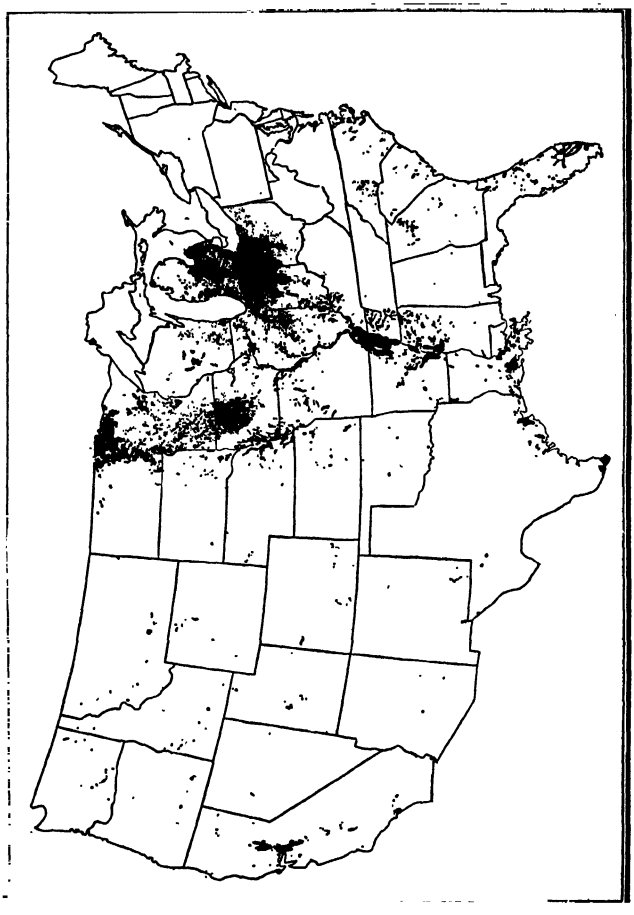
irrigation works in the United States in 1920 was estimated at $697,657,328. The total value of irrigated crops in 1919 was $772,473,000. Over 24 per cent of this amount was alfalfa, 6 per cent grasses, and about 7 per cent each oats and wheat. Irrigated crops have usually shown a higher value per acre than those grown under natural watering. This is notably the case with alfalfa, potatoes, wheat, corn, barley, and some fruits.

224. **Drainage.**—Many millions of acres could now be used for farming if the excess of water were removed from the land. Public interest in the work of drainage is relatively new, as is indicated by the fact that in 1880 only 2,958,000 acres were involved in drainage enterprises, while the amount in 1920 was 65,265,400 acres.

Lack of drainage "makes a soil hard and lumpy when dry, difficult to cultivate and unsuited to the development of plant roots or to the release of plant food; it keeps the soil acid or 'sour,' counteracting the inherent fertility; it keeps the soil cold, delaying planting in the spring; and when only a part of a field has poor drainage, it interferes with cultivation of the other parts."

In many cases the drainage of the land of one owner cannot be accomplished without the construction of works through adjacent property. Also drainage is often too large a financial undertaking for one farmer and thus co-operation of some sort is necessary. Practically every state has recognized the public character of drainage enterprises and has enacted laws permitting or encouraging the formation of an organization of some kind for the purpose of developing drainage works.

In general, there are two types of organization. (*a*) The corporate district which "is governed by its own officers, who either are elected by the residents or land owners of the district, or are especially appointed by the authority which creates the enterprise." (*b*) The county drain which



LOCATION AND AREA OF OPERATING DRAINAGE ENTERPRISES IN THE UNITED STATES

is "established and constructed as any other public work or local improvement, the enterprise being managed by regular officers who have charge of all the enterprises of the county." In 1920 the districts and county drains comprised 96 per cent of the area of all organized drainage enterprises.

The total capital invested in drainage enterprises in the United States in 1920 amounted to $372,200,000. Funds for such works, as shown above, are often obtained by means of public corporations which are organized for the work of drainage. Bonds are sold which are secured by the land of the district. The areas in the United States which have made largest use of drainage are indicated in the accompanying table.

LAND IN ALL DRAINAGE ENTERPRISES: 1920

State	All Enterprises	Per cent
Michigan	9,754,679	14.1
Indiana	9,375,907	13.5
Minnesota	9,362,944	13.5
Ohio	8,147,546	11.7
Iowa	5,383,012	7.8
Arkansas	4,151,834	6.0
Illinois	3,982,033	5.7
Missouri	2,980,265	4.3
Louisiana	2,732,368	3.9
Florida	2,645,816	3.8
Texas	2,166,128	3.1
Mississippi	1,879,001	2.7

225. Discontent among Farmers.—It has often been said that farmers are among the most conservative classes in the country, but it is to be observed that a class may be conservative with respect to one activity and radical

with respect to another. It is true that farmers have been slow to adopt improved methods of cultivation and organization. Improvements in these respects have often been promoted by outside agencies, such as by government departments, and by railroad companies, the latter being interested chiefly in increases in the volume of traffic. In political matters, however, farmers in certain sections of the United States have often allied themselves with the most progressive, or radical element, depending on the point of view of the critic.

The Greenback, the Populist, and Free Silver movements received strongest encouragement from the farmers, and these tillers of the soil have been behind various other great political issues, such as reform of banks, attacks on railroads and trusts and reform of marketing methods. While much of the early legislation has been repealed, the farmers' movement from 1870 to the present time has left a permanent stamp upon American industrial institutions. It is found, for example, in the new attitude in government in relation to industry, which manifests itself in (*a*) promotion of certain desirable enterprises, particularly aid to farmers, and (*b*) regulation of railroads and trusts.

Among the organizations which have played an important part in our history in recent years are (*a*) the National Grange of the Patrons of Husbandry formed in 1867, which directed attacks chiefly against the railroads; (*b*) the Greenback Party which opposed the redemption of the greenbacks; (*c*) the Populist Party which favored the free coinage of silver, government ownership of railroads, Federal income taxes, and the abolition of national banking; (*d*) and in recent years the Non-Partisan League which has been particularly strong in the northwest grain states. This organization began in North Dakota in 1915. The program in that state included state owned flour mills and grain elevators, state owned and operated banks, and

loans by the state to home builders and farmers for the purchase of land. The activity of the Non-Partisan League has been particularly strong since the close of the War. The decline of prices of grain after the removal of government control brought great distress to many of the farmers of the northwest and was one of the chief reasons for discontent in this section. However, the rising prices of wheat and corn beginning in the spring of 1924 seems to have brought at least temporary relief. On September 6, 1923, the average price for hard winter wheat in Chicago was $1.09, which was less than half the price guaranteed by the government during the War. On September 5, 1924, the price of the same grade of wheat in Chicago was $1.26, and from that date it rose steadily until the week of January 24 to January 30, 1925, the average price was $1.97.

Not only the states, but the Federal Government, came to the rescue of the farmer. The War Finance Corporation was authorized to make loans under certain conditions, and in March, 1923, Congress created a new credit organization for the special benefit of farmers.

In substance, this new law authorized the Federal Farm Loan Board to grant charters for 12 institutions to be known as Federal Intermediate Credit Banks. The capital for each bank amounts to $5,000,000, all of which is to be paid for by the United States. Among other operations these banks are to discount notes, drafts, etc., of various credit institutions in cases where loans have been made for agricultural purposes. On December 31, 1924, the direct loans and discounts of these banks amounted to $62,267,000.

The hard times in the grain states due to the low prices led to other schemes. In the spring of 1924 Congress debated a measure known as the McNary-Haugen bill, which was designed to maintain the price of agricultural products through the agency of a great government organization which was to buy certain agricultural products at

a reasonable price and dispose of the surplus in foreign markets at what they would bring. Of course, high protective tariff would have been needed in connection with the measure, but such rates were provided in the Fordney tariff of 1922 and more was promised if necessary. In the tariff act just named wheat was protected by a duty of $0.30 a bushel, corn $0.15 a bushel, and oats $0.15 a bushel.

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CHAPTER XVIII

AGRICULTURE: II, DEVELOPMENT OF THE INDUSTRY

The causes discussed in the last chapter refer principally to Government aids of various descriptions. Lawmakers, in legislating in the interest of agriculture, have been influenced by the fact that, from the point of view of the value of the products, farming was for many years our leading industry, and, because of our vast resources, it will always rank among the first. It has been the part of wisdom, therefore, to encourage the expansion of the industry in which nature has given us special advantages. The field of Government enterprise has usually been the broad, general, promotive work which individuals could not do well for themselves, or in fields where some incentive was necessary to give a strong stimulus to individual effort. But while agricultural progress in this country owes much to Government encouragement, individual initiative has contributed handsomely, notably by the invention of farm machinery and through the introduction of effective systems of farm management.

226. Farm Machinery.—As early as 1860 the country could boast of a considerable number of agricultural inventions of great value. The following tribute to the enterprise of the time is contained in a Report of the Census of 1860:

> In nearly every department of rural industry mechanical power has wrought a revolution. . . . The greatest triumphs of mechanical skill in its application to agriculture are witnessed in the instruments adapted to tillage, harvesting, and subsequent handling of the immense grain crops of the country, and particu-

larly upon the Western prairies. Without the improvements in plows and other implements of tillage which have been multiplied to an incredible extent, and are now apparently about to culminate in the steam plow, the vast wheat and corn crops of those fertile plains could probably not be raised. But were it possible to produce wheat upon the scale that it is now raised, much of the profit and not a little of the product would be lost were the farmer compelled to wait upon the slow process of the sickle, the cradle, and the hand-rake for securing it when ripe. The reaping machine, the harvester, and machines for threshing, winnowing, and cleaning his wheat for the market have become quite indispensable to every large grain grower.

In case of grain, as the Report indicates, one of the prime requisites for large production is the ability to harvest the crop quickly. Grain deteriorates if left standing in the field when ripe. The amount the farmer can plant depends on what he can harvest quickly. Thus the progress of invention which has facilitated rapid harvesting made possible the taking up of more land without increasing the labor force in proportion, and was a great factor in the growth of large-scale farming, such as is found in some Western States. On the other hand, the need of such machinery called attention to the possibilities of invention and thus gave a necessary stimulus. Many inventions have been made since 1860 in machinery for harvesting and reaping; but notable changes have also taken place as the result of the substitution of steam for horse power, and the later introduction of the gas engine for power purposes.

The lack of labor to perform the immense volume of agricultural work has always afforded a great stimulus to invention; on the other hand, farming conditions in this country have been most favorable to the use of such appliances. These conditions were greatly emphasized when population moved into the vast stretches of open and relatively level country west of the Mississippi. Here much

of the machinery could be used to the best advantage. Consequently the introduction of large power machines, like the great tractor engines to operate plows, drills, harrows, and harvesting machines have been contemporaneous with the settlement of this region. Wire and twine binders, which are new devices since 1860, are improvements of great value. Said Professor Carver: "The invention of the twine binder, therefore, by increasing the amount which a farmer could harvest, increased by that precise amount the quantity which he could profitably grow. In other words, it was the twine binder more than any other single machine or implement that enabled the country to increase its production of grain, especially wheat, during this period." But other crops have been great beneficiaries of inventions. The development of the Corn Belt has been promoted by improvements in the planting, cultivating, and husking of corn; weeders, riding cultivators, two-row cultivators, and the check rower have contributed in the same direction. The latter device automatically drops the seeds in rows running across the field at right angles to the direction in which the planter is being driven. It has the advantage of enabling one man to do the work which formerly required two. Haying came in for its share of improvements with mowing machines, tedders, horse hay-rakes, and stackers. In a general way, new methods of drainage, ditch diggers, and manure spreaders have considerably lessened the labor of farming.

Inventions since 1860 have not only been characterized by the introduction of new classes of machines, but by the wide specialization of instruments already in use. In the case of the plow, for example, successive improvements have put the farmer in possession of a "long line of special-purpose plows from which he may select the one best adapted to the soil he wishes to work, and to the condition in which the soil may be at the moment." Similar specialization has

taken place in the invention of drills, seeders, planters, and in harvesting machinery. This specialization is one of the products of the growth of scientific agriculture which has studied soil and crop conditions in relation to the use of implements. Specialization of this description not only saves time and labor in preparing the ground and in cultivating the crop, but permits the instruments to perform their task better than the old unspecialized machinery.

The increasing use of machinery not only enabled farmers to take up and cultivate more land, but to increase their output and lower their costs. The benefits were soon diffused through all grades of industries. The increasing volume of farm products has been a tremendous stimulus to improvements in transportation and to the development of better methods of marketing. All the while, the growing use of machinery enabled farmers to supply factories and ultimate consumers with increasing quantities of foodstuffs. Such devices have also affected the attitude of the farmer toward his own occupation by offering a greater encouragement to enterprise and by promoting the study of better methods. His social status, meanwhile, has improved with his increasing wealth.

Some idea of the increasing use of machinery in agriculture may be obtained from the following table:

VALUE OF FARM IMPLEMENTS AND MACHINES, 1860–1920

Year	Total Value	Value per Farm	Value per Acre of Farm Land
1870	$270,913,678	$102	$0.66
1880	406,520,055	101	.76
1890	494,247,467	108	.79
1900	749,775,970	131	.89
1910	1,265,149,783	199	1.44
1920	3,594,772,928	557	3.76

Evidently the most notable increase has taken place since 1890. In 1910 a little over 50 per cent of the farm machinery was employed in the leading grain States, that is, in the region north of the Ohio and north of Arkansas and Oklahoma, and lying between Colorado and Wyoming on the west and Pennsylvania on the east.

227. **Farm Management.**—Better forms of organization and management rank along with improved machinery as causes of agricultural progress. Except as a farmer here and there developed business methods as a result of his own experience, very little attention was paid to managerial problems of the farm before 1860, but with the growth of agricultural education such matters have come to the forefront. Courses have been gradually developed in agricultural colleges so that the prospective farmer may be informed on all phases of organization and management. Among the questions he is called on to solve are the proper size of the farm taking all his conditions into account, whether it is best to become tenant or land owner, the kinds of crops to raise, what machinery and how much to purchase, the best methods of cultivation and protection of crops, marketing practice, farm finance, and questions of coöperation. By such studies he is taught to reduce waste, to make the most profitable use of his land and equipment, to supplement his leading crops with others that may be profitable, and to make use of his by-products. In short, the study of these problems enables him to use his resources to the best advantage.

228. **New Crops.**—While the great crops of 1860 rank first to-day, many new products have been added. These have considerably diversified the output of American fields and at the same time have increased the income of the farmers. The development of Florida and California added a considerable number of fruits to the list grown in 1860. Oranges, lemons, and grapefruit are among the best

known. At present Florida ranks first in the production of grapefruit. The output increased from 12,300 boxes in 1899 to 3,158,400 boxes in 1919. The production of lemons in Florida and California, principally in the latter State, increased from 876,800 boxes in 1899 to 6,585,200 in 1919. Oranges and lemons were grown in California on a small scale for many years, but the growth of the industry in that State and in Florida had to await adequate methods of shipping and marketing. The first consignment of green fruit was shipped from California to New York in 1867, but a profitable market was not developed for some years. A notable feature in the marketing of California fruits has been the growth of coöperation among the producers. As early as 1893 attempts were made to bring the citrous fruit growers together, but the first satisfactory association was the Southern California Fruit Exchange, organized in 1895. Since that date this organization and its successor, the California Fruit Growers' Exchange formed in 1905, have largely controlled the marketing of Western citrous fruits.

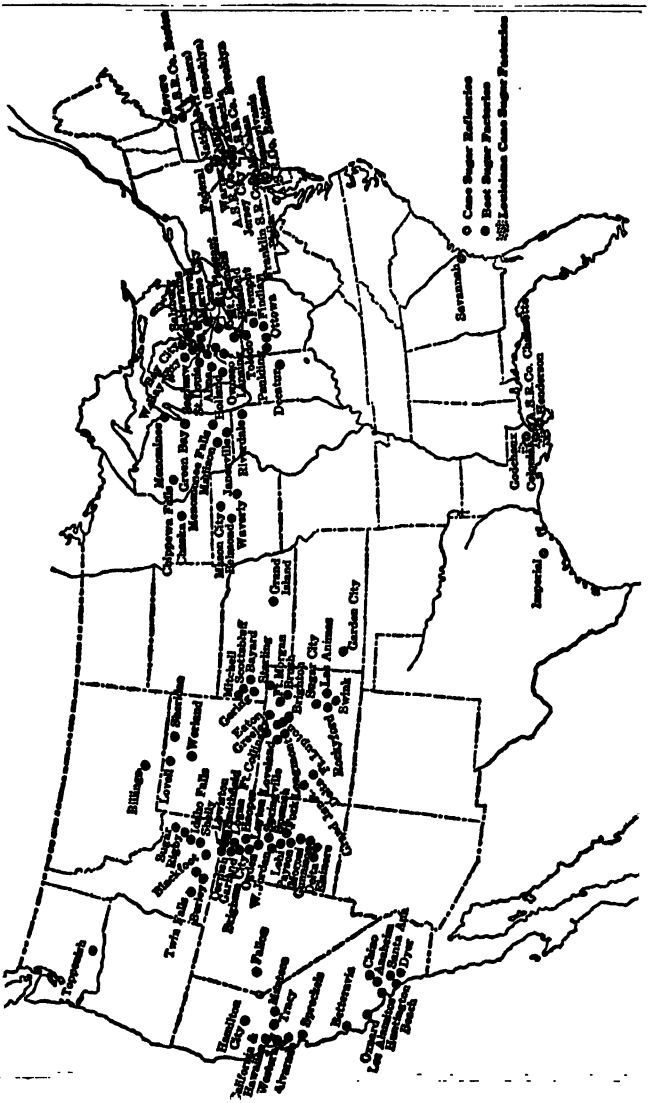
Among other new products are limes, tangerines, and kumquats, grown chiefly in Florida; mandarins, produced in Louisiana; and pineapples, in Florida. Figs are grown in California, olives in California and Arizona, almonds chiefly in California, and Persian or English walnuts in California, Mississippi, and Oregon.

Experimenters in recent years have given attention not only to the introduction of new products but to increasing the varieties. Among other results they have been able to discover hardier kinds which grow well in colder and more variable climates. Success has also been met in the production of seedless fruits, and in increasing the size, and in improving the appearance and flavor of many products. The development of all kinds of fruits has been promoted by the introduction of processes of storage and refrigera-

tion, by improvements in transportation, and by the development of the fruit canning and preserving industries.

The westward movement, which brought the farmer into contact with the semi-arid regions, led to efforts to find crops which would grow under conditions prevailing in such regions. One of the results was the production of Kafir corn and milo maize which are used chiefly as food for livestock. In 1909 over 1,635,000 acres were devoted to these crops, chiefly in Texas, Oklahoma, and Kansas. Emmer and spelt have also made good dry-farming crops. Over 573,000 acres were given up to their production in 1909.

The experiments of the Department of Agriculture have resulted in the introduction of Egyptian cotton, which is one of the finest of the world's fibres. It is grown on a limited scale in the Salt River Valley in Arizona. We should not overlook cottonseed. If this is not a new product, at least a number of important uses have been found for it, and now it ranks as one of the greatest raw materials of commerce. The principal uses of cottonseed are in the manufacture of oil for food and for cooking, as a substitute for or adulterant of olive oil, in the manufacture of oleomargarine and of soap, and in the production of candles. The manufacture of cottonseed oil began about 1876 and grew very rapidly. In 1891 the output amounted to 42,740,000 gallons valued at $11,540,000, and by 1914 production had grown to 229,260,000 gallons valued at $80,540,000. This industry quickly developed one of the great characteristics of most modern manufactures by finding uses for the by-products. Thus the oil-cake remaining after pressing oil from the seed kernel is ground into meal which serves as cattle feed and as fertilizer; the impurities and coloring matter which are worked out in the process of refining are called "cotton-oil foots," and are used in the production of some kind of soaps; hulls are employed



BEET AND CANE SUGAR FACTORIES AND CANE SUGAR REFINERIES OF THE UNITED STATES 1921

as fuel and in the manufacture of paper. Thus the discovery of methods of utilizing this seed not only created a considerable number of new industries but added immensely to the value of the cotton crop. The total value of cottonseed products in 1914 was $152,880,000.

The history of cottonseed is on a fair way to be repeated with the peanut. Until a few decades ago this article was consumed only in a small way and for a single use; but the growing demand for vegetable oils stimulated various manufactures which depend on this crop as a raw material. In addition a number of food products are now made from the nut. In response to the new demands the crop has increased from 11,964,000 bushels in 1899 to 27,449,900 in 1919, and the indications are that the output has grown even more rapidly since the last census.

Another important new industry is the growing of sugar beets. The discovery of methods of extracting sugar from this substance dates back to the experiments of Marggraf in Germany in 1747. Although efforts were made as early as 1830 to introduce the industry into the United States, lack of knowledge of the processes of manufacture, and what was more unfortunate, ignorance of soil and climatic conditions under which beets could be profitably grown, prevented success. In 1876 the erection of an adequately equipped factory at Alvarado, California, gave an initial impulse to the industry. Aided subsequently by bounties by some States, by the experimental work of the Department of Agriculture, and not a little by the sugar bounty of the Federal Government, which was in operation from July 1, 1891, to August 27, 1894, both the raising of beets and the manufacture of sugar were placed on a firm footing. Originally a Far Western industry, the growing of sugar beets has spread to a number of States. The principal producers in 1919 were Colorado, Michigan, Utah, California, Nebraska, and Ohio, named in the order of rank. The total

acreage devoted to the crop in 1902 was 216,000 acres and in 1919, 636,400 acres. In 1893 scarcely 20,000 tons of beet sugar were produced in the United States. The output of the two kinds of sugar since 1880 is shown in the following table:

PRODUCTION OF CANE AND BEET SUGAR, 1880–1922

Year	Cane Sugar, pounds	Beet Sugar, pounds
1881–1890 *	282,001,287	2,353,568
1891–1895	541,284,654	27,272,000
1896–1900	557,479,947	95,243,615
1901–1905	681,636,489	388,724,619
1906–1910	735,616,000	879,405,532
1913–1914	601,074,880	1,466,802,000
1921–1922	655,399,300	2,041,000,000

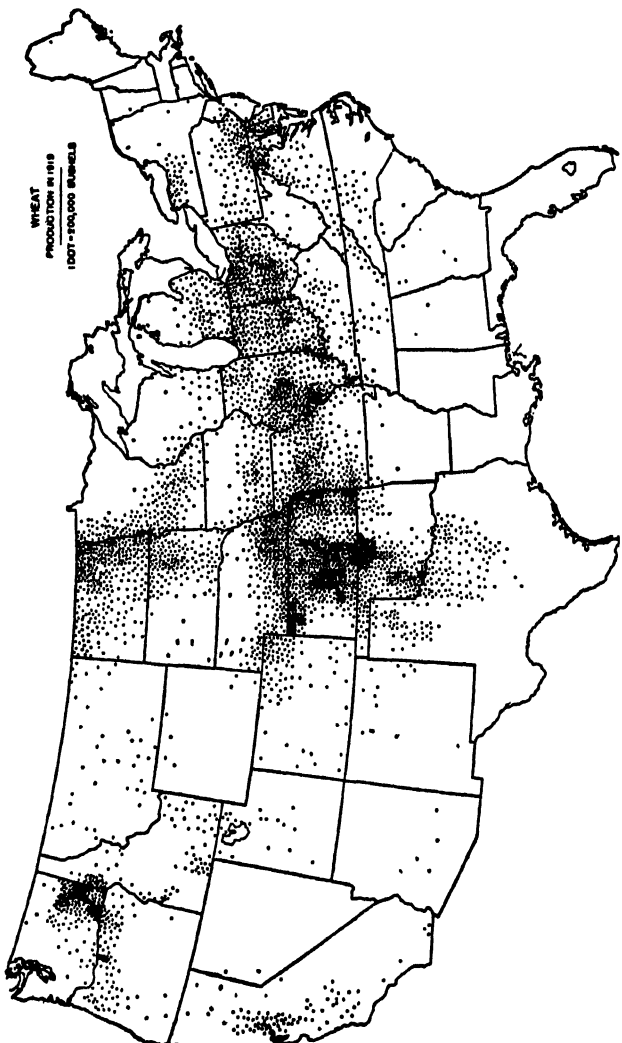
* Average for the period.

229. **The Production of Cereals.**—One of the results of the taking up of the national domain has been a great increase in the output of cereals. But the effect of the new machinery, the growth of transportation, improved methods of marketing, and the great increase of demand both for domestic and foreign consumption, have contributed to the same end. During the years from 1860 to 1914 the production of wheat increased more than 5 fold, of corn more than 3 fold, of rice more than 6 fold, of oats about 6 fold, and of barley about 11 fold. While many States produce some quantities of most of these cereals, production has been concentrated largely in those regions which offer the greatest advantages. Thus in 1909 the twelve States composing the east and west north central division produced nearly 74 per cent of the wheat, nearly 80 per cent of the oats, and over 72 per cent of the corn. They are also the largest producers of rye and barley, although the Pacific States grow large quantities of the latter. The north cen-

tral sections, therefore, have become the granary of the country. Concentration has been aided greatly by transportation facilities, this section being one of the best served in the United States both by water and rail carriage. On the other hand, strong concentration of the leading grain crops brought about a localization of other industries, such as flour milling, the fattening of livestock for the market, meat packing, and the by-product industries related to the latter. The largest manufactures of agricultural implements and of carriages and wagons are found in this section. The cities, moreover, have become great distributing centers for most of the commodities demanded by farmers. Here are large hardware and dry-goods stores and mail-order houses. It is probably clear from this that the process of specialization which has become a characteristic feature of our industries is going on with regard to the cereals. Farmers, as a rule, no longer try to produce a variety of crops nor even to supply all their own wants, but devote attention largely to one or two great staples.

In the case of rice, the largest producing States are now Louisiana, Texas, and Arkansas where irrigation is largely used. In 1909 these States produced about 96 per cent of the crop, while in 1860 South Carolina and Georgia were the ranking States, producing about 97 per cent of the total. The production of rice declined abruptly in 1861, due to the disturbances of the Civil War and did not regain its old volume until about 1880. The rise of the industry in the Southwest largely accounts for the rapid growth in recent years. Production in 1860 amounted to 106,279,200 pounds; by 1880 it had reached only 111,868,900 pounds, but thereafter the development was marked. The output in 1921 was 1,044,778,000 pounds.

The consumption of a number of grains has been increased not only because of the demands for food, but as a result of the diversification of industries which both cre-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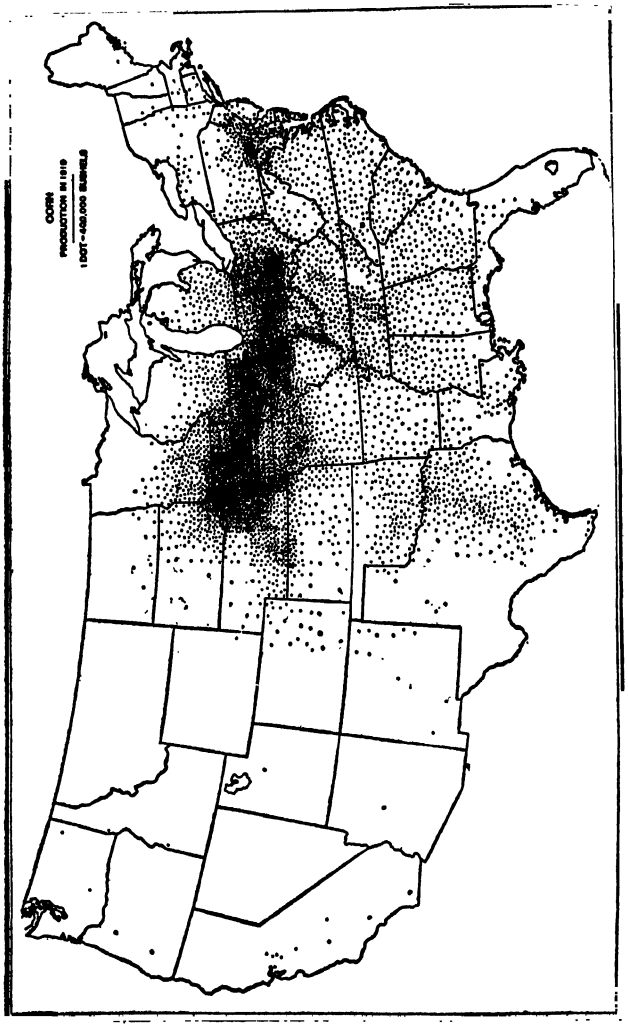
ated new uses and intensified the demands of the old. Chemical analysis and inventions have greatly expanded the uses of corn. In one way or another it now contributes raw material for a long list of manufactures. Glucose, one of its products, is employed in the production of jams and jellies, in the manufacture of candy and chewing gum, and to mix with sirups. Dextrine, made from corn starch, is consumed in the production of fine fabrics, confectionery, and some medicines. Ever increasing quantities of starch are consumed in laundry work, in the dressing and finishing of textiles, in the manufacture of baking powder, and in candles, and face powders. Corn oil enters into many manufactures, including various kinds of soaps, machine and cylinder oils, and is used for mixing with other oils. By-products of considerable importance are produced from the cob, stalk, and husks. The introduction of the breakfast food and canning industries augmented the demand. The silo, also, has contributed through the better utilization of fodder. As with cotton the tendency of modern industry has been to use every part of the plant, and little or nothing goes to waste. It is needless to say that such diversification not only greatly adds to the value of the corn crop, but leads to the creation of new industries and to the better serving of the old.

In the case of spring wheat, new processes of production introduced during the decade from 1870 to 1880 raised this variety to first importance among American grains and laid the foundation for the prosperity of the wheat industry of the Northwest. By the old process of grinding with millstones it was impossible to produce a good quality of flour from hard spring wheat. Friction and heat generated in grinding often "brought about chemical changes which injured the color, taste, and quality of the flour." Until this difficulty was overcome the spring wheat region labored under handicaps. The problem was solved by the intro-



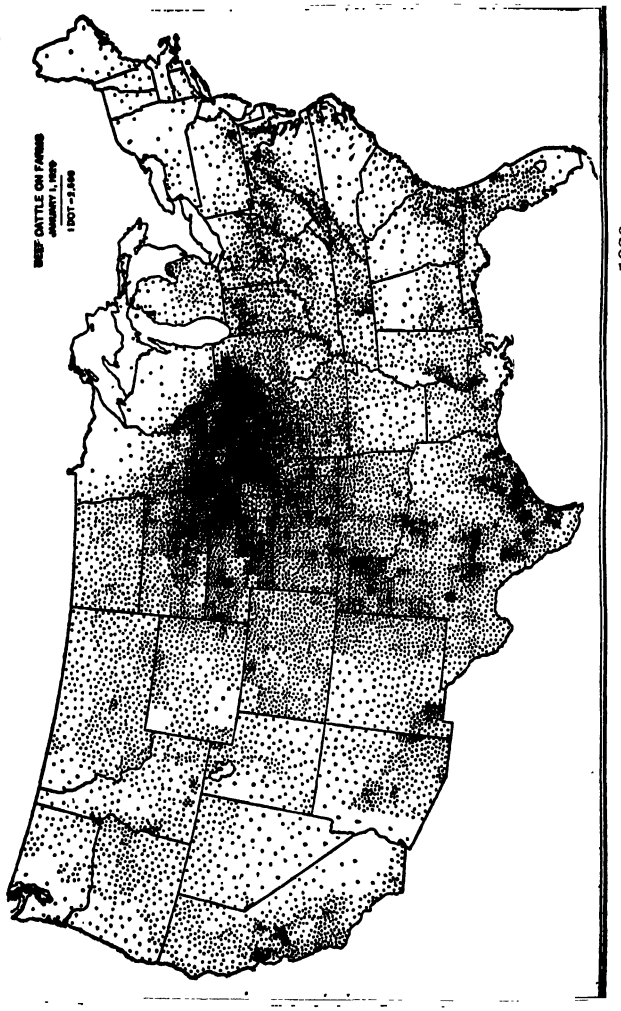
DISTRIBUTION OF CORN PRODUCTION, 1919

duction of chilled-iron and porcelain rollers, and by the substitution of a number of sets of rollers for a single pair of millstones, the flour being sifted and graded after each breaking. "With the introduction of the new rolling process came the big mills, which have made Minneapolis famous, and the development of the spring-wheat industry." Meanwhile the center of the milling business was shifted to the Northwest.

PRODUCTION OF CEREALS, 1860–1922

Year	Wheat	Corn	Oats	Barley
1860	173,104,924	838,792,742	172,643,185	15,825,898
1870	287,745,626	760,944,549	282,107,157	29,761,305
1880	459,483,137	1,754,591,676	407,858,999	43,997,495
1890	468,373,968	2,122,327,547	809,250,666	78,332,976
1900	658,534,252	2,666,324,370	943,389,375	119,634,877
1910	683,379,259	2,552,189,630	1,007,142,980	173,344,212
1914	891,017,000	2,672,804,000	1,141,060,000	494,953,000
1922	867,598,000	2,906,020,000	1,215,803,000	182,068,000

230. The Export of Breadstuffs.—Relatively small quantities of wheat and flour were exported from the United States prior to 1860. Foreign trade in these commodities rose abruptly during the Civil War, due largely to the surplus created by the falling off of the Southern demand, but the trade declined in the years immediately following the War. The rise of the grain and flour trade in recent years dates from the decade from 1870 to 1880 with the opening of the greater grain area and with the rise of a large American surplus. Since 1885 in spite of the increasing production of grain, the foreign flour trade has shown no marked gains. In fact since that date, taking the period as a whole, exports have been relatively stationary. The average annual value of shipments of flour from 1885 to 1894 was $57,448,000; during the next period it was $64,748,000, and for the decade ending with 1914 it was



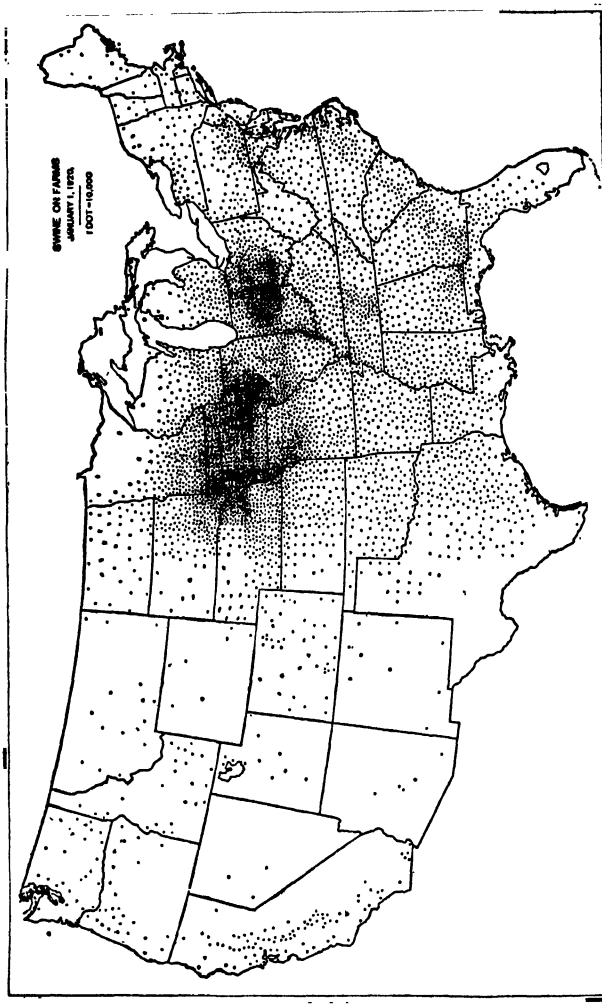
DISTRIBUTION OF BEEF CATTLE ON FARMS, 1920

$53,242,000. Shipments of wheat, except for a few years, have shown a decided downward tendency. These facts not only indicate that our growing population is consuming more and more of the surplus but forecast for the future a decline of exports and a rise of an import trade in breadstuffs; they also contain the unpleasant suggestion of food won from the soil at the expense of greater labor and under more intensive methods of cultivation. The era of plenty prevailing from 1865 to nearly 1900 was an incident of the tapping of the virgin resources of the country. The period of rapid increase of grain crops and of large surpluses over home consumption is probably past, and such gains as occur in the future will be the result of better methods of cultivation and of greater application of labor and capital.

Among the foreign customers for breadstuffs, Great Britain has usually held the first place, although American flour has been consumed in many parts of the world. New markets have been found in South and Central America and in the Far East. In the Orient Hongkong is one of the largest importers; from thence flour is distributed to many places.

231. **Stock Raising.**—Farm animals serve industrial progress in other ways than by the provision of traction power and food. Animal products, such as wool, hides, fats, tallow, and bone, are important raw materials of commerce. A considerable list of industries, therefore, is dependent upon the growing of livestock. The United States has long enjoyed great advantages in this industry because of the abundance of foodstuffs, and because of the growing domestic market for animal products. That our industries have found ways of using many by-products has added not a little to the profitableness of stock raising.

The period of most rapid growth was from 1860 to about 1890; since that date the increase has scarcely kept pace with that of population. The rising cost of producing



DISTRIBUTION OF SWINE ON FARMS, 1920

livestock is largely due to the fact that grain and forage must now be produced by more intensive, and hence by more costly methods, and, as a result, the industry does not hold out the encouraging profits of former years. This is notably true with cattle raising because the disappearance of the range has removed the free grazing area. According to census enumerations the number of cattle and swine on the farms has increased but little since 1890. While the increase in number of cattle from 1860 to 1890 was from 25,620,000 to 57,648,000, the numbers as enumerated in 1900 and 1910 were only 52,403,800 and 53,997,300, respectively, exclusive of calves. In the case of swine the increase from 1860 to 1890 was from 33,512,800 to 57,426,000; the returns for 1900 and 1910 were 62,868,000 and 58,185,600, respectively.

As with grains the years of abundance were a product of pioneer conditions in which nature yielded its stores with the minimum of effort on the part of man. These conditions, however, have disappeared, and the growth of the livestock industry in the future will depend on skill and economies of production through all the stages from field to final consumer.

Much the same condition prevails with regard to sheep, although this is not so much a food as a clothing problem, because sheep in the United States are raised chiefly for wool. Notwithstanding the fact that this country is a large producer, it never has been able to satisfy the domestic demand. In the years from 1901 to 1910 we imported on the average of 193,203,000 pounds a year, which was about two-thirds the amount produced in this country. Production of wool in the United States increased from 60,264,000 pounds in 1860 to 289,419,000 pounds in 1910.

232. The Concentration of the Livestock Industry.— The growing of livestock is practiced to some extent in all

parts of the country for the reason that most farmers find it good economy to raise at least a small number of animals as a sort of by-product to other branches of agriculture. Nevertheless, in the raising of certain kinds of stock there is a strong tendency toward concentration in regions which offer the greatest advantages. Sheep raising has been largely concentrated in the Rocky Mountain States which contained over 22 million of the 52 million sheep reported on farms in 1910. Within this region there is further concentration in Wyoming, Montana, and Idaho. East of the Mississippi, Ohio, which almost from the first years of settlement has been interested in the industry, was the largest producer, and Michigan ranked next in importance.

It is no mere coincidence that the twelve States of the north central divisions, which produce over 72 per cent of the corn, should also grow about 61 per cent of the swine, for corn is the chief substance employed in fattening the animals for market. Within this section the growing of swine is further concentrated in Iowa, Illinois, Missouri, Indiana, Nebraska, and Ohio, named in order of their rank.

Cattle raising is more evenly distributed over the country, but there is a tendency here, also, toward concentration in the grain and forage States. The rank, according to the number of animals reported in 1910 was Texas, Iowa, Kansas, Nebraska, Wisconsin, Missouri, and Illinois.

233. **The Development of the Range.**—The distinction often made between "range" and "ranch" cattle business is that the former "applies to the raising and fattening of cattle upon public lands, or upon unfenced lands generally, where the herds of different proprietors freely range and intermingle; whereas the 'ranch' cattle business is carried on within enclosures belonging to cattlemen on which their own cattle graze." The range in the United States has always been a characteristic of pioneer conditions. It was confined to the rim of settlements and consequently moved

steadily westward somewhat ahead of settled farming. The business lost its importance with the disappearance of the frontier, but for several decades it was an important feature in our industrial development. Cattle raising on the range required vast stretches of territory and ample funds, and was therefore usually conducted on a large scale. It was estimated that one animal required from 5 to 30 acres for its support, depending on the nature of the native grasses and on the extent of water supply.

Cattlemen of that day might have inferred from the ability of the great herds of buffaloes to shift for themselves at all seasons that cattle would likewise prosper on the plains, but, according to the story of the origin of the business, a demonstration of quite a different sort was required. In 1864 a Government freighter, on the way to Camp Douglas in Utah Territory, was overtaken on the Laramie plains by an unusually severe snow storm. The teamster turned his cattle adrift believing, as a matter of course, that they would die of cold and starvation. But it happened that dried grasses, obtained from patches where winds had blown the snow off the highlands, afforded abundant forage, and, when spring came, the animals were in better condition than when turned out to die some months before. This discovery "led to the purchase of stock cattle in Texas to be matured and fattened on the northern ranges," and during the next three decades the trade grew to large proportions.

Since the industry could be most profitably managed on a large scale, and because successful operation required cooperation, the ranching business was usually conducted under the corporate form. Companies were chartered both under the laws of the United States and foreign countries. In the course of time organizations began to take up the public domain, with the result that the range was transformed into the ranching business; moreover settlement of

the country by permanent farmers, which pushed ranchmen further west, limited the area available for the business and hastened the acquisition of the domain, and this movement was further accelerated by the building of the Pacific railroads.

Differences in conditions affecting the breeding of livestock, on the one hand, and of fattening for the market, on the other, led to a division of labor between the North and South. The impression prevailed that cows were more prolific in Texas, but that they gained more weight when fed on the nutritious grasses of the Northern range. It was said, for example, that Texas steers driven North at the age of two years would weigh on the average, when four years old, about 200 pounds more than if kept in Texas until they reached the same age. Texas thus became the breeding ground, and the Northern range the place where cattle were fattened for market. From this region they were driven, or shipped, after the completion of the railroads, to Chicago, St. Louis, and Kansas City where the packing industry was beginning to rise.

Cattle towns of this period manifested many of the characteristics of American mining towns. Among other features they usually enjoyed an ephemeral prosperity to be surrendered shortly when farmers crowded into the region and the trail was pushed westward. From 1870 to 1872 the chief markets for Texas cattle were Newton, Kansas, on the Atchinson, Topeka and Santa Fe, and Abilene on the Kansas Pacific. Later these markets were Great Bend on the Atchison, and Ellsworth on the Kansas Pacific. For a brief period Dodge City on the Atchison, and Hayes City on the Kansas Pacific enjoyed prosperity. About 1885 the leading cow towns were Ogallala, Nebraska, on the Union Pacific, and Dodge City.

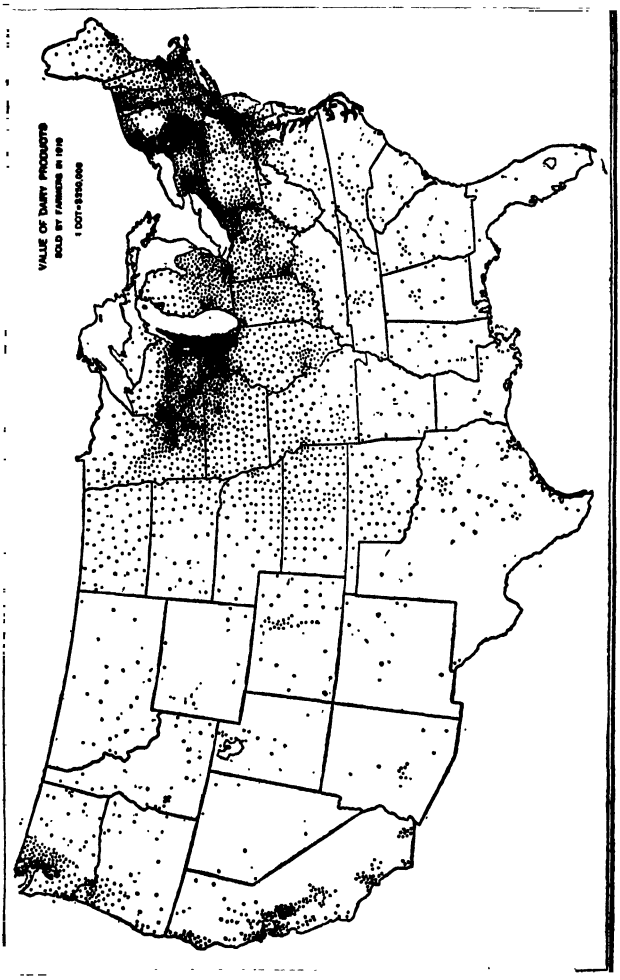
The development of the range was of great significance in the opening of the Western country. In the first place

it formed the basis for an important branch of internal commerce. From about 1866, when the movement began, to 1884, more than 5,200,000 cattle were driven from Texas. The "drive" of 1884 amounted to about 300,000 cattle valued at $5,100,000. But these animals again entered the commerce of the region when shipped to the cities, so that the total value of the trade based on Texas cattle was much greater than the figure given above.

Prior to the development of the trail cattle were grown in Texas largely for hides and tallow. For want of cheap means of transportation, and in the absence of adequate methods of refrigeration and storage, it was impossible to use other animal products on any important scale. But the opening of the Northern range not only opened a market for meat, but in other respects afforded a great stimulus of many descriptions. This both promoted the development of Texas and of much of the country to the North and Northwest. The revelation of these

new and enormous commercial possibilities to the cattle-owners of Texas has developed a vast amount of wealth, and has, of course, greatly stimulated the cattle industry of that State. Cattle which about the year 1868 were worth only $4.50 a head advanced in value to $15 and $18 per head. The lands of Texas also greatly appreciated in value, and the general prosperity of the State attracted to it hundreds of thousands of immigrants from other States and from foreign countries. The opportunities for gain and the wild fascination of the herdsman's life have also drawn to Texas many young men of education and of fortune in the Northern States, and even scions of noble families in Europe. This has also been the case throughout the entire range and ranch cattle area of the United States.

234. The Dairy Business.—The concentration of population in cities has been an important factor in the organization of the dairy business. Because a large number of people now live away from the farm, it has been neces-



DISTRIBUTION OF DAIRY PRODUCTS SOLD BY FARMERS, 1919

sary to supply urban communities regularly and on a large scale. For this purpose labor saving devices in production and means of storage and refrigeration were necessary. Factory methods have more and more taken the place of hand production on the farm. The growth of such production has been encouraged by the introduction of the Babcock test for determining the proportion of butter fat in milk, and by the invention of the centrifugal separator by means of which cream is removed quickly by mechanical process. The invention of power churns and mechanical mixers provided other essentials for factory production. Such devices have greatly reduced the amount of labor involved and have rendered much of the work a mere matter of routine. Of the 1,628,216,000 pounds of butter produced in this country, as reported by the Census of 1919, about 920,550,000 pounds were made in factories. The factory product increased about 48 per cent over the previous decade, while production on the farm declined about 40 per cent. In support of dairy cows the introduction of the silo, which affords a relatively cheap means of feeding throughout the winter, has been of material aid to the farmer. Americans are large consumers of butter, a fact which constantly stimulated the demand for the product but, on the other hand, the introduction, in recent years, of substitutes in the form of compounds of vegetable oils and animal fats has subtracted somewhat from the demand for the real product, and this has been notably the case with the rise in price of the latter.

In the case of milk, new methods have occasioned great changes in the industry. Even more than with butter, it has been necessary to provide a regular, wholesome, and ever increasing supply to the urban communities. Hence has arisen a development of methods of sterilizing, bottling, refrigerating, and of quick deliveries from farms to cities. The city distributors themselves have developed plants along

factory lines for the preparation of milk as it comes from farms for delivery to consumers. It is not possible to obtain an accurate idea of the amount produced in this country for the reason that large quantities are consumed on the farms; but the number of gallons of milk sold by farmers increased from 235 million in 1870 to 1,937 million in 1909.

As with butter the production of cheese has also become largely a factor industry. Of the 479 million pounds produced in 1920 over 473 million pounds were produced in factories.

235. **The Poultry Business.**—The introduction of the incubator and brooder, and the application of cold storage, have been important factors in revolutionizing this industry. From 1847 when the first patents were taken out to 1887, little or no success was obtained in perfecting devices for artificial hatching. The first incubator of commercial value dates from the latter year; since that date artificial incubation has developed wonderfully in the United States. The incubator has many advantages over the natural method of hatching, and each of these adds to the industrial possibilities of the poultry business. It helps the producer overcome difficulties of weather conditions; it reduces somewhat the dangers from disease, prevents young chickens from becoming covered with vermin, and makes possible the supply of "broilers," as well as autumn and winter laying pullets in sufficient numbers to make poultry raising profitable. An equally important consideration is that the incubator is said to lessen the "brooding" period of hens and consequently to increase their productivity of eggs.

The widening of the markets due to the growth of transportation has done much to encourage poultry raising. While chickens and eggs were sold only locally, there was little chance for large-scale production and the resulting economies, because there was always the danger of a

glut of the market. Cheap, rapid transportation overcomes this difficulty. Moreover long-distance distribution makes possible the growing of poultry in sections where foodstuffs are cheapest. Therefore while chickens are grown in all sections of the country in connection with farming of every description, concentration in regions where feeding is cheapest is clearly indicated. Thus in 1909 the twelve States of the east and north central divisions, which are the largest producers of grain, reported 53 per cent of the eggs produced and 47 per cent of the poultry.

Further encouragement was an outcome of the development of cold storage. Preservation had been practiced with water glass, vaseline, lime-water, and other chemicals, and even by storage in cellars, caves, and ice chambers, but none of these means was adequate to large-scale enterprise. Before cold-storage methods were introduced, prices were often discouragingly low in spring and summer, and in the winter, when prices were high, the farmer had little or nothing to sell. The new method made possible a more even distribution of the supply and, therefore, it put the business on a more certain basis.

Some notable changes have occurred in poultry raising and marketing. More and more attention has been given to the development of breeds, and to the selection of poultry products to meet the peculiar demands of the markets; hence the grading and selecting of eggs, and the preparation of dressed poultry by scalding and by dry picking. To some extent poultry raising has become a specialized branch of farming where producers give attention chiefly, or entirely, to raising chickens or other fowls.

The modern poultry producer has advantage of markets which the farmer of 1860 did not possess. Millions of eggs are now consumed in connection with such manufacturing processes as the printing of calico, the manufacture of dyes, the production of dry plates for photography, and in the

clarifying of wine. Methods recently developed of dessicating eggs put the product in better commercial form for some users and have increased the demand. Under the stimulus of the new conditions the growth of the poultry business has been remarkable. In the case of eggs the increase was from 456 million dozen in 1880 to 1,654 million dozen in 1919, and this roughly indicates the increase in the number of chickens on the farms.

236. **Cotton.**—The cotton industry was in a sadly demoralized state in 1865. The old plantation organization was largely broken up, plantation discipline over the working force had disappeared, negroes as wage earners were shiftless and uncertain, the credit of the planters had been greatly diminished, seed cotton was difficult to obtain in quantities, and means of transportation were in bad condition. In fact not only had the organization disappeared, but the physical conditions of the country were such as to render prompt and permanent revival of the cotton industry impossible.

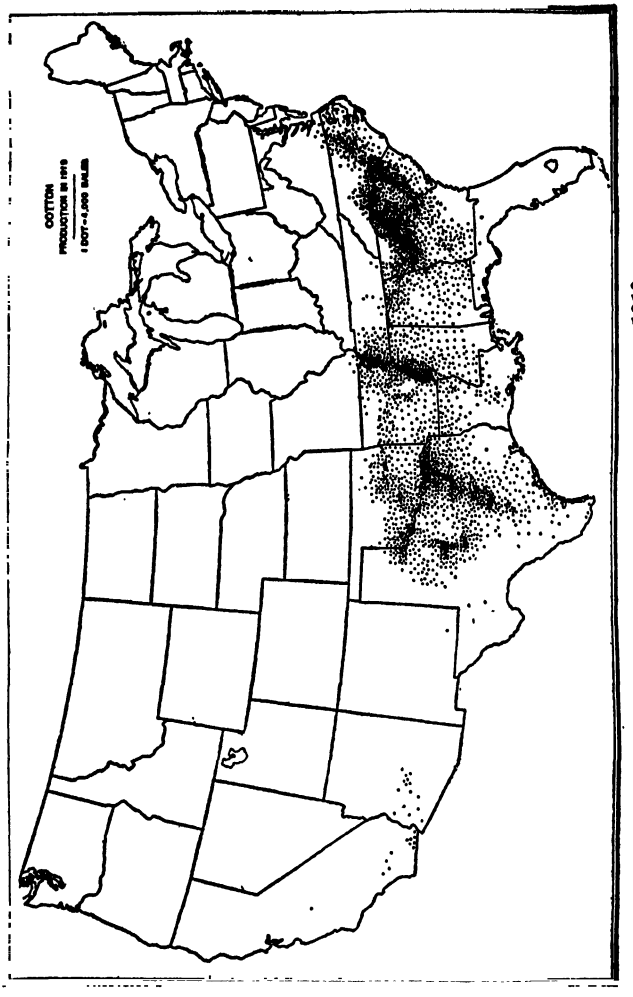
In the early stages of the War planters believed they would be able to market some of their product. Although the markets of the Northern States were closed, there was still the possibility of selling cotton in England; but with the growing success of the Northern blockade, this outlet also was largely closed. Still another possibility was to hold cotton for shipment after the War, for it was evident that the consuming parts of the world would be in need of large supplies. The product thus stored might be used as the basis for loans. Indeed, a considerable amount of Southern cotton was employed to secure bond issues where funds were obtained from abroad. But with the growing disorganization of production as the War proceeded, it became impossible to maintain production. These conditions are reflected in the output which declined from 4,490,000 bales of 500 pounds each in 1861 to 1,596,000 bales

in 1862, and to 299,300 bales in 1864. The 1861 level was not again attained until about 1876.

The one encouraging feature after the War was the high price of cotton. During the transition period many of the old planters again resumed the industry, employing borrowed capital and wage labor. But the outcome was unfortunate. The industry could not be maintained under high costs and uncertainties unless prices continued high; but with increasing output prices dropped and many planters were ruined. The burdens of taxation under the carpetbag governments added to their misfortunes.

In course of time many of the large holdings were broken up, and a new system came into existence in which the poorer whites and the more enterprising negroes became cultivators on a small scale under some method of rent tenure. While cash rentals were paid in all the Southern States, the method which came largely into vogue was the share system. Thus, in Alabama in 1880, over 40,700 farms were operated under this system while only 22,800 were on the money rental basis; in Georgia, 43,600 farms were operated on shares and 18,500 on the money rental basis, and in Mississippi, 27,100 on shares and 17,400 by the cash rent method. Much the same condition prevailed in other cotton States. These farms, whether on the cash or share basis, were small, the greatest number ranging from 20 to 50 acres. The effect of the breaking up of the plantations is indicated by the decline of the average number of acres of improved land per farm; in the South Atlantic division such areas diminished steadily from 115.6 acres in 1860 to 47.9 acres in 1900.

The system of small culture usually required outside financial help and in many instances outside direction. This usually came from merchants and storekeepers who provided the funds and who exercised great supervision over the crops.



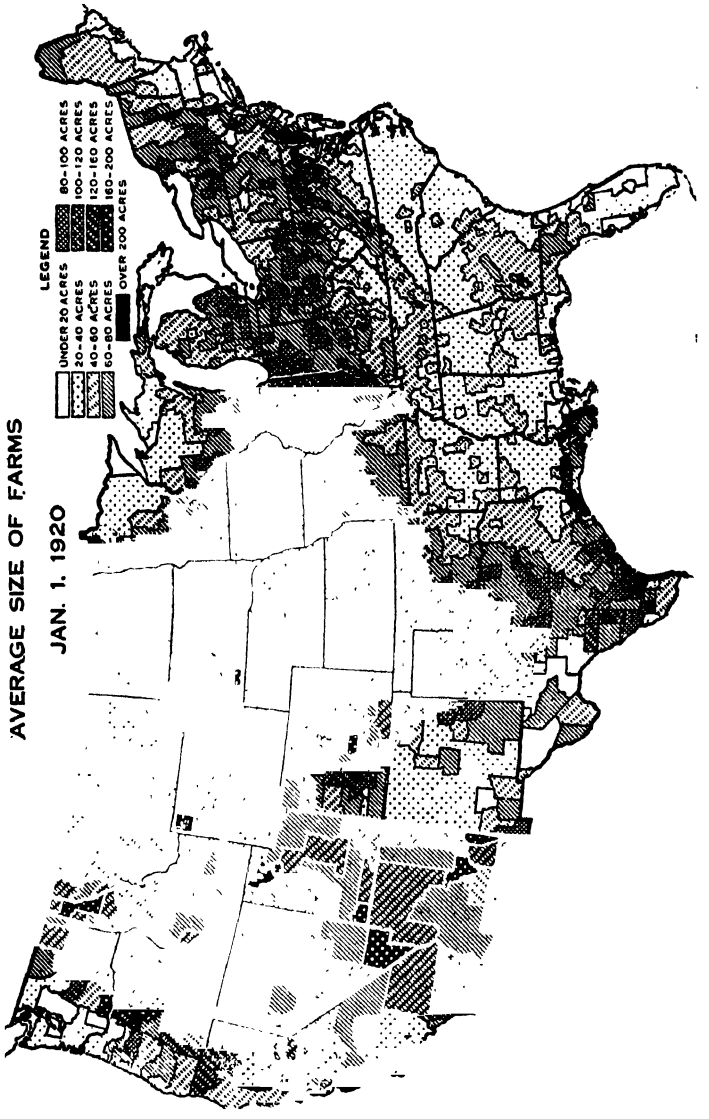
DISTRIBUTION OF COTTON PRODUCTION, 1919

Though the present system is not conducive to the best forms of agriculture, there has been a marked tendency toward improvement. Increasing demand for American cotton both at home and abroad, and the growing use of the by-products have afforded a great stimulus. Farming methods are gradually improving with the use of fertilizers and of modern farm machinery. Notwithstanding the fact that serious efforts have been made to introduce American varieties of cotton in other parts of the world, the experiments have not met with great success and the foreign demand for the American product has continued to grow. At present, the United States produces between 60 and 65 per cent of the world's cotton. It is no wonder, therefore, that the crop has increased greatly. While the product amounted to only about 4,300,000 bales in 1875, it has grown to 16,134,000 bales in 1914. The amount in 1923 was 10,081,000 bales.

After the invention of the cotton gin, cotton rose rapidly to first place among American exports. In 1860 it constituted in value about 57 per cent of the shipments. But, particularly since 1890, the rise of a large export trade in other raw materials and of varied manufactures diminished the relation of cotton to the total. But, at that, since 1880, raw cotton rarely amounted to less than 20 per cent of the total.

As may be gathered from what has been said, the Southern States are still specializing in the crop in which they have a great advantage. In 1919 Texas was the largest producer of cotton, reporting over 2,971,700 bales; Georgia ranked second with 1,681,900 bales. Other States in order of importance were South Carolina, Mississippi, Arkansas, and North Carolina.

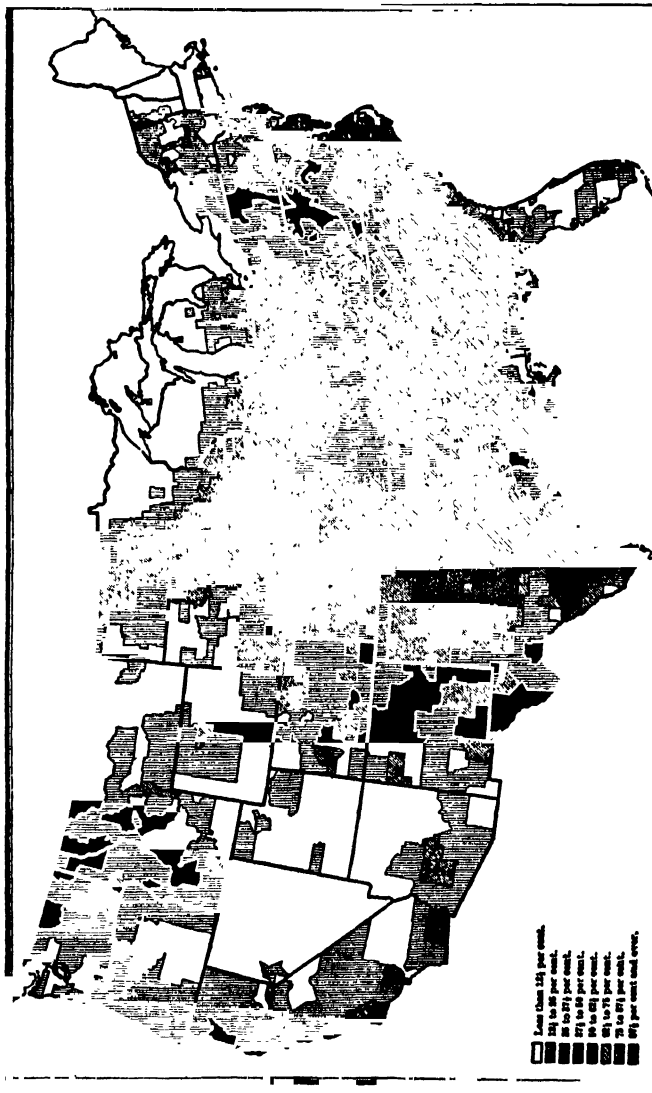
Though the dominant interest is cotton, a considerable variety of other crops are produced. We have referred to rice in Texas, Louisiana and Arkansas, and to fruits in


AVERAGE SIZE OF FARMS
JAN. 1, 1920
LEGEND
UNDER 20 ACRES
20-40 ACRES
40-80 ACRES
80-100 ACRES
100-120 ACRES
120-160 ACRES
160-200 ACRES
OVER 200 ACRES

Florida. Tobacco is a great staple in most of the States south of the Ohio and east of the Mississippi. In 1919 this section produced 1,114 million of the 1,372 million pounds produced in the country. Within this area Kentucky, Tennessee, Mississippi, and Alabama are the largest producers. More sweet potatoes and peanuts are raised in the South than in any part of the country, and cereals and vegetables are produced to some extent. When her agricultural industries are considered in connection with the present development of mineral and forest products, it can be seen that the industrial interests of this section are more diversified than in 1860.

237. **The Size of Farms.**—The question of number, size, and ownership of farms is of great social and economic importance because of the relation of these matters to the distribution of wealth and opportunity. The magic of property is one of the greatest incentives to industrial progress. Moreover, a strong, prosperous agricultural class is one of the best foundations of stable institutions. Tenancy is connected with the concentration of ownership. This method of holding land has a business as well as a social aspect, because under some circumstances it may mean more dollars and cents to the farmer to operate as a tenant than as a landowner. This may be the case where he has not sufficient funds to equip his holdings, or where rents are low because of social prestige connected with ownership, as in some foreign countries. Indeed, there are some considerable advantages in tenancy provided leases are properly drawn so as to protect both tenant and landowner.

A farm, as defined by our census, includes "all the land under one management, used for raising crops and pasturing livestock, with the woodlots, swamps, meadows, etc., connected therewith, whether consisting of one tract or of several tracts." The number of farms in the United States increased from 2,044,077 in 1860 to 6,448.300 in



PERCENTAGE OF TENANT FARMS OPERATED BY TENANTS BY COUNTIES 1920

1920. The principal factor in this increase has been the taking up of public domain west of the Mississippi, though the division of the old plantations in the South, and the diminishing size of the farms in the North Atlantic division had added something to the increase in numbers. Farm lands are fairly well distributed among the rural population as is indicated by the fact that in 1910 there was one farm for every eight of such population. The distribution in 1860 was one to every fourteen.

Owing to the fact that new settlers frequently take up more land than they intend to cultivate, and that these holdings are later broken up and sold, the average size of farms in the United States displays considerable changes from decade to decade. On the whole, the tendency has been toward a smaller average. The figures for 1860 and 1920 were 199.2 and 148.2 acres respectively. The largest farms are now in the west north central and Mountain States where, in the latter instance, grazing, and in the former, large-scale farming with modern machinery, make the large unit advantageous. In 1920, about 35 per cent of the farms were under 50 acres, about 23 per cent from 50 to 99 acres, 24 per cent from 100 to 174 acres, and 18 per cent over 175 acres. Considering the effects of modern machinery and the organization it may be questioned whether farms, as a rule, are not too small rather than too large for the most economic operation.

238. Tenancy.—Fear has been expressed in recent years that tenancy is on the increase and that in consequence this country is threatened with a system which is foreign to our traditions. It is true, taking the country as a whole, that the percentage of farms operated by their owners has been declining since 1880, when statistics of farm ownership were first taken. In that year 74.5 per cent of the farms were operated by owners; but succeeding census reports have revealed a decline to 71.6 per cent in 1890, to 63.7 per

cent in 1900, and to 60.9 per cent in 1920. But a survey of the country by divisions does not reveal an alarming condition. In 1910, for example, in the New England States 89.5 per cent of farms were operated by owners, and in the Pacific and Mountain States, 76.9 and 83.0 per cent, respectively. In the grain States from 68 to 72 per cent are worked by farm owners. Tenancy is greatest south of the Ohio where it has grown up as one of the results of the reorganization after the Civil War. Taking the South as a whole, a little over 51 per cent of the farms are worked by tenants. Much of the tenancy in the United States is probably due to the practice of farm laborers, and sons of farmers who are just starting out in life, to rent land with the expectation of later becoming landowners as the result of their labor and saving.

239. **Agricultural Products.**—The present position of American agriculture may be summarized by a statement of the value of the leading crops.

VALUE OF FARM PRODUCTS, 1919

Cereals	$6,937,557,000
Hay and forage	2,316,115,000
Cotton and cotton seed	2,355,169,000
Vegetables	1,302,200,000
Fruits and nuts	732,251,000
Tobacco	444,047,000
Sugar crops	162,439,000
Plants and nursery products	77,380,000

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CHAPTER XIX

MANUFACTURES: I, GENERAL CHARACTERISTICS

240. The Function of Manufactures.—The chief function of manufactures is to put the raw materials received from extractive industries in form or condition for final consumers. But an important qualification is necessary. Many of the largest factories of to-day are engaged not in producing things to eat, wear, and protection against the elements, but in making machinery, tools, and equipment for factories themselves, or for the supply of the building and transportation industries. Under the highly developed factory system of the present, production is largely by roundabout machine methods, and this involves the existence of a large and varied manufacturing industry concerned solely with supplying such establishments. In a broad way, therefore, manufactures may be divided into two groups; the first comprises machines and tools, building materials, supplies, and equipment of various descriptions; the second is made up of enterprises which furnish products ready for household consumers, including principally foodstuffs of many kinds, clothing, ornaments and trimmings for the home, jewelry, articles for pleasure uses such as automobiles, bicycles, and commodities used in play and recreation like toys and sporting goods, to mention only a few.

This brief exposition is enough to show the function of manufactures and to indicate their relation to the extractive industries. We have already discussed the growth of the latter, and we should now understand the extent of their

contribution to the development of manufactures. The relation, of course, is reciprocal, for factories have supplied vast quantities of machinery and supplies for the development of mines, quarries, and fields. Without this service their growth to large proportions would have been impossible.

241. **Features in the Growth of Manufactures.**—So many new features are associated with the growth of manufactures since 1860 that it is worth while to state them as an introduction to this section. In general the period was characterized by (*a*) remarkable growth, (*b*) by increasing localization of establishments at places which offered the greatest combination of advantages, (*c*) by important changes both in external and internal organization of business, (*d*) by a new relation of Government to industry, and (*e*) by the rise of important problems affecting the relation of industries to each other, to society as a whole, and to laborers and consumers. We may discuss these topics in the order just named.

242. **Growth of Manufactures.**—An English authority about 1894, comparing the development of manufactures in this country with Europe, made the following comment: "The United States produce about one-third the manufactured total of the nations, as they do also of grain and wheat, while their population is less than one-sixth. . . . American manufactures have multiplied just twentyfold since 1840, while those of Europe have only doubled. Nearly all American manufactures are produced by machinery, while in Europe more than one-half is handwork." Using our own census figures, and comparing the years 1860 and 1919, the increase in the value of products was something short of thirty-fourfold; to give the figures, the output in the former year was valued at $1,885,861,000 and in the latter at $62,418,078,000. The years of most rapid growth were from 1880 to the present. This period

is contemporary with the extensive development of mineral and farm resources, with the growth of large scale enterprise, and with the introduction of many new industries. The rapidity of growth has put this country in the front rank among the manufacturing nations. In 1860, for example, the United States was surpassed by England, France, and Germany, named in order of their rank; this country occupying the fourth place. But in 1894 the rank was the United States, United Kingdom, Germany, and France. Manufacturing progress in this country is summarized in the following table:

THE GROWTH OF MANUFACTURES, 1860–1919 [1]

Year	Number of Establishments	Wage Earners	Capital	Value of Products
1860*	140,433	1,311,246	$ 1,009,855,715	$ 1,885,861,676
1870	252,148	2,053,996	1,694,567,015	3,385,860,354
1880	253,852	2,732,595	2,790,272,606	5,369,579,191
1890	355,405	4,251,535	6,525,050,759	9,372,378,848
1900	207,514	4,712,763	8,975,256,496	11,406,926,701
1910	268,491	6,615,046	18,428,269,706	20,672,051,870
1915	275,791	7,036,337	22,790,979,937	24,246,434,724
1920	290,105	9,096,372	44,466,593,771	62,418,078,773

* Census years.

The great manufactures of modern nations are those which provide food, clothing, shelter, and implements of production. The rise of the factory system, however, brought about notable changes in the position of the industries which supply construction materials and machinery and the materials from which they are made. With reference to this country, in 1914 the production of iron and

[1] As to the comparison of the returns for the different years the census reports make the following comment: "The statistics of manufactures secured at the decennial censuses from 1850 to 1900, inclusive, covered the neighborhood, hand, and building industries, as well as the factory industries, while the reports of 1904, 1909, and 1914 were confined to factory industries."

steel, including the output of steel works and rolling mills, was the second greatest industry, measured from the point of value of the products, and the products of foundry and machine shops ranked fourth. The great demands of modern transportation raised car and general shop construction and repairs to the seventh place. Of the food-product industries, slaughtering and meat packing ranked first not only in this group, but among all manufacturing industries;

RANK OF LEADING INDUSTRIES, 1860 AND 1920

1860			1920		
Rank	Industry	Value of Product	Rank	Industry	Value of Product
1	Flour and meal	$248,580,000	1	Slaughtering and meat packing	$4,246,290,000
2	Cotton goods	115,726,000	2	Iron and steel	2,828,902,000
3	Lumber planed and sawed	104,928,000	3	Automobiles	2,387,903,000
4	Boots and shoes	91,889,000	4	Foundry and machine shop products	2,289,250,000
5	Iron founding and machinery	88,648,000	5	Cotton goods	2,125,272,000
6	Clothing, including furnishing	88,095,000	6	Flour and grist mill products	2,052,434,000
7	Leather, including morocco and patent leather	75,698,000	7	Petroleum refining	1,632,532,000
8	Woolen goods, including yarn, etc.	65,706,000	8	Shipbuilding steel	1,456,489,000
9	Sugar refining	42,143,000	9	Lumber and Timber products	1,387,471,000
10	Printing, book, job, etc.	31,063,000	10	Cars and general shop construction, etc.	1,279,235,000
			11	Clothing, women's	1,208,543,000
			12	Clothing, men's	1,162,985,000
			13	Boots and shoes	1,155,041,000
			14	Bread, etc.	1,151,896,000
			15	Woolen and worsted goods	1,065,434,000

flour and grist-mill products ranked third, and bread and bakery products eleventh. It is difficult to compare groups of industries at various periods because the components of the groups change, but the preceding comparison indicates roughly the position of the great industries in 1860 and in 1915.

243. **The Cause of Growth.**—While the Civil War itself provided an initial set of causes for the growth of manufactures, the movement was constantly leavened by new and powerful forces. War demands for food, clothing, and iron in many forms brought prosperity to such industries as flour milling, canning, the manufacture of ready-made clothing, the production of cottons and woolens, and the manufactures of iron. The rise of prices resulting from the issue of paper money had an enlivening effect on all industries, and the war tariffs, which afforded heavy protection in many industries, prevented effective foreign competition. Though these conditions gave manufactures an initial momentum, subsequently still greater forces began to operate. Among these were the great supplies of raw materials produced cheaply from some of the most abundant resources in the world. In our chapters on the extractive industries we have indicated to what extent this group contributed raw products. The great quantities of coal, iron, copper, petroleum, timber products, cotton, and foodstuffs provided the essential basis for the manufacture of tools and machines, for construction work of many descriptions, for power, for railway materials of all kinds, and for the feeding of the population.

While materials for production became more important and cheap, improvements in factory processes for working these into finished forms continued both to lower prices to consumers and thus to encourage consumption, and to increase profits and thereby encourage further production. Thousands of inventions contributed to this development;

sometimes these provided only minor mechanical improvements, but, in many cases, they laid the basis for great new industries, as with bicycles, automobiles, telephones, and airplanes. That manufacturers in their effort to increase profits were able to find methods of using materials that were formerly waste was a factor of immense importance in promoting manufacturing development. Such materials, moreover, have formed the basis of many new industries.

The increase of population, whether by immigration or natural increase, was an important element for two reasons: on the one hand, it added to the labor force available for all grades of industries, and, on the other, it greatly increased the domestic market for commodities. This is particularly the case with a population like our own which is composed of effective producers and eager consumers. Meanwhile, the spread of this population over the country led to increased demand for a large number of commodities required for developing the new resources; in this class were agricultural implements, mining machinery, hardware, railway cars, iron of many descriptions, and lumber.

Another important influence in our manufacturing development has been the growth of transportation. Some suggestion of the contribution of the railroads is contained in the increase of mileage from 30,620 in 1860 to 263,540 in 1914. During the greater part of this period the expansion of railroads was attended by better service and by lowering the cost of carriage. For some time after 1860 the inland rivers were a factor of considerable importance, but these lost a great deal of their value after the building of railways. The Great Lakes, however, have become an element of ever increasing significance. They offer to a great producing area in the United States one of the cheapest means of transportation in the world. Development of freight traffic over this route "has been so great during

the past decade (1889 to 1899), that in 1899 it had become the greatest internal waterway in the world, having a ton mileage equal to nearly 40 per cent of that of the entire railroad system of the United States. In 1899 more than five times as many vessels passed through the United States and Canadian canals at Sault Ste. Marie as through the Suez Canal." To these means of transportation should be added the coastwise facilities. They afford highways for traffic not only up and down the Atlantic and Pacific Coasts and to the Gulf ports, but since the building of the Panama Canal between the coastal ports of both oceans. The policy frequently followed by railroad builders and by carriers on the waterways has been to provide transportation in advance of the opening of the country. Transportation agencies, therefore, have often been pioneers in promoting industrial development of all kinds, with the result that much of the country did not have to wait the construction of means of communication but found them provided at the time of settlement.

Another element of greatest importance for the growth of manufactures has been the freedom with which commerce moves through all parts of the country. The mainland of the United States, it has been said, "is the largest area in the civilized world which is thus unrestricted by customs, excises, or national prejudice, and its population possesses, because of its great collective wealth, a larger consuming capacity than that of any other nation." Development of transportation affected the growth of manufactures in other ways. By widening the markets it paved the way for intense competition which, in turn, became a powerful stimulus for the introduction of new methods and for the improvement of forms of business organization. Railroads also facilitated the localization of industries at the most favored places.

In our quest for causes we should not overlook the new

methods of creating wants. Manufacturers would be greatly handicapped, and progress would be slow, if producers had to wait for consumers to feel of the need of new commodities, and to discover producers. Desires for goods are now created by such effective agencies as advertising and salesmanship. The development of these methods has been one of the significant characteristics of the period under discussion, and they have exerted a most important influence on manufacturing progress.

As with agriculture, business education is beginning to contribute to development; in the engineering trades it has been a factor for a number of years, but in entrepreneurial and executive work it has just recently made its influence felt.

The character of the Americans has afforded a favorable atmosphere for the growth of manufactures because of the facility with which they adapt themselves to new conditions. One aspect of this is the eagerness for new ideas, and another is the ease with which they are influenced by new wants. The people of this country have been most ready to discard old means of production when better methods have been discovered; thus tradition has played very little part in fettering industries to the past. By contrast with European people it has been said: "In the United States the tendency of the artisan class to abandon the slow hand processes has been as strong as the tendency elsewhere has been to adhere to them. Moreover, there has been developed among the laboring classes in the United States a mobility such as is unknown elsewhere in the world. This has made it possible to attract to any point in the country the skilled labor required to develop any branch of industry."

Much of this suggests the importance of the introduction of machine methods. In no country has this proceeded as far as in the United States. Hundreds of illustrations

could be found of the use of machinery for handling freight, in means of factory transportation, in the use of power devices, and in the introduction of labor-saving methods of all kinds. These have increased immensely the producing power of our workmen. Where labor is on the hand basis, growth of output depends either on the development of skill, or increase in numbers, or perhaps on both. But with machine production, increase of output is limited only by the ingenuity of men in finding new ways of manifolding power. Under such conditions the manufactured output grows at a much more rapid pace than population. About 1894, Mulhall, in his *Industries and Wealth of Nations,* estimated that the product per employee in Great Britain, where the processes are more largely by hand than in the United States, was about £107, or, in round numbers, $500, and for the United States about $1,300. According to our Census for 1900, the output per wage earner was about $2,450.

244. **Power used in Factories.**—The growing use of capital in manufacturing was shown in a previous table. To the extent that the value of such machinery is an index of its increasing use, it is apparent that this factor has come rapidly into use since 1860. The employment of machine methods requires, of course, some other power than muscular labor force. Waterfalls, at one time, were the chief source in the United States. Indeed, in 1870, just about as much mechanical power was derived from this source as from steam. In actual figures, 1,130,431 horsepower were contributed by water wheels and motors, and 1,215,711 by steam engines and turbines. Since that date, however, the use of water for factory production has increased only slowly while the power obtained from steam engines increased more than twelve times. The development of electricity and the introduction of the gas engine have added new sources of power which bid fair to be of

increasing importance in the future. They began to be employed on a considerable scale in the decade from 1890 to 1900. Electricity is valuable in many instances because it makes possible numerous economies; the current is supplied in relatively small motors through the plant, thus saving long lines of belting and energy-consuming shafting; it is convenient for machinery that is in use only a part of the time, for it can be turned on and cut off at will; in addition, cleanness and quietness of operation are in its favor, and in regions where it can be generated from waterfalls there is the further advantage of cheapness.

As with electricity, the use of the internal combustion engine is an illustration of the economies of modern production. The wide use of this kind of power is due to its adaptability where only a small amount of power is consumed, or where the use is not continuous. This form is frequently employed in regions which are large producers of natural gas, although blast furnace gas is used to some extent in these engines. Consumption of water power on a large scale is now confined to a relatively small number of industries, including the manufacture of paper and wood pulp, of cotton goods, of flour and grist-mill products, and of lumber and timber products. Where power is a large element in the cost of production, waterfalls are sometimes the dominant element in the localization of an industry. The New England States, since the rise of the factory system, have made large use of their waterfalls; in 1914 this section reported about 42 per cent of the power generated by this method, and the Middle Atlantic section, including New York, Pennsylvania, and New Jersey, reported 24 per cent of the total water power.

The increase of power devices is a fairly good index of the development of the factory system. The growth in the United States was from 2,346,142 horsepower in 1870 to 29,504,700 in 1919. The distribution in the latter year

was steam, 17,037,000 horsepower; electric, 9,347,000; internal combustion engines, 1,259,000 and other horsepower, 1,861,000.

When it is remembered that all this power economizes human labor, some idea may be obtained of its contribution to manufacturing purposes. It should be added, also, that a horsepower as a unit of mechanical measurement, is from ten to fifteen times a man power, and thus the capacity of doing work incorporated in machines represents the working force in a population three or four times as large as that of the United States. It should be remembered further, that without these power devices the use of modern machinery would be impossible; in fact, the factory system as it exists to-day is largely the creation of steam and electricity.

245. Patents.—We have referred to new inventions as a cause for manufacturing development. Improvements of this description are often both labor saving and power increasing. The growth of invention, therefore, is one indication that a nation is becoming better served with the essentials of economic growth. During the decade from 1880 to 1890, patents were taken out in this country at a rate of over 50 a day, and in the next decade at the rate of more than 60 a day. The number of patents issued by the United States has increased steadily from 71,800 for the ten years ending with 1870 to 221,500 for the decade ending 1900.

A significant change has taken place in the method of working up new discoveries. Invention has now become a matter not only of some individual genius working in seclusion, but of an organized effort on the part of great business working for improvements in their own establishment, or sometimes for general improvements which might benefit the trade. Many inventions are now the product of work in research departments of large manufacturing

plants, where trained engineers or chemists are employed solely to discover new and better methods. Frequently the patents that result from such work are only improvements on existing machinery, although new fields are often explored. This new development, however, does not deprive the individual inventor with a great idea of the opportunity of blazing new trails.

Probably the most important of all the inventions since 1860 have been those in the field of electricity. These have ramified to such an extent through the whole industrial world that it is scarcely possible to find an establishment that does not use electricity in some form, or an electrical implement of some description. The decade from 1870 to 1880 was especially prolific in fundamental inventions in this field. The patents of this decade covered methods of generating and transmitting the current, methods of transforming the current from one electric pressure to another, and ways of using the same for a considerable variety of purposes. Thus the basis was laid for electric railways, electric light, power for factory use, and telephones, to mention only a few of the applications. Some idea of the development of this group of industries may be obtained from the statement that in 1880 only 76 plants were manufacturing electrical machinery and supplies; their total output was valued at $2,635,000; in 1919, 1,404 establishments were engaged in the industry, manufacturing products valued at $997,968,000.

It would be impossible to name even in a page the inventions which, during the past sixty years, have revolutionized much of our industrial and home life. Thus said our Census:

> If we attempt to enumerate the industries which, existing prior to the period of patent growth, have been revolutionized by inventions, a catalogue of all of the old industries is virtually required. . . . The great iron and steel industry as it exists to-day

is the product of countless inventions, as for example, the Bessemer process (invented in England in 1856 and later introduced into the United States). . . . The same may likewise be said of the textile industry, the manufacture of leather, of lumber, chemicals, etc., and the railway system in its entirety, from the rail to the top of the smokestack, and from the pilot to the rear train light or signal, is an aggregation of American inventions.

Some new discoveries, however, may be mentioned. The modern wood-pulp industry, which supplies raw materials for much of the paper produced in this country, is the outgrowth of a patent granted to Voulter in 1858. Modern high explosives date from a patent to Nobel in 1865. The fundamental patents covering phonographs and graphophones were granted in 1877. A patent of 1877 laid the foundation for the development of the modern gas engine; the principle of using fuel direct in the engine, however, had been discovered as early as 1861. Elevator machinery, which made the modern skyscraper possible, is the product of various patents granted from 1880 to the present, covering many safety appliances, notably contrivances to give perfect control to the winding drum. The linotype machine for producing cast lines of type developed from a patent to Mergenthaler in 1890. The forerunners of registering and calculating machines were found in inventions between 1875 and 1880, covering contrivances to measure fares and to check the number of passengers in street cars.

Even this brief list should include inventions covering machinery for dredging, conveying, and hoisting. Some of these devices are of great value in modern construction work, and for lifting heavy weights, and for distributing materials in factories. In the case of metal working we should include inventions involving annealing, tempering, boring, and welding; the development of high speed tools is a notable improvement. New inventions have made it possible to use compressed air for a number of purposes.

Other innovations that belong to this period are armored or metal reinforced concrete, steel structures, typewriters, rubber goods, fountain pens, bicycles, and tricycles, and, of course, wireless telegraphy, and telephony, and the airplane. The discoveries in the field of chemistry are probably as revolutionary as those in electricity.

The patent policy of the United States was designed to stimulate invention with the hope that the benefits would shortly be diffused among the people. Thus a provision in the Constitution confers on Congress the power "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." There can be but little doubt that the protection which the patent laws afford is a great stimulus to invention, or at least, to the putting of scientific discoveries in commercial form, and there is probably much truth in the contention that business men should be unwilling to risk their funds in the development of new inventions unless they were protected for a reasonable time. However, the growth of modern large-scale enterprise has called attention to defects in our patent system. Something can be said for and against the practice of buying up patents and storing them away. While, on the one hand, this policy deprives the public of the prompt benefit of a new invention, and also denies its use to other manufacturers, on the other hand, if inventions were open to competitors, manufacturers, because of competition, would be compelled to "junk" machinery which was still in good condition; this would result in social waste.

A more serious criticism of our patent system is that, in a number of instances, it enables large producers to control the output of both patented and unpatented commodities. Where, for example, a very efficient machine is covered by a patent, the manufacturer may require a pur-

chaser, as a condition to obtaining this machine, to purchase his "full line" of products, some of which may not be covered by patents, or on which patents have expired. This practice often puts consumers, and other producers, at a grave disadvantage. Where patents are used in this way, they are a very important factor in promoting monopoly control.

Various reforms have been suggested. One is to require the patentee, within reasonable time, to prove that some use, which benefits the public, is being made of his invention, under penalty of having the grant revoked. This plan has worked satisfactorily in other countries. Another remedy is to permit the Government to buy up the patent at an appraised valuation; or again, the owners of patents might be compelled to share them with others on the payment of a fair royalty. Still another proposed remedy is to reduce the term of the patent from seventeen to ten years, with the permission of renewal, provided the public interest demands it.

Whatever criticism may be brought against the patent system it must be remembered that possession of patents does not exclude others from a given industrial field, for other series of patents may exist under different ownership. In that case, one group of patents competes against another. Moreover, patents are only one factor in industrial progress; many of the great ideas which have promoted business development are not patentable, and, therefore, improvements of this kind are quickly diffused among all enterprising producers. In this class are new forms of business organization, the results that may come from the proper locating of an industry, better factory architecture, systems of routing and storing materials in a factory, new systems of management, and ideas about the economical consumption of waste materials. Some of the great incentives to progress have come from these more

general ideas which by their nature cannot be made exclusive, and which are open to all wide awake business men.

246. **The Use of Waste Materials and By-Products.**— The practice of using the waste of a manufacturing plant, or of consuming waste material obtained from other sources, has been practiced in some industries for many years. Some examples are the collection of old rags for the production of paper, the use of gas-house coke, and the consumption of tangled wool, or old woolen materials as raw materials in the production of shoddy. But, strictly speaking, industries for the consumption of waste are of modern creation. In the days when raw materials were abundant, and when competition was not severe, very little thought was given to the use of factory waste. But with the growth of modern competition, particularly among large business units, it became necessary to employ all the resources of an establishment to create an income. Moreover the growth of better business methods, and above all, the great advance in engineering and chemical sciences, revealed methods of utilizing many materials that were formerly thrown away. Thus the development of by-product industries has become one of the prominent features of economic growth during the past sixty years.

A number of illustrations may be taken from the mineral industries. A large part of the new platinum produced in the United States is obtained as a by-product in the electrolytic refining of blister copper. In 1915 at smelters in Utah, Nebraska, and California, from .342 to 1.825 troy ounces of platinum were obtained from 100 tons of copper treated. Considerable quantities of palladium, another rare element, were also recovered. With the price of platinum at $55 an ounce, and that of palladium at $56 an ounce, the recovery of small quantities added a considerable sum to the profits of the business. Metals of the platinum group

were likewise obtained at the mints of the United States at San Francisco, Denver, and New York from gold bullion, scrap, and sweepings. Frequently the content of the rare metals was so small as not to be readily detected by assay, yet the extraction afforded a profit.

Gold and silver are often by-products in the production of copper and of other baser metals. In 1915 about 344,010 ounces of gold and 18,781,500 ounces of silver were recovered in the production of copper. Lead ores frequently contain enough silver to make the separation profitable. Large quantities of sulphuric acid are produced every year from gases resulting from copper and zinc refining. In some instances, the sale of the by-product is one of the largest sources of profit.

The production of iron at blast furnaces yields a number of by-products, such as slag, used to some extent in the production of bricks, cement, and fertilizers, and blast-furnace gas, consumed as a fuel. The use of the substance last named developed remarkably during the last two decades and is significant because, as with many by-product industries, it conserves a material that was formerly waste. According to the Census of 1909 about 60 engines were consuming blast-furnace gas; the total horsepower generated was 125,230, or an average of 2,087 horsepower per unit. At one of the largest plants in the United States the consumption of this gas was carried to such a point that it was the chief source of power, except as auxiliary or reserve power for use when the furnaces were not operating.

Industries associated with the production of coke afford another notable example of the development of by-products. The list includes tar, gas, ammonium sulphate, and ammonia liquor. Since the introduction of the retort oven on a large scale, in the decade from 1890 to 1900, the recovery of these substances has reached large proportions. The value of such products in 1899 was only $952,027, but in 1914

it was $17,529,088. In addition to other uses, gas-house tar is often consumed as a fuel; as such its value is said to be nearly double that of coal.

Prior to 1860 coal tar was regarded largely as a waste. It is now consumed in preserving timber, in protecting stone and brick work from moisture, in the manufacture of roofing felt and roofing paper, as a paint for metals, in the manufacture of lamp black and soot, and as a top-dressing for roads.

Another important use should be mentioned. In recent years, coal tar has become the basis of a long list of valuable by-products including dyes, medicines, and disinfectants. Naphthalene, for example, is used in producing indigo, a substance that was formerly derived from the vegetable world. From anthracite is produced the dye alizarin which largely takes the place of a coloring matter obtained from madder root.

There is scarcely a field in which the triumphs of modern chemistry are more pronounced than in the production of coal-tar dyes. Aniline was first discovered in 1826 among the products obtained from the dry distillation of indigo, and in 1834, Runge identified aniline in coal tar; but it was not until 1856 when the young English chemist, Perkins, produced a substance he called "mauveine" that a basis was laid for the development of the industry on a commercial scale. Subsequent discoveries greatly stimulated growth. Aniline black was discovered in 1863, and in 1868 two German chemists effected a synthesis of alizarin from anthracene, thereby opening a new field for chemical activity. In 1880 artificial indigo was placed on the market. More than 155 substances are now found in coal tar; about nine of these are used in the production of dyes, and they, in turn, form the basis of a wide range of colors and of hundreds of dye materials. Until recently the bulk of the artificial dyes consumed in the United States

was imported from Germany, although this country has been a large producer of the raw materials. One of the results of the European War was to stimulate manufacture in this country. According to returns in 1914, the value of such products, including coal-tar dyes, intermediates, etc., was $4,652,947.

We should consider two other industries which have made large use of their by-products. For some years after 1860 petroleum was exploited chiefly as a source of illuminating oils. Little or no use was made of the residue obtained in refining. Crude petroleum is made up of a large number of substances of different chemical composition and of widely varying properties. The lighter and heavier of these are known as by-products. As a result of years of experiment it has become possible to separate many of these compounds. Petroleum is refined by heating in large containers; the temperature is raised by stages and maintained at a given degree until the material which vaporizes at that temperature is driven off. The temperature is again raised, and so on throughout the process. In this way various "fractions" are obtained. Some are light and volatile, like gasoline, naphtha, and benzine; some less volatile, like kerosene and other illuminating oils; others are still less volatile, like the heavier oils used for lubricating purposes. Paraffin, one of the by-products, is used for waxing floors, for waxing paper, in the production of candles, and as a substitute for other waxes. Vaseline, another by-product, has a number of well-known uses. The thick residuum obtained toward the end of the distillation process resembles asphalt and is used with that substance for paving; mixed with coal dust it is manufactured into briquettes used for fuel. Many other substances of smaller commercial importance are obtained. Among the products other than illuminating oils enumerated by our Census of 1914 were lubricating oils, residuum or tar, grease, paraffin wax, as-

phalt, candles, and various compounds. The product of these was valued at $152,966,200.

The meat-packing business is another large industry which has made large use of its by-products. The development of these branches of the industry has been described as follows:[1]

Until within comparatively late years little attempt was made to utilize the waste products of the abattoir. The blood was allowed to drain away, and the disposal of heads, feet, tankage, and other waste material was a source of expense, men being hired to cart it away and bury it. After a time industries grew up in the vicinity of the slaughtering establishments, using as their raw materials the waste products of the abattoir. Glue, tallow, soap, and fertilizers were among the articles so produced from waste. With increasing competition the packing house gradually absorbed these industries, until the utilization of "waste" materials constituted a source of no little profit. The aim is that nothing shall be wasted. The large packing houses utilize the horns, hoofs, bones, sinews, hide trimmings, and the other so-called waste materials. From these are manufactured glue, gelatin, brewers' isinglass, curled hair, bristles, wool felt, hair felt, laundry soap, and soap powders, toilet soaps, glycerin, anhydrous ammonia, fertilizers, dried blood (after the albumen is extracted), bone meal, cut bones, poultry food, albumen, neat's-foot oil, pepsin, knife handles, and many other things.

Surely this is a record of conservation. But in addition, "each large establishment has its chemical laboratory, where expert chemists are constantly seeking for new combinations to render more valuable and extensive the already long list of by-products."

247. **The Localization of Industry.**—The localization of industry is both cause and result of industrial progress. To the extent that the careful selection of a place for a new enterprise makes for economies in manufacturing and

[1] Twelfth Census of the United States, *Manufacturers*, IX, p. 417.

marketing it promotes further growth. The policy of many businesses in choosing a location with reference to the economic factors involved makes for economies in all kinds of operations and thus is an important element in industrial development. But the localization of industry is a result to the extent that until the country was settled, and until its parts were joined by suitable means of communication, the principles involved in selecting a location could have only limited scope. In short, the settlement of the whole country, the revelation of the advantages of the different parts for certain kinds of industries, the development of transportation, and the new methods of studying the advantages of one region as compared with others, have been important factors in influencing the concentration of industries in regions which offer the best chances for success.

The principal factors affecting this localization are the presence of water power, convenient transportation facilities, large amounts of capital available for investment in industries, a large supply of labor adapted either for manufactures in general, or peculiarly suited for the enterprise in question, proximity to sources of raw materials, nearness to markets, the momentum of an early start, and the habit of industrial imitation. Climatic conditions were once a factor of considerable importance, but to a large extent such conditions can now be created artificially in a factory; and in the case of water power, the development of methods of electric transmission makes it possible to utilize the products of such power at long distances from the original source.

The factors named above operate in varying proportions "to prescribe the broad area in which an industry is economically possible." Locally, numerous other elements are involved in selecting the immediate site for an establishment. The list includes local means of transportation,

the neighborhood of banking facilities, nearness to fire-fighting apparatus, the cost of land, room for expansion, and the presence of machine shops.

Some of the factors involved in general localization require explanation. While there is usually a large supply of mobile capital and labor, nevertheless industries are often founded at places which offer local supplies. "Although most large enterprises are now financed from the great financial centers, the plants are located usually in places which have already become industrial centers in a smaller way through the efforts of the people there and by means of their money. The cotton mills which are springing up through the South just now illustrate the tendency of a town itself, in the early stages of its industrial life, to own largely the stock of an enterprise, and Fall River affords a most remarkable illustration of the perseverance of this tendency." Outside capital is often solicited, but it is obtained more easily after the people themselves have invested in the industry.

Labor is somewhat less mobile than capital. The attachment of home and friends, and the uncertainties and inconveniences of change of location, particularly with men with families, tend to render a considerable part of the labor supply of the country relatively fixed. Where labor is an important element in the product, therefore, the available labor supply is a large factor in selecting the location for an industry.

The "momentum of an early start," as a cause of localization, is a matter of both labor and capital. Where a branch of industry has become established in a region either as the result of some early advantages, or because of chance circumstances, there are some reasons why the enterprise should remain, even after the original opportunities have disappeared. Probably the factory and equipment would have to be sold at a loss, and the labor organization could

not be transferred readily to some other region. Other factors make for permanence, such as the presence of various establishments which supply the industry in question with raw or partly manufactured material, or perhaps, because of the existence of organized markets in which raw materials may be obtained, or in which finished products may be disposed of.

On the whole, nearness to sources of raw materials is one of the principal factors involved in localization; this is notably true where materials are bulky and thus involve heavy transportation charges. Where materials are widely distributed, as with grains and timber, the manufacturing industries themselves, but with few exceptions, are widely scattered.

The table below gives an idea of the present localization of some industries:

LOCALIZATION OF INDUSTRIES, 1909

Industry	State	Per Cent of Total Value of Product	Industry	State	Per Cent of Total Value of Product
Collars and cuffs . .	N. Y.	92.3	Pipes, tobacco	N. Y.	60.5
Grindstones	Ohio	88.8	Firearms, ammunit'n	Conn.	58.5
Artificial flowers, feathers, plumes	N. Y.	88.2	Rice cleaning and polishing	La.	56.0
Peanut grinding, roasting, cleaning	Va.	81.5	Clocks	Conn.	55.7
Plated ware	Conn.	77.4	Coke	Penn.	54.1
Fur goods	N. Y.	73.8	Iron and steel, steel works and rolling mills	Penn.	50.8
Clothing, women's ..	N. Y.	70.8	Turpentine and rosin	Fla.	47.2
Hair work	N. Y.	70.1	Men's furnhg goods	N. Y.	46.9
Liquor, vinous	Calif.	68.1	Clothing, men's	N. Y.	46.8
Pens, fountain, etc. .	N. Y.	67.9	Boots and shoes ...	Mass.	46.1
Needles, pins, etc. ..	Conn.	63.3	Ink, printing	N. Y.	45.8
Gloves, mittens	N. Y.	61.7	Brass and bronze products	Conn.	44.6
Millinery and laces ..	N. Y.	60.7	Iron and steel, blast furnaces	Penn.	43.1

Within the States, industries are frequently strongly concentrated in certain cities. The following are illustrations: automobiles at Detroit, Cleveland, and at Flint, Michigan; boots and shoes at Lynn and Brockton, Massachusetts, and at St. Louis; carpets and rugs at Philadelphia; collars and cuffs at Troy, New York; gloves and mittens at Gloversville and Johnstown, New York; men's clothing at New York City and Chicago; pottery at Trenton, New Jersey, and East Liverpool, Ohio; the manufacture of silks at Paterson, New Jersey, and at New York City; slaughtering and meat packing at Chicago, at Kansas City, Kansas, at New York City, and at South Omaha; and the manufacture of jewelry at Providence, New York City, and at Newark, New Jersey.

248. The Density of Manufactures.—Although manufacturing of some description is carried on in almost every community to supply local wants, by far the greater part of the manufacturing industry of the country is concentrated in the region north of the Ohio and Potomac and east of the Mississippi. But within this region the density is greatest in a relatively narrow strip parallel with the Atlantic Coast, and extending from about Lowell, Massachusetts, to Wilmington, Delaware. This is the place of densest poplation, and therefore both the greatest market of the country and the largest source of labor supply. A study of the manufactures of the region would show that many of these are industries in which the labor element is more important than that of raw materials. The bulkier products and partly manufactured goods are worked up in parts of the country near the primary sources of raw materials.

There has been a marked tendency of manufacturing industries to move westward with the opening of new markets created by the migration and with the development of new resources. During the years from 1860 to 1900 the

center of manufactures moved westward some 200 miles, from 5.5 miles west of Indiana, Pennsylvania, to 17 miles southeast of Mansfield, Ohio.

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CHAPTER XX

MANUFACTURES: II, GROWTH OF CERTAIN INDUSTRIES

Our Census of 1914 enumerated 344 manufacturing industries divided into 14 general classes. These manufactures have contributed in a varying degree to the development of the country. Some have been of vital importance; others have added little or nothing. Owing to the fact that the growth of industries of one group is related to expansion in other fields, it is difficult to rate manufactures in the order of their importance for social progress. But it is possible to name those which have been of great significance. Among these are various branches of the iron and steel industry, particularly those engaged in the production of tools and machinery whether for use in factories or on farms. A high rank should also be given the manufactures which provide means of communication, and food, clothing, and shelter. All the industries just named rank among the first in the value of their products.

It would be impossible in a brief chapter to discuss the development of all our important manufactures, but we may survey some of these which have made exceptional contributions to industrial progress.

249. Iron and Steel.—There is not an industry of any importance that does not use iron and steel in some form. Thus said our Census of 1900: "Iron and steel penetrate so widely into other industries that prosperity in any of them increases the demand for iron entering as material into their products, and at the same time also increases the demand for machinery and tools for working up that ma-

terial into finished products." One of the principal causes, therefore, for the enormous development of the iron and steel business has been the great increase of demand. To illustrate further:

> The nineteenth century witnessed (1825) the building of the first railroad for general freight and passenger traffic, the Stockton and Darlington road in England. The street railway dates from 1832. The general use of iron and steel for bridges and steamships is a development of the last half-century; the use of steel in the construction of large buildings is a development of the last quarter-century; the invention and use of steel cars for general freight purposes belongs to the last decade. Simultaneously with the demand for iron and steel to carry out these developments, there has been a constantly increasing demand for these materials for agricultural machinery, textile machinery, mining machinery, electrical machinery, machine tools, iron and steel pipe, hardware, stoves, shovels, tin plate, wire, and thousands of minor tools and mechanisms, the use of many of which was unknown even as late as 1850.

Keeping pace with the mounting demand has been the favorable development of a number of important factors affecting supply. Many inventions, the introduction of new systems of management and of new forms of organization have particularly contributed to success. Moreover, the iron and steel business has been exceptionally fortunate in its supply of industrial talent; a number of the greatest captains of American industry have been engaged in this field. This industry was one of the first to be organized on a large scale, thereby obtaining the numerous economies of large-scale production.

One of the most important contributions to growth was the Bessemer process for producing steel, invented about 1856. Although an English invention, the method was shortly introduced into the United States. The first experimental steel rails produced in this country were rolled in

Chicago in 1865. Owing to foreign competition and to prejudice in favor of foreign-made rails the industry was rather slow in developing, but by 1879 this country was producing annually a larger tonnage than England. From 1867 to 1900, inclusive, this country produced over 33 million tons of Bessemer steel rails, or an average of almost one million a year. The Bessemer process has the advantage of being a quick method of producing steel. Instead of slowly working out carbon and other impurities, as was done by the processes in vogue before 1860, molten iron is now run into large converters, carbon is burned out by a blast of air, and then carbon and other elements are added to give the desired properties. This method has been well adopted to the use of high-grade American ores which contain only very small quantities of phosphorus and sulphur. Low-carbon steel, which does not differ much from wrought iron, is also made in this way, and is replacing the more expensive wrought iron for many purposes.

The open-hearth process was introduced almost simultaneously with the Bessemer method. The invention dates back from about 1856 when the Siemens brothers, who were natives of Germany but at the time were living in England, perfected the Siemens regenerative gas furnace which made the new process possible. Owing to the abundance of suitable ores, Bessemer steel was for many years the chief product of the United States, but since 1899 the open-hearth product has been rapidly increasing until in 1914 more steel was made by this method than by any other. Of the 10,685,000 tons of steel produced in this country in 1899, some 7,532,000 were made by the Bessemer process and about 3,044,000 by the open-hearth process; in 1919, however, the production of open-hearth steel amounted to 26,726,000 and that of Bessemer only 6,946,000. The total production of steel in that year was 34,026,000 tons.

Abundance of iron ore and of good coking coal has been

an important factor in the growth of the American iron and steel industry. The production of pig iron, which amounted to scarcely more than 821,000 tons in 1860, and to a little over 3,385,000 tons in 1880, rose to 38,364,000 tons in 1923. Along with this increase of output has gone a growth of furnace capacity. In 1870 blast furnaces were still rather primitive, producing on an average of not more than 50 tons a day. A large percentage of the furnaces in 1914 had a daily capacity for over 400 tons. The total daily capacity increased from 54,400 tons in 1899 to 138,300 tons in 1919. Other important factors promoting the growth of the iron and steel industry were the introduction of new processes of rolling, of high-power machinery, of devices for lifting and transporting crude products in the process of manufacture, the development of a large foreign market for iron and steel products, and the enormous expansion of domestic demand,

What we have said above refers to tonnage. The value of the products of iron and steel manufactured in the United States rose steadily from $207,208,000 in 1869 to $2,828,902,000 in 1919. This is the value only of basic products. But upon these are a large number of finished iron and steel commodities valued in the aggregate in 1914 at $1,986,825,000. Thus the sum total of the products of this metal in 1919 was $9,403,634,000,[1] an amount which was about one-eighth the total value of the manufactures of the country in 1919. Some idea of the growth of this group of industries may be obtained from the statement that in 1860 the total output of all forms of iron and steel was valued at a little over $117,000,000. This development is an illustration of the fact that industrial society in the United States is devoting a large measure of its attention to the manufacture of productive equipment in the

[1] This includes iron and steel and their products. See Abstract of the Fourteenth Census, 1920, p. 1054.

form of better structures, and of more ample supplies of machines, tools, and engines. To a large extent the growth of the iron and steel business explains the enormous expansion in all other departments of industry, for these other lines depend on the metal industries for the equipment which increases their power and capacity of production. By far the largest item included in "other products" of iron and steel is machinery, valued in 1919 at $2,289,250,000. In 1860 the value of machinery and foundry products was only $75,000,000.

250. Electrical Apparatus and Supplies. — There is scarcely a group of industries that characterizes the enterprise of the period since 1865 as well as the manufacture of electrical apparatus and machinery. Almost the only representative of this group in 1860 was the telegraph and the industries which supplied it; these had been developed on a commercial scale during the preceding twenty-five years. But since 1870 dozens of new electric industries have come into existence, and meanwhile many new products have been placed on the market for the use either of productive enterprises or for the benefit of final consumers. Some idea of the rapid growth of these manufactures may be obtained from the fact that in 1879 the value of the output of electrical apparatus and supplies was only $2,655,000. In 1919 the output was valued at $997,968,000. To all intents and purposes, therefore, this group of industries is a product of the twenty-five years preceding.

There is hardly a field in which the efforts of inventors have been more prolific and more productive of valuable results than this. During the years from 1871 to 1895 Thomas A. Edison alone was credited with 711 inventions and Elihu Thomson with 394. During the twenty-five years ending with 1895 electric lighting seems to have claimed the largest number of inventions, followed in order by telegraphy, electric generation, telephony, electric rail-

ways, electric signalling, and electric motors. Some 17,539 patents were recorded in these fields. Commenting on the "rapid and violent" changes in this industry the Census Report of 1900 contains the following: "In 1850 it would have had equal pertinency with respect to the telegraph; in 1860 it would have found its application in the stock ticker, burglar alarm, and other electrical conveniences now familiar; in 1880, concurrent with the development of telephony, came the great advance in electric lighting; in 1890 the vast exploitation of the electric railway would once more have justified the sagacious comment; in 1900 the unprecedented adoption of the electric motor for power transmission, factories, etc., as well as for the automobile, would have offered further proof of the rapidity of movement which it is sought to reduce to analysis." In addition to telling the story of the rapid development of the electric industries, this account also gives some idea of the sequence in which these various branches of business were commercialized.

The success of the inventors has been one of the great causes for the growth of the electric industries, but other forces have been operating; the United States has been favored with abundant supplies of the chief metals which enter into the manufactures, such as iron, copper, lead, zinc, and aluminum. The high development of machine processes in this country has been a cause for the prompt introduction of electrical machinery particularly in cases where there was a clear gain in efficiency. Thus there has always been a large market awaiting the new products. The wide range of application of electric devices has also been a factor, for there is scarcely an industry of any size that cannot use electric wares of some description, and scarcely a household that is not served in some way. The market has been increased by the many contrivances which promote comfort and convenience in the home, such as

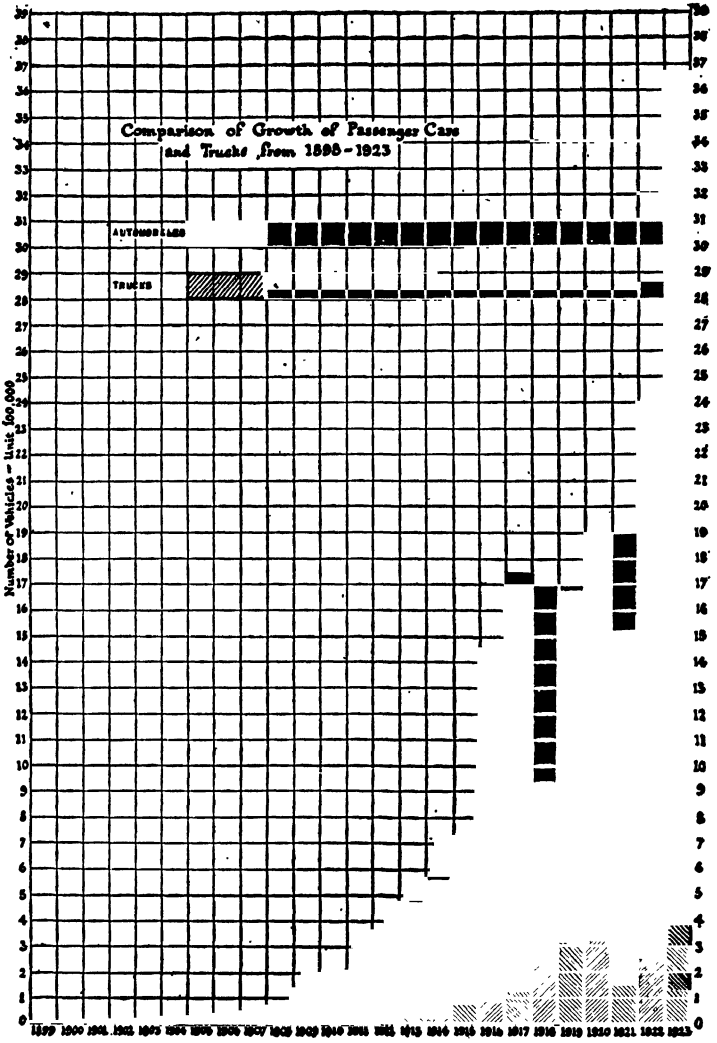
electric flat irons, fans, vacuum cleaners, toasters, disk stoves, and washing machines, to mention only a few of the most important.

As with other inventions discoveries in the electric field have not only created many new industries, but they have greatly stimulated the development of others established at an earlier date. The demand has increased for all the important metals, for structural materials, for machinery of various kinds, and for many other commodities that serve the electric industries. Some of the most valuable industrial results are the opportunities offered by the new machines for the economic use of power.

Some of the leading products are insulated wire, motors, dynamos, batteries, telephone apparatus, incandescent lamps, magneto and ignition apparatus, and transformers.

251. **Automobiles.**—The manufacture of automobiles was first shown as a separate industry in our Census of 1904. Production, however, began to assume the character of a regular industry about 1895; the subsequent growth was remarkable. In 1899, there were about 3,700 vehicles of this description in this country, consisting chiefly of steam carriages and runabouts, but including also about 300 gasoline cars and 500 electric carriages. The abundance of materials and the facilities of this country for the manufacture of machinery have been important causes in the rapid growth of the industry, but an equally important cause was the readiness with which American consumers have taken up the new idea. The policy of many companies of reducing the price to the purchasing power of many consumers helped the sales. The Ford Company alone from the time of its organization in 1903 to 1916 produced over 1,386,000 automobiles.

By far the largest part of the output is passenger cars. Of a total of 1,683,916 automobiles produced in 1919, 1,557,480 were pleasure vehicles and 126,436 were for business



PRODUCTION OF PASSENGER AUTOMOBILES AND MOTOR TRUCKS, 1898–1923

(*Wall Street Journal.*)

purposes, chiefly delivery wagons and trucks. The growth of the industry is shown in the table below:

GROWTH OF THE AUTOMOBILE INDUSTRY, INCLUDING BODIES AND PARTS

Year	Number of Establishments	Capital	Wage Earners	Value of the Product
1899	57	$5,769,000	2,241	$4,748,000
1904	178	23,084,000	12,049	30,034,000
1909	743	173,837,000	75,721	249,202,000
1914	1,271	407,730,000	127,092	632,831,000
1919	2,830	1,780,948,000	343,115	3,080,073,000

The automobile industry is centralized in a relatively few places in the United States. In 1919 Michigan was credited with over 52 per cent of the value of the product, or $1,620,383,000. Detroit is the industrial center of the industry. Ohio ranked second with a product valued at $379,436,000; New York, third with $211,137,000.

252. Agricultural Implements.—Manufactures and agriculture are our two greatest branches of industry. It is just as important, therefore, that the latter should have the advantages of labor-saving devices as the former. This field has not been neglected. The growth of the use of machinery in farming is only a counterpart of the development of mechanical methods in shops and factories. Conditions in the United States have been most favorable both for inventors of agricultural machinery and for manufacturers. The rapid development of agriculture since 1860 created an enormous demand for labor-saving devices, and the scarcity and relatively high wages of American laborers made it necessary to find methods of economizing human energy. Much of the topography of the country, which is level, or relatively so, makes possible the use of machinery on a large scale. In addition the tendency of farmers to specialize in a few staple crops adds still fur-

ther to the advantages of farm machinery, and the relatively large size of American farms makes the use of machinery economical. The promotion of enterprise among our farmers through our system of agricultural education, and through the diffusion of knowledge by the periodical press has made the farmer receptive of new ideas. Indirectly all the forces which have promoted the growth of agriculture have increased the demand for many forms of farm machinery.

Notable improvements have been introduced since 1860 in power devices used on the farm. Activity in the invention of the steam plow began about 1861. Subsequently gasoline and electricity have come to afford a considerable amount of power. These inventions have created a demand for power machinery.

The tendency in the development of agricultural implements has been in the direction of diversification to give a better application of machines to the particular work in hand. This applies notably to plows and harrows, which are represented by a great variety of implements. Thus there has been created not only a demand for more implements, but for a greater variety. In the case of mowing machinery, the end sought by inventors has been to combine in one machine as many operations as possible. The development has been somewhat as follows: "To cut the hay or grain with machines; to cut and rake or gavel; to cut and bind; to cut and thresh." Owing to climatic conditions, the combined reaper and harvester is used very little east of the Rocky Mountains, but it is employed on the large farms of the Pacific Coast. In the case of corn, inventions have produced a machine which cuts the stalks, forms them into bundles, and binds and deposits these bundles in the field. The development of the beet-sugar industry directed inventive talent to this department of industry. Notably since 1880 machines have been devised

to cut the tops, lift the beets from the ground, and convey them by means of an elevator either to a receptacle in the rear or to a wagon at the side.

Thus, just as in the case of the factory, the tendency in agriculture has been to reduce as much of the work as possible to mechanical process. This has greatly increased the demand for farm implements. The effect of this demand is indicated by the fact that the value of agricultural implements manufactured in the United States increased from $20,831,000 in 1860 to $304,961,000 in 1919. This manufacture is strongly localized in the great farming States. In 1919 Illinois reported nearly 42 per cent of the total value of the manufactured product, or $128,285,000; Wisconsin ranked second with $43,623,000, and Indiana third with $31,824,000. The development of this manufacture is shown in the table below:

GROWTH OF THE AGRICULTURAL IMPLEMENT INDUSTRY

Year	Number of Establishments	Capital	Number of Wage Earners	Value of the Product
1860	2,116	$13,866,000	17,093	$20,831,000
1870	2,076	34,834,000	25,249	52,066,000
1880	1,943	62,109,000	39,580	68,640,000
1890	910	145,313,000	38,827	81,271,000
1900	715	157,707,000	46,582	101,207,000
1914	601	338,532,000	48,459	164,087,000
1920	521	366,962,000	54,368	304,961,000

As with other industries the tendency has been to concentrate manufacture in large establishments. The average capital per establishment in 1860 was $65,524; in 1914 it was $563,280. Indeed, some of the notable combinations have taken place in this industry. It will be observed from the table above that there is a relatively small number of men employed, considering the increasing amount of capi-

tal engaged in the business. This is due to the increasing use of labor-saving devices in the manufacture itself. Thus it was said some twenty years ago that "in the manufacture of agricultural implements new machinery has, in the opinion of some of the best manufacturers of such implements, displaced fully 50 per cent of the muscular labor formerly employed." The tendency since that time has been more and more in that direction.

253. The Textile Industries. — What we have said hitherto in this chapter refers chiefly to the production of iron, and steel, and machinery. In 1919 the manufacture of "textiles and their products" was the second largest group of industries in this country, with a total product valued at $9,216,103,000. This group includes (*a*) those engaged in one or more of the processes involved in the manufacture of the fabric, (*b*) those which convert the fabric into articles for personal wear, and (*c*) those making other textile products. The table given below shows the value of the product in 1919 of some of the leading industries of these groups.

VALUE OF CERTAIN TEXTILES AND THEIR PRODUCTS MANUFACTURED IN 1919

Cotton goods	$2,125,272,000	Clothing, women's	$1,208,543,000
Woolen and Worsted goods	1,065,434,000	Clothing, men's	1,162,985,000
Hosiery and knit goods	713,139,000	Millinery and lace goods	255,724,000
Silk goods	688,469,000	Shirts	205,327,000
Dyeing and finishing textiles	323,967,000	Bags, other than paper	214,059,000
Carpets and rugs other than rag	123,253,000	Furnishing goods, men's	107,834,000

Although most of the basic inventions in the textile industries belong to the period before 1860, the machinery in

use at that date has been improved in numerous ways resulting both in economy of labor and in increased productive power of the machines. In addition great changes have taken place in methods of organization and in systems of management which have further increased the economies of production.

Some features in the growth of the textile industries since 1860 stand out conspicuously; among these are the remarkable growth of the manufactures, the rise of the new cotton industry in the South, and the enormous expansion of certain branches of the textile industries, such as the manufacture of silk, of hosiery and knit goods, of carpets and rugs, and of the products of hemp and jute. The industries last named have existed for many years, but they have assumed great importance in recent years in consequence of the immense demand for binder twine.

The Civil War, which imposed serious difficulties on the manufacture of cottons, gave a considerable stimulus to the production of woolens. This War created an enormous demand for blankets, "army cloth," and clothing and led to the prompt establishment of mills to satisfy the new needs. The momentum thus gained was strengthened by the high protective tariff which was one of the results of war financing. On the other hand the interruption of supplies of raw material from the South depressed the cotton industry. The manufacture of woolens thus took first rank among American textiles, which position was held until nearly 1900. In 1860 the value of cotton manufactures was in round number 115 million dollars, and of wool, 73 million dollars; in 1880 cotton manufactures were valued at 192 million dollars, and woolens at 238 million dollars. In 1900, when the manufactures of cotton had again resumed their first rank, the value of the product was 339 million dollars, and of woolens, 296 million dollars.

In a number of important respects the United States pos-

sesses advantages for the manufacture of cotton which are not enjoyed by any other country. One of these is the great supply of raw cotton. Our chief competitors must come to us for the largest amount of their raw materials. It is true that, for purposes of mixing, a considerable amount of cotton must be imported into this country from a distance, but this is a disadvantage which is shared with all great manufacturing countries. Our advantages in the growing of cotton have been further increased, since 1870, by the rapid development of the manufacture of cottonseed oil and its various by-products; thereby the growing of the staple has become more profitable and more certain. Further, the enormous domestic market affords American manufacturers an enormous advantage; some of our competitors must look largely to an uncertain foreign market for the consumption of their growing surplus. If the labor costs have been higher in this country than abroad, there are at least compensating considerations in the fact that we have an abundance of cheap materials, great technical improvements, a high state of organization, and probably lower power costs.

Until about 1870 the New England States were the chief seat of the cotton textiles. Since that date, however, there has been a notable shift of some branches of the industry to some of the Southern States. It is possible that increasing taxation, and the development of labor legislation, have been factors of some importance in causing the industry to migrate, but, on the other hand, the South held out a number of opportunities; the Southern press urged the manufacture upon those who had capital; in some instances, municipal aid was given in the form of exemptions from taxation for a number of years; railways offered encouragements by arranging schedules so as to favor the manufacturers; besides, nearness to raw materials, lower labor costs, and, in many instances, cheap power were other induce-

ments. As enterprises passed beyond the experimental stage, more and more local capital was available for the business.

The principal producers in the South are North and South Carolina and Georgia, but considerable amounts of cottons are manufactured in other Southern States. In 1880 the output of the three States just named was scarcely 13 million dollars; in 1919 it was valued at about 733 million dollars. Competition with Southern mills has changed to some extent the character of New England cotton manufactures, which are tending toward a finer quality of cloth, leaving the coarser grades of sheeting, drills, and ducks to the Southern mills. Thus, "while the South is consuming an ever larger proportion of the cotton crop, she is still far from receiving for her product the money that comes to the New Englander, who with a higher grade of labor and greater variation of output is constantly catering, with dress fabrics and fine stuffs of various kinds, to a discriminating well-to-do patronage."

A notable development in the American spinning industry during the past fifty years has been the growing use of the ring spindle. This device dates back to an invention of James Thorpe in 1828. It was not until after the Civil War, however, that this method was placed on equal terms with mule spinning. Now it dominates in the United States. Thus, of the 33 or more million spindles in this country in 1917, more than 30 million were of the ring type. For the American spinner the ring has undoubtedly many advantages: "Because it spins continuously, and not intermittently, it turns out about a third more yarn per operator. It is usually admitted, however, that the thread from the mule is more even in diameter. Advocates of the mule say, moreover, that the thread from the mule is softer and 'loftier,' and that cloth woven from it has a more 'clothy' feel. But others say they can produce soft

yarns with the ring. In the United States, where the labor cost is a vital item, the ring-spindle has an assured place."

The rapid growth of the silk industry is another feature of textile manufactures since 1860. The value of such products as recorded in 1860 was only $6,607,000. The output at that time consisted chiefly of ribbons, silk trimmings, and silk thread. The value of the product in 1919 was $688,469,000. In 1860 this country produced only 13 per cent of the amount consumed; in 1900 it increased to about 70 per cent of consumption. Commenting on the progress of this industry our Census for 1900 contains the following: "Every weave, article, and quality known to mechanical weaving, or which, through alterations on machinery or simplification in manufacturing, could be put in the reach of power-loom weaving, have been manufactured in the United States." That the industry has been able to achieve these results has been attributed to the enterprise and intelligence of its leading men, who readily experiment with new and untried methods even if there is only a small hope of success. Undoubtedly the great American market which is eager to consume these fine wares has been a great stimulus to capitalists to take the risks of investment even where there was no immediate hope for profitable returns. The high development of mechanical skill in this country has been an advantage; and, in some instances, manufacturers have been aided by grants and concessions of various kinds such as donations of land, exemption from taxation, local subscriptions to stock, and low rentals for buildings. The growth of the industry has been remarkable when one considers the many disadvantages which had to be overcome: the raw materials must be imported from a great distance; the manufacture requires a high degree of skill, and, moreover, the new American producers encountered the competition of the old-established industries, particularly of France, where the "skill and

taste of generations have been concentrated upon the production at these centers of fabrics which in beauty of design, in richness of coloring, in delicacy of workmanship, alone among the fabrics made by modern machinery, rival the splendors of mediæval textile art."

The silk industry is localized principally in Pennsylvania, New Jersey, New York, and Connecticut, ranking in the order named. Paterson, New Jersey, is the principal producing center in the United States, with a product in 1914 valued at $44,672,000; New York City, Allentown, Pennsylvania, Philadelphia, and Scranton are other important places of production.

In another branch of the textile industry the United States has made great progress since 1860, namely, in the manufacture of hosiery and knit goods. Until about 1832 the knitting of socks and stockings remained mostly in the household. The invention of Egberts that year successfully applied the principle of knitting by power. His invention consisted in the adaptation of the square stocking frame to the use of power. The industry developed slowly during the next twenty-five years. In 1860 the value of hosiery and knit goods produced in this country was only $7,280,000. While the development of the factory system has been an important factor in the growth of this business, the character of American tastes, on the other hand, has been an important cause of development, since the widespread desire for personal comfort has greatly increased the demand for such goods. The output in 1919 was valued at $713,139,000. About 55 per cent of this product was made in New York and Pennsylvania. The largest producing centers were Philadelphia, New York City, Utica, Amsterdam, New York, and Reading, Pennsylvania, named in the order of their importance.

Among woolen manufactures, the growth in production of worsted cloths, and of carpets and rugs is a particular

feature. The manufacture of worsted cloths for men's wear did not begin in the United States on a commercial scale until the decade 1860–1870. The value of the product increased from $3,701,000 in 1860 to $700,537,000 in 1919. In the case of carpets and rugs, the fundamental improvements date back to the inventions, about 1844, of Erastus Bigelow, who adapted the power loom to the weaving of ingrain carpets; subsequently he adapted the power loom to the weaving of Jacquard Brussels and to Wilton carpets. In 1856 Smith and Skinner of Yonkers, New York, obtained patents covering the use of the power loom in the production of Axminster carpets. This invention, however, was not utilized until about 1867. These improvements laid the foundation of the modern carpet industry. The production of carpets and rugs, other than rag, in the United States rose from $7,857,000 in 1860 to $123,253,000 in 1919. The growth of manufacture of textile fabrics is summarized below:

GROWTH OF THE TEXTILE FABRIC INDUSTRY, 1859–1919

Year	Number of Establishments	Number of Wage Earners	Capital	Value of the Product
1859	3,104	191,152	$148,440,000	$211,707,000
1869	4,709	267,321	285,175,000	418,527,000
1879	4,290	387,554	406,337,000	534,674,000
1889	4,056	497,822	729,333,000	730,567,000
1899	4,099	631,979	982,559,000	886,882,000
1909	4,825	834,087	1,717,795,000	1,591,736,000
1914	4,991	874,702	1,921,925,000	1,761,711,000
1919	6,087	969,260	4,102,969,000	5,006,639,000

254. **Men's Ready-Made Clothing.**—Although the beginnings of this industry are found in the period before 1860, the great improvements in the business which have revolutionized both methods of production and habits of consumers date from after the Civil War. Thus the ready-

made clothing industry, in its newer aspects, is a creation of the past fifty years. The wholesale manufacture of medium-grade goods began in a small way in New York City about 1835. The first systematic attempt "to make up clothing for immediate wear" may have originated a few years earlier. It has been suggested by writers on this subject that the "cradle" of the industry was at New Bedford, Massachusetts, where the manufacture was inaugurated "to supply the immediate and pressing needs of sailors returning from whaling voyages, or to stock their slop-chests for new adventures on the sea." During the decade from 1840 to 1850 an industry of considerable importance appeared in several of the cities along the Ohio River to supply cheap clothing for farm hands and negro slaves.

The great factors which have promoted the growth of the industry may be summarized as follows:

1. The introduction of the sewing machine about 1850, which made possible the manufacture of clothing on a large scale.

2. The demands incident to the Civil War, which made it necessary to supply hundreds of thousands of men with ready-to-wear clothing. Thus the custom was established among a large number of men of wearing the factory product. Soldiers returning from the War were wont to overlook minor defects in fit, and, in addition, the lower price of the ready-made goods, compared with tailor-made suits, was an advantage in their favor.

3. The growth of the textile industries which afforded an ample and a cheap supply of the chief raw materials used.

4. The development of new marketing methods which enabled the manufacturer both to control his market and to afford a greater stimulus to the consumer. In this category should be included the rise of the large-scale retailer,

various systems of direct selling, and the rise of the specialized clothing store.

5. New methods of advertising which made a direct and powerful appeal to neatness, style, and comfort.

6. Characteristics of the American consumer which causes this appeal to become effective.

7. The introduction of many inventions to aid in cutting, pressing, and sewing, and the use of electricity as a motive power.

8. The continuous supply of cheap immigrant labor which has been largely used in this industry.

Machines for cutting cloth were introduced about 1870. The first of these consisted of long knives working perpendicularly like saws and cutting through a number of thicknesses of cloth. Later, the knives were replaced by circular disks, operating like buzz saws, which cut through almost any number of thicknesses. In the larger establishments pressing came to be done by large irons heated by gas or electricity, instead of the iron heated on open stoves.

The new mechanical devices afford a splendid illustration of the saving of labor and of the increase of production. To give a few examples, "By the use of this machine (for steam sponging) the cloth of 100 coats was prepared by two persons in 1 hour and 48 minutes, as against 11 hours and 40 minutes required by the hand method. For 100 pairs of trousers the time was 1 hour and 8 minutes, as against 8 hours and 20 minutes by the hand method. For a like number of vests the time required was 20 minutes, against 3 hours and 20 minutes. . . . While it required 1,000 hours to sew coats by hand, it took only 66 hours and 44 minutes when the same seams were made by the use of the sewing machine." Similar savings were obtained by the use of other labor saving devices.

Immigrant labor has been a large factor in the growth of the industry. Soon after 1850 the Irish came largely

into the trade. "Next the Germans entered into the manufacture of ready-made clothing, and by them was introduced a division of labor in the marketing of the garments. . . . Prior to 1876 there was little change in the methods of manufacture, but following the great influx of Russian Jews, which began about that time, the task system was introduced."

The ready-made clothing industry was one of the first to develop the evil effects of the sweating system, characterized by long hours, low pay, contract work, and labor carried on under unsanitary conditions. Many of the larger establishments, however, have largely overcome these evils. One of the great criticisms against the sweating system was the distribution of materials over a wide territory where the work was done under unsanitary conditions. Massachusetts, in 1891, was one of the first States to enact laws to remedy the shortcomings of this system. The purport of these laws was that clothing could not be produced in tenements except under license, that factory inspectors should determine the conditions before license was granted, that manufacturers were required to keep a register in which was to be found the names of persons producing clothing in tenements, that only members of the family could be employed in such rooms, and that a tag or label was to be affixed to garments bearing the legend "tenement made." While the early effect of such laws was to put an end to the chief evils of the sweating system, ultimately a number of the manufacturers were driven to some of the neighboring States.

This industry is largely localized in a few cities where manufacturers may obtain the advantages of outside shop help, abundant labor supply, and of various marketing facilities. In 1919 New York City ranked first in the value of the output with a product valued at $564,408,000; Chicago was second with $190,016,000; Baltimore third with

$83,466,000; and Philadelphia fourth with $54,074,000. These four cities together produced more than 75 per cent of the product. The total value of men's ready-made clothing manufactured in the United States in 1919 was $1,162,985,000. The value of the product in 1860 was $80,830,000.

255. Women's Ready-Made Garments.—The inception and development of this industry, at least as it applies to factory products, lie wholly within this period. Prior to 1880, the business was confined almost entirely to the manufacture of cloaks. Subsequently suits, and other commodities, which go under the collective name of lingerie, were added. At present the factory output includes in addition to the articles just named dresses, skirts, petticoats, kimonos, wrappers, capes, and various other goods for women's, girls', and children's wear.

Although a greater amount of skill is required in the production of women's than of men's garments, immigrant labor is required to a large extent. In the cheaper grades of work, women have largely replaced men on account of the lower wage they will accept.

The value of the product in 1860, principally customs work and repairs, was $7,181,000. The amount in 1919 was $1,208,543,000. As with men's clothing, localization is largely determined by neighborhood to the market, by certain marketing facilities, and by an adequate supply of labor. Concentration is even greater than with men's garments. In 1919 nearly 72 per cent of the product was manufactured in New York City, that is, a product valued at $866,244,000; Philadelphia ranked second with about 6 per cent of the output, or $69,183,000, and Chicago third with about 5 per cent, or $64,203,210.

256. Boots and Shoes.—Prior to 1845, which marks the first successful application of machinery to American shoemaking, the industry was in the strict sense a hand process. The leather-rolling machine came into use about that year.

With this improvement "a man could do in a minute what would require half an hour's hard work with a lap-stone and hammer." But the invention which probably accomplished more than any other in revolutionizing this industry was the McKay sewing machine, introduced about 1860. About this time steam and water power became important resources of the industry, and this change made possible the introduction, on an extensive scale, of the Howe sewing machine. Since that time a long list of great inventions put this industry among the first of those favored with modern machinery. Summarizing the accomplishments of the past forty years, our Census for 1900 contains the following:

> At the present time the genius of the American inventor has provided for every detail of shoemaking, even the smallest process being performed by mechanical devices of some kind. This has naturally made the shoemaker of to-day a specialist, who very seldom knows anything of shoemaking apart from the particular process in the performance of which he is an adept, and from which he earns a livelihood. The American shoe of to-day is the standard production of the world. It is in demand wherever shoes are worn, and although the tools which have made its production possible have been perfected in the face of most discouraging conditions and opposition, they are to-day classed among the most ingenious productions of a wonderfully productive epoch.

While the many inventions have been of immense advantage to the industry, manufacturers have been favored by other conditions; materials have been relatively abundant and cheap; the increasing scale of production made possible the organization of factories in the most effective way; meanwhile, through the powerful agency of modern advertising, and aided by systems of direct selling which gave producers a better control over the market, consumption has been greatly stimulated.

While Brockton and Lynn still hold their historic position in this industry, there has been a marked tendency in recent years for the manufacture to move westward, due chiefly to the growing interior markets, and to the westward movement of the tanning industry. In 1919 St. Louis ranked fourth among the cities producing boots and shoes, Brockton, Lynn, and New York ranking ahead of that city. Large numbers of shoes are also produced in Boston, Haverhill, Manchester, New Hampshire, Cincinnati, Rochester, and Philadelphia.

257. Food and Kindred Products.—We should include in our discussion one more important group of manufactures. Food products are, of course, among the indispensable commodities. The total output of this group in 1919 was valued at $12,438,891,000, or nearly 20 per cent of the total value of the manufactures of the country, Of this sum, the vegetable products amounted to $6,498,188,000 and animal products to $5,940,703,000. Much the same general course of development prevailed here as with other manufactures discussed in this chapter. The growth has been characterized by a great increase in demand, due to the rapid increase in population since 1860, by the addition of many new products, by the presentation of some old products to consumers in new ways, by great technical improvements in the process of manufacture, by new methods of marketing, by improved methods of factory organization and management, and in many instances by concentration of manufacturing into large establishments, and by the localization of industries at certain favored places. These statements may also serve as a summary of the general features of manufacturing development since 1860.

Due to many of the changes named above, the aspects of the food-product industries is totally different from that which prevailed in 1860. An impressive feature in the change has been the migration of a number of important

industries from the home to the factory, as with the manufacture of canned fruits and vegetables, the production of butter and cheese, the preparation of poultry and its products, and the production of preserves and pickles. Many new industries have been added, such as the manufacture of beet sugar, inaugurated about 1880, with a product in 1919 valued at $149,155,000, and peanut roasting, grinding, and cleaning, valued the same year at $33,354,000. The enormous growth of the urban population produced notable changes in industries producing bread, bakery products, and confections. Many new methods of presenting commodities to consumers have been introduced. Package products, such as cereals, breakfast foods, macaroni, vermicelli, canned and potted meats, blended and refined syrups made of maple and other sugar, coffee substitutes, Saratoga chips, and numerous others, will occur to the reader as belonging to this class. A summary of some of the leading food products will indicate what the present status of these industries is:

VALUE OF LEADING FOOD PRODUCTS IN 1919

Animal Products		Vegetable Products	
Slaughtering and meat packing	$4,246,290,600	Flour and gristmill products	$2,052,434,000
Butter	583,163,000	Bread and bakery products	1,151,896,000
Condensed milk and milk products other than butter and cheese	339,506,000	Sugar refining	730,986,000
Cheese	143,455,000	Confections and ice cream	637.209,000
Canned and preserved fish	77,284,000	Food preparations	631,598,000
		Coffee and spice, roasting and grinding	304,791,000
		Canning and preserving fruits and vegetables	402,242,000

258. Slaughtering and Meat Packing.—This industry has displayed a remarkable growth since 1860; with a product valued at $1,651,965,000 it ranks first among American manufactures. From 1820 to about 1860 Cincinnati had been the chief packing center of the country; other cities in the Ohio Valley were important producers. But with the westward movement of the corn belt, with the development of adequate banking facilities in some of the further Western cities, with the growth of means of transportation, and particularly with the invention of means of refrigeration, particularly as applied to storage and transportation, the packing industry moved further west, notably to Chicago, which shortly after 1860 began to take the lead in the business. Meanwhile an important packing industry grew up at Kansas City, Kansas, Omaha, St. Louis, and at East St. Louis, Illinois. Until the latter part of the decade 1860–1870 the industry was confined largely to the curing and salting of pork products, and to some extent to the barreling of beef. The growth of beef packing was due to the adoption of various systems of artificial refrigeration. The refrigerator car was based on a patent issued to William Davis of Detroit in 1868. The following year the first cargo of fresh beef was shipped from Chicago to Boston, inaugurating a branch of the business which has grown to such large proportions. Other causes involved in the growth of slaughtering and meat packing were the introduction of processes of chilling and freezing, improvements in methods of canning, the discovery of uses for the numerous waste products of the packing plants, and the wonderful economies of the business obtained through systems of organization. The expansion of American agriculture has supplied an ever increasing number of animals to the packers. Meanwhile the increasing consuming power of the American public has been the chief factor operating on the demand.

The industry is chiefly localized in Illinois, Kansas, New York, Nebraska, Missouri, and Iowa, ranking in the order named. Chicago is the leading packing center reporting a product valued in 1919 at $1,083,090,000, or nearly 25 per cent of the total. The growth of this business since 1860 is summarized below:

GROWTH OF THE PACKING INDUSTRY

Year	Number of Establishments	Number of Wage Earners	Capital	Value of the Product
1859	259	5,058	$10,158,000	$29,441,000
1879	872	27,297	49,419,000	303,562,000
1899	921	68,534	189,198,000	785,562,000
1909	1,221	87,813	378,319,000	1,355,544,000
1919	1,304	160,996	1,176,483,000	4,246,290,000

259. **Flour and Grist-Mill Products.**—In 1860 the production of flour and meal was the most important industry in the country, judged from the value of the product. In 1914 the manufacture ranked third, having yielded the first place to slaughtering and meat packing. The growth of the industry has been favored by the westward movement of population which opened up the great grain section west of the Mississippi, by the development of transportation, which benefited both the farmer in marketing his grain and the miller in obtaining his raw materials and in disposing of his finished product, and by the introduction of the roller process of milling which both improved the quality of flour and led to more rapid production. Although the industry is conducted in many places on a small scale, there is a noticeable concentration at some places and in large establishments. The average amount of capital invested per establishment in 1860 was about $6,100, and in 1914, $35,250. In many parts of the United States,

where milling is confined to the supply of a local demand, there are a large number of small establishments; but, on the other hand, in those sections where milling is the chief industry, concentration is a great characteristic.

A notable feature in the industry since 1860 has been the development of the large milling business of the Northwest. Minneapolis is the chief milling center of the country. In 1914 Minnesota reported flour valued at $148,244,000. Of the Western States, Kansas, Texas, Missouri, Washington, and California are the largest producers. In all these States the output in 1914 exceeded $20,000,000. East of the Mississippi the leading States are Ohio, Illinois, Pennsylvania, and New York. The wide dispersion of the industry is shown by the fact that flour is produced in every State in the Union. In only one was the output valued at over one hundred million; in two it was valued at from fifty to one hundred million; in nine, over twenty-five and under fifty million; and also in nine, over ten million and under twenty-five million. The total value of the product in 1860 was $248,580,000; in 1919, $2,052,434,000.

260. Other Industries.—It would be impossible in one chapter even to outline the growth of other important industries. The development of those we have discussed,

OTHER INDUSTRIES; VALUE OF PRODUCT, 1919

Printing and publishing	$1,536,407,000	Paper and wood pulp	$788,059,000
Lumber and timber products	1,387,471,000	Furniture	571,356,000
Tobacco manufactures	1,012,932,000	Gas, illuminating and heating	329,278,000
Copper, smelting and refining	651,101,000	Oil, cotton seed and cake	581,244,000
Liquors, malt	379,905,000	Liquors, distilled	31,854,000
Petroleum refining	1,632,532,000	Lead, smelting and refining	196,794,000
Leather	981,544,000	Carriages and wagons	91,463,000

however, is typical of the others. We have given above a statement of the value of the product of certain great manufactures which we have not been able to discuss in this chapter.

261. **The United States Census.**—We should not dismiss the subject of manufactures without brief reference to the work of the Federal Government in collecting and tabulating statistics of industrial matters. The varied work of the Bureau of the Census is the product of the needs of the Government in devising industrial policies, and of business men who are seeking exact information about industrial conditions in the country. The Constitution provided for the taking of a census in order to determine the apportionment of representatives in Congress, but the work has expanded far beyond the conception of the earliest census takers. The First Census, taken in 1790, related solely to population. At the Third Census in 1810, an attempt was made for the first time to collect industrial statistics; the returns covered kinds, quantities, and values of manufactured goods for each State and Territory, together with fragmentary statements relating to quarries. The Census of 1820 proceeded with greater detail, showing for the first time the numbers engaged in agriculture, commerce, and manufactures. The Census of 1850, taken under authority of a law drawn with much more care than any former Census Act, constituted the beginning of scientific census taking in the United States. Successive reports have greatly elaborated schedules and details. The returns of the United States Census now constitute the most valuable resource not only for the student of economic history, but for business men of all descriptions. Census taking was put on a permanent basis by the Act of 1902, which provided for the creation of a permanent Bureau of the Census, originally a branch of the Department of the Interior, but in 1913 transferred to the Department of Commerce.

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CHAPTER XXI

MANUFACTURES: III, THE COMBINATION MOVEMENT

262. **The Modern Aspects of Business.**—In the last two chapters we have discussed the causes of the growth of manufactures and have traced briefly the development of certain great industries. Several related questions now require attention. In this chapter, and in the one that follows, we shall discuss in order the combination movement, labor problems, and tariff changes.

Strictly speaking, these are questions which relate to all departments of industry, to commerce, mining, agriculture, and forestry, as well as to manufactures. The combination movement, for example, has taken place among commercial enterprises, such as retailing and wholesaling, among banks, and in mining, as well as among manufactures. Commercial and agricultural enterprises also have their labor problems. The tariff, moreover, affects all branches of industry; various products of the field have been favored by protection, and the movement of commerce is greatly affected by tariff policy. The three topics named above, therefore, might be discussed in connection with the development of agriculture or commerce. But their bearing on manufactures is most obvious, and the features of their development may be discussed most conveniently in this place.

In the three topics named above notable changes have taken place since 1860. Consider first the growing size of business. This stands out as one of the great characteristics of industrial growth since the Civil War. The de-

velopment has a number of aspects: (*a*) there is the question of the external form of business; (*b*) the growing size of the business unit; (*c*) the consolidation of separate enterprises under one direction. These changes have given rise to two of the greatest problems confronting the American public to-day, namely, (*a*) the corporation problem, and (*b*) the trust problem. The first is a matter of the form of business; the second is largely a problem of monopoly.

263. **Business under the Corporate Form.**—Prior to 1860 business was usually carried on either by individuals or by partnerships, and the amount of capital engaged in an organization was small, compared with enterprises of later times. Occasionally, where it was desirable to raise a considerable amount of capital, or to distribute risks, the business was put in the corporate form. This was particularly the case with banks, turnpikes, the early railroads, and with some shipping ventures. But the States were afraid of corporations, believing that somehow they possessed monopoly powers. The case of New York was typical. It was not until the adoption of the Constitution of 1846 in that State that incorporation under general laws was fully conceded, "and thus," according to a writer of the time, "was consummated one of the greatest triumphs that our American experiment of equal rights has ever achieved in practical results." The Constitution of 1777 made no specific provision for the creation of corporations, and that of 1821 for the first time recognized such organizations "as one of the interests which the organic law should regulate."

Partly because of the change of attitude on the part of the public, and partly because of the demands of new business conditions, legislatures became more liberal and incorporation under general laws was permitted. Illustrating the new point of view a writer in Hunt's *Merchant's*

Magazine about 1848 characterized the corporation as "the rose of wealth without its supposed thorn; artificial pecuniary giants, without the dangers that might be consequent to the existence of natural giants." Enumerating some of the advantages of such organizations, this writer said: "Thus corporations transfer social progress from the rich, who are always comparatively few in number, to the relatively poor, who are numerous. Nor is this all. Men's timidity and lack of enterprise are naturally great in proportion to the largeness of their property; hence, corporations, in transferring social progress from the rich, transfer it from the timid to the bold, as well as from the few to the many." Possibly this author would have changed his mind in some respects if he had known the modern corporation, but his opinion is indicative of the new point of view.

New business conditions after 1860 were also responsible for the growing interest in the corporate form. Railways had opened vast markets for merchants and manufacturers; enterprises were growing in size, and much larger amounts of capital were required. At the same time the risks of enterprise were much greater. Producers were selling to large numbers of consumers they did not know and had never seen. Gradually competition became a more potent factor, particularly when railroads began to admit producers of one region into the markets of other producers. The telegraph, and later the telephone, worked in the same direction. Thus it was necessary to employ a form of business which would both distribute risks among a larger number of proprietors and permit the raising of more capital. The corporate form offered the desired advantages. Meanwhile the great increase in wealth afforded a supply of financial resources for the new organizations.

According to a definition which is frequently quoted, a corporation "is an artificial being, invisible, intangible,

and existing only in the contemplation of the law. Being a mere creature of the law, it possesses only those properties which the charter of its creation confers upon it. . . . Among the most important are immortality, and, if the expression may be allowed, individuality; properties by which a perpetual succession of many persons are considered as the same, and may act as a single individual." Under the corporate form many persons may contribute to an enterprise; this is managed by persons of their own choosing. The organization is looked upon as a body separate and distinct from the persons who contribute the capital. For a number of reasons this form is suitable for the management of modern business; indeed, it is difficult to understand how many of the large-scale enterprises could be carried on under any other organization. Some of the advantages are: (*a*) it facilitates the raising of large amounts of capital for investment in business; (*b*) it relieves persons, who have a surplus to invest, of the worries and burdens of management; (*c*) it limits the risks of investors usually to the par value of the stock they hold; (*d*) the organization is not disrupted by death or retirement of members; (*e*) the shares may be sold, or otherwise transferred so that a person may withdraw from an enterprise when he wishes. Some of our modern corporations have each thousands of stockholders distributed over the country, and to some extent in Europe. Considering the country as a whole, hundreds of thousands of people are directly owners of stock in corporations; and indirectly, through investments in life and fire insurance policies, through interest in savings deposited in banks, and through inter-corporate holdings millions of people have an interest in the corporations of the country. This institution, therefore, largely permeates industrial and social life.

The dominance of this form of business is shown in the table on the following page.

ORGANIZATIONS ENGAGED IN MANUFACTURE, 1919

Character of Ownership	Number of Establishments	Per Cent Distribution	Wage Earners	Average per Establishment	Value of Products	Per Cent Distribution
All classes	290,105	100.0	9,096,372	31.0	$62,418,078,000	100.0
Individuals	138,112	47.6	623,469	4.0	3,536,321,000	6.2
Corporations	91,517	31.5	7,875,132	86.0	54,744,392,000	87.1
All others	60,476	20.8	597,771	10.0	4,137,364,000	6.7

It appears from the table given above that while corporations constitute only 31.5 per cent of the businesses engaged in manufacturing in 1919, they employed about 86 per cent of the workmen and produced 87 per cent of the product. Some industries are completely organized in the corporate form, as with the manufacture of boots and shoes, locomotives, and general shop construction and repair of cars.

264. **Corporation Evils.**—While the growing use of the corporate form has been an important cause of industrial development, it has raised serious problems. If all corporations obeyed the spirit of the law, and if promoters and directors were moved only by the Golden Rule, this institution would work wholly for good. But, unfortunately, it often turns out otherwise. If a corporation is a small republic, as it has sometimes been called, it falls heir to some of the shortcomings of democracy. Power must be delegated because stockholders, sometimes numbering thousands, cannot take part in the management even if they wished to do so. Consequently the affairs of the organization must be left largely in the hands of directors chosen at the annual meetings. Because stockholders are often widely scattered over the country and even in foreign countries, elections of directors are frequently in the hands of a few men who hold the proxies. As long as dividends are received regularly, and there is the absence of apparent

mismanagement, stockholders are quiescent. Many evils arise out of this situation. Among these are speculative management, fraudulent promotions, inadequate representation of minorities, insufficient reports of the affairs of the organization, and overcapitalization, or stock-watering. In connection with the evil last named one authority has said:

> The general public avers, in behalf of its interest as consumer, that while of course there is no direct relation between capitalization and prices, an excess of securities craving dividends is in itself an indirect incentive to unreasonable charges. An even more cogent objection than this is that the absence of any direct relation between investment value and the volume of stocks and bonds confuses all parties concerned. . . . It invites unearned profits on the part of promoters leading to corporate organization or financial readjustment in unnecessary and unmerited instances. It stimulates extravagance on the part of banking syndicates in the prices offered or paid for constituent companies. It facilitates internal mismanagement, even promotes actual fraud, by the ease with which the most alert stockholders may be confused as to the real standing of their own company. And finally it invites speculation and stock-market jobbery among the public by the relatively small capital necessary to deal in, or acquire control of, considerable blocks of stock.

Another shortcoming of corporations is the great variety of securities incident to the financing of the organizations. Although variety is necessary from the financier's point of view, this condition is frequently a cause of loss to investors because they cannot understand the status of the securities they hold. Another evil should be added: the stock feature of the corporation makes possible an easy exchange of directors among the organizations—interlocking directorates—a practice which has been largely used in the past to give organizations in competing lines control over the market for commodities, and thus in a measure to eliminate

competition. The joint-stock principle of the corporation also made possible the holding company, which is the most effective device known for perfecting combination. The organization of the legal trust was also made easy by this feature.

Although writers and speakers in the past have laid great stress on corporate evils, it should be added that among many of the older corporations there has been a decided change for the better. And even among others public opinion and the operation of the laws are gradually producing reform. Evils are a necessary incident to rapid economic growth of any kind, and it sometimes requires years to put any new institution on a satisfactory basis. Reform should proceed with great care. Stated broadly, "the problem of public policy towards business organization is to combine prevention of abuse with progressiveness, to secure justice and safety without hindering initiative and flexibility."

265. The Increasing Size of the Business Unit.—As we have seen above, one of the great causes for the growing size of the business unit was the use of the corporate form of organization which made possible the assembling of large amounts of capital under one direction. But other important reasons were involved: the development of means of communication, by widening the markets, increased the opportunities for large-scale operations by affording a greater outlet for the products. Competition, also, greatly stimulated the movement by making necessary greater economies among rival establishments. These economies were obtained by the use of numerous labor-saving devices, by a better organization of the factories themselves, and by a minute division of labor. Changes under the caption last named were of great importance because they resulted in increased skill and productivity of the workman; they also made possible a saving of time which was formerly lost by

men passing from job to job in the factory, and they made possible the more continuous use of all the equipment of the establishment. Industrial managers realized promptly that there were other advantages of large business, such as better facilities for using by-products, better control over the final consumer's market, and greater opportunities for bargaining with labor organizations, with banks, and transportation companies. This array of advantages was very great. The line of least resistance, therefore, was to increase the scale of production both because larger establishments afforded a better instrument for competition, and because of the prospective economies.

Taking into account all the manufacturing establishments of the United States, the average amount of capital invested in an enterprise in 1860 was only $7,190; in 1914 it was $82,602. The average number of workmen engaged in factories at the former date was 9.3, and at the latter 25.5. These figures, of course, do not tell the whole story, because they do not indicate the amount of capital and the

AVERAGE PRODUCT, CAPITAL, AND WAGE EARNERS IN ESTABLISHMENTS IN GIVEN YEARS

	1860	1870	1880	1890	1900	1910	1920
Product	$13,420	$13,420	$21,100	$28,070	$25,418	$76,993	$215,157
Capital	7,190	6,720	10,960	19,020	19,269	68,638	153,293
Wage Earners	9.3	8.1	10.6	13.8	10.4	24.6	31.0

ESTABLISHMENTS CLASSIFIED ACCORDING TO SIZE, 1919

Value of Product	Establishments	Per Cent Distribution	Wage Earners	Per Cent Distribution	Value of Product
Less than $5,000....	65,485	22.6	45,813	0.5	$ 167,085,044
$5,000 to $20,000.....	87,440	30.1	249,722	2.7	945,602,857
$20,000 to $100,000...	77,911	26.9	793,528	8.7	3,571,283,301
$100,000 to $1,000,000.	48,855	16.9	2,834,597	31.2	15,433,003,954
$1,000,000 and over..	10,414	3.6	5,172,712	56.9	42,301,103,617

number of men employed in the very large factories. In 1914 3,819 establishments, out of a total of 275,791, reported capital of $1,000,000 and over. They employed 35.2 per cent of the wage earners and manufactured 48.6 per cent of the product. Only 33,985 establishments of the total given above employed more than $100,000 capital, but they employed 77.9 per cent of the wage earners and manufactured 84.7 per cent of the product. The big establishments, therefore, while not numerous, very largely supply the country with manufactured goods. The table on page 476 conveys some idea of the changes which have taken place since 1860.

266. **The Combination Movement.**—Another aspect of the growth of big business is the combination movement. Some industries have grown in size by the expansion of the existing business; others have attained their present proportion both by internal growth and by combination. Sometimes the union has taken place only among enterprises of the same kind, as where distilleries were brought under one management, but sometimes the organization takes in not only those in the same, but in related, lines. Some of the corporations in the steel business illustrate this development. Not only the manufacturing of given products, but the operation of mines, transportation companies, blast furnaces, rolling mills, the production of finished iron and steel products of a number of kinds, and even in some cases the marketing of the finished products are under a single control. This method of combination gives the following advantages: it relieves manufacturers of uncertainties as to raw materials and the marketing of finished commodities; it cuts out various middlemen, and it tends to eliminate competition, and thus secures for the business some monopoly profit.

Some forms of combination existed in the United States before 1860, but such organizations were of relatively small

importance. As early as 1830 salt producers along the Kanawha River in western Virginia were associated in a combination for the purpose of restricting the output of salt furnaces and keeping up prices. For a brief period this combination attracted a considerable amount of attention, particularly among Western Representatives in Congress who were concerned about the advance in price of salt to farmers who were their principal constituents. The great combination movement, however, which has attracted so much attention in recent years, began on a considerable scale during the revival of business after the panic of 1872.

The principal kinds of combination which have dominated the field at one time or another since 1860 have been the following: (*a*) pools, (*b*) legal trusts, (*c*) holding companies, and (*d*) consolidations in the form of amalgamations and mergers.

The earliest form to attract attention was the pool, which was employed both among manufacturing enterprises and among railroads. Professor W. Z. Ripley, writing about 1905, distinguished four periods in the growth of the combination movement in this country. The first dated from the revival of business after the long depression of 1873–1879 and extended to about 1887. This period was characterized by an increase in the size and number of large-scale organizations. Various pools and the Standard Oil Trust foreshadowed the future. Sometime before the beginning of this period the Michigan Salt Association, which has been of considerable interest to students of the combination movement, was formed, and for a number of years experienced a varied history. In substance this combination operated through an agreement "for the purchase of the entire output of all the important producers in a certain field." Some of the notable pools of the time were found in the distilling industry, in the iron and steel in-

dustry, and in the manufacture of cordage. Pools had some advantages both from the point of view of their managers and from that of the public, but they were difficult to manage, and therein was found their chief weakness. They were but "temporary expedients" and afforded no certainty for stability of prices or of industrial policy. This shortcoming was probably the principal cause for the quest of another form of organization which would give firmer control over the parties to the combination. Thus was ushered in another stage in the development of big business.

The second period, according to Professor Ripley, covered the years from 1887 to 1897. It was characterized chiefly by the organization of trusts in the strict legal sense. The pioneer in this movement was the Standard Oil Trust in the agreements of 1879 and 1882. The prospective advantages of the new form soon attracted the attention of other business men. Other notable trusts of this description were found in distilling and in the business of sugar refining.

Meanwhile public attention was directed strongly to the monopoly problem. Already railroad combinations had received tentative treatment in the Interstate Commerce Act of 1887. State legislators turned to the new danger, and from 1889 to 1893 the States were actively engaged in framing measures against the trusts. In 1890 the Federal Government itself attacked the problem by the passage of the Sherman Anti-Trust Law, which is one of the great landmarks in legislation of this description.

The industrial depression from 1893 to 1897 put a check upon the combination movement. Meanwhile the new laws, together with several important court decisions, gave the development a new turn. At this juncture New Jersey revised her statutes, inserting a provision which enabled a corporation to hold stock in other corporations. Shortly

several other States "liberalized" their laws granting a similar privilege. "Vast possibilities were involved in the amendment of this clause in a code of American corporation law. Corporate organization could henceforth be promoted, not to serve the ends of industrial management, but solely in order that financial combinations might indirectly control operating companies through ownership of their stock." The holding-company principle had been employed as early as 1870 by the Pennsylvania company, organized to hold and control stocks of subsidiary corporations owned by the Pennsylvania Railroad Company west of Pittsburgh. It was employed also, about 1880, by the American Bell Telephone Company and a little later by the Southern Pacific Company. But in these cases the organizations came into existence under special laws. The innovation in the case of the New Jersey statutes was that corporations for the purpose of holding stock could be formed under general laws.

Partly because of adverse decisions against legal trusts, and partly because of the inviting opportunities of the new laws, combinations began to take the form of holding companies. Thus the third period, dating from 1897 to 1904, is characterized by the appearance of a number of organizations in this form. The Federal Steel Company with a capital of about $100,000,000 was chartered by New Jersey in 1898; the Amalgamated Copper Company, capitalized at $75,000,000, was formed the following year; and 1901 witnessed the formation of the United States Steel Corporation with stocks and bonds aggregating $1,400,000,000. In the railway field the Northern Securities Company and the Rock Island Company were types of organizations taking the holding-company form. The courts again intervened, and this latest form became uncertain. Eventually many of the larger organizations sought to make their position more secure by consolidation.

The fourth stage in the combination movement dates from 1904. Some of the leading features were a number of "speculative scandals," the great decline of stock-market quotations in 1903, "the failure of bright promises made by promoters, a reviving interest in railroad regulation and the tariff, and an increasing demand for publicity" in the conduct of affairs of big business. Proceedings under the Sherman Anti-Trust Law became more numerous. In two notable instances the Government succeeded in dissolving great organizations, namely, in the case of the Standard Oil Company and the American Tobacco Company, which resulted from decrees handed down by the Supreme Court in the spring of 1911.

267. **What Is a Trust?**—Writers on the subject of trusts have defined the term in different ways. Sometimes they mean "legal trusts," the form taken by the great prototype, the Standard Oil Company. Thus Professor Ripley says, "A trust may be defined as an organization managed by a board of trustees to whom all the capital stock of the constituent companies is irrevocably assigned; in other words, the original shareholders accept the trustees' certificates in lieu of former evidences of ownership." Sometimes the term "trust" means a combination. Thus the Twelfth Census of the United States contains the following: "For the purpose of the Census the rule has been adopted to consider no aggregation of mills an industrial combination unless it consists of a number of formerly independent mills which have been brought together into one company under a charter obtained for that purpose. We therefore exclude from this category many large establishments comprising a number of mills which have grown up, not by combination with other mills, but by the erection of new plants or the purchase of old ones."

Sometimes the term "trust" is synonymous with big business. Writers sometimes associate the idea with that

of monopoly. There is probably a logical sequence in the developing use of the term. It originated with the legal trust. But since this resulted in a combination of businesses the term came to be applied to combinations. The latter, however, were usually big businesses, and these in turn frequently possessed monopoly powers. Hence the term "trust" came to be applied to these two conditions just named.

268. **The Number of Combinations.**—When the Census for 1900 was taken, the combination movement had assumed such large proportions that it was deemed essential to enumerate such enterprises. Accordingly the Census for that year listed 185 industrial combinations which controlled 2,216 plants. Of these 2,040 were active and 176 idle. The total capitalization of these organizations amounted to $3,619,039,000, distributed as follows:

INDUSTRIAL COMBINATIONS: CAPITALIZATION, 1900

	Authorized	Issued
Total	$3,619,039,200	$3,093,095,868
Bonds	270,127,250	216,412,759
Preferred stock	1,259,540,900	1,066,525,963
Common stock	2,089,371,050	1,810,157,146

Combinations were most numerous in the iron and steel industry, in the production of food and allied products, in the manufacture of chemicals and related products, in the production of liquors and beverages, and clay, glass, and stone products.

269. **The Advantages of Combination.**—Many advantages are claimed for business in the combined form, but it is probably true that some of these are more apparent than real. Some of the vaunted advantages, moreover, are due as much to large-scale operations as to combination. The leading points in favor of combination are: (*a*) operation

only at the most efficient plants, especially in dull times when only a part of the capacity of the establishments can be used; (*b*) elimination of some of the expenses for advertising and salesmen; (*c*) specialization of production at the various plants of the combination; (*d*) the application of the principle of the deadly parallel whereby the costs of production at the various plants may be carefully compared, and thus wastes and ineffective methods easily detected; (*e*) the full use of patents and of the best methods of production; (*f*) greater facilities for the use of by-products; (*g*) elimination of some of the administrative expenses, particularly in the case of duplicated offices occupied by high salaried officials; (*h*) saving of cross freights because orders may be filled from the nearest plants; (*i*) better control over the market from manufacturer to consumer; (*j*) various other economies which come from large scale production, such as better organization of the factors of production, economies in the division of labor, and greater power in bargaining for raw materials, labor, and capital.

From the promoter's point of view combination affords great opportunity for the elimination of competition and for the control of the markets. Thus all those factors which in recent years have tended either to increase the intensity of competition, or to increase the scale of production, lie at the basis of the combination movement.

270. **Unfair Competition.**—A peculiarity of modern business has been the appearance in an aggravated form of a number of unfair practices. While it is true that unfair methods prevailed to some extent among the smaller businesses of former times, the evil has become glaringly apparent with some of the big businesses of modern days. Although competition produces a number of desirable results, it is itself a cause of a number of practices which injure both other competitors and consumers. It is thus a

rather impressive anomaly involved in present conditions that laws must be devised to reform the evils of monopoly on the one hand, and those of competition on the other. Probably the reasoning of the lawmakers is that competition is the lesser of the two evils, and that, in the long run, business rivalry is the best policy, provided industry can be purged of malicious practices. At any rate, since the beginning of the attack on trusts about 1890, lawmakers and courts have fixed their attention on one goal, namely, the restoration and the maintenance of competition. Thus the efforts of the Government have taken two directions; first, the prevention of monopoly, except in the case of natural monopolies and those that arise from legal grant, and second, prevention of unfair methods of competition.

During its brief career the Federal Trade Commission has considered a large number of cases and has indicated what measures are to be prohibited. Local price-cutting is under the ban; the misbranding of goods, and misrepresentation and false statement about one's own or a competitor's merchandise or business are prohibited. The use of boycotts and blacklists is also proscribed. Likewise threats against competitors or consumers are regarded as unfair. So also all forms of espionage, whether for the purpose of obtaining lists of competitors' customers, or their trade secrets. The proscribed list also includes the enticing away of competitors' employees, the use of bogus or of independent companies for the purpose of cutting prices in given localities, the use of rebates to encourage dealers to purchase exclusively the goods of a given house, effecting long-term contracts with customers, refusing to sell to dealers unless they refuse to sell products of competitors, harassing of competitors by infringement of their patents, and the selling of machines under license agreements whereby purchasers may not use with such machines the supplies of competitors. This list is not complete, but

it will give the reader some idea of the kind of practices that have grown up under the modern competitive system.

271. **Anti-Trust Laws.**—The "first gun of the attack (on the trusts) was fired by the State of Louisiana against the American Cotton Oil Trust early in 1887, in an attempt to have that combination declared an illegal association so far as its operations in the State of Louisiana were concerned, and to secure the liquidation and winding up of its affairs." Shortly cases were started in an Ohio court against the Standard Oil Company of that State and in New York against the North River Sugar Refining Company. In both cases the courts declared the combinations illegal. Thus was inaugurated in a relatively small way the policy of proceeding against a big business when it was thought to be against the public welfare.

In the case of the North River Sugar Refining Company the court declared that the stockholders had acted beyond their powers, that they could not transfer their stock to another organization, and decided that under the existing laws in New York there could be no partnership of separate and independent corporations whether directly or indirectly, through the medium of a trust, and that manufacturing corporations must "be and remain several as they were created, or one under the statute." Since the organization was illegal on this count, the court did not think it necessary to consider the question of monopoly. In the Standard Oil case, however, the Ohio court considered the monopoly feature and declared that the object of the combination was to establish a virtual monopoly, and that all such associations were contrary to the laws of that State.

272. **The Sherman Anti-Trust Law.**—Public sentiment in 1888 was strongly in favor of legislation of some kind to curb the threatened evils of the trusts. The platforms of both political parties that year contained anti-trust

planks. It was reasonably certain, therefore, that Congress would take some action at an early date. The Sherman Anti-trust Law of 1890 was the result. The Act was brief and covered the case admirably. Contracts, combinations in the form of trust or otherwise, and conspiracies in restraint of trade were declared illegal. Persons who made such contracts, or who engaged in any such combinations or conspiracies were deemed guilty of misdemeanor, subject to a fine not to exceed five thousand dollars, or imprisonment not exceeding one year, or both. The law applied to commerce among the several States and Territories and with foreign countries. Under this Act it became the duty of the several district attorneys to institute proceedings in equity to prevent violations of the law. Property owned under the kinds of contracts named in the law, or owned by any proscribed combination, in the course of transportation from one State to another, or to any Territory, or to foreign countries could be condemned and seized. Persons injured in their business by persons or corporations who violated the law could sue in the courts and recover threefold damages, including a reasonable attorney's fee.

273. **The Dissolution of the Standard Oil Company and the American Tobacco Company.**—Although the combination movement in some form was developing rapidly, it was some years before the Government scored notable success in dissolving such organizations. The two cases which have attracted most attention were the Standard Oil Company of New Jersey, and the American Tobacco Company. In the instance of the former, the method of procedure was to distribute ratably to the stockholders of the great company shares of the various companies held by the Standard Oil Company of New Jersey. In the case of the American Tobacco Company the problem was somewhat more difficult because the organization comprehended quite

a variety of industries, such as the manufacture of tin foil, licorice paste, little cigars, chewing and smoking tobacco, and snuff. An attempt was made to restore some measure of competition in these various branches by ordering the creation of a certain number of companies in each line. Thus, according to the plan of dissolution, the cigarette business of the trust was divided among three concerns, the smoking-tobacco business among four, the manufacture of plug tobacco among four, and that of tin foil among two. These various companies issued their stock to the old American Tobacco Company in payment for the properties turned over to them, and this stock, in turn, was distributed *pro rata* among the shareholders of the trust. Thus the stockholders of this organization became the stockholders of the new companies in proportion to their holdings in the old. Judged from its results, the dissolution was more in form than in fact. Since a relatively small number of stockholders in the former company were still the principal owners of stock in the new organizations, a community of interest was set up which the decree did not reach and probably could not have reached without doing serious injustice to both large and small shareholders. Thus the problem of restoring competition was yet a long way from solution. That the new organizations have prospered since the dissolution is indicated by the rising quotations for their stock.

274. **The Clayton Act and the Federal Trade Commission Act.**—The monopoly feature of big business was the first to attract attention, but during the last decade public sentiment has been more and more directed to the methods of competition employed by the great companies. In many cases where such organizations have been investigated by the courts, it has been shown that while bigness is something of a menace to competition, it is largely the unfair methods that are responsible for the squelching of rivals.

These would have more chance of remaining in the field if the rules of the game could be defined and purified, and if all could be compelled to fight by the same rules. Moreover the situation could be improved, if the relations among competitors could be scrutinized by some administrative arm of the government which had power to watch the operation of the laws. Such a body could exercise vigilance over trade practices, could listen to complaints of injured parties, and, if necessary, could be of considerable assistance to the courts in devising methods of dealing with the problems of big business. Hence the demand for more legislation. This led, in 1914, to the enactment of two new laws, namely, the Clayton Act and the Federal Trade Commission Act.

The following are some of the leading provisions of the Clayton Act:

1. Certain practices are declared unlawful, such as discriminations in price between different purchasers, where the effect of such discriminations is "substantially to lessen competition" or to tend to the creation of monopoly. It is also unlawful for a person to lease, or make a sale or contract for the sale of goods, on condition that the lessee or purchaser shall not deal with competitors, if this practice tends to the lessening of competition or the creation of monopoly.

2. The Act prohibits the acquisition by one corporation of stock in another, where the tendency of such acquisition is substantially to lessen competition.

3. In the case of banks, it is made unlawful for a person to serve as director or other officer of more than one bank chartered by the United States, if deposits, capital, surplus, and undivided profits of any of the institutions exceed $5,000,000; a similar provision applies to private bankers and to officers of state banking institutions, where the capital, etc., exceeds the amount named above.

4. Another provision of the law restricts the relations of common carriers with construction companies, or with corporations which deal in securities and supplies.

5. The interlocking of directors is prohibited in companies engaged in interstate commerce, in cases where capital, surplus and undivided profits aggregate more than $1,000,000, if such organizations are competitors by virtue of their business or location.

The other Act of 1914 provided for the creation of a Federal Trade Commission, consisting of five persons appointed by the President. This Commission has extensive powers of investigation, it may summon witnesses, call for papers and documents, it may hear complaints of injured parties, it may order companies or persons to desist from using unfair methods, and, if necessary, it may present cases to the courts for trial.

275. **The Webb Export Act.**—In some respects the Sherman Act has been modified by this new measure, or at least its provisions have been defined. For some time businessmen entertained doubts as to whether the Sherman Act applies to combinations engaged in foreign trade. Associations in this field were necessary to enable domestic exporters to compete with great organizations abroad. The Webb Act was intended to clear up this issue and to confer certain privileges of combination on organizations doing an export business. An analysis of this act will be found in a later section.[4]

276. **Other Acts.**—The laws cited above by no means exhaust the anti-trust legislation of this country. In August, 1921, Congress passed the Packers and Stockyards Act which provided for the regulation of stockyards and related marketing agencies and granted certain power of control to the Secretary of Agriculture. In September,

[4] See Section 348.

1922, Congress passed the Grain Futures Act, designed to regulate the purchase and sale of grain for future delivery.

277. **Attitude of the Courts.**—Since the passage of the Sherman Act hundreds, perhaps thousands, of suits have been brought on the issues of monopoly and restraint of trade. What constituted restraints of trade was a hard nut for the courts to crack. Through a series of cases there was developed the doctrine of "rule of reason" in the judicial interpretation of the Sherman law. Thus it was held in the Standard Oil case: "Applying the rule of reason in the construction of the statute, it was held . . . that as the words 'restraint of trade' at common law and in the law of this country at the time of the adoption of the Anti-Trust Act only embraced acts or contracts or agreements or combinations which operated to the prejudice of the public interests by unduly restricting competition or unduly obstructing the due course of trade or which, either because of their inherent nature or effect or because of the evident purpose of the acts, etc., injuriously restrained trade, that the words as used in the statute were designed to have and did have a like significance."[5]

As to the method of determining reasonableness, we may quote the following from the Continental Candy Corporation *vs.* California & H. S. R. Company:[6] "The only way, or at least one of the most satisfactory ways, by which you can determine what is the reasonableness or unreasonableness of the restraint put upon trade by a contract is to consider the motive, extent and effect of the contract, consider the circumstances under which it was made, consider what the parties had in mind, what motives served to move them to the various ends they sought to attain, and then,

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[5] U. S. *vs* American Tobacco Co. (221 U. S. 106, 179, 180.)

[6] Continental Candy Corporation *vs* California & H. S. R. Co. 270 Fed. 302, 305; 1920.

in the light of these considerations, say whether or not that which they did was, under all the circumstances obtaining, in its nature and effect, unreasonable in its restraint upon the free flow of the commerce involved. So measured and tested, if it be unreasonable in its restraints upon trade, it lies within the prohibitions of the Sherman Law; if not, that law has no concern with it."

It should be added that not all the judges who have been in anti-trust decisions agreed with the doctrine of the "rule of reason." Some, in fact, have insisted that it amounts to judicial legislation, and as such, is contrary to the intention of the framers of the law.

278. **The New Point of View.**—In recent years courts have tended to consider not only the legal aspects of the cases, but the social and economic results. This is seen very clearly in United States *vs.* American Can Company, tried in the district court of Maryland.[7] A few quotations from the decisions will make the point of view clear. In the words of the court in administering the Anti-Trust Acts:

> Thus a number of great and powerful offenders against them have been dissolved. So far as is possible to judge, the consuming public has not as yet greatly profited by their dissolution. . . . While it (the defendant) had its origin in unlawful acts and thereby acquired a power which may be harmful, and the acquisition of which in any event was contrary to the policy of Congress as embodied in the statute, it has for some time past used that power, on the whole, rather for weal than for woe. . . . Defendant once sought to emancipate itself from restraints of competition. Its power is great, but, as has already been pointed out, is limited by a large volume of actual competition and to a still greater extent by the potential competition, from the possibility of which in the present state of the industry it cannot

[7] 230 Fed. Reporter, No. 4, pp. 902 ff.

escape. Those in the trade are satisfied with it. They do not want it dissolved. Whether its dissolution would profit any one is doubtful. The first and immediate effect would almost certainly be the reverse, whatever larger good might in the end come from it. . . . A dislike for useless waste and destruction makes one loath to follow the authority which may be understood as requiring the breaking up of defendant's organization, in spite of its proved power for good, albeit with serious possibilities of evil.

279. Open Price Associations.—In recent years a number of associations have attempted to escape the deadly effect of competition to eliminate some of the risks and wastes of industry by forming associations, one of whose purposes is to acquaint the trade with certain important information concerning prices, stock on hand, conditions of trade, number of orders, etc. Until recently there has been some doubt as to whether these organizations are in restraint of trade. A decision of the Supreme Court in June, 1925, throws some light on this issue. The cases involved were the Maple Floor Manufacturers' Association and the Cement Manufacturers' Protective Association, both of which were found guilty by the lower courts of breaking the Anti-Trust Law. To quote briefly from the words of the Supreme Court:

It was not the purpose or the intent of the Sherman Anti-Trust Law to inhibit the intelligent conduct of business operations, nor do we conceive that its purpose was to suppress such influence as might affect the operations of interstate commerce through the application to them of the individual intelligence of those engaged in commerce, enlightened by accurate information as to the essential elements of the economics of a trade or business, however gathered or disseminated. . . . Trade associations or combinations of persons or corporations which openly and fairly gather and disseminate information as to the cost of their product, the volume of production, the actual price which the product

has brought in past transactions, stocks of merchandise on hand, approximate cost of transportation from the principal point of shipment to the points of consumption, as did these defendants, and who, as they did, meet and discuss such information and statistics, without, however, reaching or attempting to reach any agreement or any concerted action with respect to prices or production or restraining competition, do not thereby engage in unlawful restraint of commerce."

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CHAPTER XXII

MANUFACTURES: IV, LABOR PROBLEMS; THE TARIFF

The labor movement in the United States, notably since the Civil War, has been profoundly affected by the great forces which elsewhere have influenced industrial development. This movement is intimately connected with the expansion of manufactures, with the growth of big business, with the development of all forms of communication, with the westward movement of population, and with the great influx of immigration. Many of our great social and political questions are bound up with the labor problem. The growth of the labor movement, therefore, is not a dissociated part of our economic history, but is closely intertwined with most of its important phases, acting sometimes as cause and sometimes as effect.

280. **The Causes Involved in the Development of the Labor Movement.**—The growing diffusion of intelligence which resulted from our democratic system of education has continually made laboring men and their leaders keener and more alert and has increasingly enabled them to match their skill with that of their employers, both in bargaining as to wages and the conditions of work and in securing the enactment of laws favorable to their interests. The development of the press has been a great force, because it facilitated the ready exchange of ideas, made possible the education of the masses to the aims and ideals of organization, contributed to class solidarity, promoted the development of loyalty, and aided in winning thousands of laborers to the cause. The growing aggressive attitude, par-

ticularly of labor journals, drove home to employers the aims of the workmen, impressed them with the seriousness of the movement, and stimulated them to concessions and reform.

The most conspicuous cause, however, was that of the growth of the factory system, including the development of big business in all its forms. The increasing division of labor tended to abolish many of the former requirements of skill and to reduce many skilled men with high wages to the rank of the unskilled with low pay. This was a constant source of alarm; thus workmen were stimulated to protest and reform. The growing size of the business units, moreover, greatly increased the power of employers and this, in turn, stirred the imagination of workmen and aroused them to action. In addition, the growing remoteness of the proprietors of the great enterprises, whether as stockholders or their representatives, the directors of the corporations, came to be responsible for a lack of understanding between labor and capital and hence was a potent cause of industrial strife. Besides, the growing size and power of business organizations, particularly since 1880, made necessary improvements in the form of labor organizations, if the latter were to hold their own in the bargaining process. Strong groups of employers, on the one hand, called forth strong groups of employees on the other. No doubt, in this regard, cause and effect are confused, for with the increasing power of labor groups, employers likewise have had to increase their strength through association to deal successfully with combined groups of laborers. Successful collective bargaining assumes strong organizations on both sides.

The development of railways, telephones, and telegraphs, contributed in several ways to the growth of the labor movement. Rapid travel, the prompt transmission of news, and the prompt and easy dispatch of funds enabled labor

groups everywhere both to communicate readily with each other and to lend assistance. Unions in one part of the country were thus enabled to keep in close contact with unions in other places. The growth of the national union and of the federation were possible only under these conditions.

281. **The Results of the Movement.**—Just as the causes of the growth of the labor movement are found in general industrial change, so the results are witnessed in many spheres of activity. This is seen in the attitude of labor toward legislation and toward the courts. The numerous labor laws are a product of this new point of view. The labor organizations are developing their own ideas about education. The present aim, as formulated by the American Federation of Labor, is to fit the youth for life in an industrial society. Much of the demand for social reform finds some of its chief supporters among labor leaders. This is true also of demands for the reform of the distributive system, for a remodelling of the land laws of the country, and for restraints upon immigration. Many of the great economic questions of the day, such as taxation, tariff, systems of banking, and marketing are shaded by the interests of labor. In all these respects the relations of workmen to the community are decidedly different from those which existed before 1860.

282. **The Effects of the Civil War.**—In some respects the period of the Civil War marks a turning point in the labor history of the country. Prior to this event much of the industry was still on a relatively simple basis. Compared with later times, the division of labor had not progressed far. In most instances factories had not grown so large that proprietors lost contact with workmen. Moreover there were still millions of acres of unappropriated public lands, which, under the liberal policy of the Government, were being distributed to settlers. The

Homestead Acts further facilitated this distribution. For the ambitious workman, or for the dissatisfied urban worker, there was the alternative occupation of farming which offered both independence and an opportunity to acquire a moderate competence from the sale of products and from the prospective rise in land values. Workmen could scarcely claim that they were oppressed by the industrial system of the time because there was an escape. Moreover the habits of the people were relatively simple, compared with later times. The great majority of the people were hard workers; the leisure class, such as it was, attracted very little attention. Meanwhile there was not the glaring display of wealth to provoke the charge of gross inequalities in distribution, nor was there a great variety of goods to mark broad distinctions in the purchasing power of the classes, nor even the extravagance of styles, fads, and fashions to cause unrest. This golden era came to an end about 1857; before the country had finally recovered from the panic of that year and the depression that followed, the Civil War had broken upon the nation.

The war itself was responsible for new movements and for a new point of view. The struggle, at least in its later stages, had stressed the liberation of the slaves. It was easy for writers and speakers to apply the vocabulary of the times to the conditions of white workers. Shortly men began to speak of "wage slavery." Some years before a prominent Southern writer, seeking to justify bond slavery, had spoken of conditions of laborers in the North as differing only in degree from those in the South. Said this writer: "I should say that where a man is compelled to labor at the will of another, and to give him much the greater portion of the product of his labor, there slavery exists, and it is immaterial by what sort of compulsion the will of the laborer is subdued. It is what no human being would do without some sort of compulsion. He cannot be

compelled to labor by blows. No, but what difference does it make, if you can inflict any other sort of torture which will be equally effectual in subduing the will? If you can starve him, or alarm him for the subsistence of himself or his family? And is it not under this compulsion that the freeman labors?"

Sentiments of this description became increasingly numerous among the expressions of men who upheld the cause of labor. It is rather interesting to note that the demands for greater industrial freedom during the Civil War found their counterpart in the late European War in the demand for the abolition of autocracy in industry and the establishment of industrial democracy, whatever that may mean.

Other forces soon began to operate in this setting. The rise of prices due largely to excessive issues of paper money during the War caused great hardships among laborers; the introduction into industry of a considerable number of women and children to take the places of men who had gone to war was an unwelcome and an alarming innovation; from the workman's point of view, a new menace appeared in the act of July 4, 1864, which enabled agents of employers to engage foreign laborers and to arrange for their transportation; finally the growing power of wealth in the hands of manufacturers and merchants aroused the fears of the working classes. Their leaders suddenly awoke to the fact that relatively weak groups of laborers were confronted by strong aggregations of employers. Salvation was to be found in organization.

283. **The Growth of Labor Organizations.**—Labor unions existed in the United States before 1860, but the formation of great organizations with definite aims and ideals was scarcely possible in the absence of adequate means of communication. Nor did the general industrial conditions make groups of this kind necessary, for, as we have just seen, economic conditions were not oppressive.

The rapid settlement of the country removed the opportunities of free land. On the other hand, the changing conditions in urban industries tended to put workers at a disadvantage. These changes stimulated the movement towards organization. The International Typographical Union dates from about 1850. In that year was held in New York a National Convention of Journeymen Printers. At the Cincinnati meeting in 1852 a permanent organization was effected. In 1869 the word "international" was substituted for "national" presumably for the purpose of including all members in the United States and Canada. "The International Typographical Union," said Carrol D. Wright, "is the oldest existing American trades union. In this respect the American labor movement resembles the labor movement elsewhere, for generally we find the printers among the pioneers in the organization of labor."

In 1854 the hatters formed the National Trade Association of Hat Finishers of the United States of America, an organization which in 1868 was separated into two unions. The Iron Molders' Union of North America and the Mechanics and Blacksmiths' Union were formed in 1859. The Brotherhood of Locomotive Engineers, which was to become one of the strongest unions in the country, had its origin in the "Brotherhood of the Footboard," formed in Detroit in 1863. Various other tradesmen followed in this movement, including railway conductors, bricklayers, cigar makers, granite workers, horseshoers, and iron and steel workers, among others. The formation of national trade unions progressed rapidly until about 1870 when some forty such bodies were in existence in the United States.

Shortly the movement began to assume a political aspect. Needless to say, laborers were suspicious of the existing political parties and determined to launch an organization of their own. A National Labor Congress was held in Balti-

more in 1866, and thereafter six annual conventions were held, the last at Columbus, Ohio, in 1872, at which a candidate for the Presidency of the United States was nominated. For a brief period the National Labor Union was able to exert considerable political pressure. In several States it secured the election of representatives to State legislatures. Its membership at one time was estimated at over six hundred thousand. But political activity proved its undoing; struggle among its ambitious leaders helped to bring on its downfall.

The demands of this organization included the eight-hour day, grants of land only to actual settlers, the establishment of a national labor bureau, restrictions on immigration of "cheap labor," and abolition of tariff duties on the necessities of life. Other demands referred more particularly to the immediate welfare of the workers, including the abolition of the contract system of convict labor, the establishment of mechanics' institutes, reading rooms for the education and enjoyment of workmen, and the establishment of coöperative stores and workshops.

About this time the labor movement in Massachusetts achieved some notable success. In 1865 an unpaid commission of five men was appointed to collect information in regard to hours and conditions of work. "This was the first step in the world toward the establishment of bureaus of statistics of labor." In addition the report of the commission brought to light some of the unfortunate conditions of labor and was one of the causes for the beginning of labor legislation in Massachusetts. Thus this State, which has been a pioneer in wholesome legislation in other fields, soon began to take a front rank in this.

284. The Farmers' Movement.—Laborers in urban industries and in the trades were not the only ones moved by the spirit of unrest. Farmers, also, found in the conditions which prevailed during the post-Civil War period a number

of things which required reform. Strictly speaking this was not a labor movement, but there were certain elements in common between farmers and trade workers because the protests of both were directed against the men who managed the great industries, including railroad men, bankers and distributors, and to some extent manufacturers. In face of the conditions of the time the traditional conservatism of farmers disappeared. During a considerable part of the period from the close of the Civil War to 1900 the landowning interests were the "turbulent, dissatisfied, radical, or semi-revolutionary elements in our population." The particular grievances of the farmers arose from their relations with railroads and commission men. The railways had failed to bring transportation facilities to every man's door; moreover, freight rates were not as low as farmers expected. On the other hand, the combination movement among railroads led to rate control and to discriminations which the agricultural classes believed were against their interestes. Commission men, moreover, were in collusion with railways for the purpose of restricting farmers' markets. These conditions were on the surface. Fundamentally the cause of discontent lay in the over expansion of agriculture due to the rapid settlement of the national domain. Farming was unprofitable. Proprietors were in debt for land, buildings, and machinery, and in the absence of good markets they were unable to obtain the funds with which to pay their debts. Farmers were thus in a suitable frame of mind to take up with movements aiming at reform of banking and railway systems, and to demand cheap money whether in the form of greenbacks or free silver. With rising prices, and with the return of prosperity shortly before 1900, unrest disappeared. The agitation, however, left important results in the railway and currency legislation of the period and probably exerted a strong sympathetic influence on the growth of the labor

movement. The farmers' demands for railroad and money reforms will be considered in a later chapter.

285. The Knights of Labor.—Of the great organizations which have come into existence since 1860 we need discuss only two, namely, the Knights of Labor and the American Federation of Labor. The latter still occupies the field, being the chief bond of union for the large number of trade and other unions now existing in the United States.

These two groups were founded on separate and distinct principles. The distinctive feature of the American Federation was "the organization of members of a single vocation. The underlying principle of such associations is that men who think alike should act together." Incident to the formation of separate unions was the organization of these into a great federation, otherwise they could not be held together. The principle at the basis of the Knights of Labor was that which "ignores vocations and seeks to harmonize all individuals on separate interests in the interests of the whole." In practice, organization on the latter principle failed, while the former succeeded.

The Noble Order of the Knights of Labor "was born on Thanksgiving Day, 1869, in the city of Philadelphia and was the result of the efforts of Uriah S. Stephens, as the leader, and six associates." All these men were garment makers. Stephens expected wonderful things from his new idea. His plan included the union of all branches of honorable toil. With the aid of education and coöperation and by the intelligent use of the ballot he expected that his plan would gradually abolish the wage system.

Stephens, who was a Free Mason, introduced into the new order many Masonic features. Even the name was kept secret, the organization being referred to in all printed matter by five stars. But this mystery exposed the organization to attack, and in 1870 the element of secrecy was

abolished. The following were some of the instructions given to each person admitted to the order: "Labor is noble and holy. To defend it from degradation; to divest it of the evils to body, mind, and estate which ignorance and greed have imposed; to rescue the toilers from the grasp of the selfish—is a work worthy of the noblest and best of our race." Their general aim was to "secure to the workers of society the fullest enjoyment of the wealth they create; leisure for the development of their intellectual, moral, and social facilities, and all the benefits, recreations and pleasures of association—in a word, they declare themselves ready to join in any movement which will enable them to share in the gains and honor of advancing civilization." To accomplish these ends the members demanded among other things the referendum in making laws, the creation of bureaus of labor for the collection of information, abolition of speculative traffic in land, the appropriation by society of the unearned increment in land, laws that apply equally to capitalists and laborers, compensation for injuries received through lack of proper safeguards, the incorporation of labor unions, and the weekly pay day.

The organization also advocated compulsory school attendance for children between the ages of seven and fifteen, a graduated tax on incomes and inheritances, postal savings banks, the gradual introduction of the eight-hour day, the introduction of coöperation to replace the wage system, and government ownership of railroads, telegraphs, and telephones.

The organization of the Knights of Labor was founded on local and district councils. Power was largely concentrated in the General Assembly, which had full and final jurisdiction in all matters pertaining to the local bodies. This central organization could suspend officers, revoke charters, and at one time it possessed power to terminate strikes. This General Assembly, which met annually, was

composed of representatives chosen from each of the local bodies.

The organization seems to have been unable to follow a consistent policy of offense and defense. The thought of some of the leaders was that success lay in coöperation and in political action, rather than in strikes and boycotts. During the years from 1878 to 1883 a strong element favored the strike method, and strike funds were raised by a tax on the members. This policy was partly responsible for the declining strength of the organization. In addition, divisions of opinion among the members, political troubles, and difficulties with the local bodies deprived the Knights of Labor of that unity which made for strength. Shortly after 1880 it was overshadowed more and more by a new body organized on a different principle.

Like the National Labor Union the Knights of Labor for some time enjoyed a considerable amount of power and prestige. The membership gradually increased, until about 1885 some 100,000 persons were enrolled. In the following year the membership suddenly jumped to over 600,000. Indeed the growth was so rapid that the executive board felt constrained to call a halt temporarily on further increase. While the evident accomplishments of this organization were not numerous, it served a useful purpose, from the workman's point of view, in giving training in organization, in educating laborers to understand a definite program of reform, and in calling to the attenion of the general public certain evils that needed remedy.

286. The American Federation of Labor.—This organization grew out of a call issued jointly by the "Knights of Industry" and the "Amalagamated Labor Union" for a convention to meet at Terre Haute, Indiana, on August 2, 1881. In November of the same year another meeting was held at Pittsburgh. The membership of the society first named was found chiefly in Illinois and Missouri. The

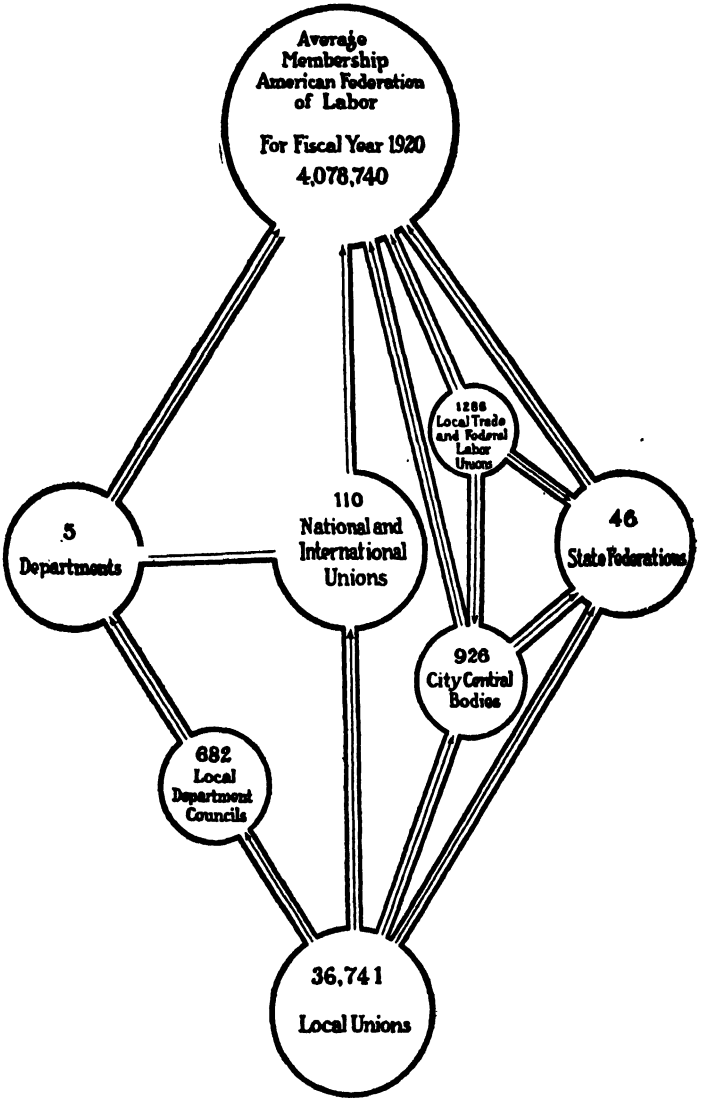

CHART OF THE ORGANIZATION OF THE AMERICAN FEDERATION OF LABOR

the other hand, several large industrial unions like the United Mine Workers, the Western Federation, and the former International Union of Brewery Workers have likewise stood the test of time.

The growth of the American Federation of Labor was relatively slow at first. In 1890 the total membership represented in the annual meeting was only 100,000. In 1900 the membership had grown to 548,000 and in 1904 to 1,676,000. The total membership of affiliated unions in 1917 was 2,371,000, the largest number thus far reported by the Federation. While the general tendency has been upward, membership from year to year shows considerable variations. Occasionally the affiliation of some large group, hitherto independent, adds materially to the numbers. Both years of depression and of great prosperity seem to affect membership adversely. Moreover the introduction of labor-saving devices, so far as these tend to limit the demand for skilled workmen, has a depressing influence. The figures given for 1917 by no means cover all organized labor in the United States. A number of important groups have grown up independent of the American Federation. Some of these groups in 1909 were the Railway Brotherhoods, the Western Federation of Miners, the National Association of Letter Carriers, and the National Association of Steamfitters. In 1911 the Western Federation associated with the great organization and more recently the Railway Brotherhoods have become affiliated with the American Federation.

287. **General Purposes of the American Federation of Labor.**—The general purpose of the Federation is to look after the broad general interests of the associated workmen. The American Federation concerns itself very little with the local affairs of the unions. The aims of the great organization, according to its constitution, are to encourage the formation of local trade and labor unions, to pro-

mote closer federation of such societies through the organization of central trade and labor unions in the cities, and through the organization of State federations. All these organizations aim to secure legislation in the interest of the laboring classes. Other purposes are to afford mutual aid, to encourage the sale of union-label goods, to influence public opinion by peaceful and legal methods, and to give encouragement to the labor press. State federations look after the general interests of labor within the States, and city centrals perform a similar function within these local political subdivisions.

288. **Union Methods and Policies.**—The elaboration of trade-union ideas required the experience of years. Such experience gradually led to the establishment of rules and principles for the guidance of labor organizations in their relations with employers. The general aim is shorter hours, higher wages, and improved working conditions, in other words, an advance of the standard of living with all that this implies. These ends are sometimes accomplished by militant, sometimes by peaceful methods. Strikes and boycotts are great weapons in enforcing demands. The history of industrial disputes since the inauguration of the American Federation shows that these methods have been largely employed. In 1881 there were 477 strikes and lock-outs involving 130,176 employees; in 1900, 1,839 strikes involving 567,719 employees; and of the 3,285 strikes and lockouts in 1918, 2,027 strikes involved 1,192,400 employees. It is apparent that with the growth of organizations a larger number of persons are engaged each year in disturbances of this kind. Strikes have met with varying success. Considering the twenty years from 1881 to 1900, the per cent of employees involved in successful strikes amounted to 35 per cent of the total, partial successes to 16.07 per cent, and failures to 48.3 per cent. Losses both to employers and men run into large figures every year.

In addition to militant methods, unions seek their goal by surrounding work with numerous safeguards. To avoid misunderstandings these are standardized. Thus rules provide for the nature of day and piece work, pay for overtime and holidays, the regulation of "waiting time" and "walking time," the number of hours that constitute a day's work, the relation of union and non-union men in a shop, the use of non-union materials, and numerous other regulations. Unions prefer the closed shop, that is, a factory in which all men are organized; they favor the determination of wages and working conditions by collective bargaining; in case of misunderstandings they advocate settlement by voluntary arbitration; they also favor limiting the number of helpers and apprentices and the use of the sympathetic strike when the proper occasion arises. They are usually opposed to profit-sharing arrangements devised by employers and to systems of standardization devised by the management. They have recently gone on record as opposed to scientific management, including the use of the stop-watch and time and motion studies. Benefit features of the unions include strike, sick, death, traveling, and out-of-work assistance. Sometimes various social features have been developed by the organizations.

289. **Results of the Labor Movement.**—The changing welfare of labor may be studied in (*a*) the course of wages and prices, (*b*) in the changing hours of labor, (c) in the participation of workers in the fruits of advancing civilization, and (*d*) in the nature and extent of laws devised for their protection.

Although wages rose rapidly during the Civil War period, prices advanced at a more rapid rate; thus real wages declined. If we represent the wage level in 1860 by 100, the average rate in 1895 would be indicated by 145. Prices, on the other hand, represented by 110 in 1860, rose to about 216 in 1865. Wages continued to advance until about the

latter part of 1873 when, compared with 1860, they stood at about 168. Prices, meanwhile, had fallen to about 138. There was some decline in wages during the depression following the panic of 1873, but about 1878 an advance began which continued with slight interruptions to the present time. On the other hand, for nearly thirty years after 1873 the trend of commodity prices was generally downward. Throughout the greater part of this period, therefore, real wages rose.

In case of the hours of labor, conditions showed a marked improvement. Prior to 1860 it was not uncommon for workers in a number of occupations to be engaged for more than eleven hours a day. In the building trades, in some portions of the country, the custom was to work from shortly after sunrise to near sunset. In 1860 the average workday for a large number of trades was 11 hours; this had been reduced to something over 10 hours in 1880 and to 9.6 hours in 1905. Since that time the average length of the working day has been further reduced; a considerable number of trades are now firmly established on the eight-hour basis.

There can be no doubt that all classes in the community are more and more sharing in the benefits of inventions and discoveries. This is seen in the increasing variety of goods offered for general consumption, in the growing *per capita* consumption of such commodities as coffee, sugar, wheat and flour, in the facilities for travel both on railroads and urban lines, in the benefits of modern medical service, and in the means for recreation and enjoyment, to name only a few.

Finally the development of laws for the protection of the workers reveals a signal advance over the period before 1860. This matter will be discussed in a separate section hereafter.

It is difficult to state how many of these benefits are due

directly to the efforts of labor organizations and how many to other causes. Improvement in the condition of the laboring classes is a product of many causes. Technical improvements since 1860 have been an important factor; great contributions have been made by the development of the capitalistic system of production, by the extension of all means of communication, and by the development of education. In many instances organizations have been able to increase wages and improve working conditions. They have caused improvement indirectly by educating both workmen and the general public to the justice of many of their demands. Without this aid their struggles would have been in vain. In estimating the influence of labor organizations on the conditions of work it must be remembered that labor has always been scarce in the United States, and that improvement would have taken place anyway had there been no organizations.

290. **Labor Legislation.**—Before 1860 very little had been done in the United States to devise laws for the protection of laborers. Almost the only activity in this field was in mechanics' lien laws, free-school legislation, and in the case of a few States, laws to limit the hours of work for women and children. Massachusetts was the first State to pass laws for the protection of laborers. In 1866 that State passed a child-labor law and in 1869 established a bureau of labor. Legislation during the next decade included a ten-hour law for women and children and a factory inspection act.

Some of the more important labor laws are covered by the following captions: (*a*) the protection of freedom of contract; (*b*) the restrictions upon the employment of women and children, including safeguards as to their health and comfort and provisions for the education of children under certain ages; (*c*) the protection of workmen engaged in dangerous occupations; (*d*) compensation in case of acci-

dents; (*e*) the protection of workers in sweated industries; (*f*) the minimum wage laws; (*g*) the laws to provide for the inspection of factories or other places where men work; (*h*) the laws providing for the settlement of industrial disputes by arbitration and conciliation. Thus, statutes often limit the hours of work, restrict or prohibit labor at night, exclude certain classes of workers from some industries, regulate sanitary conditions in factories and shops, provide for regular pay days, and prescribe the nature of payment.

During the early part of the nineteenth century even peaceful combinations of laborers to improve conditions of employment were illegal. Before 1860, however, workmen had acquired the right to combine both to secure better wages and to improve conditions. The anti-trust legislation, however, inaugurated a new phase of the attitude of the courts toward labor. In some jurisdictions, many of the customary activities of the unions, such as strikes to obtain the closed shop, and the use of the "unfair list," were regarded as restraints of trade. Injunctions were used more and more to anticipate union activity. The Clayton Act of 1914 inaugurated still another phase. According to section 6 of this law, labor organizations cannot "be held or construed to be illegal combinations or conspiracies in restraint of trade." Nothing in the Federal anti-trust statutes is to be interpreted to prohibit the existence and operation of "labor, agricultural, or horticultural organizations, instituted for the purposes of mutual help . . . or to forbid or restrain individual members of such organizations from lawfully carrying out the legitimate objects thereof." Section 20 prohibits the use of restraining orders or injunctions in cases between employers and employees, "unless necessary to prevent irreparable injury to property, or to a property right, of the party making the application, for which injury there is no adequate remedy at law."

Among the most important modern labor laws are those applying to the employment of children. Workers of this description are unable to make wise decisions as to their future, nor can they provide adequately for their own protection. Dangers lie particularly in the fact that the "child who goes to work early usually gets into a 'blind alley' occupation and is thus prevented from developing his full potential earning power." The avenues of advance are closed to them because they are not trained to grasp opportunities. Their wage is frequently used to supplement that of other members of the family, particularly where these other members are receiving a small compensation. Child-labor laws frequently prohibit the employment of children under fourteen, provide for continuation education, prohibit their work in dangerous or in "immoral occupations," proscribe night work, and limit the hours to eight, or even less, a day. Congress legislated on the question of child labor in 1916 when an Act was passed debarring commodities produced by young children from interstate commerce.

The enactment of minimum-wage laws is a feature of modern labor legislation. These laws assume that in some trades workers do not receive enough to maintain physical efficiency, that such trades are more less "parasitic," that work under such conditions is contrary to the public welfare, and that such trades should be placed upon a self-supporting basis. The customary provision is for a minimum wage to be fixed directly by a State labor or industrial commission. Such laws refer principally to woman's work.

291. Employers' Associations.—The growth of labor organizations stimulated the development on the other side of powerful groups of employers. Societies of this kind are known as employers' associations. Like labor unions these have worked out well defined methods and policies.

Their measures are directed chiefly against corresponding policies of the labor groups. In form of organization employers' associations closely parallel those of labor, being grouped sometimes by trades, sometimes by industries, and sometimes by combinations of these. Organizations also follow local, State, and Federal lines. In 1903 the Citizens' Industrial Association, a federation of employers' societies, included 60 national employers' associations, 66 State and district bodies, and more than 330 local groups.

The attitude of these employers' societies varies from association to association. At one extreme are the conservative organizations which work harmoniously with labor groups; they are sometimes the chief means of working out systems of collective bargaining. At the other extreme are associations which adopt a militant policy, opposing vigorously organizations of labor and using every possible means to weaken and discredit the unions. Their weapons, the lockout and blacklist, are matched against strikes and the use of the "unfair list." Occupying middle ground are groups of employers' associations which, while offering no serious resistance to labor groups, insist on working out their own policies in their own way without particular reference to the demands of labor.

292. Methods of Industrial Peace.—A notable feature in the history of relations between employers and men since 1860 has been the growth of various methods of industrial peace. Such measures are necessary where each side is highly organized, and where the policies of the opposing groups are often antagonistic. With great militant organizations opposing each other the outcome would be war unless peaceful measures were provided for.

The earlier methods included chiefly arbitration of some kind, machinery for collective bargaining, and occasionally profit-sharing arrangements. These are still employed to a large extent, but during the last decade other methods

have come to the forefront. Industrial democracy, so-called, in some form is coming into vogue with many employers as a remedy for industrial disturbances. The common element in all these systems is a plan whereby laborers in an establishment secure representatives to discuss wages and working conditions with employers. This is sometimes accomplished by committees of workmen elected by secret ballot. These committees then take up all matters relating to the welfare of the men. In some instances employers have developed within their establishments a kind of representative government in which workmen "legislate" on matters concerning their interests. The measures of such bodies are submitted to employers or their representatives for approval. In a few instances employers have permitted workmen to elect representatives to sit on the board of directors along with the representatives of capital.

In recent years many employers have introduced systems of welfare work designed to improve the conditions of their workmen and to create a more friendly feeling. Such plans include improvement of the physical conditions within an establishment, beautifying factory surroundings, provisions for housing, education and medical care, the organization of social clubs, the development of societies for the promotion of thrift, and various other features. This movement is in response to the demands of laborers for improved working conditions and for a voice in the management of the business.

293. **Tariff History.**—As in other fields of our industrial history the period of the Civil War ushered in a new epoch in the tariff history of the country. Measures incident to war financing have largely influenced tariff development since that time. The Civil War, as Professor Taussig has said, "revolutionized the financial methods of the United States. A new monetary system was created and tax resources before undreamed of were resorted to, at first

timorously, in the end with a rigor that hardly knew bounds.'' These tariff measures were at first regarded as temporary, but were later retained, increased, and systematized. The country gradually became accustomed to the new régime; in fact, a high protective system came to be regarded as the established policy of the country. This contrasts strongly with the policy that prevailed before 1860 when the tendency of tariff duties was downward. By the Act of 1857 ''the maximum protective duty was reduced to twenty-four per cent; many raw materials were admitted free, and the level of duties on the whole line of manufactured articles was brought down to the lowest point which had been reached in this country since 1815.''

Three causes were at work during the war period to produce the changes named above. First, the urgent need of revenue to carry on the War; second, the need of offsetting duties imposed on domestic manufactures by a tariff on imports; third, the protectionist proclivities of some of the leaders in Congress. From 1861 to 1865 scarcely a month passed without the raising of duties on some articles; but the most important Acts were passed in 1862 and 1864. The excise measures of the former law included taxes on the products of iron and steel, coal oil, paper, leather, and other articles; licenses were required in many callings, an income tax was imposed, and taxes were imposed on gross receipts of railroad, steamboat, and express companies. One of the prime purposes of the tariff of that year was to increase duties to offset the internal rates. Without the compensating import duty, domestic producers would have been exposed to foreign competition and the internal tax measure would have been largely defeated.

The Act of 1864 greatly increased the scope of domestic taxation. At the same time, the tariff on imports was extended and increased. The average rate on dutiable com-

modities which stood at about 37 per cent in 1862 became about 47 per cent by the Act of 1864. The average level in 1857 had been about 19 per cent.

Tariff legislation after the War was affected notably by the problem of disposing of the increasing surplus, by the rapid development of manufactures which was an occasion for demanding more protection, and since 1900 it has been affected by the rise of our export trade in manufactured goods. In addition, there has been a growing willingness to accept lower import duties, partly because declining costs of production in the United States made protection less necessary, and partly because of the growing demands for foreign raw materials. The changing sentiments of the industrial classes have been a large factor in tariff legislation since 1880. On a number of occasions the tariff has been one of the principal issues in national political campaigns.

After the War the internal revenue duties were gradually reduced until by 1872 this feature of war financing had largely disappeared. Import duties, however, remained. This method of dealing with the revenue situation tended to make the tariff a distinctly protective measure. Towards 1870 the growing surplus in the Treasury caused alarm and was the occasion for a makeshift revision of the duties in 1872 when a horizontal reduction of 10 per cent was made. The old rates were restored in 1875, due to a shortage of revenue. No important attempt was made to revise the tariff until 1883. The surplus in the Treasury was again causing trouble. In 1874 national expenditures exceeded receipts by more than a million dollars. There was a small surplus in 1875; in 1881 the excess of revenue amounted to more than one hundred and one million, and in 1882 to more than one hundred and forty-five million. Revision of the tariff offered a remedy for this situation. In 1883 reductions were made in excise

duties by abolishing taxes on bank deposits, matches, and patent medicines, among others. The Tariff Commission of 1882 had urged a substantial reduction in import duties; but Congress, now under the influence of a growing protectionist element, did not accept the recommendations. The Tariff Act of 1883 made some reductions, principally on articles which were little affected by foreign competition. The general level was reduced only about 5 per cent.

President Cleveland in his second Annual Message, 1886, vigorously urged a downward revision of the tariff. He stated that the "continuation of our present revenue system would soon result in the receipt of an annual income much greater than necessary to meet the Government expenses;" he thought that the existing state of affairs prevented economical administration of the public revenues. Thus he urged a careful revision of the tariff with due regard for the interests of all elements in the community. Manufacturers who had built up industries were not to be denied necessary protection; consideration was also to be given to the welfare of the working classes. In this connection the President recommended "such arrangement of Government revenues as shall reduce the expenses of living, while it does not curtail the opportunity for work nor reduce the compensation of American labor and injuriously affect its condition." The interests of farmers were also to be taken care of. Again in his third Annual Message President Cleveland denounced the tariff as "the vicious, inequitable, and illogical source of unnecessary taxation."

Tariff revision was an important element in the campaign of 1888. The Republicans interpreted their success to mean that the country was in favor of a high protective system. The McKinley Act of 1890 was an attempt to satisfy this demand. Higher duties were imposed on the finer grades of cottons and woolens, on iron and steel, glass, and on other commodities. Various farm products were pro-

tected. Duties were increased on eggs, potatoes, beans, wheat, corn, tobacco, flax, and hemp. Sugar received special tratment. The beet and cane producers, on the one hand, protested a lowering of the duty on their products. Refiners, on the other hand, desired cheaper raw materials, and the public, of course, wanted sugar at as low a price as possible. The matter was adjusted by placing sugar on the free list and by providing a bounty of two cents a pound on all sugar grown in the United States. To forestall retaliation on the part of foreign countries because of the high American rates, the President was authorized to negotiate reciprocity treaties. Such arrangements were made with a number of Central and South American countries and with the German Empire and Austria-Hungary. This tariff raised the general level of duties to 49.5 per cent.

The McKinley Act by no means settled the tariff controversy. The Democrats were successful in the campaign of 1892. Another revision of the tariff was one of the results. The Wilson-Gorman Act of 1894, which was in effect only about four years, reduced the general level of duties to about 39.9. Wool, copper, and lumber were placed on the free list, the revenue duty on raw sugar was reimposed, and the law contained a provision for a tax of 2 per cent on incomes over $4,000. This provision, however, was later declared unconstitutional.

Another revision was made in 1897 after the Republicans had returned to power. The Dingley Tariff of that year raised the level of rates to 57 per cent, the highest point reached in our history. Practically every commodity that appeared to need protection was given this advantage. Thereafter for more than a decade the tariff dropped into the background. This was partly due to the fact that the Republican Party remained in power continuously during these years, partly to the period of great prosperity, but a more important factor was the fact that other important

problems were pressing for solution. Meanwhile the attitude of the Republican Party was undergoing change. As now stated the tariff principle was "that protection is best maintained by the imposition of such duties as will equal the difference between the cost of production at home and abroad, together with a reasonable profit to American industries." Against this was soon to be set another new principle, namely, that of the "competitive tariff."

Although the Payne-Aldrich Tariff of 1909 changed many duties, there was no substantial reduction. Hides were admitted free, and some reductions were made on leather, shoes, harness, and saddlery. Little or no change was made in cotton and woolen duties. The Act provided for the free admission of not to exceed 300,000 tons of Philippine sugar; since the Islands had never exported this amount to the United States, this provision meant that all Philippine sugar was to come in free. Meanwhile the treaty arrangement with Cuba of 1903, by which sugar from the island was to be admitted with a twenty per cent reduction, remained unchanged. An interesting provision of this Act was an arrangement for a maximum and minimum tariff. Maximum rates of 25 per cent of the value of articles imported were to be added in case foreign countries "unduly discriminate" against American goods. The administration of this provision was placed in the hands of the President.

The stage was shortly to be set for another tariff change. The Republicans were defeated in the Congressional elections of 1910, and in the Presidential election of 1912. The evils of big business, more and more associated in public discussion with the tariff, came to the forefront. Rising prices, also attributed to the tariff, were causing concern. The Underwood Act of 1913 was thus the result of a new industrial and political situation. Notable reductions were made in some duties. Wool was admitted free, and after

two and a half years sugar, also, was to go on the free list. Specific duties on cotton and woolen goods were abolished, and the *ad valorem* rates were reduced; iron ore, pig, and scrap iron, steel rails, and agricultural implements, among others, were placed on the free list. Moderate *ad valorem* duties, however, were retained on a number of iron and steel products.

294. The Tariff Commission.—On several occasions since 1860 attempts have been made to put tariff revision on a more careful basis. The Tariff Commission of 1882, however, met with no success, its recommendations being ignored by Congress. The Tariff Board of 1909 fared but little better. That body had been abolished, under the influence of the Democrats, on the ground that it was inexpedient. But oddly enough this party was largely influential in the constitution of the present Tariff Commission. The creation of such a body has been partly due to the growing public sentiment in favor of tariff revision by more "scientific" methods; another factor is the need of a body of qualified experts to study not only the tariffs of other countries but also the operation of our own tariff laws.

The Act of September 8, 1916, provided for the creation of a Tariff Commission of six members. The following are some of the powers and duties of the Commission: to investigate matters relating to tariff administration; to study the fiscal and industrial effects of the operation of our tariff laws; to investigate tariff regulations with foreign countries; to study the conditions of competition in foreign trade; to summon witnesses and otherwise to secure information. The Commission embodies its recommendations in reports to Congress. Whether the present Tariff Commission will meet with better treatment than was accorded to its predecessors at the hands of Congress remains to be seen.

295. **Fordney-McCumber Tariff, 1922.**—Tariff-making moves in an endless chain in the United States. The work of the Tariff Commission does not seem to have made the task any simpler, or any more scientific, contrary to the expectations of some of the members of Congress at the time the Commission was organized.

At the conclusion of the late War many manufacturers professed to believe that this country was in imminent danger of competition from the industries of Europe. Plant capacities had been increased to meet war demands, and it was feared that foreign competitors would absorb so much of the domestic market as to prevent full operation of these American factories. Moreover, the high labor and material costs in this country seemed to enhance the difficulties of competition. Reports of the rapid recovery of German industries stimulated the demand for protection; this was particularly the case with those manufactures which had sprung up during the War, or which had greatly increased their productive capacity.

The Republicans who came into power in 1920 were favorable to the policy of more protection. An Emergency Tariff was passed in May, 1921. In more leisurely moments Congress passed the Fordney-McCumber Act (September 19, 1922) which raised many of the rates above the 1909 level, and which imposed high duties on a number of agricultural products.

Another interesting feature of the Act was the new power bestowed upon the President. In the event that any foreign country imposed unreasonable charges on American products, or discriminated against the commerce of the United States, he was authorized to proclaim "such new and additional rates as he shall determine, which will offset such burdens"; except that such rates were not to exceed 50 per cent of the value of the goods.

New burdens were also laid upon the Tariff Commission,

for it now became the task of this body to investigate the policies of foreign countries and to report to the President and to Congress.

Section 316 of the Act suggests some of the features of our domestic anti-trust legislation; in this case, however, the measures are directed against monopoly and unfair methods in importing and distributing foreign merchandise in the United States. The Tariff Commission was instructed to investigate such violations and to report to the President, who was authorized to impose additional duties not to exceed 50 per cent.

296. Manufactures, Our Leading Industry.—With the enormous development of the past forty years manufacturing has now become the dominant branch of industry in the United States. This is shown in the accompanying table which indicates the value of the products from agriculture, manufactures, and from mines and quarries:

Year	Agriculture	Manufactures	Mineral Products
1869	$1,958,030,000	$3,385,860,000	.....
1889	2,460,107,000	9,372,378,000	$542,325,000
1919	21,425,623,000	62,418,078,000	4,138,670,000

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CHAPTER XXIII

COMMERCIAL DEVELOPMENT: I, MEANS OF COMMUNICATION

297. The Scope of Commercial Industries.—In the preceding chapters we have discussed the growth of extractive and manufacturing industries. These groups cannot be carried on without the aid of the commercial branches. At least transportation and banking facilities are necessary to place the products of factories and of forest, field, and mine in the hands of consumers. As a rule, many other services are required, such as insurance, means of learning customers' credit, advertising, mail, telephone, telegraph, and news service, and various agencies of distribution including wholesalers, commission men, and retailers. In a number of instances great market places are necessary; this is particularly the case with the selling of grain, cotton, and securities. The function of the commercial industries is to provide the means for passing goods on from one class of producers to other classes, or from producers to consumers.

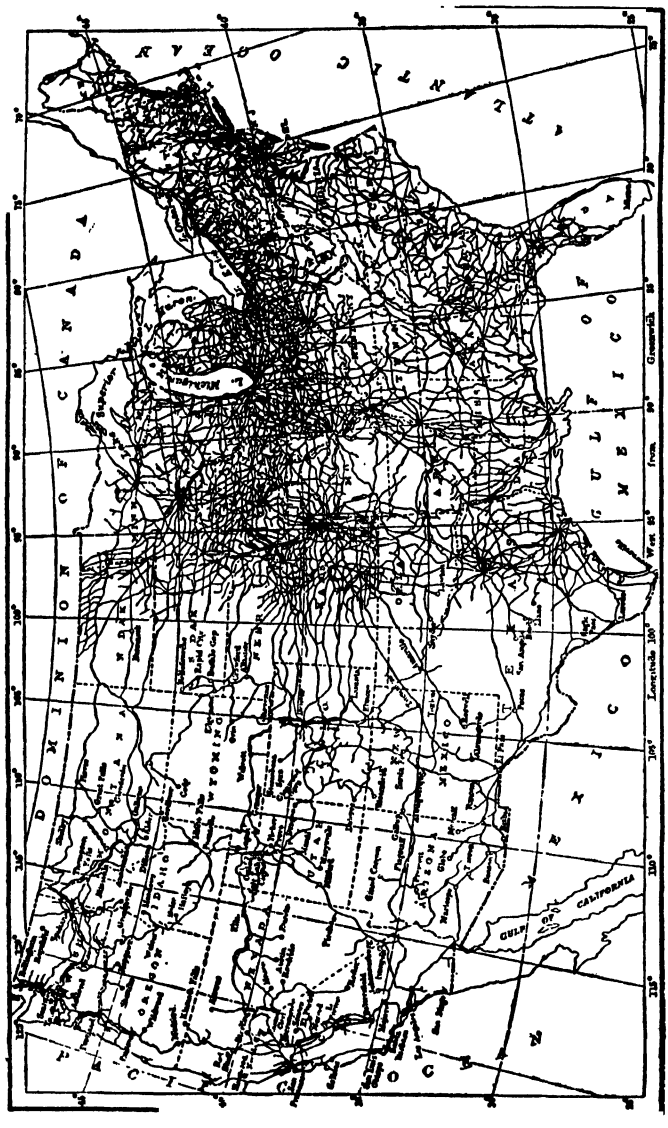
It goes without saying that the great groups of enterprises have not developed independently. Each has stimulated the other. Cause and effect are constantly intermingled. Economic development may be compared to the flow of a great river fed by many tributaries, the main stream itself being a composition of the various branches that have added to its volume.

Our purpose in this chapter is to discuss the growth of means of communication. In the two chapters that follow we shall study the growth of credit, marketing, and related institutions.

Some of the leading features in the transportation history of the country since 1860 have been the enormous increase in railway mileage, particularly in the West and Southwest, the completion of the transcontinental lines, the development of certain evils of railway competion, the growing combination among railroads, and the development of State and Federal regulation.

298. **The Increase in Mileage.**—The building of railroads was made necessary partly by the opening of the new country, partly by the growth of the older sections. Transportation has always been one of the most urgent needs of settlers in a new country. Without it they cannot develop natural resources, for such development depends on the facilities for obtaining machinery and supplies and on markets for products. The United States affords many examples of dormant sections aroused to intense economic activity through the stimulating effect of a railroad. Conditions in the country west of the Mississippi made the early building of railroads particularly necessary. The western tributaries of that stream are as a rule shallow and uncertain. They are not as satisfactory for freighting purposes as the main river or its eastern tributaries. Political factors, such as the need of uniting various parts of the country, and social elements, including the desire to communicate with friends and otherwise to keep abreast of improvements, contributed to the demand for transportation. Meanwhile railroad promoters have always had in mind the advantages of transcontinental traffic. One of the great arguments in favor of the Pacific roads was that they would both promote trade with the Pacific seaboard and stimulate oceanic trade with the Orient.

We should not overlook the effect of the rise of urban communities on the building of railroads. Although the growth of cities was one of the results of the development of communication, on the one hand, the concentration of



RAILROADS IN THE UNITED STATES IN 1910

population in such centers created most urgent needs for means of transportation. This was due to the fact that the urban population became more and more dependent upon agriculture for food supplies and on other extractive industries for raw materials and supplies.

What we have said refers to the need for railroads. Consider the conditions of supply. Much of the railroad building during this period was in relatively level country. Expenses for grading and tunneling were relatively small. Thus the cheapness with which roads could be built was an encouraging factor. To this should be added the aid given by Federal and State Governments. The United States took the initiative in exploring the country beyond the Mississippi and in providing preliminary surveys for some of the important roads. In some instances both Federal and State Governments guaranteed the securities of the roads, thus enabling them to raise funds. But equally important assistance was given in the form of land grants. This policy had been employed in the earlier period to encourage the building of turnpikes and canals and was now used on a large scale to promote the construction of railroads. This practice was begun in 1850 when the Federal Government granted to the State of Illinois every alternate section of public land on either side of the proposed Illinois Central; the State, in turn, granted the land to the railroad under certain conditions.

From 1850 to 1871 some 159,000,000 acres were disposed of in this way by the Federal Government. Not all of this land, however, was actually obtained by the roads, because some failed to comply with the terms of the grants. The States also granted land, and in some instances actually took a hand in railroad building. Most of the State roads, however, were ultimately sold to private corporations. Meanwhile financial aid came from Europe in the form of investments in railway securities. A factor of great im-

portance was the ability of this country to supply railway iron cheaply. While the iron and steel industry has been greatly stimulated by the building of railroads, this industry, in turn, became a contributing element of great importance in railway development.

These various factors combined to promote an era of rapid railroad construction. In 1860 the mileage of the country was only 30,626; it increased to 242,107 in 1910. The additions, however, were unequally distributed. The region west of the Mississippi was the chief beneficiary. The mileage of this section increased from 1,840 in 1860 to 114,465 in 1910. Mileage in New England scarcely doubled during these years; in the middle and north-central sections the increase was about fourfold; west of the Mississippi it was about sixty-two fold. In 1860 the latter section possessed only 6 per cent of the total mileage of the country, in 1880 about 34 per cent, and in 1900 about 44 per cent. The South, on the other hand, lost its relative position. Here the discouraging industrial conditions following the Civil War retarded railway building. Conditions began to change after 1880; the development of varied industries in this section and the growth of prosperity once more attracted the attention of railroad promoters. In 1860 the South possessed about 30 per cent of the railway mileage of the country; in 1880, owing to rapid construction elsewhere this section possessed only 16.6 of the total mileage, and in 1900 about 19.7 per cent. During the decade from 1900 to 1910 about 12,500 miles were added in this section while the additions in the country north of the Ohio and Potomac amounted to only 5,900. In 1910 the South possessed 20.9 per cent of the total mileage of the country.

299. **Transcontinental Roads.**—The construction of a railroad between the Atlantic and Pacific had been proposed as early as 1834, but at that time the plan was considered

visionary. The discovery of gold in California, which led to rapid emigration to that section, brought the project somewhat nearer. In 1848 Asa Whitney, a New York merchant, tried to interest the country in a Pacific railroad, and probably as one of the results of his efforts a bill was introduced in Congress. As yet, however, the country was not prepared to sanction State aid to such an enterprise. But the turn of events during the next decade produced a change in public sentiment. Gold seekers from California began to scatter through the Rocky Mountain region; after the Mexican War immigration and freight traffic greatly increased over the Santa Fe trail. Shortly before 1860 silver was discovered in Colorado with the result that large amounts of freight began to move overland between the cities along the Missouri and the new town of Denver. The disturbances in Utah, the Kansas-Nebraska trouble, and the outbreak of the Civil War made necessary more rapid communication with the remote parts of the country. For political reasons, as well as for economic, railroads into the Far West became necessary. But private enterprise would not venture upon such enormous undertakings without the aid of the Government. Most of this country was as yet unsettled, and there was little prospect of paying traffic. Railroads had to be built in advance of settlements in order to facilitate immigration. Thus the only way to promote railroad building into this country was for the Government to come to the aid of railroad builders.

A bill providing for the Union Pacific and the Central Pacific was approved July 2, 1862. Among other things the Act made generous grants of public funds, amounting to $27,236,512 in the case of the Union Pacific and to $27,855,562 in case of the Central Pacific. These figures were based on the cost of construction over various sections of the line. In addition the Act of July 1, 1864, granted each company every odd section of land in a strip twenty

miles wide along the entire route, some 25,000,000 acres in all. The companies were permitted to issue bonds to the amount granted by the United States, and these securities were to enjoy first lien on the roads, the government's claim ranking second.

Construction proceeded more rapidly than was anticipated. The Union Pacific was built westward from Omaha, the Central Pacific eastward from Sacramento. On May 10, 1869, the two roads were joined at Promontory Point, near Ogden, Utah. This incident was heralded as one of the great events in the history of the country. Thus was completed the first transcontinental line in America. The successful consummation of this enterprise stimulated further railroad building in the Far West; laterals were built to connect with the main line; explorers and immigrants began to move into the country in large numbers; land values rose, population increased on the Pacific seaboard; and transcontinental traffic began to grow. In short, the necessary stimulus was provided for the development of the vast region between the Mississippi River and the Pacific.

Liberal grants were also made to other western roads. On July 2, 1864, the Northern Pacific was chartered to extend from Lake Superior to Puget Sound, thence to the Columbia River. The land grant included upwards of 47,000,000 acres. This road was completed on September 9, 1883, when the last spike was driven at a point about 50 miles west of Helena, Montana. The Atlantic and Pacific, to extend from Springfield, Missouri, to the Pacific was chartered in 1866, receiving a grant of 42,000,000 acres. And the Southern Pacific, to extend from Marshall through El Paso, thence by way of New Mexico and Arizona to Los Angeles, was chartered on March 3, 1871. These various Acts laid the foundation for the great railroad system west of the Mississippi. Most of the roads encountered

financial difficulties and have undergone reorganization. But subsequently the development of the grain States, the rise of the mining and grazing industries in the Far West, and the growth of transcontinental trade paved the way for future prosperity.

300. **Crédit Mobilier.**—Serious evils arose in this period of railroad building for which the generosity of the Government was partly responsible. But other causes were involved; railroad construction on a large scale was a new experience for the country; the Government had not learned to protect itself against the measures of those who elected to use shady methods. Moreover the rapid growth of wealth, holding out many opportunities for men whose morals were not well grounded, placed a great strain on business honesty. Thus the history of the times reveals many cases of wrongdoing. The railroads were our first big business, and it was in this field that the earliest problems of large-scale enterprise were encountered. As a result, this was the first industry to attract the attention of the legislators.

One of the fraudulent methods of the period was to turn over large amounts of securities to construction companies; such organizations were often composed of officials of the railroads. Handsome profits were made by such transactions. A notable instance of this kind was the Crédit Mobilier, a joint-stock company chartered in Pennsylvania with the name of the Pennsylvania Fiscal Agency. Subsequently the charter was purchased by a company possessing contracts for the building of the Union Pacific. Unfortunately the interested parties included not only promoters and officials of the road, but in some instances members of Congress. A Senate committee which investigated the matter reported the innocence of a number of persons whose names had been connected with the scandal, but the expulsion of one member was recommended. A House commit-

tee which also investigated the affair recommended the censure of two members.

301. Railroad Consolidation.—The building of the Pacific roads was one of the greatest features in the transportation history of the country. Another outstanding characteristic was the combination movement among the roads. Combination in this field has taken two forms; first, the uniting of railroads to form a continuous line of travel, and second, the consolidation of roads covering a given geographical division, including main and branch lines and feeders. The latter form of combination attracted the greatest attention because it was feared that the combined roads would possess monopoly powers. This movement has been one of the chief causes leading to demand for railroad regulation.

Most of the roads of the country, particularly those east of the Mississippi, were built by relatively small companies. They were, as a rule, short lines connecting inland cities, or connecting cities with lakes, navigable rivers, or ocean ports. These roads were frequently of different gauges; each road had its own terminals and time schedules. Even where the roads abutted in the same city it was often necessary to transfer passengers and freight. As yet the great streams had not been bridged to afford continuous travel. The costs and inconveniences of such arrangements were great. Economy thus demanded the consolidation of these various short lines into one continuous system.

This early consolidation movement began shortly before the Civil War, when various separate lines between Albany and Buffalo were brought under one management. Thus, in 1853, the New York Central was formed by the consolidation of what was originally eleven roads. From 1855 to 1858 this system gained control of five more roads. "Then came Vanderbilt's achievements: the union with the

Hudson River Railroad and the Harlem on the east; and (in some sense) with the Lake Shore and Michigan Southern, the Canada Southern, the Michigan Central, the New York, Chicago and St. Louis, on the west; the whole system including more than four thousand miles of line." Similar combinations took place in the case of the Pennsylvania and Baltimore and Ohio and other railroads. One of the purposes of such combinations was to afford through lines of travel from seaboard cities to the Ohio and its tributaries, to the Great Lakes, and ultimately to Chicago and St. Louis. Combinations of this description aroused little or no hostility because they were clearly of benefit to the public, and because there was scarcely any question of eliminating competition and securing monopoly.

But the public viewed the later combination movement in a different way. The causes involved in this new development, which began to attract attention shortly before 1880, were largely the same as those involved in the combination of large manufacturing enterprises, namely, the desire to reduce expenses, to obtain numerous economies, and to secure some monopoly control over the traffic. Cooperation was necessary even among railroad competitors. Unbridled competition did not work. Thus, said Professor Emory R. Johnson: "Since the rivalry of railroads to secure competitive business, tends, unless artificially restrained, to carry the rates in that business down nearly to the extra costs incurred in carrying that traffic, a large measure of the unity of action becomes necessary if the railroad companies are to keep their properties on a solvent and profitable basis, and are to protect the public interests by keeping their rates stable and relatively reasonable as between different persons, competing localities, and the various kinds of commodities." Added to this desire to stabilize the business, was, of course, the eagerness to obtain some monopoly control over rates.

Combination among railroads was accomplished by purchase, by lease, by means of stockholding, and by "community of interest" in the management of the different companies. A great railway system employs all of these methods. The upshot of the movement during the past three decades has been to bring a large part of the mileage of the country under the control of a small number of systems. In 1906 some seventeen of these systems controlled about 176,000 miles of railroads out of a total of 228,000 miles. Among the more important groups were the Vanderbilt system (21,333 miles), the Pennsylvania, (20,370 miles), the Morgan group, (17,810 miles), the Gould roads (16,902 miles), the Harriman roads, (19,182 miles), and the Hill group, (21,303 miles). The grouping changes somewhat from year to year. While consolidation has been one of the causes of great economies in the operation of railroads, it has been the occasion for alarm and hence a cause for the demand for regulation.

302. **Railroad Evils.**—After 1870 public attention was more and more directed both to the matter of railroad financing and of the evils of rate making and discrimination. The companies had secured large amounts of capital from individuals in towns and counties along the routes. Farmers subscribed for stock in the expectation that the building of railroads would both provide an outlet for their products and increase the value of their lands. While, in some instances, these investments were profitable, in many others reorganizations of the roads forced out the original shareholders. The chief gainers were the clever financiers who understood the nature of the transactions. This was not the only cause of complaint. Local subscribers felt that at least they were entitled to low freight rates, but they discovered among other things that the charges to and from the cities were often lower than to the country shipping points. In the case of the cities, competition was

severe and the roads were often compelled to offer what seemed to be discriminating rates in order to secure the traffic, but the agricultural population did not understand this matter.

Meanwhile growing competition resulting from the building of more roads caused trouble for the carriers themselves. This was particularly the case in the country north of the Ohio and Potomac where the railroad net was thickest. The roads sought to regulate competition by pooling arrangements. This policy began about 1870 and from that time until 1887 when the Interstate Commerce Act was passed there was scarcely a railroad in the country which had a large amount of competitive traffic that was not a party to pooling arrangements of some kind. In some cases the method was to divide the business among the competing companies; in others, either incomes or profits were pooled. The sums thus contributed to the pool were later divided among the companies according to some prearranged ratio.

As early as 1870 a pool was established among roads connecting Chicago and Omaha, that is, the Northwestern, Rock Island, and Burlington. A few years later, the Southwestern Railway Rate Association was formed to adjust rates on traffic between Missouri River points and Chicago and St. Louis. Various other agreements followed. The Southern Railway and Steamship Association, formed in 1875, provided for an annual convention of delegates of the interested roads. In the interim between conventions the business was in the hands of a commissioner who possessed great powers. Questions he could not settle were referred to an executive committee. Rates on competitive traffic "were determined by an executive committee, which also apportioned traffic among the competing roads. Each road carried the traffic coming to its lines, but paid a large amount of its gross earnings from competitive traffic (at

one time 80 per cent) into the pool for distribution, according to the stipulated percentages. One useful feature of the association's organization was the clearing-house for the settlement of the account of the joint traffic."

303. **Railroad Regulation.**—Many persons were convinced that these practices were contrary to the public interest and should be prevented. The States began to legislate on such matters about 1869, but Federal regulation did not begin until 1887. Prior to the date first named very little effort had been made to supervise railroads. According to the theory of the time the public interest would be served best by letting the roads alone. But the experience of the years from 1860 to 1880 proved that some regulation was necessary. The new Government agencies by which the companies were to be controlled were State railway commissions. These were of two types: those existing in the South and West usually possessed greater power than those constituted in the Eastern States and were designated "strong commissions," while those in the East were called "weak commissions." The bodies in the Eastern States as a rule possessed only the power to investigate and advise, while those in the West were frequently empowered to issue orders and enforce decrees by legal procedure. Massachusetts established a commission in 1869 and Illinois in 1871. When the latter State revised its constitution in 1870, a clause was inserted requiring the legislature to enact laws regulating railroads. Accordingly the statute of 1871 prescribed maximum rates and fares and prohibited discriminations. Another act of the same year established a railroad warehouse commission, and a law of 1873 made it the duty of the commission to prescribe reasonable maximum rates for passengers and freight.

The Massachusetts commission, on the other hand, possessed the power only to examine railroad corporations and determine whether they were fulfilling the terms of their

charters, to supervise the roads, particularly with reference to the security and accommodation of the public, to investigate complaints, to act as a board of arbitration in disputes involving railroads and the public and to report its findings to the legislature, including recommendations for appropriate railway legislation.

304. The Interstate Commerce Commission.—Many other States established commissions. Because of the prominent part the farmers' societies took in encouraging the passage of such laws the measures are frequently called "granger legislation." State laws, however, prevailed only within State boundaries. But most of the commerce was already interstate and consequently the coöperation of the Federal Government was needed to make the laws effective. The need of national regulation was brought a step nearer by the decision of the Supreme Court in the Wabash case in 1886 which restricted the authority of the States to intra-state traffic. As with State laws, it was hoped that the prospective Federal statutes would restore competition, lower rates, and prevent discriminations.

Although Congress had considered the question of railway legislation as early as 1874, nothing was done until 1887. The Interstate Commerce Act of the year laid the foundation for Federal regulation of railroads. The law has been amended on various occasions, notably in 1903, 1906, and 1910. In 1913 Congress required the Commission to ascertain the value of all property of the railroads subject to the Commerce Act, a work which has not been completed. Other duties were added by the Clayton Act of 1914, which gave the Commission power to enforce the provisions of the new law so far as they applied to common carriers. The new duties included principally the regulation of the relations between railroads and business organizations from which the roads obtained goods and services, largely for the purpose of maintaining competitive

bidding among such companies, and of eliminating railway influence.

The original Commerce Act provided for a Commission of five members to be appointed by the President. Among other things, the Act prohibited rebating, discriminations, pooling, and traffic agreements. One of the complaints of the time was that railroads frequently charged higher rates for short than for long hauls. To prevent this practice the Act provided that if the circumstances were "substantially similar" the carriers were not to charge or receive a greater compensation for the transportation of passengers or goods "for a shorter than for a longer distance over the same line, in the same direction, the shorter being included within the longer distance." The Commission was also given power to investigate cases brought before it, to summon witnesses, and to call for necessary papers.

305. **The Amendment of the Commerce Act.**—The powers of the Commission were more and more called into question; some of its important functions, including its authority over rates, were actually taken away by court interpretations. Moreover long delays occurred in proceedings before the body. It became the practice to withhold important evidence when cases were presented to the Commission in the expectation that the case would be appealed. In these ways the Commission, "instead of being a coordinate body with the courts, was reduced to an entirely subordinate position. Its function became merely to institute proceedings and thereafter to appear as a complainant before other tribunals competent alone to decide the case." Revision was therefore necessary if the Commission was to work successfully.

In addition changing railroad conditions demanded amendment. Some of the elements in the new situation may be summarized as follows: the persistence of some of the old evils, the consolidation of railroads into great sys-

tems, the loss of relative commercial position by some cities because of these changes, the enormous financial power involved in the great combinations, and the advance of freight rates after 1900.

The first important amendment was in the Elkins' Act of 1903 which dealt chiefly with methods of legal procedure and penalties for infraction of the law. Not only officers and agents, but railroad corporations themselves were made liable to prosecution and penalty; any departure by a railroad from the published schedules was declared a misdemeanor and punishable as such; injunction could be secured against a road in case the Commission had reasonable grounds to believe that the road was departing from its published rates. The new law made the shipper, or any other interested party, also liable to prosecution in case of rebating.

The Hepburn Act of 1906 further enlarged the scope of Federal regulation. Express and sleeping car companies and pipe lines were now brought within the law. Transportation, which the Act was to regulate, included "all services in connection with the receipt, delivery, elevation, and transfer in transit, ventilation, refrigeration or icing, storage, and handling of property transported." The regulation of switches, spurs, and terminal facilities was also included. The rate-making power was greatly increased; thus, in case of complaint, the Commission was authorized to "determine and prescribe" just and reasonable maximum rates. Reports of the railroads were to be standardized, and the Commission was given further power to demand specific reports wherever these were desired.

Several new features were added by the Mann-Elkins Act of 1910, including the power to postpone changes in rates pending examination as to their reasonableness. The Act also provided for a Commerce Court to review the orders of the Commission; this Court, however, was abolished in

1913, and its duties vested in the several district courts. The Commerce Commission as constituted in 1914 consisted of seven members appointed by the President to serve seven years. Its jurisdiction included not only railroads, express and sleeping-car companies, and pipe lines, as heretofore indicated, but telephone, telegraph, and cable companies. The regulation of water carriers has recently been placed under the new United States Shipping Board. Regulations during and after the late war further affected the relation of the Government to the carriers. These matters will be taken up in a later chapter dealing with the War period.

Summarizing the results of railroad regulation after the amendment of 1906, Professor W. Z. Ripley said: "The gains for effective regulation were considerable. Among them may be noted its (the Commission's) enlarged field, the separation of transportation from other businesses, elimination of iniquitous railroad passes, control over joint rates and prorating, the expedition of judicial procedure, full publicity of accounts, enhancement of the dignity and compensation of the Commission, and most important of all, the grant in so many words of administrative rate-making power."

306. **Railroad Rates.**—From the shipper's point of view the desired goal of railway development is lower rates and improved service. Regulation has been a factor of some importance in reducing charges, but it is to be observed that the decline began some years before Government regulation was inaugurated. An element of far more importance has been competition among the roads themselves, and between railroads and water carriers. Another factor in reducing rates was the struggle for traffic at the great terminal points where competition was most severe. The lowering of the rates was made possible by numerous economies in construction and operation. Consolidation paved the way for the

elimination of various wastes, and good management, in many instances, played a part in bringing down the rates. Meanwhile improved facilities for handling freight at terminals, betterment of roadbeds and rolling stock, increasing size of freight cars, the elimination of troublesome grades, and the straightening of many lines were elements in securing more effective operation. Further opportunities for reducing rates resulted from the development of heavy traffic along the routes of some of the older railroads. It has been more and more possible to operate the roads to capacity, to increase trackage and rolling stock, and again to utilize the improvements to capacity. Meanwhile, the steady decline of rates greatly stimulated the development of the country, and this, in turn, was a conspicuous cause of the lowered cost of railway operation.

The results of these changes are seen in the decline of freight rates. The decline was steady until about 1899 when the charges began to advance. The average rate per ton per mile in 1867 was 1.927 cents (gold); in 1883 it had declined to 1.224 cents, and in 1890 to .927 cents, and in 1899 to .726 cents. In 1905 the average ton mile rate was .784 and in 1910 .753 cents. Passenger rates have also declined, although in this department the tendency has been to improve the service rather than to reduce the rates. In 1871 the average charge per passenger per mile was 2.632 cents. In 1898 it was 1.994 cents. Since the date just named the charge has fluctuated slightly above and below this figure.

Low freight rates have been an indispensable factor in the development of the country, partly because long-distance carriage is the rule, and partly because the great volume of commodities carried on American railroads is composed of raw materials or partly manufactured goods which could not be transported long distances if burdened with high rates. The chief beneficiaries of declining freight

rates have been producers of raw materials, such as farmers, lumbermen, and mine operators; the more expensive goods, the product of urban manufactures, have stood the higher charges, yet the city manufacturer has obtained a compensating advantage in the facilities for receiving cheaply large quantities of raw products.

307. Electric Railways.—Another notable feature of the recent transportation history of the United States has been the introduction of the electric railway both as a means of urban and country communication. Electricity was first applied on a commercial scale to transportation in the early part of the decade from 1890 to 1900. The total mileage in 1916 was 47,560, over half of which was in the Eastern and Central States. These roads operated about 80,050 motor passenger cars, 2,900 trail passenger cars, 1,020 express cars, 1,780 freight cars and 13,730 service or other cars. The development of the interurban was an inevitable result of the growth of city electric transportation. Indeed, in many instances, the country roads are operated by the management of the city lines and are often supplied with power from the city central station. But of course, many lines have been developed solely for interurban traffic and are not controlled by the city companies. Economies of construction and operation give the electric considerable advantages over steam railways both for passenger and freight traffic. The cars may be sent off singly at relatively short intervals, thus affording more frequent service than can be obtained from steam railroads. This service made possible the prompt delivery of goods from city merchants and manufacturers; on the other hand, it facilitated the speedy delivery in the city of perishable farm products. Bulk commodities, such as coal, stone, and sand, are carried to some extent by the interurban.

The cross-country electric lines have been an important factor in improving not only economic, but social conditions

in country regions. Cheap and convenient travel encourages communication between urban and country regions, tends to increase the attractiveness of country living and to diminish the disadvantages, and affords country regions many of the cultural and business opportunities of the city.

308. **Inland Waterways.**—In addition to railways the United States has had the benefit of various means of water communication, including river, canal, the Great Lakes, and coastwise navigation. By far the larger amount of tonnage, however, is carried on the railroads. The amount carried in this way increased from 631,740,000 tons in 1890 to 1,976,138,000 in 1914. We do not have adequate figures covering freight carried on the rivers, but in 1914, according to estimates, the river freight was less than four per cent of that on railroads. In fact, except for the Great Lakes, traffic on the inland waterways has declined greatly since 1860. The new movement favoring barge transportation on the Mississippi and its tributaries may result in a considerable increase in this kind of transportation.

Before the building of railroads connecting the Mississippi and Ohio River points with the Atlantic seaboard, the bulk of the products of the Mississippi Valley moved to market over the inland streams. This often involved a long and circuitous haul. One of the immediate effects of railroad building was to divert traffic from river routes directly to the East by rail. Railroad transportation afforded a number of advantages over the rivers, such as continuous service throughout the year, facilities for moving freight in all directions, facilities for loading freight at the factory or warehouse, and greater rapidity of transportation, and fewer transhipments. It was impossible for rivers to compete with railroads in the face of these advantages. The construction of north and south lines to connect Lake and upper Mississippi and Ohio River points with Gulf ports caused further diversion of traffic from

rivers to railroads. To select only one point for illustration, the tonnage received at St. Louis by river declined from 893,800 tons in 1880 to 327,600 tons in 1906. Even in the case of cotton, which once moved largely by river, the railroads have more and more taken the traffic. Thus the receipts of cotton at New Orleans by river declined from 1,087,000 bales in 1880 to 231,000 bales in 1906.

Notable changes have also taken place in the composition of river commerce. Instead of general merchandise, the principal commodities transported at the present time are coal, sand, stone, lumber, and wood; grain is carried to some extent, and cotton is carried on the lower Mississippi. The packet business of the Ohio, Mississippi, Illinois, Tennessee, and other rivers which was once of great importance, has declined to relatively small proportions.

309. **Improvement of the Rivers.**—Notwithstanding the decline of river commerce there has been a constant demand since 1866 for improvement of the streams. A number of factors have been responsible for this. The demand has been notably strong in the case of river cities which once looked to the streams as the chief means of transportation, and the tendency of the railroads to divert traffic to other commercial centers has greatly increased the interest of river communities in water transportation. Moreover both merchant and farming classes hoped that the improvement of the streams would prove an effective means of lowering railroad freight rates because of water competition. In addition, Western Congressmen have often seen in the improvement of rivers a means for the general industrial development of the interior. Thus said O. D. Conger of Michigan in 1870: "I am firm in the belief, Mr. Speaker, that every dollar which the Government spends judiciously in giving security to shipping, in enlarging and multiplying the channels and routes of transportation and travel, in opening new ways of communication by land and water,

is not only returned fourfold to the producer, the farmer, the lumberman, the artisan, and the consumer, but adds vastly to the material wealth and vital prosperity of the nation at large." The large surpluses in the United States Treasury after 1880 offered encouragement to the advocates of river improvement. From 1866 to 1882 grants for improvement of the Ohio, Mississippi, Missouri, and Arkansas Rivers amounted to more than $25,000,000. From 1882 to 1910 inclusive, appropriations for the Mississippi alone amounted to $61,704,000. In 1907 the Trans-Mississippi Commercial Congress urged an annual appropriation of $50,000,000 for the improvement of rivers and harbors. It was announced at this time that it is "the sense of this Congress that it is desirable that the Government shall issue its 2 per cent bonds to the extent of $500,000,000 more to carry forward the work which has already been approved by the engineers of the army."

Although the Government has spent great sums in river improvement since the close of the Civil War, there has been no indication of an appreciable stimulus to the development of river transportation. As already indicated railroad transportation offers many advantages over that on the streams. In addition to the great annual expense in maintaining the rivers in a fit condition for safe and continuous navigation another insuperable difficulty is encountered in providing through-transportation from Lake and river ports to Gulf cities and to foreign countries. Without through-transportation a number of expensive transhipments would be necessary.

310. **Canals.**—Canal traffic in the United States is burdened with difficulties similar to those of the rivers. It has thus been impossible, in the face of growing railway competition, to maintain a large amount of commerce over canals. According to the Census of 1880 more than 4,460 miles of canals had been constructed in the United States

at a cost of $214,000,000. At that date, however, more than two-fifths of the mileage had been abandoned and the traffic over the remaining three-fifths was declining. Notwithstanding the diminishing importance of canals there has been an increasing demand for appropriations for such improvements. In 1903 the State of New York authorized the expenditure of $100,000,000 for the widening and deepening of the Erie, Oswego, and Champlain Canals. The appropriations have since been increased by more than $65,000,000, and an additional $25,000,000 has been demanded for the construction of terminals. The old waterways once carried more than 3,000,000 tons annually. In 1914 the traffic amounted to about 2,000,000 tons, and in 1922 to only 1,485,100.

The development of water communication along the line of the old Illinois and Michigan Canal, a project which goes under the name of the Lakes-to-the-Gulf Deep Waterway, is another enterprise which has attracted attention in recent years. The Chicago Drainage Canal which occupies a portion of this route was begun in 1892 and completed in 1900 at a cost of $45,000,000. The length of this waterway from the mouth of the Chicago River to its terminus south of Joliet is about 42 miles. The canal was intended primarily as a means of conveying sewage from Chicago to the Illinois and thence to the Mississippi River, but the waterway may also be used for commercial purposes. According to the proposed improvements, this channel is to be sufficiently widened and deepened to permit through-transportation from the Lakes to the ocean.

Several canals along the coast have recently been completed. Early in the seventeenth century colonists had spoken of a canal from Buzzards Bay to Barnstable Bay, and this project was later included in Gallatin's plan of internal improvements; but nothing was done until 1906 when a company was organized for the construction of a

canal. The work was begun in 1909 and completed in 1914. The Houston Ship Canal, designed to give Houston, Texas, more adequate communication with the sea than was secured through Buffalo Bayou was completed in 1914 at a cost of $4,500,000.

The greatest of all the recent projects, however, is the Panama Canal. In January, 1903, a Treaty was negotiated with Colombia which gave the United States certain rights for the construction of a canal across the Isthmus of Panama. This Treaty was rejected by Colombia in the same year. When Panama revolted in 1903, its independence was promptly recognized by the United States, and a Treaty was negotiated with the new country. Preparatory work on the Canal was begun in 1904, and commercial traffic was inaugurated in August, 1914. The total cost of the Canal to 1914, excluding the cost of fortifications, administration, etc., was about $365,000,000. This canal is destined to work great changes in the ocean trade routes. It facilitates ocean communication between the Eastern and Western coasts of the United States, increases the advantages of trade with the west coast of South America, and shortens a number of ocean routes to the Orient. In 1914 357 vessels passed through the canal carrying 1,753,000 tons of cargo; in 1923, 5,037 vessels moved through the canal with 25,160,500 tons of freight. The interruption of ocean transportation during the recent War retarded the development of shipping by this route, but with the restoration of normal conditions the tonnage will probably increase rapidly.

311. **Lake Transportation.**—Of all the inland waterways the Great Lakes alone have been able to stand the competition of modern railways. Unlike rivers and canals, there is little or no expense for the maintenance of the waterway, except for clearing channels near the ports. The Lakes afford deep and continuous means of travel most

of the year. Moreover the Great Lakes serve one of the greatest traffic areas of the country, and a peculiarity of much of this region is that it supplies bulky commodities which demand cheap transportation. That the Lakes are able to meet this requirement is indicated by the relative cost of freighting on these waterways and on railroads. Thus in 1870 the freight rate on wheat per bushel from Chicago to New York by Lake and canal was 17.11, and by the all-rail route 33.3. Both Lake and rail rates have declined since that year. In 1900 the Lake and canal rate was 4.42 per bushel and the all-rail rate 9.98; in 1916 the two rates were 7.95 and 10.08, respectively.

A considerable volume of traffic had developed over the Great Lakes before the close of the Civil War, but the great expansion came after that time with the opening of the great resources of the Northwest. A good idea of the growth of Lake commerce may be obtained from a statement of commerce passing through the Sault Ste. Marie Canal, although a large amount of Lake trade does not pass through the canal. In 1860 the tonnage of vessels passing through this waterway was 403,600 tons; it was 690,800 in 1870, 8,454,000 in 1900, 49,856,100 in 1910, and 52,595,000 tons in 1922. The tonnage of vessels engaged in the trade of the Great Lakes increased from 467,700 in 1860 to 2,723,800 in 1922. The freight of the Lakes is chiefly iron ore, coal, grain, flour and lumber.

312. **Coastwise Trade.**—Until after the outbreak of the European War only vessels flying the American flag were permitted to engage in the coastwise trade. Thus protected, ocean traffic along the seaboard increased steadily. In 1860 the tonnage engaged in this branch of transportation, including vessels engaged in certain fisheries, was 2,800,000 tons; it was 2,715,000 tons in 1880, and 6,277,000 tons in 1916. Coastwise freight is made up chiefly of bulky articles such as cotton, lumber, and coal. The distribution

of tonnage in various branches of the water service is shown below:

TONNAGE OF AMERICAN VESSELS

Date	Foreign Trade and Whale Fisheries	Coastwise Trade and Cod and Mackerel Fisheries	Great Lakes	Total
1860	2,546,237	2,807,631	467,774	5,821,642
1880	1,352,810	2,715,224	605,102	4,673,136
1900	826,694	4,338,145	1,565,587	6,730,426
1916	2,191,715	6,277,934	2,760,815	11,230,464
1923	9,073,063	9,211,671	2,758,401	21,043,135

313. **The Telegraph and Telephone.**—The period since 1860 has been characterized by the introduction of several new methods of electric transmission of intelligence, by the extension of both telegraph and telephone service to the Pacific, and by the extension of the postal service, notably throughout the region west of the Mississippi.

The development of the telephone was a direct result of electrical discoveries after 1860. The electrical speaking telephone became known in 1876. In 1895 over 660,000 telephones were in use. The first instruments employed only a single wire connecting two stations; the next step was to bring the various stations into contact with each other by means of a local exchange. Improvement in this respect was so rapid that by 1885 there was an exchange in every city of the United States having a population of over 10,000. Many of these exchanges, however, were small affairs; in the course of time, central stations in adjacent towns were connected, and telephone service was later extended over long distances. One of the first lines of this description was from New York to Chicago, formally opened in October, 1892. In 1922 the companies of the United States which reported an income of over $5,000 a year operated

about 37,265,900 miles of single wire. Of this about 30,613,600 miles were operated by the Bell Telephone system.

Meanwhile, telegraph service, inaugurated on a commercial scale during the decade from 1840 to 1850, was greatly extended. A notable achievement at the beginning of this period was the completion of the first transcontinental line. Such an enterprise had been seriously urged as early as 1853, but little was done except to discuss the feasibility of such an undertaking. But political troubles in Kansas and Nebraska, disturbances in Utah, and the impending Civil War called attention to the need of rapid communication with remote parts of the country. In 1860 Congress took an active interest in the matter and authorized the submission of sealed bids for the construction of a line across the continent. By the Acts of 1861 and 1864 grants were offered to proposed lines similar to those later made to the railroad companies. A little earlier California offered a subsidy of $100,000 to the company that would first construct a line to the Pacific. It was urged that the prospective transcontinental telegraph would facilitate rapid communication with Government officials on the Pacific Coast, that it would promote the exchange of commercial intelligence, enable the Government to learn promptly the movement of the Indian tribes, and that it would aid greatly in making the survey of the Pacific Coast. Taking the Western Union as an illustration, the miles of wire have been extended from 104,500 in 1869 to 1,845,200 in 1922. The number of messages transmitted increased from about 8,000,000 in 1869 to about 191,000,000 in 1922. Many improvements lowered the cost of operating the telegraph and stimulated its use; on the other hand, the growth of business was a great factor in the extension of this service, for the growing number of messages increased the scale of operation of the companies and this in turn made possible

operation at lower costs. In the case of the Western Union the average toll per message in 1869 was 89 cents; the charge reached the lowest figure in 1898 when it was 30.1 cents. Since that date the toll has risen, amounting to 38.8 cents in 1911. Related lines of electric communication have been developed along with the telegraph, including notably the burglar and fire alarm and ticker service employed largely on grain and stock exchanges and in brokers' offices. The development of the wireless since 1900 inaugurated a new era of communication. The total number of wireless messages dispatched in 1922 was 2,365,100.

These new means of communication have been factors of great importance in promoting industrial growth. Thereby merchants and manufacturers have been enabled to keep closely informed about trade conditions; slight changes in prices which influence business may be taken advantage of; other commercial conditions which affect production and distribution of goods may be known within a few hours; the great staple markets are made immediately responsive to the price-making factors. Thus rapid communication promotes freedom of competition. The big business of to-day which controls plants in various parts of the country, and which requires almost hourly information from these properties, relies largely on the telegraph and telephone for many of its economies. Farmers and ship owners derive a great benefit from telegraphic news by being informed promptly of the approach of storms and of changes in weather conditions. Finally by making possible the quick transmission of news electric communication has become one of the greatest socializing factors of modern times.

314. The Post Office.—The Post Office Department was one of the original divisions of the United States Government, but until about 1860 almost its only function was to collect and distribute the mails. Many new activities have

been added since that date. Free city delivery was authorized by the Act of March 3, 1863, the money-order system by the Act of May 17, 1864, and special delivery by the Act of March 3, 1885. Post cards were first issued in 1873, and rural delivery was started in an experimental way on three routes in West Virginia in October, 1896. The Parcel Post and the postal savings bank are among the most recent additions to the work of the Department.

An important feature in the development of the work of the Post Office Department has been the extension of mail service throughout the country west of the Mississippi and to the Pacific. After the Mexican cession Congress promptly authorized the establishment of a mail route from St. Louis by way of Independence, Missouri, to Santa Fe. The discovery of gold in California made necessary the rapid delivery of mail to the Pacific Coast. As early as 1847 Congress authorized the Postmaster General to establish a post office at Astoria, and an Act of the following year provided for post offices at San Diego, Monterey, and San Francisco. The postage rates to and from Pacific points at this time was 40 cents. The charge, however, was shortly reduced to 6 cents an ounce on prepaid letters, and to 10 cents on those which were not prepaid. These amounts were much lower than the cost of delivering letters to the Pacific, which on the route from New York by way of Panama and Chagres was estimated at 22 cents. Indeed, for a number of years both Pacific and intermediate overland deliveries were made at a great loss to the Government. To give only one illustration, the cost of delivering mail to the Far West by way of El Paso in 1860 was $600,000 a year, while the income amounted to only $119,760.

The first overland stage was sent across the continent in 1858. The route followed was from St. Louis to Jefferson City, thence to Springfield, Missouri, to Fort Smith,

Arkansas, to Sherman, Texas, through the valley of the Rio Grande to Tucson, thence to Fort Yuma, Los Angeles, and San Francisco.

On July 7, 1838, Congress declared every railroad a mail route, but until railways were built in every part of the country the Post Office Department was compelled to rely on any kind of conveyance for the delivery of the mails. This was notably true in the sparsely settled country west of the Mississippi. Contracts of the time show that mail was carried by steamboat, by two-horse coach, by four-horse coach, and by horseback. One contract called for delivery by "horse or muleback, or on the backs of men, in whole or in part, or in wagons, carriages, and sleighs, in whole or in part." One eager contractor on the route from Independence, Missouri, to Santa Fe agreed to carry mail in a "six-mule coach with iron axles and elliptic springs once every week." Some of the Western mail contracts ran into large sums, such as those of John Butterfield. The high cost was due to the risks of the enterprise and to the need of an elaborate equipment including vehicles, animals, relay stations, and storage for food for men and animals along the route. The organization of the business for carrying the mails was one of the unique features of our Western history. While contractors sometimes imposed upon the Government, as a rule they rendered honest, prompt, and efficient service. Gradually the railroads, as they were extended over the country, became the chief carriers of the mails, but for many years coach, animal, and even man delivery was required in remote parts of the country. Postage rates have declined somewhat since 1860. By the Act of March 3, 1851, letter postage was reduced to 3 cents per half-ounce for distances under 3,000 miles where the postage was prepaid. The Act of March 3, 1883, authorized the reduction of postage on all first-class mail to two cents an ounce. The great bulk of the

mail is now made up of business matter, including letters and advertising in various forms. Cheap postage has, therefore, been an indispensable aid to industrial growth.

Some idea of the growth of the postal service may be obtained from the following table:

THE GROWTH OF THE POST OFFICE DEPARTMENT

Year	Post Cards Issued	Ordinary Postage Stamps Issued	Gross Revenue of the Department	Gross Expenses of the Department
1860		216,370,600	$ 8,518,000	$ 19,170,000
1870		468,118,400	19,772,200	23,998,800
1880	272,550,500	875,681,900	33,315,400	36,542,800
1890	429,515,000	2,219,737,000	60,882,000	66,259,500
1900	587,815,000	3,998,544,000	102,354,000	107,740,200
1916	1,047,894,800	11,671,842,200	312,057,600	306,204,000
1923	1,253,195,900	15,478,095,100	532,827,900	556,850,900

The value of domestic money orders issued by the Department in 1865 amounted to $1,360,100, in 1880 to $100,352,800 and in 1923 to $1,388,090,000. The growth of the various activities of the Post Office Department is one index to the industrial development of the country.

315. **Roads.**—No account of the transportation system of the country would be complete without reference to the enormous sums which states are spending in the construction of roads. The enthusiasm for this form of transportation suggests the internal improvement period, in the years before the panic of 1837, when the states incurred great debts for the purpose of building turnpikes. At the present time, however, the incentive comes not from the need of opening new countries, but from the demand of new methods of travel, including automobiles and trucks.

In the past six or eight years the states have embarked on great road building enterprises and they have received notable assistance from the Federal Government in the form of grants of funds. This policy of Federal appro-

priations was begun in a small way in 1916 and developed on an extensive scale with the passage of the Federal Highway Act of 1921. Under this plan the states also contributed a part of the expenses of building highways. To the close of 1924 the total estimated cost of projects under construction, and approved for construction was $549,655,000, and Federal aid thus far granted was $237,852,000, and the total mileage constructed under this arrangement was 32,450. When all the enterprises are completed it is estimated that Federal aid will amount to $469,498,000.

In the case of financing by the states the policy has usually been to issue bonds to defray the expenses of the enterprises. Tax exempt features have added something to the attractiveness of such securities as investments.

The new roads have come to be avenues over which vast amounts of freight are carried to market, to say nothing of the enormous passenger travel which they accommodate. In the neighborhood of large cities a great quantity of perishables—milk and vegetables, are brought to market, and in some parts of the country the freight business includes general merchandise. Sometimes the business is handled by private truck companies, and sometimes by the railroad as supplementary business. In any case, these highways have become competitors of railroads, both with respect to passenger and freight business.

The new roads have contributed enormously to the development of the country. They should be considered not only as a business enterprise, but also as a means of improving social conditions in country areas by making communication easy.

The mileage of hard surface roads in the United States in 1922 amounted to 387,760 of which 263,200 miles were surfaced with sand, clay and gravel, and 87,600 were macadamized roads. The total construction in 1922 was more than 34,000 miles of surfaced roads.

PIPE LINES AND OIL REFINERIES, 1926

316. **Pipe-Line Transportation.**—A unique feature of transportation development of the United States has been the method of conveying petroleum. In 1923 there were over 82,000 miles of pipe line in the United States, including more than 41,000 miles of trunk lines. The total capacity of this system is 14,400,000 barrels. These lines extend through 23 states. The greatest mileage is in Oklahoma which contains over 17,000 miles of pipe line. The next state of importance is Texas with nearly 12,000 miles, and next is Pennsylvania with over 11,000 miles.

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CHAPTER XXIV

COMMERCIAL DEVELOPMENT: II, MONEY AND BANKING

The development of the communication industries rendered an invaluable aid to the industrial growth of the country. But this work is confined to moving of goods from place to place and to the transmission of business and other intelligence. This process of moving commodities from producers to producers and thence to ultimate consumers requires the aid of credit institutions. Thus enterprises of this description have been compelled to expand and to take on new functions to meet the growing requirements of manufactures and trade. Great changes, therefore, have taken place in the banking world; not only have banks multiplied in number, but they have tended to specialize more and more in selected lines of credit. This latter movement is one of the great characteristics of modern banking development and has been made necessary by the peculiar demands of growing industry.

317. Specialization in Banking.—By far the most important of the credit institutions are the commercial banks of which national and State banks are the chief illustration. Their work is principally the granting of credit for brief periods, usually not to exceed ninety days, to merchants and manufacturers to aid in the purchase and sale of goods. Another demand of modern industry is for institutions which collect funds for investment and which organize investors' markets. This is the work of a few great investment bankers located chiefly in New York City, Boston, Philadelphia, Baltimore, and Chicago. Establish-

ments of this kind owe their origin and growth to the financial demands of railroads and large manufacturing industries which are constantly in need of funds for construction, enlargements, etc. Trust companies are still other institutions which owe their growth to the enormous expansion of business since 1875. Their chief work is to act as trustees under mortgage in deeds of trust securing bonds, to act as transfer agents and managers of sinking funds, to pay dividends and interest for railroads and big business, to act as syndicate managers, and to perform numerous other important services for a modern business enterprise. Because of the great increase in wealth, trust companies are frequently called upon to hold and administer property of various descriptions for individuals. Thus the trust company has become one of the great units in the banking field.

Since the city banks serve chiefly the credit needs of manufacturing and commercial enterprises, it has become necessary in recent years to develop a kind of organization which can administer to the peculiar needs of farmers. To some extent trust companies serve this need; but in addition, specialized institutions have developed in the form of mortgage companies, and more recently in the form of Federal Land Banks which came into existence under the Federal law of 1916. The needs of home builders have been met by the growth of building and loan associations. Thus the outstanding features of the development of banking since the Civil War have been the specialization of banking, the great expansion of banking resources, and the rapid development of investment banks and trust companies and of institutions to finance farmers and home builders.

318. Currency Changes.—Notable changes have also taken place in the money history of the country. The issue of greenbacks during the Civil War, the struggle over the redemption of the greenbacks, the Free Silver

the Gold Standard Act of 1900, the provisions for emergency currency under the Aldrich-Vreeland Act of 1908, and the creation of the Federal Reserve System, with its provisions for a more elastic currency, have been some of the leading characteristics in our money history.

319. The Need for Banking Reform.—Both the money conditions of the times and the financial needs of the Federal Government during the Civil War made necessary notable changes in the banking system. Prior to this time banking had been largely in the hands of State institutions. There were hundreds of banks of this description; some were good; others were bad, and there was a suprisingly large number of the latter kind. There was a confusing variety of bank notes in circulation and little or no uniformity in the policy of the banks themselves in putting out or redeeming their notes. Even with the aid of periodicals which informed bankers of the status of the notes of various banks it was impossible to determine with certainty the value of paper money that circulated at any distance from home. The conditions in 1862 have been described as follows: "They (the banks) were established under the laws of twenty-nine different States; they were granted different privileges, subjected to different restrictions, and their circulation was based on a great variety of securities, of different qualities and quantities. In some States the bill-holder was secured by the daily redemption of notes in the principal city; in others by the pledge of State stocks, and in others by coin reserves. There were State banks with branches, independent banks, free banks, banks organized under general laws, and banks with special charters." Some of the leading evils of the time were the lack of uniform circulation, the uncertain value of the notes, violent contraction and expansion of the currency, and the uneven distribution of note issues. It was expected that the proposed new banking system would cure these evils.

In addition to the conditions of the circulation, the financial needs of the Government during the War demanded a change in the system of banking. Bonds of the United States at times sold with difficulty. The Secretary of the Treasury, Salmon P. Chase, suggested that a market might be created for national securities by the organization of national banks which should be required to purchase Government bonds as security for their circulation. This was not an untried experiment because it had been applied in New York State under the free banking system originated in 1838 one of the features of which was the deposits of securities to protect note issues. The Secretary's suggestions were largely embodied in the Act of February 25, 1863. This law was revised the following year. It was expected that State banks would promptly take advantage of the new Federal law, but few of them did so until after the passage of the Act of March 3, 1865, which placed a tax of 10 per cent on their circulation.

320. **The National Banking System.**—The National Banking Act has been amended many times since 1863. Some of the leading provisions refer to capital, note issues, and reserve. According to the original Act, the amount of circulating notes was not to exceed $300,000,000. Of this amount $150,000,000 was to be apportioned among the States and Territories and the District of Columbia, and the remainder was to be distributed by the Secretary of the Treasury with "due regard to the existing banking capital, resources, and business of such States, District, and Territories." The arrangement for apportionment worked badly, some sections securing more than their share. The shortage of circulation was particularly noticeable in the South which had been in no position to avail itself of the privileges of the Act. Limitations on the volume, moreover, could only be temporary because of the expanding needs for circulation. The Resumption Act of 1875

finally eliminated these difficulties by removing limitations on total volume and on apportionment of distribution.

Banks were required to purchase at least $30,000 of United States bonds and not less than one-third of the capital stock paid in, and in the event that the capital stock was increased the bond purchases were also to increase to one-third of such capital. These bonds were to be deposited with the Treasurer of the United States. Banks were permitted to issue notes up to 90 per cent of the market value of the bonds deposited, but not to exceed the amount of capital stock actually paid in. To prevent counterfeiting and fraudulent alterations and to secure uniformity, the Comptroller of the Currency, a new officer provided by the law, was authorized to provide plates and dies and to make arrangements for engraving the notes. Bank notes were to be of various denominations, including one-, two-, three-, five-, and ten-dollar bills, the largest being one thousand dollars; not more than one-sixth of the notes were to be in denominations of less than five dollars, and after specie payment was resumed, no bank was to issue notes of less than five dollars.

The notes were to express on their faces that they were secured by United States bonds deposited with the Treasurer and that such notes were to be received "at par in all parts of the United States in payment of taxes, excises, public lands, and all other dues to the United States, except for duties on imports; and also for all salaries and other debts and demands owing by the United States to individuals, corporations, and associations within the United States, except interest on the public debt, and in redemption of the national currency." This is substantially the reading on the notes to-day.

The Act added certain provisions for redemption. Banks were required to redeem their notes at their own counters, at par, in lawful money of the United States. Redemption

could also take place at certain other places in the country, particularly at selected banks in New York City. Subsequent laws provided a five per cent redemption fund to be kept with the Treasurer at Washington.

In recent years, owing to the refunding of the debts of the United States at lower rates of interest, the profit on bank-note issues has declined, and in consequence banks have been inclined to limit their circulation. Some concessions were made by the Government in the Act of 1900 which permitted the issue of notes to the full face value of bonds deposited, so long as they stood at or above par, and which reduced the tax to one-half of one per cent on circulation based on the new two per cent thirty-year bonds. The Aldrich-Vreeland Act of 1908, and the Federal Reserve Act of 1913, made notable changes in the kinds of security to be deposited for circulation. These matters will be discussed presently.

A second important provision of the National Banking Act refers to reserve. Thus, according to the law of 1864, banks in certain cities named in the law were to carry a reserve against notes and deposits of 25 per cent; in all other places the reserve was to be 15 per cent. Banks of the latter class, however, were permitted to count as part of their reserve three-fifths of the amount due them from other banks. Subsequently the five per cent redemption fund kept with the Treasurer at Washington could be counted as part of the reserve and this reserve was to be kept for the prompt payment of deposits instead of notes and deposits as heretofore. These rather rigid provisions were at times a cause of embarrassment to the banks. They came to be regarded as one of the weaknesses of the National Banking system. Thus the Federal Reserve Act and its amendment have made marked changes in the amount of reserve which member banks must carry.

As to capital, the law provided that, except with the ap-

proval of the Secretary of the Treasury, no bank was to be organized with capital less than $100,000; in a city whose population exceeded 50,000 the capital was to be not less than $200,000. With the approval of the Secretary, however, banks could be organized in places of less than 6,000, but the minimum capital was to be $50,000. This provision retarded the formation of national banks in the smaller communities and it was found necessary to reduce the amount of required capital. As the law stood in 1914 the smallest capital permitted was $25,000, and this was in places of 3,000 or less. In towns of 6,000 or less the capital was at least $50,000; between 6,000 and 50,000, $100,000; and in cities of 50,000 or more, the capital was to be not less than $200,000. The shares of national banks have a par value of $100, and shareholders have an additional liability of $100 a share.

Students often obtain the impression that national banks are Government institutions. They are such only in the sense that they are chartered by the Federal Government and are regulated by such laws as Congress sees fit to impose. They are, in fact, private corporations regulated by the various provisions of the national banking laws. The original Act provided for the appointment of a Comptroller of the Currency, who is vested with important powers with respect to the administration of the national banking system.

321. **Importance of the National Banks.**—An estimate of some of the leading contributions of the National Banking system is given by Professor Davis R. Dewey as follows:

> The founding of banking currency upon national Government securities had many advantages: first of all, it not only created a special demand for bonds, but enlisted a strong and active interest in the general welfare of the Government's credit. In the second place, by driving State bank issues out of existence

through heavy taxation, it tended to create a demand for United States legal tenders and other treasury issues for meeting the ordinary operations of trade and exchange. Lastly, the assistance of the national banks in floating loans of the Government was of the greatest importance. A more remote effect of this legislation was its influence in shaping both popular discussions and Congressional action upon Government paper currency as a rival system to bank paper.

The original National Banking Act was far from acceptable to the bankers of the time; but gradually they came to see its value, and amendments tended to make it more acceptable. The system grew in strength and, in time, enlisted the support of most of the great institutions, to say nothing of thousands of smaller ones. Although Federal laws are more severe than those of the States, this severity has proved to be an advantage because it has increased popular confidence in national banks. The number of such institutions in 1864 was 467 with capital paid in amounting to $75,213,900, and with loans and discounts amounting to $70,746,500. In 1890 the number of national banks had increased to 3,484 with capital of $642,073,600 and with loans and discounts amounting to $1,933,509,300. In 1923 the number was 8,241 with capital of $1,328,891,000 and with loans and discounts aggregating $11,817,671,000. Some idea of the distribution of the banking business among the various classes of institutions in 1923 may be obtained from a comparative statement of their individual deposits which stood as follows: national banks, $13,964,081,000; savings banks, $7,897,301,000; State banks, $11,118,078,000; loan and trust companies, $6,822,481,000; private banks, $131,399,000.

322. **Greenbacks.**—The financial stress of the Civil War forced the Government into an experiment with paper money. Although Treasury notes issued on three previous occasions had enjoyed a limited circulation, the Govern-

ment had never issued paper money, and only gold and silver had been legal tender. In 1862 owing to the pressing need for funds, Congress authorized the issue of $150,000,000 legal-tender notes. The measure met with much resistance on the part of the bankers, but members of Congress were convinced that it was a satisfactory policy; moreover, there was little hope that taxation would be promptly productive, or that the proposed new banking system would be of any immediate assistance. Under these conditions the Act was passed. Subsequently owing to the inability of the Government to borrow on satisfactory terms and due to the tardy effect of taxation, Secretary Chase asked for a further issue of legal tenders. This request was granted in the Act of July 11, 1862, which provided for another issue of $150,000,000 of which $35,000,000 should be in denominations less than five dollars, but not less than one dollar. Two Acts of 1863 added another $150,000,000 to the amount of legal tenders authorized. These issues were supplemented by fractional currency and by interest-bearing notes, which both possessed legal-tender qualities.

The greenbacks are promissory notes of the Government and were in effect forced loans without interest. The notes read on their face the "United States will pay the bearer" the denomination of the note. On the reverse side the bill bears the statement: "This note is a legal tender at its face value for all debts public and private, except duties on imports and interest on the public debt."

323. **Effects of the Greenbacks.**—In view of the faulty policy of taxation employed by Congress at the beginning of the War it is difficult to see how any other rapid method of obtaining funds could have been used; but the effects were most unfortunate. On various occasions, almost to 1900, the greenbacks became a troublesome problem to Government financiers, and even to-day they are not an altogether satisfactory part of our circulating medium.

One of the first effects was to compel banks to suspend specie payment, and the Government itself was soon obliged to adopt the same policy. Gold and silver, even coins less than a dollar, were driven out of circulation, and it became necessary to resort to postage stamps and other currency for "change." From 1862 to nearly 1879, when resumption of specie payment was effected, the country was on a paper basis. Greenbacks, moreover, were one of the important causes of the rise of prices during the war period. This was an unfortunate result, particularly for the Government, which was the largest purchaser of commodities; thereby, the cost of the War was greatly increased. The added expense due to this cause has been estimated at from $528,000,000 to $617,000,000. As usual rising prices disturbed the relations among all classes of the community. Nominally the debtor paid back the amount of his loan, but since money had depreciated, he returned a smaller purchasing power than he had obtained, depending on the value of the greenback. Laborers, people on salaries, ministers, school teachers, and a host of others were greatly burdened. Wages rose during the latter part of the war period, but not as rapidly as prices, with the result that the workers' income declined in purchasing power. Rising prices, however, were a great stimulant to business during and after the War. The changes in wages and prices are shown in the table below.

WAGE AND PRICE CHANGES IN THE CIVIL WAR PERIOD

Year	Prices	Money Wages
1860	100.0	100.0
1861	100.6	100.8
1862	117.8	102.9
1863	148.6	110.5
1864	190.5	125.0
1865	216.8	143.1

The greenbacks also impaired the credit of the Government and interfered with subsequent borrowing. Nor did the trouble end with the war period. For some years after these notes played an important part in the political agitation of the times and were in consequence a disturbing element in business life. As late as 1893, during the panic, legal tenders were employed as a method of withdrawing gold from the Treasury and thus became a cause of embarrassment and loss to the Government. This unfortunnate incident was the occasion for a section in the Act of 1900 which provided for the redemption of legal tender notes on demand in gold, and for the maintenance of a gold reserve of $150,000,000 in the United States Treasury to provide for such redemption. This Act also provided that if the reserve should at any time fall below $100,000,000, the Secretary of the Treasury was required to restore the amount to $150,000,000 by the sale of bonds.

324. Resumption of Specie Payment.—At the time of issue the greenbacks were considered a war measure, but their retirement proved to be impossible. Secretary McCulloch urged the speedy resumption of specie payment and insisted that this could only be accomplished by a reduction of the volume of circulation. He therefore asked Congress for authority to sell bonds for the purpose of retiring the notes. But arguments were advanced against contraction: it was urged that this policy would injure trade and possibly cause a panic, that it would reduce the public revenues "through a distressed condition of commerce and industry, affecting employment, consumption, and import of commodities," that contraction would embarrass the banks, and that the Government should not give up the privilege of issue. The plan of retiring notes had actually been tried by Secretary McCulloch. After much controversy in which several policies were followed, Congress finally ordered in 1878 that there should be no further

destruction of notes. The amount then outstanding was $346,681,000 which volume is still current.

By an Act of January 14, 1875, Congress provided that specie payment should be resumed on January 1, 1879; the Secretary of the Treasury was authorized to accumulate gold for this purpose. On January 1, 1879, the "Treasury had gathered together $133,000,000 of coin over and above all matured liabilities. To do this $95,500,000 of bonds were sold, the balance being met from surplus revenue. Slowly but gradually the value of the notes approached parity with gold, and on December 17, 1878, a fortnight before the date set, paper currency was quoted at par." In later years the great surpluses in the Treasury made it possible to maintain the convertibility of legal tenders without difficulty. The real test came in 1893 when, as we have seen,the parity of gold and paper currency was maintained by buying gold to redeem the notes.

325. The Panic of 1873.—The period of good times following the Civil War was brought to an end by the panic of 1873. Thereafter, until almost 1879, followed one of the most trying business depressions in the history of the country. Some five thousand failures occurred alone in the panic year, and during the panic and depression period the failures aggregated 47,000, with a total loss estimated at more than one billion dollars. Imports fell off, immigration declined, business came to a standstill, and laborers by the thousand were thrown out of work. As in most periods of unusual prosperity, the years from 1865 to 1873 had been noted for great speculative activity. The rise of prices due largely to inflated currency stimulated many kinds of production, and such enterprises were frequently floated on borrowed capital. Railroad building, unchecked by the War, continued at a rapid rate after its close. Between the years 1865 and 1873 upwards of 33,000 miles were built, an amount which exceeded the total mileage of the

country in 1860. A considerable portion of this mileage was in the new country west of the Mississippi where there was little hope of paying traffic. Yet investors borrowed to buy stocks and bonds in such roads. Many of the new roads were unable to pay interest on their bonds and failures and reorganizations followed. Likewise the rapid development of farming, due partly to the stimulus of the Homestead Act, was a factor in the situation. Many farms were covered with mortgages; farmers' difficulties were increased because a large part of their product could not be sold at profitable prices, and they were unable to pay their debts. The embarrassments of the farmers were passed on to country stores, thence to city merchants and manufacturers, and through them to banks which had extended loans. Many industries, therefore, felt the strain of funds sunk in unprofitable enterprises. The tightening of the money markets for more than a year before the panic was a forewarning of what was to come. In this tense situation all that was necessary to precipitate a panic was the failure of some large establishment; the failure of Jay Cooke and Company, a banking house which had been interested in financing the Northern Pacific, provided the precipitant. This occurred September 18, 1875; hundreds of failures followed before the year was out.

326. **The Silver Question.**—As early as 1866 a revision of the coinage laws of the United States had been suggested in order to provide a "code or compendium which would more clearly correspond to existing technical and commercial needs." In 1869 a committee composed of the Director of the Mint and the Comptroller of the Currency was appointed to consider this matter. The committee reported the following year. Although the question was discussed in Congress on various occasions, the suggestions of the committee were not enacted into law until February 12, 1873. Under ordinary circumstances such a law would have

been considered only a matter of routine regulations of the Government but the turn of economic events during the following decade directed criticism to certain portions of the Act.

The provision that was made the object of attack was that which dropped the standard silver dollar from this list of coins to be minted by the United States. Many persons regarded the act as a "conspiracy on the part of the Eastern bankers and the legislators to demonetize silver without the general knowledge of the public." Thus the Act was denounced as the "Crime of 1873." But these charges were untrue. One of the chief purposes of the bill was to clarify the coinage measure of the country. The silver dollar had not been in general circulation for many years; in fact from 1792 to 1873 not more than $8,000,000 silver dollars had been coined. Until the opening of the Western mines shortly after 1860 very small quantities of silver had been produced in the country, and metal for coinage had been obtained chiefly from outside the United States. When the Act of 1873 was passed, the country was on a paper basis. Silver, moreover, was worth about $1.02 in gold, and there was no profit in bringing the white metal to the mint for conversion into United States coins. But the new economic situation which developed after 1873 brought the silver question into the foreground.

327. The Bland-Allison Act, 1878.—The issue raised at this time continued to agitate public opinion for the next quarter of a century; it did not pass into the background until the rise of prices during the good times following 1898. One of the most important factors in the new situation was the development of silver mining in some of the Far Western States. In 1860 the commercial value of silver produced in the United States was only $156,800; it rose rapidly to $16,434,000 in 1870, and to $57,242,100 in 1890. While the supply was thus rapidly increasing, the

demand was lagging far behind, due in part to the stoppage of free and unlimited coinage of silver by some of the European countries and to the falling off of the Indian demand. These changes are reflected in the varying ratio of the value of gold and silver. For almost a century this ratio had not been far from 16 to 1; but with the increasing output of silver it changed to 16.62 to 1 in 1875, to 18.04 to 1 in 1880, and to 31.60 to 1 in 1895.

Other factors affected the silver question; many persons were not content to see the Government pay the war debt in dollars of greater purchasing power than those borrowed; yet this would happen if the greenbacks reached parity under the Government's plan of resumption of specie payment. Moreover, farmers who had mortgaged their property would have to pay in dollars of higher value, and prices would decline with the rising value of money. The Greenback Party, which arose out of the Grangers in 1876, demanded the repeal of the Resumption Act, the abolition of bank notes, and the issue of more legal-tender bills by the Government. And now, with the development of silver mining, mine owners who were anxious to have a market for their new product, wished to have the government resume free coinage of silver at the old ratio of 16 to 1.

The forces working for cheap money were not able to obtain the kind of measure they wished, but the Bland-Allison Act of 1878 made great concessions to their demands. The Act required the Secretary of the Treasury to purchase not less than $2,000,000 worth of silver bullion per month at the market price, and not more than $4,000,000 worth, and to cause the same to be coined monthly into silver dollars weighing 412½ grains. The gains in seignorage were to be accounted for by the Treasury Department in the same manner as with subsidiary coins. These dollars were made legal tender at their nominal value for all debts public and private, except where

otherwise expressly stipulated in the contract. The Act also provided for the deposit of silver dollars with the Treasury Department and for the issue therefor of silver certificates in denominations of not less than ten dollars, redeemable in silver on demand. This Act continued in operation until 1890, and during these twelve years more than $378,166,000 silver dollars were coined.

This increasing coinage, however, could not readily be taken into circulation. As a rule, people found it inconvenient to use heavy coins, and in spite of efforts of Secretaries of the Treasury, they were promptly deposited in local banks, transferred thence to city institutions, and thence to Government sub-treasuries. In 1880 Secretary Sherman reported that it was difficult to maintain more than 35 per cent of the coins in circulation. To make way for silver Congress in 1886 authorized the issue of silver certificates in denominations as low as one, two, and five dollars, and the Treasury department helped to create a demand for these bills by withholding as far as possible legal-tender notes of small denominations. Meanwhile the decline of banknote circulation from 1886 to 1890 made room for further circulation of silver certificates.

328. **The Sherman Act, 1890.**—The Act of 1878 was not satisfactory to any of the interests concerned; its operation was resisted by the banks; moreover little sympathy was obtained from the Treasury Department which was burdened both with the duty of continuous purchase and coinage of silver and with the maintenance of the gold standard. On the other hand, silver advocates found abundant cause of complaint; the panic of 1884, with the subsequent depression, brought the usual distress; farmers were disturbed over the evils of the railroads; advocates of cheap money complained that the gradual decline of gold production with the consequent fall of prices brought real hardships to debtors. As the result of the admission of several new

Western States the strength in Congress of the silver-producing interests was increased. The Sherman Act of 1890 was an outcome of these conditions.

The following are some of the provisions of this law: (*a*) the Secretary of the Treasury was required to purchase not more than 4,500,000 ounces of silver a month, or as much of this amount as was offered for sale, and was to pay the market price for the same but not more than one dollar for $371\frac{25}{100}$ grains; (*b*) payment was to be made in Treasury notes, later called "coin notes" and "Sherman notes," in denominations of not less than one dollar and not more than one thousand dollars; (*c*) these Treasury notes were to be redemeed on demand in coin; they were to be legal tender for all debts public and private, except where otherwise expressly stipulated in the contract, and were to be received for all customs, taxes, and public dues, and when so received could be reissued; (*d*) they could be counted as part of the lawful reserve of national banks; and (*e*) upon demand of the holders of these notes could be redeemed in gold or silver, since it was "the established policy of the United States to maintain the two metals on a parity with each other upon the present legal ratio, or such ratio as may be provided by law."

329. The Panic of 1893.—Some of the provisions of this Act greatly embarrassed the Government. As in all periods of good times, the years prior to 1893 had been characterized by speculation, inflated credit, and by the sinking of large sums in enterprises which at best offered only remote returns. This was a cause of industrial weakness; but the Act of 1890 added to the uncertainty by threatening the credit of the Government. The large additions of silver coin and currency to circulation tended to drive out gold; it thus became more and more difficult to maintain the parity of the two metals prescribed by the laws. Following the Tariff Act of 1890 customs receipts declined

from $229,668,000 in 1890 to $177,452,000 in 1892 and to $131,818,000 in 1894. On the other hand, due to the large appropriations of Congress, the drain upon the Treasury for payments increased. The failure of the English banking-house of Baring Brothers in 1890 caused the withdrawal of some English capital from American industries; other causes also contributed to the export of gold, and at the same time large amounts were hoarded. Both Sherman notes and greenbacks were employed to obtain gold from the Treasury, and since notes thus redeemed could be reissued they served as an "endless chain" for the further extraction of gold from the Government's reserve.

During the fourteen years from the resumption of specie payment to 1892 only insignificant amounts of gold had been demanded in payment of legal tenders; but with the approach of uncertain times about 1893 the call for gold became so great that the reserve could only be maintained by the sale of bonds. The reserve dropped to the lowest point in years in June, 1894, when it stood at about $65,000,000. From 1894 to 1896 bonds worth more than $262,000,000 were sold for the purpose of replenishing the gold reserve and meeting the current deficit. It was not until business turned for the better about 1898 that the Treasury was again placed on a safe footing.

The panic of 1893 and the subsequent depression brought great distress to the country. The

production of coal, both anthracite and bituminous, fell off; the output of pig-iron, which had been about 9,157,000 tons in 1892, fell to 6,657,000 tons in 1894; new railway construction almost ceased; in 1894 there were 156 railways, operating a mileage of nearly 39,000 miles, in the hands of receivers; among these were three great railway systems, the Erie, Northern Pacific, and Union Pacific. The total capitalization in the hands of receivers was about $2,500,000,000, or one-fourth of the railway capital of the country. The earnings of railroads and dividends paid to stock-

holders were seriously affected; securities fell to one-half and even to one-quarter their former value; commercial failures increased from 10,344 in 1892, with liabilities of $114,000,000, to 15,242 in 1893, with liabilities of $346,000,000. The problem of unemployment became general; special committees were organized in nearly all the large cities to provide food, and in many places relief work by public bodies was instituted.

330. The Gold Standard Act, 1900.—The silver issue was one of the leading elements in the campaign of 1896. The Republican convention put itself on record as against the free coinage of silver except by international agreement, and in favor of the maintenance of the gold standard. The Democratic convention, on the other hand, declared for free and unlimited coinage of both gold and silver at the old ratio of 16 to 1 without awaiting the action of European countries. Although delayed, the currency legislation of March 14, 1900, was one of the results of the success of the Republicans. Among other things, the Act provided for the definite adoption of the gold standard.

The following were some of the leading provisions of the law: (*a*) the establishment of the gold dollar of 25.8 grains (9/10 fine) as the standard unit of value; (*b*) the maintenance of all forms at parity with this standard; (*c*) the maintenance in the Treasury of a gold reserve of $150,000,000; (*d*) the gradual retirement of Treasury notes of 1890 was provided for by directing the Secretary to retire and cancel such notes as fast as silver dollars could be coined and silver certificates issued to take their place; (*e*) lest the "endless chain" operations should be repeated, the Act provided that legal-tender and Treasury notes once redeemed should not be reissued except for gold. The Act left unchanged the legal-tender quality of silver dollars and of other money and coin issued by the United States; it also provided for the issue of gold certificates for gold deposited with the Treasury Department.

331. **The Revival of Business.**—Towards 1898 the country began to emerge from the depression of the last five years. A succession of good harvests was an encouraging feature. With the discovery of gold in Alaska large quantities of this metal were brought in for coinage, stimulating the rise of prices and the development of business. Thus the average annual coinage of gold in the United States increased from $67,185,000 during the decade from 1891 to 1900, to $101,022,000 during the decade from 1901 to 1910. With the turn of business for the better, immigration increased. During the years from 1894 to 1899 the inflow had never exceeded 350,000 a year; but with the turn of good times the immigrant tide increased to 448,000 in 1900, to 1,026,000 in 1905, and to 1,285,000 in 1907, the largest number in the history of the country.

Meanwhile manufactures began to share in the new prosperity. The value of manufactured products increased from about $11,400,000,000 in 1899 to $24,246,000,000 in 1914. The invasion of foreign markets by American manufactures began about this time. Thus the export of manufactures "ready for consumption" increased from $222,537,000 in 1898, which was about 18.38 per cent of the total exports, to $724,908,000 in 1914, which was 31.11 per cent of the total; and the export of partly finished manufactures grew from $101,990,000 to $408,806,000 during the years just named, forming 8.43 per cent and 16.83 per cent, respectively, of the total exports of those years. A statement of the increasing quantity of matter of all kinds sent through the mails, of bank clearings, of the production of iron and steel, and of the tonnage carried by the railroads, would indicate in a similar way the enormous expansion of business during this brief period.

Great demands were placed upon financial institutions of all kinds as is indicated by the fact that individual deposits in national and State banks and in loan and trust

companies increased more than three times. Trust Companies and the great private bankers, who were called upon more and more to take a hand in financing the great enterprises, received an unusual stimulus to development. The growth of business during this period affected notably the policy of many educational institutions. High schools and colleges began to give more attention to training for business; the modern school of commerce and administration was developed to render a new service to the community.

332. The Panic of 1907.—This period of prosperity was checked briefly by industrial crises in 1903 and 1907. The disturbance of the latter year has been called a "rich man's panic" because the stress fell largely upon investors who were compelled to sacrifice their securities. The panic was an incidence of rapid industrial expansion. So great were the new opportunities that the country was not able to accumulate capital rapidly enough to exploit them. Corporate promoting and financing reached their highest development. Signs of approaching danger were seen as early as 1906 when it became increasingly difficult to market high-grade securities. Perceiving the danger, banks either restricted or suspended payment of money to depositors. As between banks, clearing-house loan certificates based upon satisfactory security were used as a means of payment, and clearing-house loan certificates, cashier's checks, and other credit instruments were employed in some cities as substitutes for money. This situation was not without its good results because it called attention forcibly to the need of reform of the banking system, a step which had been urged with increasing vigor during the past ten years.

333. The Shortcomings of the National Banking System.—As early as 1897, the Indianapolis Monetary Commission, speaking for chambers of commerce and boards of trade chiefly in the Middle West, had urged as one of

its measures the reform of the national banking system. Although the National Bank Act had been amended from time to time, it became evident that something more than amendment was necessary; a complete revision of the system was needed to adapt it to the business needs of the time. A number of criticisms were brought against the system:

1. The inelasticity of note issues due to the fact that national-bank notes were secured by United States bonds. Expansion was possible only by the purchase of bonds; in times of growing business, when banks wished to increase their circulation, the rising price of bonds due to the increased demand tended to restrain the banks from increasing their issues. Contraction of the notes, moreover, was not adequately provided for. Indeed, it was complained that the tendency of circulation was to increase when the need declined and to decline when the demand for hand-to-hand money increased. Again, the future of national-bank circulation was involved with the policy of the Federal Government in paying its debt. To the extent that the Government reduced its bonded debt the security available for protecting bank-notes declined.

2. A second criticism brought against the system was the inelasticity of credit due to the rather rigid reserve limits fixed by the law. The rigidity of these reserves was sometimes a cause of embarrassment to banks in times of panic.

3. A third criticism was that national banks were not adequately serving smaller communities. In many instances, because of this want, it became necessary to organize banks under State laws; the capital of such institutions was sometimes as low as $5,000 and $10,000.

4. Another criticism of the national banking system was that it encouraged the flow of funds out of communities where they had been accumulated, and where they would be needed later, to the great financial centers where they

were often used for speculative purposes rather than for development of commerce and industry.

5. Although not a part of the national banking system, the existence of the independent Treasury was sometimes a cause of trouble because the deposit of Government funds in the sub-treasuries withdrew money from commercial uses and thus deprived banks of funds needed for service to industry. Our financial structure was criticized also because of its lack of a discount market, and because of the absence of such important instruments of credit as acceptances. These criticisms were taken into account in subsequent banking legislation.

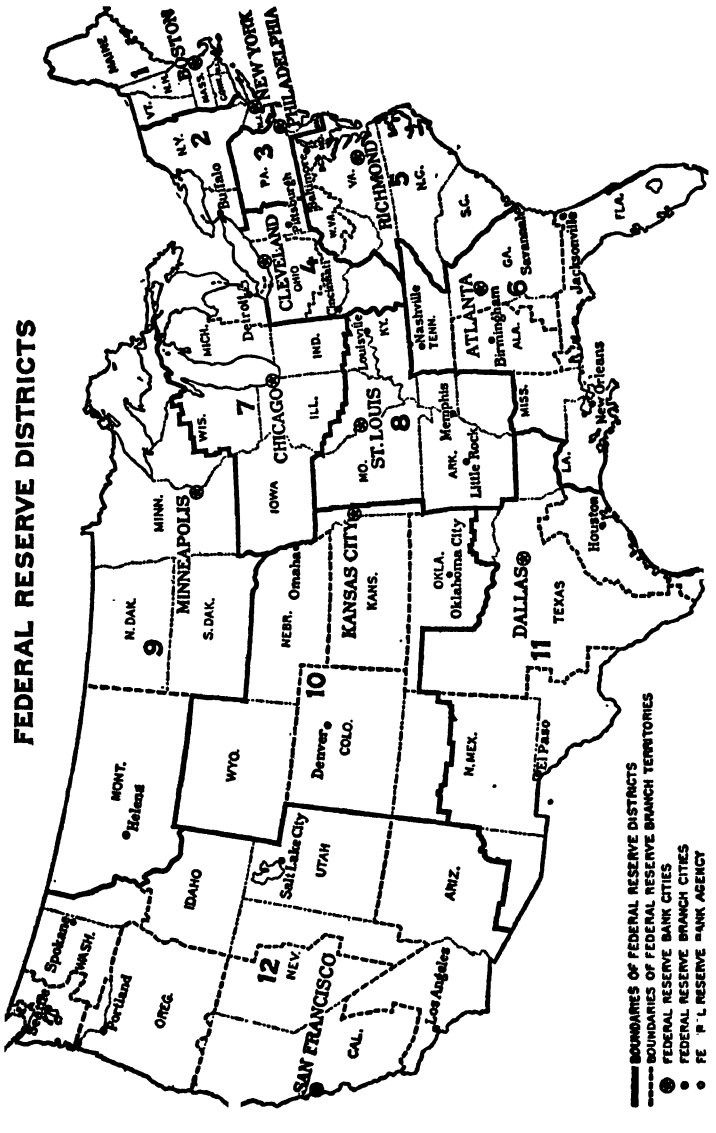
334. The Aldrich-Vreeland Act, 1908.—One of the first steps towards reform was the Aldrich-Vreeland Act of 1908. It was an emergency measure passed after the panic of 1907. This law was to have expired by limitation June 30, 1914, but due to the fact that the new Federal Reserve system was not fully operating, the force of the law was extended to June 30, 1915. For several years no notes were issued; but during the critical period following the outbreak of the European War many banks availed themselves of its note-issue provisions. Bills to the amount of $386,000,000 were issued by 1,363 banks; all of these, however, were retired before the expiration of the Act.

This measure was a notable departure from the old method of securing bank notes; by its provisions, notes could be secured not only by United States bonds, but by approved securities of States, cities, towns, or municipalities deposited with the Treasurer at Washington, or by other securities customarily held by national banks, including commercial paper. The credit instruments last named were defined to include "only notes representing actual commercial transactions, which when accepted by the association shall bear the names of at least two responsible parties and have not exceeding four months to run."

For the purpose of issuing notes, banks were permitted to form "national currency associations," composed of national banks in a "State or part of a State, or contiguous parts of one or more States." Not more than one currency association could be formed in any one city. Associations were to be managed by a board composed of one representative from each of the component banks. In the event that their circulation was secured otherwise than by United States bonds, they were to pay for the first month a tax of five per cent per annum on the average amount of notes in circulation, and an additional tax of one per cent per month up to a maximum of ten per cent. By an Act of 1913 the tax was reduced to 3 per cent for the first month, with a maximum of 6 per cent.

The Aldrich-Vreeland Act provided also for the appointment of a National Monetary Commission composed of 9 members each from the Senate and the House of Representatives, chosen respectively by the presiding officer of each. The duty of this Commission was to make a study of banking conditions and report to Congress necessary or desirable changes.

335. **The Federal Reserve Banking System.**—This Commission reported to Congress in January, 1912, and brought in a bill which subsequently became known as the "Aldrich plan," after Senator Aldrich, chairman of the Commission. This bill was referred to a committee of the House of Representatives but was never reported out of committee. Banking reform, however, was becoming a national issue. The National Citizens' League, formed in Chicago in June, 1911, inaugurated an educational campaign, distributed thousands of pieces of literature, sent out speakers, and formed local branches. Business organizations elsewhere, and the press, expressed opinions. Although the plan of the National Monetary Commission was condemned by two political parties in the platforms


FEDERAL RESERVE DISTRICTS
BOSTON
NEW YORK
PHILADELPHIA
CLEVELAND
RICHMOND
ATLANTA
CHICAGO
ST. LOUIS
MINNEAPOLIS
KANSAS CITY
DALLAS
SAN FRANCISCO
BOUNDARIES OF FEDERAL RESERVE DISTRICTS
BOUNDARIES OF FEDERAL RESERVE BRANCH TERRITORIES
FEDERAL RESERVE BANK CITIES
FEDERAL RESERVE BRANCH CITIES
FED'L RESERVE BANK AGENCY

of 1912, members of all parties were agreed that some form of banking legislation was necessary. The bill which was to emerge as the Federal Reserve Act was introduced in Congress June 26, 1913, and the final measure was approved December 23 of the same year.

336. **The Organization of the Federal Reserve System.**—This new law makes notable changes in the banking organization of the country and in the provisions for note issues and reserves. Other new features are the provisions for rediscount of commercial paper, for the establishment of foreign branch banks by member banks, for branches of Federal Reserve Banks, and for the use of acceptances.

National banks are the units of organization under the new system and these, together with such State institutions as conform to the Federal law, are called member banks, forming the basis of the new system. The Act provided that an organization committee composed of the Secretary of the Treasury, the Secretary of Agriculture, and the Comptroller of the Currency should designate not less than eight cities and not more than twelve to be known at Federal Reserve cities, and that the committee should divide continental United States, excluding Alaska, into districts, each of which was to contain only one Federal Reserve city. The committee selected twelve cities and designated the territory to be served by each. The following are the Federal Reserve cities: Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Minneapolis, Kansas City, Dallas, and San Francisco. The districts are numbered in the order given.

Member banks in each of these districts were authorized to subscribe 6 per cent of their paid-up capital and surplus for stock in the Federal Reserve bank of their district. If banks increase or diminish their capital, they are to change their stockholdings accordingly.

The Federal Reserve Banks are thus corporations chartered by the United States. Their stock is all owned by member banks. Like all corporations they are governed by a board of directors. The law requires that there shall be nine directors for each Federal Reserve Bank, divided into three classes, designated classes A, B, and C, with three directors representing each class. Members of the first are chosen by and are representative of the stockholding banks; members of Class B are persons who, at the time of their election were actively engaged in their districts in commerce, agriculture, or in some other industrial pursuit; members of Class C are appointed by the Federal Reserve Board, and one of these is designated chairman of the board and "Federal reserve agent."

At the head of the system is the Federal Reserve Board composed of seven members, five of whom are appointed by the President of the United States by and with the advice and consent of the Senate. The Secretary of the Treasury and Comptroller of the Currency are *ex officio* members of the Board. This Board does not exercise banking functions, but is charged with the duties of administering the system. In addition there was created a Federal Advisory Council composed of a representative from each of the Federal Reserve Banks. The functions of this Council are to confer with the Board on general business conditions, to make recommendations, and to call for information about the operation of the system. The Council meets four times a year at Washington, or oftener, at the call of the Federal Reserve Board.

337. **The Federal Reserve Banks.**—The Federal Reserve Banks are a new feature in American banking. Instead of a central system as was provided by the First and Second United States Banks, or as exists in many European countries, banking in the United States under the new law is centralized by districts. Member banks in each

region look to their Federal Reserve Bank for aid and assistance, and for the performance of necessary banking functions. These include chiefly the rediscount of commercial paper, acting as a central reservoir for the reserves of the district, the issue of Federal Reserve bank notes on Federal securities and of Federal Reserve notes on the deposit of approved commercial paper, receiving deposit from member banks, the purchase and sale of exchange, and the maintenance of agencies in foreign countries.

338. **Note issues.**—The purpose involved in much of the proposed reform was to secure a kind of note issue that would both expand and contract with the changing demands of business. The framers of the Federal Reserve Act sought to satisfy this need. The law provides for the issue of two kinds of notes, namely, Federal Reserve bank notes, secured in much the same way as national bank notes, and Federal Reserve notes secured by commercial paper. The latter kind are expected to be the elastic element in the system. Since they are based on commercial paper, they may be increased with the expansion of business; on the other hand, since Federal Reserve Banks may not put out notes of other Federal Reserve Banks which they receive, and since Federal Reserve notes may not be counted as reserves, it is expected that the currency will contract when the demand for hand-to-hand money diminishes.

Federal Reserve notes are obligations of the United States and are receivable by all national and member banks and Federal Reserve Banks and for all taxes, customs, and other public dues. They are redeemable on demand in gold at the Treasury Department, or in gold and lawful money at any Federal Reserve Bank.

339. **Reserves.**—The reserve requirements of the new law apply both to Federal Reserve and to member banks. The former are required to carry a reserve of 35 per cent in gold or lawful money against deposits, and 40 per cent

in gold against Federal Reserve notes in actual circulation. The reserve requirements of member banks have been changed since the original law was enacted in 1913. As amended June 21, 1917, the law requires member banks in central reserve cities to maintain with the Federal Reserve Bank of the district a reserve of 13 per cent of its demand deposits and 3 per cent of its time deposits; in the case of reserve cities the reserve is to be 10 per cent and 3 per cent, and for all other banks in the system 7 per cent and 3 per cent. The result of these provisions is to throw a large part of the burden of administering reserves on the Federal Reserve Banks.

340. **Other Provisions.**—Federal Reserve Banks are permitted to buy and sell in the open market bankers' acceptances and bills of exchange; they may deal in gold coin and bullion at home and abroad; they may buy and sell bonds of the United States and act as fiscal agents for the United States Government; subject to review by the Federal Reserve Board they are empowered to establish rates of discount to be charged by the Federal Reserve Banks; they may carry deposits abroad and select foreign institutions as their agents.

341. **The Growth of the Federal Reserve System.**—Due to the fact that the Federal Reserve Act blazed a new trail in American banking practice, it has become necessary to amend the law in a number of important respects. Under the original Act, national banks were required either to enter the system, or within a year to forfeit their rights and privileges under the National Bank Act. This provision, however, could not be applied to institutions chartered by the States, and many of such institutions hesitated to join the system until it had been tested, and until the law was amended in such a way as to offer them advantages. An amendment of 1917 encouraged State banks to become members. On December 31, 1917, only 250 State banks and

trust companies had entered the Federal Reserve system; but by January 1, 1919, such membership had increased to 936, with total resources amounting to $7,338,813,000.

As a result of another amendment branches of Federal Reserve Banks have been established in New Orleans, Louisville, Omaha, Portland, Seattle, Spokane, Cincinnati, Pittsburgh, Detroit, Baltimore, and Denver by the Federal Reserve Banks in whose districts these cities are located.

The number of foreign branches of member banks has also increased. Both for the purpose of facilitating the expansion of American trade and to obtain business in competition with European banks, branches have been established in South and Central America, in the Orient, and to some extent in Europe. In 1918, the National City Bank of New York had 21 branches in South America, Cuba, Porto Rico, Russia, and Italy; and the Federal Reserve Board had authorized the establishment of branches in Belgium, Switzerland, Portugal, and Spain. Other national banks, a number of State member banks, and banking corporations organized for foreign business have established branches or agencies abroad.

The acceptance business, which is a relatively new feature of American banking, has grown rapidly. Some idea of this development may be obtained from the fact that the amount of acceptances bought in the open market by Federal Reserve Banks increased from $64,845,000 in 1915 to $1,818,354,000 in 1918.

In a general way the increase of earnings of Federal Reserve Banks is an indication of the growth of prosperity of the institution under the system. Although the income the first year was discouraging, subsequent development of business of the Banks has not only enabled them to pay the 6 per cent cumulative dividend permitted by the law, but to add large amounts to their surplus. In 1919, the net earnings of the twelve Banks amounted to $55,446,000;

after the payment of dividends the sum of $21,605,000 was added to their surplus.

342. **The Development of the Clearing House.**—With the multiplication of banks and with the enormous expansion of business, it became necessary to find some prompt and effective way of settling claims of banks against each other. In New York City, as late as 1850, the prevailing method of making such adjustments was for each bank to send out a porter with a book of entry, or pass book, together with the items to be exchanged. "The receiving teller of the first bank visited entered the exchanges brought by the porter on the credit side of his book and the return exchanges on the debit side." The porter then hurried away to another bank where this process was repeated. Meanwhile, porters from all the other banks were making their round on a similar mission. Once a week "the cashier of each bank drew a check for each of the several balances due it, and sent a porter out to collect them. At the same time the porter carried coin with which to pay balances due by his bank." This method not only involved great risk and loss of time, but much duplication of effort. Moreover it permitted banks who were inclined to do so to make use of the balances they owed other banks, thereby lending to their customers much more than their balances would allow. The purpose of the clearing house was to remedy these various shortcomings.

The first institution of this description was established in New York in 1853. A clearing house was formed in Boston in 1856, in Philadelphia in 1858, in Chicago in 1865, and in St. Louis in 1868. In the course of time the clearing house developed other functions than the settlement of balances between banks. These institutions have come to serve as a medium for united action among banks, especially in times of stress or panic when it is necessary for banks to support each other. In addition, clearing-house associa-

tions usually make rules covering various matters in which the banks are interested. The Boston Clearing House developed a "foreign department" to make collections for its members throughout New England, and institutions in some other cities have worked out similar arrangements.

Certain provisions of the Federal Reserve Act have a particular bearing on clearing operations. This Act, for example, authorizes Federal Reserve Banks to receive checks and drafts on member banks and other Federal Reserve Banks, and requires such banks to receive these instruments drawn upon any of their depositors at par. The Federal Reserve Board may also exercise the function of clearing house for the Federal Reserve Banks, or may designate one of them to act in such a capacity for the others, as well as for its members.

The modern clearing house handles smoothly and quickly an enormous volume of transactions. The clearings of New York in 1855 amounted to $5,632,900,000, and in 1923 to $214,621,431,000. Clearings for the whole country this year amounted to $411,251,633,000.

343. Trust Companies.—Two important factors are responsible for the growth of the modern trust company: the most important is the development of large businesses under the corporate form which require numerous aids in promoting and financing enterprises and in the handling and disposing of securities. The second factor is the enormous accumulation of wealth in the hands of individuals. Trust companies are called upon to render many services to individual owners of wealth, such as acting as trustees under will or otherwise, and administration of property for persons who do not wish to undertake the burden or responsibility of management. Trust companies have gradually taken the place of individual trustees because of their superior responsibility, greater efficiency, and better facilities for administering property.

One of the first trust companies in the United States was the Farmers' Fire Insurance and Loan Company of New York City, which was granted a charter in 1822. The early institutions were engaged chiefly in the insurance business. One of the first organizations formed to transact a trust business exclusively was the United States Trust Company of New York City, incorporated in 1853. The number of such enterprises, however, increased slowly; possibly not more than 35 existed in the country in 1875. Their real development began about 1890, and their growth was contemporary with the great expansion of large-scale enterprises. In 1900 there were 290 of these companies in the country possessing capital of $126,930,000 and total resources amounting to $1,330,160,000; in 1917 the number was 2,009 with capital of $567,885,000 and total resources amounting to $8,958,511,000.

344. **Building and Loan Associations.**—The institutions discussed hitherto serve chiefly merchants and manufacturers. The question of financing farmers has been discussed in a former chapter. The purpose of the building and loan association is to aid the home builder. Organizations of this kind are known by various names, such as "homestead aid associations," "savings and loan associations," "coöperative banks," and "coöperative savings and loan associations." As the names usually indicate, their purpose is coöperation to assist home builders both to save for the purpose of building or acquiring a home, and to aid them in obtaining funds either from their own association, or with the aid of their organization from banks.

Although the first institution of this kind was the Oxford Provident Building Association formed in 1831 at Frankford, a suburb of Philadelphia, the permanent inception of the movement dates from the decade 1840 to 1850. About 1893 there were 5,598 local associations in the United States with a total membership of 1,359,366; in 1910 there

were 5,937 such associations with a membership of 2,216,912, and in 1922, 10,009 with a membership of 6,364,144 and assets amounting to $3,342,531,000.

Although building and loan associations are found in almost every State in the Union, they have reached their highest development in Pennsylvania, Ohio, New Jersey, Massachusetts, Illinois, New York, and Indiana, ranking in assets in the order named.

345. **Federal Farm Loan Banks.**—In a former section we discussed the organization of the Federal Farm Loan Banks and indicated their service to the farmer. Here, we may mention briefly the extent of operations. On December 31, 1924, the twelve land banks had $927,567,000 mortgage loans outstanding. From the beginning of the system to the date given above 4,903 farm loan associations had been formed. It will be recalled that practically all the capital of the twelve banks was subscribed by the United States Government. At the close of 1924, seven of these banks had repaid the government all the initial capital stock, while the remaining five were in the process of retiring the government stock out of earnings.

346. **Joint-Stock Land Banks.**—These banks also transacted a large volume of business. On December 31, 1924, the net mortgage loans amounted to $446,429,400.

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CHAPTER XXV

COMMERCIAL DEVELOPMENT: III, COMMERCIAL ORGANIZATION

One of the greatest factors in the industrial growth of the country, probably the greatest single factor, has been the development of the various means of communication. Until changes of this description took place, markets were relatively small and their organization relatively simple. Not only was the scale of manufacturing and commercial enterprises limited, but the facilities required for distributing commodities were few and unimportant. With the building of railroads and telegraphs and with the expansion of other means of communication, markets became nation-wide and even international. Thereupon great changes took place both in the industrial structure and in the nature of the facilities required for carrying on commerce successfully.

These changes may be grouped for discussion under three topics: (*a*) the growth of commercial organizations; (*b*) changes in methods of distribution; and (*c*) the development of commercial facilities.

347. **Commercial Organizations.**—Organizations among merchants and traders are nothing new, but such associations have assumed such importance in the past fifty years as to constitute them invisible yet powerful bonds of union among business men of every description. Every important trade has its association; in addition, business men in cities and towns are organized into general associations, such as chambers of commerce and boards of trade; there are also national organizations of business men of which

the Chamber of Commerce of the United States of America is an illustration. Likewise merchants and manufacturers in given lines are organized both locally and nationally. In fact, wherever there is a community of interest among business men, this interest usually results in an association of some kind. In recent years representatives and friends of American houses abroad, following the practice of representatives of other countries, have formed organizations which usually take the title of chambers of commerce, and such associations are increasing rapidly.

The English Board of Trade, which figures conspicuously in the relations between England and her American Colonies, came into existence in the latter part of the seventeenth century. In 1660 Charles II created two separate Councils for Trade and for Foreign Plantations. These were united in 1672, but the new organization was abolished in 1675 when its place was taken by a committee of the Privy Council. A permanent Board of Trade was established in 1695. This organization, as well as its successors, was a government body. Its purpose was partly to regulate the growing commerce of England and partly to investigate trade conditions for the purpose of advising Parliament. The Chamber of Commerce of the State of New York, which is the oldest commercial organization in this country, was an organization of merchants. It was formed in 1768 during the struggle between England and the Colonies over the regulation of trade. As in the case of England, the commerce in which American merchants were largely interested was that of the sea, and it was deemed advisable to form an association both for its promotion and protection.

The purpose involved in the formation of this chamber of commerce is contained in the following statement: "Whereas, mercantile societies have been found very useful in trading cities for promoting and encouraging commerce,

supporting industry, adjusting disputes relative to trade and navigation, and procuring such laws and regulations as may be found necessary for the benefit of trade in general . . . For which purpose and to establish such a society in the City of New York the following persons convened on the first Tuesday in, and being the 5th day of, April, 1768."[1]

In addition to promoting measures of more or less local importance, the New York Chamber of Commerce has frequently given attention to matters of State and national concern. During the Revolutionary period it was opposed to the issue of paper money by the legislature of New York; as early as 1786 it urged the legislature of New York to create a fund to be used to construct an artificial waterway connecting New York City with the Great Lakes; on various occasions it advocated the establishment of tribunals of commerce wherein commercial disputes could be readily settled; in 1849 it was interested in Whitney's project of building a railroad across the continent to the Pacific; and in 1860 it urged the establishment of mail facilities from San Francisco to Shanghai, China, as an aid to the development of commerce with the Orient. Many other important economic measures have been supported by this organization.

In the course of time other chambers of commerce came into existence. In 1801 there were four such organizations in this country, namely, in New York, New Haven, Connecticut, Charleston, South Carolina, and in Philadelphia. During the next fifty years some thirty commercial organizations were founded. The broadening of the range of competition was a cause for the establishment of the new organizations, for with the growth of cities and with the inevitable development of rivalry among them, some kind of an organization was necessary to look after their general

[1] Quoted from Sturgis, *American Chambers of Commerce*, p. 13.

interests. The new bodies were also a product of the growing commercial spirit which sought to exploit in a collective way new industrial opportunities; but another important cause was involved, namely, the eagerness of the leaders in the industrial communities to enter the broader field of action which comprehends not only commercial and industrial development, but civic improvement of every description. Thus the period since 1860, which has witnessed a great awakening in all these particulars, was characterized by a great increase in the number of chambers of commerce. In 1912 there were more than 412 such organizations in the United States, to say nothing of nearly 490 boards of trade and 870 commercial clubs, commerce leagues, and other associations bearing similar names.

348. **The Work of the Chamber of Commerce.**—As indicated above, the early chambers of commerce were interested almost entirely in commercial matters; in recent years, however, their activity has come to include everything which may be of vital interest to a city. They work to improve traffic conditions, particularly in matters of prompt service and favorable freight rates; they study trade conditions both domestic and foreign; they seek to interest merchants throughout their tributary territory; they are frequently active in social welfare work and in various kinds of charitable enterprises. Sometimes they concern themselves with matters of education. City planning frequently comes within their purview, the purpose being not only to make the city an attractive and healthful place to live in, but to improve facilities for handling street traffic and shipping at wharves and stations. Sometimes these chambers of commerce make industrial surveys of their locality for the purpose of showing advantages in respect to building sites, the supply of coal and other raw materials, cost of labor, and relative freight rates. Publicity of some description is usually a part of their pro-

gram, because activity of this kind calls attention to the city and its advantages and attracts industries and population. In this connection, some chambers of commerce seek to bring conventions to their city because it is thought that this is profitable advertising. For this purpose they maintain convention bureaus. In all these respects a chamber of commerce is now an indispensable part of the industrial and social life of a city.

349. The Chamber of Commerce of the United States of America.—The federation movement is one of the most recent developments in the history of business organizations. It is a counterpart of combinations among manufacturing and commercial enterprises. In union there is strength. By united action city organizations throughout the country can frequently prevail in securing desirable national measures where even large powerful local organizations would fail. Besides, there are many matters of general interest which do not fall within the scope of any particular organization yet which are of great interest to all. For example, such matters as tariff policy, aid in exploiting foreign trade, national budget, conservation of national resources, the relation of government to industry, and many others, are important questions for all organizations, yet no single association could be successful in promoting a policy with respect to any of these. Hence the advantage of combination.

As early as 1859 a report of the Boston Board of Trade contained a recommendation favoring the formation of a United States Board of Trade "not to replace but to help the local chambers of commerce by bearing some of the labor and expense." The plan of a general federation was again discussed at a meeting of business men at Detroit in 1867, and since that date American trade bodies have looked forward to the time when they would be brought together in a national organization. In 1907 an unsuccessful at-

tempt was made by the Department of Commerce and Labor to establish closer relations between the Government and the commercial bodies of the country. At that time Secretary Straus invited chambers of commerce and boards of trade in some forty cities to appoint committees to meet in the Department on December 5, 1907. An organization was formed consisting of a National Council of Commerce and an advisory committee, to be appointed by the Council, but this plan failed to interest business men. In 1912 President Taft, acting through Secretary Nagel of the Department of Commerce and Labor, again tried to secure a national organization, presumably for the purpose of securing greater coöperation between the business organizations of the country and the Department. Out of this meeting on April 22, 1912, grew the Chamber of Commerce of the United States of America.

The aims of this organization are stated in its by-laws as follows: "To secure coöperative action in advancing the common purposes of its members, uniformity and equity in business usages and laws, and proper consideration and concentration of opinion upon questions affecting financial, commercial, civic, and industrial interests of the country at large." In 1913, over 600 commercial organizations were included in the membership of the National Chamber. In addition, there were 1,716 individual members. The "activities of the Chamber center in the annual meetings held in various large cities and attended by delegates from all the constituent organizations. On these occasions questions of a national character are discussed and voted on. In the interval between meetings the 'referendum plan' is largely used, the vote of the members being obtained through the mails." Among the questions submitted to referendum vote are the following: the question of a national budget, the expansion of power and functions of the Bureau of Domestic and Foreign Commerce, and the estab-

lishment by Congress of a bureau, or bureaus, of legislative reference and bill-drafting.

350. **Foreign Chambers of Commerce.**—With the rapid expansion of foreign commerce of the United States during the last twenty-five years large numbers of representatives of American firms have taken up their residence in foreign cities. If organized, these men could form a nucleus of an American interest which would be of great assistance in the further development of commerce. The American Chamber of Commerce in Italy was organized in 1905 for the purpose of studying industrial and commercial relations between America and Italy. Membership was open to citizens of the two countries. The American Chamber of Commerce for the Levant was organized in 1911 through the instrumentality of the American consul at Constantinople. Subsequently branches were established in Smyrna, Beirut, Cairo, and Saloniki. American chambers of commerce have recently been established in China, South America, and in some European countries. Representatives of foreign firms in the United States have also organized in this country chambers of commerce bearing the name of their country, and for the same purpose that American bodies are formed abroad. Among other things, these associations perform an important service in studying trade opportunities, in adjusting disputes among merchants, in assisting companies in obtaining agents, in the exhibition of samples, and in the maintenance of translation bureaus.

351. **Boards of Trade.**—Another important development of the period since 1860 has been the growth of great organized market places, wherein are bought and sold the staple products of the country. The most important exchanges of the country are those which provide markets for the selling of grains, cotton, produce, and securities. In addition there are coffee exchanges, butter and egg exchanges, livestock exchanges, hay exchanges, and various

others which range in importance from relatively small, local trading places to those which are of national, and even international, importance.

Before 1860 the staple products of the country were usually disposed of by farmers to city merchants or their factors, or to commission men, and these undertook to find the market. Facilities for storage were limited; there was little or no opportunity for carrying the surplus of one season over to the next; nor did the facilities exist for learning prices and selling conditions in distant markets. Within the brief period of six months the price for a staple commodity like wheat fluctuated over a wide range, and prices on the same day in distant markets were often far apart. Distant buyers and sellers found great difficulty in communicating with each other. There was no great market place to facilitate the sale of the surplus of one region in another, or to provide the means for transferring the surplus of one season to another season. The building of railroads and telegraphs changed this situation, and it gradually became the practice of traders to meet in certain places for the purpose of dealing in given commodities. Thus in the course of time the function of the exchange came to be (*a*) to provide a convenient market or trading place; (*b*) to regulate the business dealings of the members; (*c*) to provide a system to facilitate the settlement of trade disputes; (*d*) to establish uniform grades and a system of inspection; and (*e*) to acquire and disseminate market information.[2]

One of the earliest of these organizations was the Chicago Board of Trade organized in 1848 and incorporated in 1859. The New York Produce Exchange came into existence about 1850 and was incorporated in 1862. The Merchants' Exchange of St. Louis dates from about 1854. The New York Cotton Exchange was formed in 1870, and

[2] Weld, *Marketing of Farm Products*, p. 267.

the New York Coffee Exchange in 1882. Other important exchanges are the Minneapolis Chamber of Commerce, the Duluth Board of Trade, the Kansas City Board of Trade, the Omaha Grain Exchange, the Commercial Exchange of Philadelphia, the Toledo Produce Exchange, and the Milwaukee Chamber of Commerce. Certain cities of the United States have become noted for the sale of particular commodities such as leather, wool, furs, furniture, pottery, and metals, and an organized market, regulated in the customary way, has developed. These boards of trade are trading organizations as distinguished from chambers of commerce which are non-trading bodies.

That a modern board of trade transacts an enormous volume of business is indicated by the operations on the Chicago exchange. The receipts of all kinds of grain at Chicago increased from 33,924,000 bushels in 1860 to 164,900,700 in 1911. In addition, in the latter year, flour received and manufactured in Chicago was equivalent to 31,262,000 bushels of wheat. This flour and grain was probably traded in, at least once, on the Board of Trade, and in addition, large quantities of pork and pork products, hay and other commodities were bought and sold.

352. **Auction Markets.**—As with other new methods of selling, the auction market is largely an incident of the growth of transportation and of the concentration of population in cities. This method is used chiefly in the sale of fruits, although it is employed at various local points in the South in the sale of tobacco, and livestock is often sold in the same way. New York City has the largest auction market in the country, although auction companies are found in a number of other cities. An organization of this description has existed in Boston since 1847. Some of the conditions for successful sale at auction are: (*a*) perishability or semi-perishability; (*b*) a large and regular daily supply; (*c*) standardization of grades and packages. "The

principal value of sale by auction is that this method results in primary distribution of huge quantities of perishables into their respective trade channels in the shortest possible time. . . . In the city there are hundreds of retail stores, hotels, push-cart men, fruit stands, etc., each requiring special sizes and qualities of fruit, and it is necessary that these tons of fruit be broken up into various lots and steered into their final channels as rapidly as possible."[3]

353. **The New York Stock Exchange.**—Although the New York Stock Exchange came into existence in 1817, its development has been most rapid since 1860 with the appearance of millions of new railroad securities, with the great development of borrowing by all grades of governments, and with the enormous expansion of business under the corporate form. Like the grain and produce exchanges, the New York Stock Exchange is a market place. It is governed by rules and regulations comparable to those which regulate transactions on exchanges of other descriptions. The New York organization is only one of a number of like exchanges in the United States, but in volume of business it outranks all the others.

Sereno S. Pratt in his *The Work of Wall Street* gives the following account of the origin of this exchange: "In 1791 Congress passed, and Washington signed, Hamilton's measure for the establishment of the first United States Bank. Speculation in the securities thus created set in. Wall Street became a market for them. It is recorded that early in 1792 there was an office for the public sale of stocks at No. 22 Wall Street. A stock list of that year gives quotations of 6 per cent United States stock, and of the shares of the Bank of North America. A number of men engaged in the business of buying and selling these stocks on commission. Their favorite meeting-place was

[3] *Ibid.*, p. 127.

near a buttonwood tree which stood in front of No. 68 Wall Street."

The rapid rise of State banks after 1811, the floating of large amounts of Government securities after the War of 1812, and the organization of the second United States Bank increased the number of securities to be traded in and thus created the need of a more orderly market. "Speculation in bank stocks," said Pratt, "had become so extensive that it was necessary to organize the stock-market into an exchange, and in 1817 the brokers who, until then, had been working under the agreement of 1792, formed an association under the name of the New York Stock and Exchange Board. This was the second great addition to the mechanism of the financial markets, the first having been the banks."

It may be said with a large measure of truth that the growth of the New York Stock Exchange is an epitome of the industrial development of the country. Its main stimulus to expansion came from all the great forces which were making for the creation and investment of capital and for the industrial growth of the country. Some of the great factors which contributed to the upbuilding of the New York Exchange were the increasing number of securities resulting from the financing of canals from about 1820 to 1837, of railroads after 1827, and of some of the new enterprises which sprung up before 1860. The purchase and sale of Government bonds during and after the Civil War added greatly to the volume of business. Then came the securities of the Pacific and other railroads, and finally the great era of corporate financing after 1880. Some idea of the effect of these changes on the development of the New York Stock Exchange may be obtained from a statement of the amount of securities listed on the Exchange; the amount for 1868 has been estimated at $3,000,000,000 and for 1911 it was $24,374,081,000.

Stock markets, like those for grain and produce, have been notably affected by the development of new means of communication. "It was not until July, 1866, that Cyrus W. Field finally succeeded in his cable enterprise, and in the following month London prices began to be regularly received by cable in New York. Arbitrage transactions soon started. The next year the stock indicator was adopted. Telephones were introduced in 1878. The Stock Clearing House was established in 1892, this being undoubtedly the most important contribution to the mechanism of the Street since the organization of the Bank Clearing House forty years earlier."

354. **Other Organizations.**—In addition to chambers of commerce and boards of trade the business world has found a use for hundreds of organizations of another type. As stated before, wherever there is a community of interest, business men have become accustomed to associate to exploit this interest. That this has become an age of organization is abundantly illustrated by the number and kind of bodies in existence at the present time. According to a list of commercial organizations of the United States published in 1915 by the Bureau of Foreign and Domestic Commerce, there were upwards of 440 interstate, national, and international associations of this kind, about 420 State and Territorial and something over 3,600 local commercial organizations, or over 4,400 in all. The following brief list will give an example of the spheres of interest of the national and international organizations: advertising, building trades, canners, chemists, commercial travelers, druggists, dry-goods men, engineers, grocers, hardware men, and producers of gas and electricity. The purpose of all bodies of this kind is the discussion and promotion of measures that relate to the general affairs of the industry or profession and serve in any way to further and enhance its prosperity and welfare.

355. Changes in Methods of Distribution.—The development of transportation and the growth of competition which resulted from it, not only affected the evolution of commercial organizations, but also the method of passing goods on from producers to consumers. The traditional plan was to sell from manufacturer or producer through one or more layers of middlemen to final consumers, and this was the prevailing method until the era of the growth of big business. Except for securities, the exchange method discussed above is employed principally in the selling of agricultural products. The marketing of manufactured commodities, on the other hand, followed a different course of development. Here the tendency has been to sell more and more directly from producer to final consumer, that is, to eliminate middlemen. The evolution is complex. Sometimes merchants whose businesses have grown to an enormous size, due to all the stimulating effects of modern industrial growth, have gone into some lines of manufacture; the middleman has been eliminated in these lines by the distributor extending his operations backward into the field of manufacture. On the other hand, large manufacturers in many cases have gone into merchandising, that is, the producer has extended his activities forward so as to reach the final consumer without the intervention of middlemen.

Conditions of modern selling made this development necessary; competition, which narrowed the margin of profit, encouraged the dispensing as far as possible with all market operations which tended to increase cost. Moreover, in the face of competition, manufacturers were eager to gain control over their final consumer's market; this would enable them to obtain better results from advertising, to push their goods, to develop good will, and to escape the whims of some middlemen. The results of the new methods are to reduce risks, to obtain a more accurate

knowledge of the final market, to render better service to the consumer, and both to increase profits and to insure success. The chain store, the branch store, the mail-order business, and the department store are largely an outgrowth of these conditions.

356. The Department Store.—A writer of some twenty-five years ago described the retail dry-goods establishment as it existed in hundreds of towns and small cities about the time of the Civil War as follows:

> The village merchant who made his annual or semi-annual visit to the city was an oracle in his neighborhood. His return home was hailed as an important event. He was immediately surrounded by his neighbors, anxious to hear all the news from the city. The answer as to whether goods were "high or low" settled the market with them for the season, as new goods would not again make their appearance for six months at least. Those who were in a position to secure the first selections were to be congratulated. After the advent of new goods ceased to attract attention, the merchant would find time to attend to certain duties which, by virtue of his position in the community, were apt to be placed upon him. As a rule, he held the office of postmaster, town clerk, school trustee, and exchange banker, for his customers. He wrote their wills, and in due time executed many of them.

As for the larger cities, retail merchants confined their attention to the sale of dry-goods. About the time of the Civil War these city merchants began to carry miscellaneous lines of goods; more and more commodities were added until the establishment developed into what is now known as a department store, which is a general retailer on a large scale of almost every class of goods demanded by household consumers. The wares thus sold included not only dry-goods, as of old, but ready-made clothing, fancy goods, haberdashery, boots and shoes, furniture, hardware, jewelry, sometimes groceries, and other goods.

This giant retailer is chiefly the product of the modern

city and of the various forces which brought population together in such communities. Rapid transit, advantages of large-scale enterprise, the presence of an enormous local demand, the opportunities which the department store offers for service, are some of the factors involved in its growth. Among other things, the increasing variety of goods of all classes offered for sale makes the department-store method of selling indispensable; the large establishment is able to carry an assortment which a small up-town store, or a country store, could not carry. It thus offers inducements to buyers of all varieties of whims and fancies.

The department store is an evolution, and it is, therefore, impossible to say just when and where it started. "It is said, for example, that S. S. Houghton deserves credit for the germ of the idea. Mr. Houghton had been engaged in the general-store business in a New Hampshire town and conceived the idea of establishing a country general store in a large city."[4] He persuaded his brother-in-law, R. H. Macy, who had accumulated some capital in the fisheries business to go in partnership with him. In 1858 they established in New York what is declared to have been the first department store. "Again, it is claimed that the Jordon Marsh Company of Boston was the first to develop an American department store, and that it transplanted the idea from the Bon Marché in Paris." Whatever its origin, the department store has become a characteristic American institution and is a prominent feature in the development of trading in the last sixty years.

Since these stores serve a great variety of consumers, the volume of their annual business is probably larger than that of any other single class of retailers. It has been estimated that in 1912 40 per cent of the total dry-goods and ready-to-wear clothing business of the country was done by 1,140

[4] Cherington, *The Wool Industry*, p. 225.

department stores which had an aggregate sale of at least $200,000 each. The business of the five leading stores in each of the one hundred largest cities amounted to about $943,451,000 out of a total of $2,094,000,000.

357. **The Mail-Order Business.**—Although the mail-order house is a relatively new institution, it has already taken its place among the largest distributors of the country. The development of the Parcel Post has largely contributed to the growth of this enterprise, although its growth has also been stimulated by the factors which have contributed elsewhere to the development of large-scale enterprises. "The mail-order house represents the extreme development of the present tendency to sell directly to the consumer—especially if it manufactures or produces its own goods. Many factories market their goods exclusively by the mail-order system; other concerns, of the department-store type, buy most of their stock, but manufacture certain articles themselves. Other articles are made to its order, and bear a distinctive trade name—rarely, however, one that identifies the article with its origin."[5]

The mail-order business is chiefly indebted for its growth to a number of advantages which it possesses over other retail merchants of distribution: (*a*) its market is not limited to any particular locality, but extends widely over the country; (*b*) it may distribute many of its goods cheaply and promptly through the mails; (*c*) it may save in rentals by selecting an inexpensive location within a city, by eliminating store display, by "regularizing" its work so as to keep employees busy most of the time, by reducing risks through its ability to forecast demand; (*d*) since it serves wide areas, it is spared many of the business uncertainties which beset urban distributors; (*e*) owing to these and other advantages it is able to sell cheaply. In a large measure, the success of the catalogue house is due to new

[5] C. W. Gerstenberg, *Principles of Business*, p. 473.

methods of business administration by which prospective customers are discovered and followed up until they become regular clients of the house.

358. **Chain Stores.**—Among other methods of distribution which are of recent origin, and which owe their growth to forces similar to those operating in the case of department stores and mail-order houses, are the chain stores. One company in 1919 operated nearly 4,000 stores and did an annual business estimated at $190,000,000. Several other companies operated from 100 to 1,000 stores. The sales of seven organizations of this kind in 1919 were estimated at $438,831,000. Groceries, drugs, and tobacco are among the commodities sold in this way; the five-and-ten-cent stores are also distributors of this type.

359. **Commercial Facilities.**—In a broad sense systems of money and banking and of communication are commercial facilities. These matters were discussed in the last chapter. But modern commerce must be aided in other ways: goods and establishments must be insured, merchants and manufacturers must be closely informed about the credit conditions of their customers, commodities must frequently be stored, and now-a-days successful selling involves advertising. The enterprises that care for these needs have undergone remarkable development since 1860.

360. **Fire Insurance.**—The need for protection against fire and other losses grew with the expansion of industry and with the growth of wealth. Insurance is one of the economical methods of reducing risks. The first fire insurance in America was probably written in 1728 in Boston by the Sun Company, an English organization. Other companies appeared from time to time, but the business was small until the settled times following the adoption of the Constitution. One of the first policies issued after the formation of the United States Government was written in 1794 by an organization having the unofficial title of the

"Hartford Fire Insurance Company" of Hartford, Connecticut. It was not until 1810 that the Hartford Fire Insurance Company was formed. Subsequently the growth of organizations of this description was rapid. Some sixty charters were issued in the decade from 1801 to 1810, and each succeeding decade until 1860 witnessed a great increase in the number of new companies.

Insurance, like other businesses of the last sixty years, has had its experience with combination; hence, although the resources of the companies and the risks underwritten have enormously increased, the number of organizations is actually less than in 1860. In 1916 the insurance risks in force by fire, marine, and fire marine companies which reported to the New York State Department amounted to more than $71,144,628,000.

The fire-insurance companies of the United States have been subjected to great strain on a number of occasions. This was the case with the New York fire of 1835 when only two of the forty or more companies doing business in New York City were able to pay their debts; the Chicago fire of 1871 and the Boston fire of 1872 were disastrous to many organizations. The losses in the first case have been estimated at $118,000,000 and in the latter case they were estimated at $75,000,000.

The fire losses of the country run into large figures. They amounted to about $75,000,000 in 1875, to $108,993,000 in 1890, to $160,929,000 in 1900 and to $172,033,000 in 1915. In 1906, the year of the San Francisco earthquake, they reached the largest amount ever recorded in America, namely, $518,611,000. Although these losses are large, they are not increasing as rapidly as the property which is subject to loss by fire. This is due to the introduction of new methods of fire fighting and fire prevention which include more effective systems of inspection and regula-

tion, the construction of concrete, steel, and slow-combustion buildings, the introduction of the sprinkler system, and many improvements in the fire departments.

The conduct of an insurance company has come to be regarded as of more vital concern to the public than that of an ordinary manufacturing or commercial enterprise. The tendency, therefore, has been to put these companies under a different set of laws than those covering businesses of other descriptions. They are frequently closely regulated, and in many instances a separate bureau or department has been created in the State government for their regulation.

361. Marine Insurance.—Some forms of marine insurance were in existence in America in Colonial times. The protection demanded by the maritime interests on the Atlantic seaboard was handled in the early days on the plan of Lloyds by personal, private underwriting. Marine insurance in America, however, encountered many years of hard sledding; in fact, throughout most of our history this industry has been burdened with serious disadvantages. The American Revolution bore heavily on the fortunes of American shipowners; conditions were no better during the Napoleonic wars; then followed the War of 1812 which caused great losses to American ships and cargoes. There was a brief period of prosperity from 1830 to about 1860 when the Yankee clipper met with great success on the sea; but the advent of the Civil War and the subsequent decline of tonnage under the American flag, deprived American companies of the stimulus necessary to growth. Since the bulk of our commerce was carried in foreign ships, insurance also was placed with foreign companies, notably with British organizations which enjoyed vast banking and mercantile connections, and which were organized in such a way as to receive the financial aid and the news service necessary for successful development. The establishment of branches of British companies in the United States after 1870 added further to their advantages. As a result

of these various causes the growth of American marine-insurance business has not been commensurate with the expansion of our maritime interests.

Even now British companies possess great advantages over the American. These may be summarized as follows: (*a*) a world market developed through years of experience; (*b*) greater reinsurance facilities; (*c*) a close union with banking and shipping interests; (*d*) freedom to combine with other organizations; (*e*) permission to write numerous kinds of insurance; (*f*) a smaller tax burden; (*g*) support of home merchants and vessel owners.[6] Most of these advantages must be met before the United States, even with its new shipping built up as a result of the European War, can obtain its share of the marine-insurance business.

362. Life Insurance.—The forerunner of life-insurance organizations in the United States was a society formed in Philadelphia in 1759 for the benefit of Presbyterian ministers and their widows; but it was not until 1796, when the Insurance Company of North America was organized, that an attempt was made to carry on a general business. The early companies combined fire or marine, or banking and trust, as well as annuities with life insurance. The modern company dates from about 1843 with the formation of the Mutual Life Insurance Company in New York. The era of greatest growth, however, has been since 1890. In that year the total number of policies was 5,202,475 aggregating $4,048,846,787; in 1915 the policies numbered 42,513,683 aggregating $22,743,336,831. In 1860 there were only 60,000 policies amounting to $180,000,000.

One of the important causes of the growth of the life-insurance business has been the shift of the United States from an agricultural to a manufacturing nation. This change, which brought about the concentration of popula-

[6] S. S. Huebner, *Status of Marine Insurance in the United States*, pp. 27 ff.

tion in cities, rendered the future of dependents of heads of families much more uncertain than under the old conditions. As long as there was a vast undisturbed national domain, and as long as a farmer's heirs could count upon a farm or its subdivision as their heritage, there was no pressing need for life insurance. But this security was not enjoyed by the millions who began to congregate in cities. Their only protection was in their savings, or in life insurance, or both. The rising standard of living has been a factor in the growth of the business. In addition, modern methods of advertising and skilful salesmanship have materially added to the volume of the business.

Insurance companies of all descriptions have not only become great business enterprises, but tremendous factors making for industrial growth. A service of estimable value is the stimulus they give to thrift. Moreover the great sums collected annually in the form of premiums form a large part of the fund which contributed both directly and indirectly to the industrial upbuilding of the country. During the last sixty years other forms of insurance have come into prominence, such as accident and fidelity. Insurance is usually a feature of numerous fraternal orders, and the out-of-work, sickness, and death benefits paid by many labor organizations are a form of insurance.

363. **Storage.**—Some form of storage of commodities has always been necessary. Even in self-sufficing, country regions agricultural products must be stored after harvest to supply the people until the next crop season. Although the pioneers were usually able to produce far more than they could consume, their improvidence, or their inability to store their surplus, frequently brought them to distress. The conservation of the surplus of crop seasons becomes of great importance with the growth of town and city life. This storage was done by farmers in barns, cellars, and sometimes in the earth. Likewise it has always been necessary

for merchants to provide a surplus stock, and for manufacturers to store both raw and finished products, but, as with agriculture, this need became of great importance with the increase of population because failure to provide for seasonal or periodic fluctuations of industry may cause serious hardships to a community, as in the case of the shortage of coal.

The growth of the grain trade and the development of the exchange method of selling demanded not only great additions to the storage capacity of the community, but the inauguration of careful methods of inspection, grading, and accounting for the grain thus stored. Great elevators were built at the leading trading and milling centers. An important development of recent years has been the building of coöperative farmers' elevators for the local storage of grain.

One of the first forms of public storage was the establishments controlled by the United States Government for the deposit of goods imported from abroad pending the payment of duty, or liquors and tobacco pending sale and payment of the tax. In recent years with the great accumulation of stocks of goods, storage houses have been constructed wherein any one may deposit goods upon the payment of the storage charge.

An interesting development has taken place in case of perishable commodities. Meats and fish were once preserved chiefly by salting, or smoking, or sometimes by preserving in ice. A new era began about 1860 with the invention of the ammonia-absorption process. The first cold-storage plant in the United States was said to have been constructed in 1865 for the purpose of storing fish; but the ammonia process as now perfected did not come into general commercial use until about 1890. This new method revolutionized the trade in perishable commodities. Now, in all large cities, are found cold-storage warehouses

wherein are stored a number of kinds of perishables. The operators of these plants have been seriously criticized in recent years because it is said they are in possession of monopolies, that they control supply and keep up prices. However much truth there may be in these charges, cold storage performs a very useful function by carrying the surplus of one season to another, thus giving a more even distribution of the supply throughout the year. The establishments are owned by private enterprise and may be used by any one upon payment of the rental charge. In 1915 there were over 1,000 cold-storage establishments in the United States which stored annually commodities valued at from $500,000,000 to $700,000,000.

364. Mercantile Agencies.—The rise of the mercantile agency was an outcome of the panic of 1837. At that time the whole system of internal commerce was disturbed, and in the midst of the confusion eastern merchants lost confidence in many of their customers, not knowing whom to trust because they did not know who had been seriously crippled by the panic.

Credit information was not wanting before this time, but it had been obtained by the expensive process of each merchant sending out his own men to collect bills and to learn the credit standing of his customers.

The agency system had so far developed by 1850 that there were at least four well established companies in New York City. The oldest of these had offices in Boston, Philadelphia, Baltimore, Cincinnati, Louisville, and St. Louis. Since the representatives of this company were in close contact with the trade of those cities, the information service covered a large part of the United States. In 1851, the office of Tappan and Douglas, the largest of the companies, kept its records in over a hundred books of from 600 to 700 pages each.

The credit information service had to make its way in

face of much opposition, due to the fact that merchants looked upon the collection of data by independent companies as spying into their affairs. But the service was justified at this time on the basis that, "the man who seeks to buy goods on credit challenges investigation, that information of this kind must be had or the credit system must be greatly curtailed or abandoned, and that if the creditor may justly make an investigation for himself he may employ others to do it for him." The mercantile agency has more than justified itself by years of experience. It provides a form of insurance which enables sellers to protect themselves against numerous losses and thus reduces the risks of business; at the same time it gives a wholesome stimulus to creditors to conduct their business in an orderly and honest fashion.

The widening of the markets, which deprived merchants of the more intimate knowledge they formerly possessed of their customers, made them more and more dependent on the rating companies. These organizations themselves were enabled to develop their business by use of the telegraph and other quick means of communication. Modern systems of filing, cataloguing, and recording of information enabled them to perfect their service.

At the present time at least two great mercantile companies render a nation-wide service. In addition there are local collection and information agencies in many of the cities. The credit department whose function is to collect and appraise useful information about customers is now an important division of all large businesses; and the exchange of such information is often provided for through organizations known as credit men's associations.

365. **Advertising.**—Merchants' notices inserted in the papers of fifty years ago were not much more than statements that the seller possessed goods of a certain kind which prospective customers were invited to come and inspect.

Little or no effort was made to attract attention, arouse interest, create desire for goods, and effect the sale, factors which are of the greatest importance in modern advertising. *Harper's Monthly Magazine* of January and February, 1870, contained only 13 and 7 pages, respectively, of advertising, and over half of this was devoted to book and magazine notices. The only illustrations were with wood cuts. Apparently no attention was given to borders, kinds and sizes of type, diction, placement of the advertisements so as to secure attention, and other matters familiar to the advertising expert of to-day.

Out of this small beginning has developed one of the greatest industries of modern times. In some respects it has become a science with definitely established laws. As a business it has developed a great organization comparable to businesses of other descriptions. The following illustration may be taken as an indication of the growth of this industry: in 1870 the *Century Magazine* contained only 33 pages of commercial advertising; the number of pages increased to 244 for the year 1880, and to 1,061 for the year 1890. The number of advertising pages in the year 1900 was 946, and for 1910 it was 906. A study of other magazines that are forty or more years old would probably show a similar increase in advertising space.

In 1916 it was estimated that between $700,000,000 and $800,000,000 was annually spent in advertising. The great media, in the order of their importance, are newspapers, direct-mail advertising, farm and mail order, magazine, novelty, billposter, out-of-door electric signs, and some others of smaller importance.

The growth of advertising would have been impossible without systems of rapid printing, and without high standards of education. Skill in commercial art has been developed rapidly to satisfy the needs of the industry. The great spending power of the American people, their eager-

ness to obtain the things that administer to their comforts and conveniences, and the ease with which they are influenced by appeals to satisfy these wants, are factors in the development of the advertising business.

This new enterprise has been an element of immense importance in the economic development of the country. It has given us a great new industry which offers an occupation to thousands of talented men and women; it has given a great stimulus to printing and publishing and to the industries which supply their needs; it made possible both the intensive and extensive development of new markets; without this agency it would have been difficult, if not impossible, to present to consumers hundreds of new commodities that come into existence every year; indirectly it has stimulated the genius of inventors and discoverers by making it relatively easy to promote the sale of new products.

366. **Commercial Education.**—The consummation of economic development during the past fifty years has been the demand for industrial education. This was an inevitable outcome of rapid industrial growth. The old method of growing up with the business no longer sufficed to supply new captains of industry because business problems became so complex that trained men in large numbers were required to solve them; thus the demand was for men who understood methods of research, who could analyze business phenomena, who were competent to obtain quickly a grasp of an industrial situation, who could be taught the intricate problems of organization and administration. On the other hand, the growing opportunities of the new business world stimulated the ambition of young men and women, and they wished to be trained to take advantage of these new opportunities. Schools, therefore, had to adjust themselves to the new conditions. The result has been the introduction of commercial courses into the curricula of

schools and colleges. It has been estimated that in 1917 approximately 500,000 students in the United States were in courses of this description. In that year there were more than 1,300 independent commercial and business schools on the records of the Bureau of Education in Washington, not to mention normal, private, and other schools offering commercial subjects.

The development of higher commercial education is also of recent date. The pioneer in this field was the Wharton School of Finance and Commerce established by the University of Pennsylvania in 1881; the Amos Tuck School of Administration and Finance at Dartmouth was opened in 1900, and the Harvard Graduate School of Business Administration was established in 1908. Many other universities have founded schools of this description. In 1915 over 10,000 students in the United States were enrolled for commerce, finance, and administration courses in the universities of the country.

The significant outcome of the past sixty years of development, therefore, has been not only the enormous growth of industry, but the closer association of business men into various kinds of organizations, the development of new methods of marketing, the introduction of new commercial facilities, and the inauguration on an extensive scale of a program for training students for business.

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CHAPTER XXVI

COMMERCIAL DEVELOPMENT: IV, DEVELOPMENT OF FOREIGN COMMERCE

The growth of foreign trade is an inevitable result of the industrial development of a country. Increasing wealth, the growing variety of wants, the rise of the scale of living, and the diversification of industries, all of which accompany industrial expansion, increase the dependence of a country on the outside world. America, even in colonial times, enjoyed a large foreign trade, and the importance of this external relation has grown steadily. But great changes have taken place since 1860 both in the volume of this commerce and in the character of imports and exports. The principal causes involved are: (*a*) growing differences in products as between the United States and the outside world; (*b*) changes in the character of our industries; (*c*) the great increase in wealth; (*d*) the enormous development of natural resources and of manufacturing and commercial enterprises; (*e*) growing diversity of industries; (*f*) governmental aid in the promotion and regulation of trade; (*g*) the expansion of certain important trade facilities, such as shipping, banking and credit, the development of cable and wireless service, the growth of foreign commercial organizations, and the introduction of methods of studying foreign markets, of ascertaining trade opportunities, and of learning credit and other conditions abroad which are necessary for commercial development.

367. **The Differences in Products.**—Differences may be chiefly of two kinds; namely, natural resources and manufactured products. The expansion of manufactures has

given us a great variety of commodities which can be produced to best advantage in the United States. Moreover the opening of new natural resources in this country provided a great source of commodities for export. No country, however self-sufficing, can live entirely unto itself. Indeed, abundance of natural products is a most potent cause for the development of foreign commerce, for the reason that merchants and manufacturers over the world seek to obtain raw materials from countries which can produce in largest quantities and at lowest costs. The early growth of our foreign trade was due to our great natural resources. Furs, fish, lumber, naval stores, grains, tobacco, and cotton could be produced here to great advantage. Hence foreign countries looked to America as one of the chief sources of supply. The development of transportation, which made our greater resources available for domestic and foreign consumption, further increased our opportunities for trade.

Differences in products are one of the chief causes for the development of foreign trade. The most obvious differences are those which arise from soil and climatic conditions. The temperate regions are dependent on the tropics and sub-tropics for large quantities of woods, fibres, vegetable oils, rubber, fruits, spices, sugar, tea, coffee, and cocoa. With the development of our industries and with the growth of population, the United States has become a large importer of these. In the case of minerals, nature has distributed her stores very unequally; some parts of the world are unusually favored; others are provided with only a scant supply. The important stores of tin, nickel, tungsten, and antimony exist in commercial quantities in only a few places, and although gold, silver, iron, lead, copper, and zinc are more widely distributed, there is a great difference in the quality and abundance of these resources as between different places. It is, therefore, an

advantage for the consumers of every nation to go to the most productive sources. With respect to most of the leading metals the United States enjoys a preëminent position both as to quantity and quality; these resources, therefore, have been an increasing source of materials for our export trade.

With the growth of industries difference in national products become more obvious and more significant. This is due largely to the fact that manufactures become more diversified, and their products become more specialized. Tastes of consumers become not only more varied but more critical. Commodities must suit the exact demands of consumers. The final consumer becomes more particular as to color, shade, texture, and quality of the goods he buys, and manufacturers to be successful must administer to these demands. To satisfy these needs the manufacturer himself must select his raw materials with greater care. Thus the demands upon nature become far more exacting, and every country finds it necessary to draw its raw materials from wider and wider fields. These conditions apply particularly to the United States where tastes are so diversified and where producers must select their raw materials with great care. The development of this characteristic in the home demand has been an important factor in the growth of our foreign trade.

368. Changes in the Character of Industries.—The existence of great stores of raw materials not only provided this country with an immediate source of commodities for export, but indirectly, by contributing to the growth of manufactures, afforded a surplus of finished products. The low cost at which many commodities can be produced in this country, due largely to our abundant resources, gives American producers a great advantage in foreign competition. This advantage has been augmented by the development of large-scale industry which has been able to

make many economies. A study of the exports in which America has met with greatest success would reveal the fact that the big businesses enjoy a large share of the export trade. Meanwhile invention has changed the character of our industries. When the genius of the discoverer is directed to improving labor-saving devices, the result is lower cost of production and better chances of success in foreign competition. The inventor has contributed a long list of commodities which are typically American, and which purchasers can obtain to best advantage in this market. The list includes sewing machines, typewriters, cash registers, adding machines, office fixtures, agricultural implements and machines, and many others. Our exports contain an increasing number of commodities of this description.

369. **The Effect of the Increase of Wealth.**—Rich countries are both large buyers and large investors. In either case the effect is to increase the volume of trade. The great increase in wealth in the United States during the past fifty years is thus a large factor in the growth of our external commerce. Among the purchases abroad which have contributed to the upbuilding of our import trade are many articles which administer to expensive tastes, such as delicacies, luxury articles of many kinds, works of art, wares produced by the peculiar skill or taste of workmen in foreign lands. Rich people are travelers. Their expenses abroad are in effect debts against the home country which must be liquidated in some way, possibly by the export of goods. Some idea of the influence of travelers' expenses on the balance of trade of this country may be obtained from the fact that Americans abroad about 1914 were said to have spent annually about $350,000,000.

The capitalists of rich countries are also large investors abroad. Funds are loaned to foreign governments for the improvement of harbors, for the building of ports, and for

productive enterprises of many kinds. Capitalists themselves take a hand in the exploiting of the resources of foreign countries, in the building of railroads, the opening of mines, the development of plantations, and the establishment of manufactures. In all these cases the materials and equipment are usually obtained in the country where the investors reside. This increases the export trade. Moreover the commodities produced by the enterprise of these capitalists are frequently marketed in the home country. In this case the effect is to stimulate imports. Notable instances of results of this kind are to be found in the case of American trade with Mexico and some South American countries.

370. **The Effect of Industrial Development on Foreign Trade.**—No single factor has contributed more to the growth of the world's trade than the tremendous industrial development going on within the borders of all the countries. The growth of transportation, more than anything else, has been the cause of this, by opening new resources and by providing a profitable outlet for the surplus of interior, or distant, regions. Inventions, improvements, and the growth of large enterprises have contributed to the same end. Moreover this has become an age of foreign investments. Poor and backward countries have received great benefit from the growth of wealth in the richer countries; foreign investments have been the cause for developing their mines and plantations, for the building of their railroads, and for providing them with banking and merchandising facilities. Their industries have been stimulated by outside capital and enterprise, and they have become large producers and traders. Even when these results were accomplished mainly by the capitalists of European countries, the United States has received an indirect benefit. For our own development before 1860 we owe a great debt to European investors. A summary of some of the

leading factors which have contributed to the growth of world commerce is presented below:

WORLD'S DEVELOPMENT OF POPULATION, PRODUCTION, VESSEL TONNAGE, AND COMMERCE, 1860–1914

Year	Population (millions)	Commerce		Tonnage (Steam vessels over 100,000 tons)	Railways (thousand miles)	Telegraph (thousand miles)	Cables (thousand miles)
		Total (million dollars)	Per Capita (dollars)				
1860	1,205	7,246	6.01	1,710	67.4	100.0	1.5
1870	1,310	10,663	8.14	3,040	139.9	281.0	15.0
1880	1,439	14,761	10.26	5,880	224.9	440.0	49.0
1890	1,488	17,519	11.80	8,295	390.0	768.0	132.0
1900	1,543	20,105	13.02	13,857	500.0	1,180.0	200.0
1914	1,661	37,760	22.73	27,988	703.5	1,489.0	335.0

371. **Economic Interdependence.**—It can readily be seen that one of the important results of industrial development in this country has been to increase its dependence on the outside world, for it has been necessary to obtain a greater variety of raw materials and to find wider markets for goods of domestic manufacture. In order to develop our varied industries it has become necessary more and more to draw upon the surplus labor of other countries. Moreover it has become necessary to establish banks abroad, to enter into more intimate relations with foreign merchants, to construct cables, and to become interested in other means of international communication. As suggested above, one of the most significant features of economic interdependence is that it increases rapidly with industrial development. Technical improvements, discoveries, and inventions both add to this dependence and further increase both imports and exports.

372. **Government Aid to Commercial Development.**—Since the adoption of the Constitution the Federal Government has displayed a more or less direct interest in the development of foreign commerce. From time to time trea-

ties were negotiated to secure favorable treatment for American goods in foreign markets, tonnage Acts were passed, favoring American ships, and on several occasions bounties were granted to promote the upbuilding of an American merchant marine. The purpose of tariff legislation was more to encourage the growth of domestic industries than to foster the development of foreign trade. Indeed, to the extent that tariffs have impeded the movement of goods to and from the United States, they have discouraged rather than promoted foreign commerce.

With the rapid expansion of American commerce since 1900 the Federal Government has begun to take a more active and direct interest in the welfare of the exporter. The Government seeks to do two things: first, to perform the broad general work of opening new trade opportunities, a task which individuals or corporations would not do, or perhaps could not do because of the great expense and because of the remoteness of the reward; and second, to regulate foreign commerce so as to keep the opportunities open as far as possible to all who wish to make use of them.

The creation of the Department of Commerce and Labor in 1903 marks the inauguration of a new policy with reference to foreign trade. An Act of March 4, 1913, provided for the creation of the new Department of Labor, and at the same time the Department of Commerce became a separate executive division. The principal work of exploiting the opportunities of foreign fields fell to the Bureau of Foreign and Domestic Commerce provided for by an Act of August 23, 1912. The law places upon this Bureau the duty of "developing the various manufacturing industries of the United States and markets for their products at home and abroad, by gathering and publishing useful information, or by any other available method."

Commercial information has become one of the great requisites for successful foreign-trade development. The

Bureau seeks to obtain such information through the State Department by use of the Consular Service, through the studies of special attachés sent out to make a study of foreign markets for American goods, and through the work of special agents who have been trained in particular lines to make special investigations. In 1919, commercial attachés were located in London, Paris, Petrograd, The Hague, Copenhagen, Buenos Aires, Rio de Janeiro, Lima, Peking, Melbourne, and Tokyo. In order both to distribute the information thus gathered and to establish closer relations with business firms the Bureau maintains a number of offices in the United States, for example, in New York, Boston, Chicago, St. Louis, New Orleans, and San Francisco.

The information collected is distributed in the form of daily *Commerce Reports* and as special reports. Many studies in the foreign markets have been put in report form and are available for business use. The daily *Commerce Reports* contain a list of "Foreign Trade Opportunities" designated by numbers, and any merchant who is interested may obtain the details by writing to the office at Washington. The work of the Bureau in collecting important information has become a valuable aid to merchants trading abroad. The Bureau also renders an important service in educating exporters both to the needs and methods of studying foreign markets.

373. **The Export Trade Act.**—The work just described comes under the caption of promotion. The Export Trade Act approved April 10, 1918, provides not only for trade promotion but for regulation. The law was needed for two reasons: first to clear up certain ambiguities in the Sherman Anti-Trust Act of 1890, because there was some doubt as to whether this Act applied to foreign trade; and second, to make legal provision for some form of association among traders to enable them both to compete in foreign markets with foreign combinations and to sell col-

lectively in our own markets to foreign combinations. It was expected also that the Act would assist the smaller firms by enabling them to coöperate in foreign selling and thus reduce selling, advertising, and other expenses.

Under certain conditions combinations for foreign trade are legalized. Nothing in the Sherman Anti-Trust Law is to be so construed as to declare "illegal an association entered into for the sole purpose of engaging in export trade and actually engaged solely in such export trade," provided that these associations do not become a party to an agreement or conspiracy to raise or lower prices within the United States, or to restrain competition within this country. Moreover, the Act of October, 1914, (Clayton Act) is not to be construed to forbid "the acquisition or ownership by any corporation of the whole or any part of the stock or other capital of any corporation organized solely for the purpose of engaging in export trade, and actually engaged solely in such export trade," unless the result is to substantially restrain trade within the United States.

The Federal Trade Commission, created by an Act of 1914, administers the new law. The Commission may demand information as to the "organization, business, conduct, practices, management, and relation to other associations, corporations, partnerships, and individuals." If the Commission finds that these organizations have transgressed our laws it may recommend a readjustment of the business, and if the association fails to comply with the recommendation, the Commission may then present its findings to the Attorney General of the United States for such action as he may deem proper. Within a year after the passage of the Export Act some 80 associations had filed papers with the Federal Trade Commission to avail themselves of the benefits of the new law.

374. The Tariff Commission.—The work of the Tariff Commission has been discussed in a former chapter. It

should be added here that this Commission is authorized to perform a number of functions which both directly and indirectly may stimulate foreign trade. It may investigate various things which bear immediately on the success of our foreign commerce, such as the advisability of establishing free ports or free zones, unfair methods of foreign competition, the operation of commercial treaties, the operation of bargaining tariffs and preferential tariffs, and the effect of the "favored nation" clause in commercial treaties. The recommendations of the Commission concerning these matters will be of great importance to the future development of our commerce.

375. **The United States Shipping Board.**—Another point of contact between the Government and the companies exploiting foreign trade is established through the United States Shipping Board brought into existence by the Act of September 7, 1916. This body was formed largely "for the purpose of encouraging, developing, and creating a naval auxiliary and naval reserve and a merchant marine to meet the requirements of the commerce of the United States . . . (and) to regulate carriers by water engaged in the foreign and interstate commerce of the United States." The Board was authorized to create one or more corporations to acquire, construct, or operate merchant vessels. Acting under this authority, the Board on April 16, 1917, created the United States Shipping Board Emergency Fleet Corporation with a capital of $50,000,000. All the stock is owned by the Government, except a few shares held by the trustees to enable them to qualify for their position.

The great work of building up a merchant fleet during the recent War was performed by this organization. On June 5, 1920, the Shipping Board's fleet was composed of 1,491 vessels of 9,224,764 deadweight tons distributed among 1,388 cargo ships, 28 cargo-passenger ships, 59

tankers, 15 refrigerator ships, and a number of vessels of other descriptions.

The various Acts discussed above brought the Government into much closer relations with the business of the country than ever before. Our policy with reference to foreign trade has thus become a counterpart of that of promoting and regulating domestic business. The significant feature is the larger rôle played by the Federal Government in all economic affairs, and this, as we have indicated on a number of occasions, is one of the outstanding characteristics of modern industrial development.

376. **Foreign Commercial Facilities.**—Improvements in communication, banking, commercial organization, etc., have been important factors in the development of our foreign trade, just as similar changes have affected the internal trade of the country.

Within a quarter of a century after the introduction of the telegraph the same principle had begun to be applied to the transmission of intelligence by submarine cables. One of the first of these was a short line constructed in 1852 from Dover to Ostend. After many trials the trans-Atlantic cable was finally put into working condition in 1866. Meanwhile a number of short lines were laid in the waters about Scandinavia, in the Mediterranean, and others were laid in the Atlantic to connect the British Islands with various European countries. In 1873 Lisbon and Pernambuco were joined by cable. In 1918 there were fifteen lines of this description between North America and Europe, nine of which were "active." In the Pacific Ocean, the Commercial Company constructed a cable from San Francisco, by way of Honolulu, the Midway Islands, and Guam to Manila, with Shanghai or Hongkong as the ultimate destination. The first section, from San Francisco to Honolulu, was opened January 1, 1903. At the present time there are more than 291,000 nautical miles of sub-

marine cable, constructed at a cost of $250,000,000, and every year witnesses additions to this equipment.

As with other enterprises, combination has taken place in this business with the result that a large part of the world's cable service is under the control of a few large companies. The Eastern Telegraph Company, for example, controls a marvelous network of submarine cables—practically all the cables from Land's End, in England, through the Mediterranean to Suez, on through the Red Sea to Aden, across the Indian Ocean to Bombay, thence linking into the system Madras, Singapore, Hongkong, Manila, Australia, and New Zealand. In addition, practically all the cables which now surround Africa, and many of those which cross the ocean and follow the coast line of South America, are in its control.[1]

377. **The Wireless Telegraph.**—The rapid march of progress soon carried us beyond even the advantages and conveniences of oceanic telegraph. Less than fifty years after the first short cable had been constructed, certain discoveries had been made which laid the foundation for the radiotelegraph, methods of transmitting messages long distances without wires. The practical development of this new method dates from about 1888 with the experiments of Heinrich Hertz of Bonn, Germany. Although many inventors have contributed necessary improvements, probably Marconi, more than anyone else, has done the most to commercialize the wireless. In 1896 he took out a British patent. The system had been so far perfected by 1903 that it became possible to communicate across the Atlantic by wireless, and in that year President Roosevelt sent a message to King Edward VII of England. Since that date the wireless has become a common means of communcation. Stations have been erected in many parts of the world, some having a radius of many thousand miles.

[1] *Encyclopædia Americana*, V, p. 123.

The wireless enjoys a number of advantages over the cable. It obviates risks and losses due to cutting and breaking of the cables and otherwise eliminates burdensome costs.

These new methods of communication have exerted an immense influence upon the development of world commerce. They greatly facilitate international financial transactions, such as providing for prompt quotation of rates of exchange and for the transfer of titles to funds. Credit may thus be made available in short time where there is the most pressing need for it. This greatly economizes the use of the world's fluid capital. Rapid communication is also of inestimable benefit to merchants and manufacturers dealing with agents and customers abroad. It permits merchants to buy closer to the market, enables them to carry smaller stocks, economizes the use of their capital, permits them to be informed promptly of conditions over the world that might critically affect their business. The transmission of messages by wireless makes possible the saving of large amounts of property which would otherwise be lost if ships in distress could not call for aid.

378. International Financial Facilities.—In the last chapter we indicated some of the changes brought about by the Federal Reserve system and suggested their effect on foreign trading. By means of branch banks, or of associations with bankers abroad, financial institutions in Europe for some years past have been building up a system which greatly promotes the movement of their commerce. The United States entered this field rather late, relying hitherto on the banking facilities afforded by foreign institutions. Since the inauguration of the Federal Reserve system, however, there has been a notable extension of credit facilities of American banks into foreign fields. The National City Bank of New York now has branches in a number of parts of the world: in addition. the International Banking Cor-

poration of New York, the Asia Banking Corporation, the American Foreign Banking Corporation, and the Mercantile Bank of the Americas each maintains extensive relations abroad. The entrance of American institutions into the foreign field gives our bankers and merchants an advantage in effecting loans, in the purchase and sale of bills of exchange, and in obtaining credit information, which was denied them less than a decade ago. These new banking arrangements, therefore, provide one of the great essentials for the further extension of our commerce.

379. **Foreign Commercial Organizations.**—The rapid growth of our commerce made necessary satisfactory organizations of merchants and manufacturers trading abroad, just as organizations of a similar kind were needed in domestic markets to take care of the general interest of the traders. The International Congress of Chambers of Commerce was in existence at the outbreak of the war, but it ceased to function during the war period. In the fall of 1919 a new International Chamber of Commerce was projected by the International Trade Conference held at Atlantic City. The purposes of the new organization are: "To create a permanent international headquarters to centralize all data concerning economic subjects and social conditions, the facts relating to the respective needs, present production, and future possibilities of each country; to act as an instrument of coördination which will suggest trade regulations and legislative measures to facilitate and encourage the development of economic commerce; to inform public opinion, through the publication of facts, with regard to business conditions and through the dissemination of views of technical experts and business men; to put at the disposal of all official organizations the reports and conclusions prepared by these experts and business men." This international organization, therefore, is to perform a task covering the world field similar to that performed by

national commercial organizations. If it does its work well, it will become an important instrument in promoting foreign commerce.

380. **The Pan-American Union.**—The development of closer relations among the American republics was urged in the early part of the nineteenth century by Bolivar, one of the liberators of South America, and later by early North American statesmen. The idea, however, did not crystallize into an organization until about 1890 when the predecessor of the Pan-American Union was founded, under the name of the International Bureau of American Republics. The first Pan-American Congress was held in Washington in 1889–1890 and was presided over by James G. Blaine, then Secretary of State. The Bureau was reorganized in 1907 upon the suggestion of members of the third Pan-American Congress which met at Rio de Janeiro. At the fourth conference, held at Buenos Aires in 1910, the name was changed to the Pan-American Union.

This organization now performs a useful work in fostering commerce, providing for the exchange of useful information, and of promoting friendship and good will. The Union is supported by the joint contribution of the twenty-one American republics, each subscribing annually an amount proportioned according to the total population. Some of the activities of the Union include: "Publication in English, Spanish, Portuguese, and French of an illustrated monthly bulletin, which is a record of the progress of all the Republics; publication of handbooks, descriptive pamphlets, commercial statements, maps, and special reports relating to each country; correspondence covering all phases of Pan-American activities; distribution of every variety of information helpful in the promotion of Pan-American commerce, acquaintance, coöperation, and solidarity of interest." The Union is housed in a beautiful building in Washington. In the performance of its work

it is assisted by a trained staff of editors, statisticians, compilers, trade experts, and others.

381. The Merchant Marine.—In the ownership of merchant shipping the United States, since 1860, has fallen behind the other great nations. The requisitioning of ships for transports during the Civil War, the danger of destruction due to the activity of Confederate cruisers, the increasing cost of building vessels due in a measure to the high tariff on certain materials, were discouraging factors. In addition, iron began to take the place of wood as the material for steam vessels, and the shipyards and ironworks of this country could not compete with British builders. Moreover the great prosperity of domestic industries during the greater part of the period to 1900 turned the attention of capitalists more to internal than to external industrial development.

In 1861 the gross tonnage of American vessels engaged in foreign trade and in the whale fisheries amounted to 2,642,628 tons; in 1870 it amounted to only 1,516,800 tons; in 1880 to 1,352,810 tons; in 1890 to 946,695 tons; and in 1900 to 826,694 tons. From that date to 1914 the tonnage remained relatively stationary. Owing to the decline of our merchant marine the benefits from the carriage of our increasing commerce have accrued largely to foreign companies. Although the total foreign commerce of the country increased more than six times since 1860 the tonnage of American vessels engaged in that trade in 1914 was only about one-third what it was in 1860. The proportion of imports and exports carried in American vessels is shown in the table on the following page.

On several occasions since 1860 weak-hearted attempts have been made to build up an American merchant marine with the aid of a subsidy, but with little or no effect. In 1891 Senator Frye of Maine introduced two bills, the purpose of one being to subsidize mail steamers, and of the

PERCENTAGE OF IMPORTS AND EXPORTS CARRIED IN AMERICAN VESSELS AT GIVEN PERIODS

Date	Imports	Exports
1860	63.0	70.0
1870	33.1	37.7
1880	22.9	13.0
1890	16.7	9.4
1900	12.9	7.1
1910	10.0	7.5
1914	11.4	8.3

other freight steamers and sailing vessels. But this aid was not sufficient to encourage new ventures in the European trade, much less on the longer routes to South America, Australasia, and the Orient. Another bill to provide more liberal subsidies, introduced by Senator Frye in 1901, was defeated.

The administration of shipbuilding and operation under the régime of the Shipping Board has been discussed on a former page. Many problems must be solved before the future success of our ocean marine is assured. The questions of Government regulation, of taxation, and of marine insurance must be settled in such a way as to encourage American enterprise to go into the shipping business. The Seaman's Act of February 28, 1915, seems to have been a discouraging factor because it increased the difficulties and expense of operating vessels under the American flag. The Merchant Marine Act of 1920, on the other hand, holds out some encouragements. Shipping companies engaged in foreign trade are exempted from excess profit taxes for ten years provided the exempted sum is invested in new vessels; two-thirds of the investment going into new ships, however, must come from ordinary funds or capital. After February 1, 1922, the operation of the coastwise shipping laws is extended to our insular possessions. According to

another provision, companies which resort to unfair methods when engaged in commerce outside our territorial waters are to be barred from our ports. Again, the Shipping Board is authorized to modify our maritime regulations whenever such action is deemed necessary to protect American commerce. Under the new measure it will also be possible to subsidize vessels engaged in the carriage of mails, freight, or passengers.

382. The Growth of Foreign Commerce.—In 1860 the total foreign commerce of the United States, imports and exports combined, amounted to $687,192,000 and in 1914 to $4,258,504,800. The growth by decades is shown in the accompanying table.

IMPORTS, EXPORTS, AND TOTAL FOREIGN TRADE AT STATED PERIODS

Year	Exports	Imports	Total
1860	$333,576,057	$353,616,119	$687,192,176
1870	392,771,768	435,958,408	828,730,176
1880	835,638,658	667,954,746	1,503,593,404
1890	857,828,684	789,310,409	1,647,139,093
1900	1,394,483,082	849,941,184	2,244,424,266
1910	1,744,984,720	1,556,947,430	3,301,932,150
1914	2,364,579,148	1,893,925,657	4,258,504,805

383. Changes in the Character of Foreign Trade.—The composition of our foreign trade has been affected by the many forces that have influenced our industrial development. The most significant are the enormous growth of manufactures and the increase of population. Because of the rise of manufactures we have begun to consume both a larger percentage of our own raw materials and to demand larger quantities of raw products from abroad. Moreover our great industries not only produce larger quantities of finished products for domestic consumption, but also more for export. In the case of foodstuffs, our increasing popu-

lation demands a larger share of the home product and thus leaves a declining amount for export. These changes may be summarized as follows: (*a*) raw materials for use in domestic manufactures form an increasing percentage of our imports; (*b*) partly finished manufactures, also, form an increasing percentage of our imports; (*c*) imports of manufactures ready for final consumption form a declining percentage of our total imports; (*d*) exports of manufactures ready for final consumption form an increasing percentage of the total. These changes have been particularly noticeable since 1890, although they began to make their appearance some years earlier.

384. The Largest Consumers of American Products.—European countries have always been our best customers. In 1914 they took more than 62 per cent of our exports and contributed more than 47 per cent of our imports. The United Kingdom received the largest share, amounting to $594,271,000. Other European countries in their rank in consumption of American products were Germany, France, Netherlands, Italy, Belgium, Spain, Russia, Austria-Hungary, Denmark, Sweden, Norway, and Portugal. Our neighbor, Canada, was one of our best customers, taking commodities valued in 1914 at $344,716,000. Asia, Africa, and Oceania together took commodities valued at $225,000,000.

385. The South American Trade.—Since 1910 the Latin American trade has commanded a large amount of attention in the United States, and this interest has grown rapidly since the outbreak of the European war. Although the volume of this commerce has been growing, the percentage of the total has remained relatively stationary during the past twenty years. In case of the countries north of the equator, the United States usually obtains the larger share, but with the more distant countries of South America, England, Germany, and sometimes France have been

the largest participants. The success of these countries is due largely to their great investments of capital, to their better knowledge of the markets, to their better organization for trade development, and to various other advantages, such as regularity of shipping, banking facilities, and the ability to take return cargoes. Our share of the trade, however, is by no means insignificant: in 1914 we exported to South America commodities worth $124,539,900, and imported goods valued at $222,677,070. Cuba in that year sent us commodities valued at $131,303,700; her imports from the United States amounted to $68,884,400. The exports from Mexico to the United States amounted to $92,690,500, and her imports to $38,748,700.

The trade with all this region is particularly valuable because it supplies us with many goods we cannot produce ourselves. From Brazil we receive coffee, rubber, hides and skins, and cacao; from Argentina, meat and related products, wool, and tanning extract; from Chile, sodium nitrate, copper, iodine; from Uruguay, meat products, wool, and hides; from Ecuador, cacao, straw hats, and vegetable ivory; from Colombia, coffee and platinum; from Bolivia, tin; Cuba supplies us with a large quantity of cane sugar and tobacco; and Central America sends us coffee, bananas, hides, cocoanuts, chicle, timber, and rubber; and Mexico exports to this country a considerable range of mineral and vegetable products.

The increasing interest in South America probably augurs well for the future development of our commerce. American capital is being invested in mines, packing plants, and to some extent in railways and port concessions. Experts trained in our agricultural colleges are teaching better methods of agriculture. Since 1914 branches of American banks have been established in a number of places. More attention is being given to the particular needs of the markets and to such questions as packing, shipping,

and consular regulations. Meanwhile exporters are learning rapidly something of the many details required for successful foreign trading. The development of a large amount of literature on these subjects and the systematic study of foreign-trade problems both in schools and business houses are helpful activities.

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PART V

THE WAR PERIOD AND AFTER

CHAPTER XXVII

WAR AND RECONSTRUCTION

386. Economic Change since 1914.—The brief period from 1914 to 1921 was marked by a number of abrupt changes in the fortunes of American commerce and industry. First, a year of uncertainty and depression followed the outbreak of hostilities in Europe. This was followed by a period of rapidly advancing prosperity due largely to the increasing demands in Europe for American foodstuffs and materials of war. A third stage began in April, 1917, when the United States became a participant in the war; at this time the Federal Government deemed it advisable through an extensive system of control to direct the important industrial activities of the nation. Finally, there followed an initial period of after-war readjustments beginning shortly after the armistice and extending through 1920. The early stages of the last period were marked by high prices, by extravagant expenditures, by growing industrial unrest, by price reductions, and by the appearance here and there of unemployment due in part to curtailment of credit by the banks which restricted the operations of certain industries, and in part to the natural readjustments made necessary by the return to peace. Among the many features of the years from 1914 to 1920 the four named below stood out as the most characteristic of the period: (*a*) the enormous expansion of the foreign commerce of the United States; (*b*) great prosperity with its usual accompaniments of rapid expansion of basic industries, and rising wages and prices; (*c*) the development

during the war of an extensive system of government control over industry, and (*d*) the enactment of a number of new laws designed to restore stable conditions.

387. **Economic Conditions in 1914.**—Although the United States did not enter the conflict until April 6, 1917, American industries were affected immediately. No one could foresee even the immediate industrial outcome. The great surplus of American cotton and grain crops had not yet reached European consumers, and it was evident that much of this surplus could not be taken. Producers of copper, lead, zinc, and iron and steel, among others, were confronted with a declining market. The unfortunate position of the cotton planter especially attracted attention, and a number of measures were urged for his relief. At one time the buy-a-bale movement attracted considerable attention. Interested parties were asked to buy small quantities of cotton which were to be stored until they could be disposed of to advantage. A measure proposed in Congress as an amendment to the War Risk Insurance Bureau bill provided for the issue of United States bonds amounting to $250,000,000 to be used to buy 5,000,000 bales at 10 cents a pound; the cotton was to be held a year or two and sold at not less than 11 cents. Various other measures were proposed in amendments. A more feasible plan, however, was worked out at the cotton conference called by the Secretary of the Treasury to meet in Washington, August 24–25, 1914, and attended by Government officials and Southern bankers and brokers. A committee of this conference approved the plan of the Secretary to issue currency against notes secured by warehouse receipts for cotton, tobacco, and naval stores; loans were to be made on a basis of 8 cents a pound for middling cotton, and on the basis of a reasonable market value for tobacco and naval stores; notes which had more than four months to run, if secured by warehouse receipts, were to be accepted for rediscount at the newly

organized Federal Reserve Banks, and by the national currency associations which were being rapidly organized to cope with the threatened financial disturbances.

Shipping conditions were also thrown into a state of uncertainty. After years of decline, the American merchant marine had reached a point where it was no longer able to render important service to the shippers of the country. For this service the United States was largely dependent on the ships of foreign countries. In 1910 only 10 per cent of our imports were carried in American vessels, and in 1914 only 11.4 per cent. In the latter year American ships carried only 8.3 per cent of our exports. It was evident that the increasing diversion of the great merchant marine of Great Britain from peace to war purposes would not only handicap our commerce with Europe but with the more distant countries. Since the English fleet patroled the seas, German merchant vessels could render no commercial service. Meanwhile the risks of ocean shipping were greatly increased. In addition, the largest consumers of American products were now in the war, and the character and extent of their future demands could not be foreseen. When the war broke out, it was expected that American merchants would fall heir to the foreign trade of Germany, and to much of that of France and England. The South American trade was particularly an object of great attention. But unfortunately not only the ships to carry the trade, but credit and merchandising agencies were in the hands of foreigners, and a period of organization was necessary before American merchants could hope to capture any important amount of the trade of the belligerents. All in all, the immediate outlook for foreign trade was not bright.

The uncertainties of the time were augmented by the disturbed state of domestic and foreign finances. Many of the foreign countries had declared moratoria, the great European stock exchanges had been closed, and when for-

eign holders of American securities began to dump their holdings, it was found necessary to close the New York Stock Exchange. This action on July 30, 1914, was promptly followed by other American exchanges. Foreign-exchange machinery was thrown into confusion. When European countries tried to draw their balances in the United States the rate of sterling in August went to the record point of $6.00. Shortly the rate dropped below par and has never since risen to that point. In the course of time Great Britain brought her foreign-exchange machinery under control and was able in a large measure to regulate the rate by restricting the importation of unnecessary articles, by controlling the export of gold, by collecting securities in the hands of Englishmen to be used as the basis of loans, and eventually, when the United States entered the war, by large loans from this government. When the War broke out, the United States owed maturing obligations in Europe estimated at from $100,000,000 to $150,000,000. It was necessary to conserve our own gold supply. In order to do this the leading banks formed a gold pool, originally placed at $150,000,000, but later reduced to $100,000,000. This fund was supplied by the leading banks of the country. A portion of the gold was shipped to Ottawa, to a depository of the Bank of England and drafts were drawn against this amount to pay foreign debts.

In spite of the adverse conditions, American foreign trade was fairly well maintained during this critical period. In 1914 as compared with 1913 our imports from Europe declined less than $100,000,000; in actual figures, from $864,666,000 in 1913 to $783,517,000 in 1914; our exports to Europe in 1914 were $1,499,573,000 against $1,339,295,000 in 1913. The decline was particularly marked during the last quarter of the year, and was greatest in the trade with the Central countries. Commerce with the northern neutrals began to grow, a tendency which became more marked

during the following years because it was through these countries that Germany had access to the outside world, until these channels were finally closed by the trade regulations of England, France, and the United States.

388. Early War Legislation.—The legislation of 1914 was designed to cope with the new conditions created by the war. Four important measures were made necessary by the industrial disturbances: (*a*) an increase of emergency currency; (*b*) provisions for war-risk insurance; (*c*) the admission under certain conditions of foreign built vessels to American registry, and (*d*) war-revenue measures.

The great task of lending financial assistance to the Government and to industries during the war period eventually fell upon the Federal Reserve and member banks, but when the crisis came in August, 1914, the Federal Reserve system was not completely organized. Emergency measures were therefore necessary. The Aldrich-Vreeland Act of 1908, which would have expired by limitation on June 30, 1914, was extended another year. Meanwhile, the Secretary of the Treasury was authorized to extend the provisions of the Aldrich-Vreeland Act to all national banks which possessed unimpaired capital and surplus amounting to 20 per cent, irrespective of outstanding circulation, and the limits of circulating notes was raised from 100 per cent to 125 per cent of the banks' capital and surplus. These arrangements were also to apply to all qualified State banks and trust companies which had joined the system or which had signified their intention of joining within a limited time. The Secretary was to require each bank to maintain in the United States Treasury a deposit in gold sufficient in his judgment to redeem the notes, but not less than 5 per cent. To stimulate the retirement of notes when the emergency had passed a tax of 3 per cent per annum was placed on outstanding circulation which amount was to be increased by ½ of one per cent per annum up to 6 per cent for each

month the notes remained in circulation beyond three months. In all, notes amounting to upwards of $386,000,000 were issued by about 1,360 banks, but all this circulation was retired before the expiration of the Act on June 30, 1915.

389. **Revenue Measures.**—Because of the business depression and the disturbances in foreign trade, the Federal Government was confronted with the prospect of a shortage of revenue. The lowering of the duties by the Tariff Act of 1913 was expected to contribute further to the decline. In fact, the income from customs declined from $318,891,000 in 1913 to $292,320,000 in 1914 and to $209,786,000 in 1915. On the other hand, it was expected that the expenses of the Government would be increased. Thus, according to estimates, the Government would require an additional income of $105,000,000. The tax law of October 22, 1914, provided for an advance in the tax on liquors and beverages of various descriptions, taxes on bankers, brokers, proprietors of theaters, museums, concert halls, etc., also a special tax on tobacco dealers and manufacturers, and a stamp tax on various documents.

390. **The Bureau of War-Risk Insurance.**—Shortly after the outbreak of the war Congress enacted two laws for the protection and promotion of American foreign commerce. Since the foreign trade of the United States was "greatly impeded and endangered through the absence of adequate facilities for insuring American vessels and their cargoes against the risks of war," it was thought expedient that the Government should provide adequate facilities for the protection of export shipping. Thus the Act of September 2, 1914, provided for the creation of a Bureau of War-Risk Insurance in the Treasury Department, and appropriated $5,000,000 to pay the losses. The Bureau was to make provision for the insurance of American vessels and cargoes if in the opinion of the Secretary of the Treas-

ury this insurance could not be provided otherwise on reasonable terms. The Bureau was authorized to publish a form of war-risk policy and to fix reasonable rates of premium; the proceeds of the sale of such policies were to go to the Treasury of the United States. The Secretary was authorized to create an advisory board composed of three persons skilled in the practice of war-risk insurance; the duty of this board was to assist in fixing the rate of premiums and to aid in the adjustment of claims. The Act of October 6, 1917, added new provisions to the law discussed above, including compensation to sailors and their dependents in case of death or disability.

On August 18, 1914, Congress modified the former laws relating to the admission of foreign vessels to American registry. This Act repealed the clause in the Act of August 24, 1912, which provided for the registry of foreign vessels "not more than five years old." At his discretion, the President was empowered to suspend the provision of former Acts that all watch officers of vessels of the United States registered for foreign trade should be citizens of the United States. He was also permitted to suspend the provision that the survey, inspection, and measurement of foreign built vessels applying for American registry should be done by officers of the United States.

391. **The United States Shipping Board.**—One of the most imperative demands of the war period was ships not only to carry our commerce, but to transport troops and supplies to Europe. As already indicated, the tonnage of American vessels engaged in foreign trade in 1914 amounted to only a little over a million tons. The rapid withdrawal of the ocean marine of England and France for war purposes created a shortage of shipping facilities; but the most serious decline was due to the loss because of the operation of submarines. The race was between shipbuilders and submarines. Shipbuilding, therefore, became one

of the most important elements in the war plan of the United States.

The control of shipping and shipbuilding was under the control of the United States Shipping Board. This organization was authorized by an Act of September 7, 1916, and was designed originally as a part of the administrative machinery of the Government to promote the development of an American merchant marine and to regulate foreign and domestic shipping. The needs of the war, however, brought new functions to this body. Training men for various branches of marine service, requisitioning and control of vessels under the jurisdiction of the United States, and the direction of the shipbuilding program of the country were among its new duties. On April 16, 1917, the Board organized the United States Emergency Fleet Corporation with a capital of $50,000,000. The work of the new organization immediately became of vast importance. On December 1, 1917, it was supervising the construction of 118 vessels in 116 shipyards, and disbursing for this work over one billion dollars. Largely as a result of the work of this organization the tonnage of American vessels in foreign trade increased from 2,191,000 tons in 1916 to 16,324,000 gross tons on June 30, 1920.

392. **The Council of National Defense.**—From an administrative point of view the outstanding characteristic of the recent war was the conscious and organized effort on the part of all governments to control economic life in order to focus industrial activities on war purposes. During previous wars nations had largely confined their attention to government finances and to such economic matters as concerned the purchase and handling of war supplies; but little or no attempt was made to direct economic activities. In the United States, as with other belligerents, war control comprehended food products, fuel, ocean shipping, railroads and telegraphs, the supply of capital to industries.

and labor. All these matters were brought under closest Government regulation.

The Council of National Defense created under authority of the Act of August 29, 1916, was the first of the great war organizations.[1] As stated in section 2 of the Act, the purpose of this body was "the coördination of industries and resources for the national security and welfare." The Council was composed of the Secretaries of War, Navy, Interior, Agriculture, Commerce, and Labor. It was assisted by an advisory commission appointed by the President "consisting of not more than seven persons, each of whom shall have special knowledge of some industry, public utility, or the development of some natural resources, or be otherwise especially qualified, in the opinion of the Council, for the performance of the duties hereafter provided." The Council and its agencies sought "to serve as a channel through which the best professional and industrial intelligence of the country could make itself most effectively available to the Government Departments." This organization, therefore, became an important connecting link between the Government and the business of the country. It was through this body that the Government not only secured coöperation with the nation's industries, but also made effective many of its measures of control.

To cover the field effectively a number of committees were created subordinate to the Council. Among these were the committees on coal production, shipping, inland waterways, women's defense work, the general munitions board, the commercial economy board, and the aircraft production board. The Advisory Council was also assisted by a large number of subordinate bodies. In many cases these were grouped by industries, the members of the committees being representatives of particular industries; these com-

[1] The material on war control discussed in the following pages is taken from the author's *Problems of Reconstruction.*

mittees rendered important service in assisting the Government in its work of war control.

As the war work of the Government grew it became necessary to create new organizations. On July 28, 1917, the Council of National Defense, with the approval of the President, created the War Industries Board, a body which subsequently developed a large organization; its work ramified into all the important fields of government control. This board functioned as a Government clearing house for war materials and supplies; it assisted the purchasing departments of the Army and Navy; it frequently worked in conjunction with the Federal Trade Commission which studied costs of production and thereby provided the information upon which was based the purchase price of commodities supplied to the Government; it coöperated with the Capital Issues Committee of the War Finance Corporation in working out priorities in claims for financial assistance; and it exerted pressure on employers whose methods of bidding against each other for the limited supply of labor caused an incessant shifting of workmen from industry to industry.

In addition to the national body, State councils of defense were formed. Like the National Council these State organizations were subdivided into committees dealing with many phases of defense work, including military, publicity, transportation, finance, food, industries and labor, minerals, medicine, science, and educational. By August 9, 1917, State councils had been formed in 48 States and in the District of Columbia. Many of these enlarged their influence by the creation of a state-wide system of local organizations based on the county as a unit, but sometimes reaching down as far as school districts and municipalities. The work of the National Council and of the many local bodies was coordinated through a division of the National Council designed to promote "Coöperation with the States."

393. **Food Control.**—It is probable that some form of food control would have been adopted in the United States even if the country had not gone to war. The shortage of shipping increased the difficulties of England and France in obtaining foodstuffs from the more remote parts of the world and increased their dependence upon us. American stocks were declining. Both conservation and stimulation of production were urged as the immediate and necessary policy for this country. Speculation was rife, export prices were largely subject to the will of combined Allied buyers, and the free foreign market had disappeared. Domestic consumers could point to the rapid changes of price on the American grain exchanges as the source of much of their trouble. On the Chicago Exchange, No. 1 Northern spot wheat ranged from $2.05½ to $2.93 during April, 1917; from $2.65 to $3.40 during May; from $2.49 to $3.10 during June, and from $2.17 to $3.00 during July. Under these conditions manufacturers and middlemen expected wide margins of profit in order to protect themselves and this became an important cause of the increase in prices.

The Food-Control Act received the President's approval on August 10, 1917. The Act provided for the control of "foods, feeds, fuel including fuel-oil and natural gas, and fertilizers and fertilizer ingredients, tools, utensils, implements, machinery, and equipment required for the actual production of foods, feeds, and fuel." The Act made it unlawful for any person wilfully to destroy any of the necessaries for the purpose of enhancing the price or restricting the supply; it was also unlawful to knowingly commit waste or wilfully to permit preventable deterioration of any necessaries whether on farms or in mines or in manufacture or distribution; it was unlawful to hoard, monopolize, either locally or generally, any of the necessaries, or to engage in any discriminatory, unfair, or deceptive practice, or to make unfair and unreasonable

charges in handling or dealing with any necessaries. The Lever Act further made it unlawful to "conspire, combine, agree, or arrange with any other person, (*a*) to limit the facilities for transportation, producing, harvesting, manufacturing, supplying, storing, or dealing in any necessaries; (*b*) to restrict the supply of any necessaries; (*c*) to prevent, limit, or lessen manufacture or production of any necessaries in order to enhance the price thereof, or (*d*) to exact excessive prices for any necessaries; or to aid or abet the doing of any act made unlawful by this section."

The Act empowered the President, if he deemed it essential, to license the importation, manufacture, storage, mining, and distribution of any necessaries. Section II gave the President power, under certain conditions, to purchase, store, provide storage facilities for, and to sell for cash at reasonable prices, wheat, flour, meal, beans, and potatoes. The proceeds of such sales were to be used as a "revolving fund for further carrying out the purposes of this Act." Power was given also to requisition and take over for use or operation of the Government any factory, packing house, oil-pipe line, mine, or other plants where necessaries were produced. Authority was given also to guarantee the price of wheat, provided that "the guaranteed prices for the several standard grades of wheat for the crop of nineteen hundred and eighteen shall be based on number one Northern spring or its equivalent at not less than $2.00 per bushel at the principal interior primary markets."

Administration under the new Act was inaugurated the same day that the Act was approved with the appointment of Herbert Hoover as Federal Food Administrator. State and local food administrators were under his direction. The principal features of the food administration were the development of control through a system of licensing, the introduction of special measures to meet the wheat and sugar situations, voluntary arrangements with producers of

the lesser essentials, and a voluntary system of conservation as applied to the ultimate consumer which required numerous local organizations.

The American consumer received his first instructions in food conservation in the economy rules promulgated by Mr. Hoover on July 7. Under the caption of "Win the war by giving your daily service" the people were urged to save wheat, meat, milk, fats, sugar, and fuel. In the case of perishable foods, the advice was to "double their use and improve your health," and to depend on local supplies as far as possible. The early rules also involved the observance of one wheatless day a week, and the use of beef, mutton, or pork only once a day.

The licensing system which was inaugurated about August 14, was soon extended to cover establishments engaged in manufacture, storage, and distribution of food products. On November 1, 1917, the following were brought within the scope of the new regulations: producers and distributors of beef, pork, mutton, fish, poultry, eggs, milk, butter, cheese, flour, sugar, cereals, lard, and various others. On February 15, 1918, bakers, hotels, restaurants, among others, came under the regulations.

The Food Act not only authorized the President to purchase wheat for Government account but to guarantee the price for prospective crops. In accordance with this provision a proclamation was issued on February 21 guaranteeing the price for the 1918 harvest as essentially the price named for Government purchases, namely $2.20 a bushel in Chicago for number one Northern spring wheat or its equivalent. Owing to the advance of railway rates by the Railroad Administration, it was found necessary to raise the guaranteed price. The new price in Chicago, effective July 1, was $2.26.

In order to carry out the provisions of the Act referring to Government purchase of wheat and the guarantee of the

price, it became necessary to create another organization. Following the precedent of the Emergency Fleet Corporation, the President, by executive order of August 14, 1917, authorized the creation of the Food Administration Grain Corporation with a capital of $50,000,000 all of which was owned by the Government. Even this large amount proved inadequate, and by executive order dated June 21, 1918, the capital was increased to $150,000,000 and the Food Administration was directed to subscribe for the additional stock in the name of the United States and to pay for the same out of funds provided by the Act. The corporation was authorized to purchase at the guaranteed price all wheat offered by any producer at any primary market named in the proclamation. Remittances were to be made at the Government price less one per cent to cover administration expenses. Country elevators and buyers were entitled to receive a fair compensation for their services and the charges for such services were made a necessary deduction from the price of the grain.

394. **Fuel Control.**—As we have already observed, the Lever Act provided not only for the control of foodstuffs, but of fuel, including fuel oils and natural gas. The law authorized the President whenever he deemed it advisable for the successful prosecution of the war "to fix the price of coal and coke, wherever and whenever sold, either by producer or dealer, to establish rules for the regulation of and to regulate the method of production, sale, shipment, distribution, apportionment, or storage among dealers and consumers, domestic or foreign." In the event producers or dealers failed to comply with the regulations, the President was authorized to take over the properties and operate them, or cause them to be operated, by such agencies as he deemed expedient. Under certain conditions the President could require producers of coal or coke in certain areas, or in the entire United States, to sell to the United States

through any agency the President might designate. A new organ of control came into existence at once.

Fuel administration was inaugurated on August 23, 1917. As with the Food Administration, regulations were enforced through State, district, and local officers under the direction of the Federal fuel administration in Washington. Fuel control involved the fixing of prices and profits, the adjustment of disputes between mine operators and workmen, the development of a system for economical production, distribution, and consumption of fuel, and an arrangement of a system of priorities in the receipt of fuel by which producers were ranged according to their relative importance in the manufacture either of war materials or of those of customary consumption.

395. **Labor Administration.**—One of the most serious problems of the war period was the shortage of laborers. The withdrawal of men for service in the army, the rapidly increasing demand for labor in the expanding war industries, and the decline of immigration combined to produce a serious shortage. During the three years ending with 1916 the net inflow of immigrants was 50,070, 125,000, and 216,400, or an average annual immigration of 130,800. In 1912, 1913, and 1914 the net immigration had been 401,860, 815,300, and 769,270, or an annual average of about 662,100. The problem was not only to conserve the supply, but to provide for its distribution among the most important industries. Machinery was necessary also to settle disputes which were inevitable with increasing prices and increasing demands for wages. At the outset the threatened strike among longshoremen on the Pacific Coast promised to delay the Government program for the prosecution of the war; and shortly the claims of coal miners and railroad employees arose for adjustment. In the case of railroad employees the matter was handled by the Railroad Wage Commission appointed by the Railroad Administration.

The report of this commission in May, 1918, contained a recommendation for advances in wages which aggregated $300,000,000 and applied to more than 2,000,000 employees. Subsequently there was created a Railway Board of Adjustment whose duty it was to settle wage and other controversies. This Board was composed of eight members, four representing the railroads, selected by the regional directors, and four representing the brotherhoods. Disagreements were to be handled in the first instance by local committees of employees and local officers of the railroads; in the event of failure to arrive at a settlement the matter was passed up the line as far as the Adjustment Board, and if necessary even to the Director-General of Railroads.

Eventually two important boards were called into existence to deal with the general labor situation, namely the War Labor Board approved by the President on April 8, 1918, and the War Labor Policies Board which came into existence in May. The Policies Board numbered among its duties the development of plans for unified administration of labor conditions; among other things it sought to bring together and to coördinate the methods of the various Government Departments in dealing with labor problems; it sought also to determine directly for war industries and indirectly for non-war industries questions involving the distribution of laborers, and of hours, wages, and working conditions. The War Labor Board, on the other hand, was a "judicial and legislative-judicial" body in the sense that it was a court of appeal where disputes could be settled on the basis of certain principles adopted by the Board for its guidance. In substance these principles guaranteed to employers and workers the right to organize and to bargain collectively; they denied to employers the right to discharge men for membership in trade unions or for legitimate trade-union activity; and they denied to workmen the use of coercive measures of any kind designed to induce persons

to join the organizations or to compel employers to deal with the same. In general, the function of the War Labor Board was to bring about a settlement by mediation and conciliation in controversies arising in war industries; to do the same in other fields of production where delays might interfere with war industries, and to provide the machinery for the settlement of disputes. This machinery included, in addition to the National War Labor Board, local committees chosen by the Board resident in the important industrial centers. Disputes which local bodies could not settle were referred to the War Labor Board, and in the event of failure here the Board was to select an umpire by unanimous vote; failing such a choice the name of an umpire was to be chosen from a list of ten "suitable and disinterested persons" to be nominated by the President. On July 10 the President named ten persons who were to act as such umpires.

396. **The War Finance Corporation.**—As the war progressed it was found necessary not only to conserve labor and materials, but also capital. Although the principal purpose was to conserve credit for war purposes, the policy of control accomplished other desirable results since it discouraged the production of luxuries, restricted investments in less important enterprises, and thereby saved materials and labor for the more important uses in war industries. Thus, to quote W. P. G. Harding, governor of the Federal Reserve Board, "There is not an unlimited supply of credit, or of goods, or of man power. Wherever possible, such resources should be conserved and set aside for the use of labor, of transportation, of material, and reserves which ought to be kept free for the use of the Government." Early in January, 1918, the Federal Reserve Board took up the duty of passing upon requests for loans through a Capital Issues Committee. According to the Committee's report of July 17, 46 meetings had been held at which 361

applications had been passed upon aggregating the sum of $478,458,300.

The creation of the War Finance Corporation, under authority of the Act of April 5, 1918, provided a new arrangement for the control of capital issues. Among other things the Act provided for the creation of a capital issues committee vested with great powers in the matter of loans. It was authorized "under rules and regulations to be prescribed by it from time to time, to investigate, pass upon, and determine whether it is compatible with the national interest that there should be sold or offered for sale or subscription any issues, or any part of any issue, of securities hereafter issued by any person, firm, corporation, or association, the total or aggregate par or face value of which issue, and any other securities issued by the same person, firm, corporation, or association since the passage of this Act is in excess of $100,000." Certain loans were excluded from this provision, such as borrowings for current account, loans for renewing or refunding existing indebtedness, and railroad securities.

The Act of April 5 also provided for the creation of a War Finance Corporation to be managed by a board of directors composed of the Secretary of the Treasury as chairman and four other persons selected by the President with the consent of the Senate. Under certain conditions the Corporation was authorized to make advances to banks and trust companies whose loans were contributing to the success of the war; the Corporation could also make advances to building and loan associations; in exceptional cases it was permitted to loan directly to persons, firms, corporations, or associations, particularly in cases where such loans were necessary for the success of the war. It was authorized to buy and sell United States securities and to issue bonds of its own, and Federal Reserve Banks were authorized to discount the direct obligations of the corporation and to

issue notes on the basis of this security. The advances to banks and trust companies were relatively small. The greatest service of the Corporation was in lending to the railroads and in the purchase and sale of United States securities. Much of the purpose involved in dealing in Government bonds was to stabilize their value. Of the total disbursements for the year ending November 30, 1919, amounting to $1,580,889,000, over $978,000,000 covered the purchase of Liberty Bonds and Victory Notes, and $296,000,000 covered the purchase of Treasury certificates of indebtedness.

397. **The Silver Purchase Act.**—During the war period a number of causes combined to increase the demand for silver. Among these were the hoarding of gold by many countries and the prohibiting of its export, and the increasing demand for circulating money due to the increasing volume of business and to the rise in prices. A complicating factor was the unfavorable trade balance of the United States with some of the Far Eastern countries and the rise of Oriental exchanges. The plan adopted in the United States to meet these conditions was to melt down a certain amount of silver held in the Treasury, not in excess of $350,000,000, to withdraw silver certificates which had been issued against this silver, and to purchase a new supply of metal to replace that which had been melted down. Provisions to this effect were contained in the Pittman Act of April 23, 1918. The Act further provided that the "sales of silver bullion under authority of this Act may be made for the purpose of conserving the existing stock of gold in the United States, of facilitating the settlement in silver of trade balances adverse to the United States, of providing silver for subsidiary coinage and for commercial use, and of assisting foreign governments at war with the enemies of the United States." The sales price was to be not less than $1.00 per ounce. To prevent contraction of the cur-

rency the Federal Reserve Board was authorized to permit Federal Reserve Banks to issue Federal Reserve banknotes of any denomination to the amount of the silver dollars melted down, and as security for these notes the Federal Reserve Banks were to deposit with the Treasurer United States certificates of indebtedness, or United States one-year gold notes.

398. The Railroad Administration.—Prior to the taking over of the railroads by the Government the transportation systems of the country were managed by the Railroad War Board organized under a resolution adopted by the chief executive officers of the principal roads at a convention held on April 11, 1917. This action was subsequently ratified by the various railroad corporations. The purpose of this body was to coördinate the operation of the railroads into a "continental railway system" to aid the Government during the War. Innumerable problems were encountered, and the growing difficulties became more apparent with the advance of the winter 1917–1918. Included in this list were questions of rates, wages, priorities for freight, and the raising of capital needed to improve the roads. There was a question whether the roads would be able to handle the increasing traffic. The Railroad War Board admitted that "trying conditions are certain to develop this winter because of the inability of the carriers to take care of the increasing traffic," and that "the transportation situation is becoming the subject of growing public uneasiness and agitation." Therefore the Board deemed it proper to "make public a frank statement and explanation of the facts and indicate some of the means which it believes should be used in dealing with the situation." One part of the plan was the elimination in whole or in part of upwards of 450 commodities which the Board believed could be dispensed with without serious inconvenience.

Federal control was brought a step nearer as a result of

the report of the Interstate Commerce Commission directed to Congress on December 1. Two methods of meeting the situation were suggested. First, the operation of the roads as a unit by the carriers themselves. This was rejected, for, according to the Commission, "in the effort along this line initiated early in this year they are restricted by State and Federal laws, and the idea is the antithesis of that which heretofore has controlled their activities." The alternative method was the operation of the roads as a unit by the President during the period of the war as a war measure under the war powers vested in him by the Constitution or which might be conferred on him by Congress.

Unified operation was further forecasted in the plan of the railroads themselves announced late in November, 1917, by which all the available facilities east of Chicago were to be pooled to the extent necessary to furnish the maximum freight movement. Under the authority of the Act of August 29, 1916, the President by a proclamation dated December 26, 1917, authorized Federal control of the railroads. The proclamation covered every system of transportation and the appurtenances thereof located wholly or in part within the boundaries of the United States including railroads and "owned or controlled systems of coastwise and inland transportation, engaged in general transportation, whether operated by steam or by electric power, including terminals, terminal companies, and terminal associations, sleeping and parlor cars, private cars and private-car lines, elevators, warehouses, telegraph and telephone lines, and all other equipment and appurtenances commonly used or operated as a part of such rail and water systems of transportation." Street railways and interurban lines were not included in the proclamation, but the President announced that, if later the step were necessary, these might be taken over also.

The control of the railroads was now put under a di-

rector-general and a new organization was effected by which the systems of the country were unified under his direction. Subsequently the Railroad Control Act of March 21, 1918, provided the financial arrangements while the roads were under Government management. The President was directed to make agreements with the carriers and to guarantee just compensation, which was not to exceed a sum equivalent to the average annual railway operating income for the three years ending with June 30, 1917. Any income in excess of this amount was to remain the property of the United States. All agreements were to contain provisions for the maintenance, repair, renewals, and depreciation of the properties, for the creation of a reserve fund to provide for these arrangements, and for adequate adjustment of charges so that the property of each carrier "may be returned to it in substantially as good repair and in as substantially as complete equipment as it was at the beginning of Federal control." The Act provided for a "revolving fund" of $500,000,000 to be used to pay the expenses of Federal control, to give a just remuneration to the owners, to provide for motive power, terminals, cars, and other necessary equipment. Federal control was to continue through the war period and for a reasonable time thereafter, but not longer than a year and nine months after the treaty of peace. For the purpose of administration the country was divided into traffic regions under the control of regional directors who were responsible to the Director-General. On July 22, 1918, the President directed the taking over of the telegraph and telephone systems of the country and directed that the control should be exercised by the Postmaster-General.

399. The Control of Foreign Trade.—For some time before the United States entered the war England had developed a method of controlling her foreign commerce for the purpose of conserving shipping and essential materials,

limiting domestic consumption, keeping down her unfavorable trade balances, particularly with the United States, of diverting her industrial activities to war aims, and, of course, of preventing important materials from reaching the enemy. Foreign trade was put under a licensing system and goods were not permitted to enter or leave the country without an official sanction. In trade with neutral countries, commodities were frequently consigned to responsible associations, or to governments themselves, under promise that they would not be disposed of except on the terms that England prescribed. In trade with Holland, for example, goods were to be consigned to the Dutch Government, or to diplomatic or consular officers, or to the Netherlands Overseas Trust. Similar methods were employed by England in her trade with the United States before this country became a participant in the war. Rubber, nickel, wool, and leather, among other commodities, could be obtained by our merchants and manufacturers only by conforming to English regulations. The prior development of England's machinery was a great help to the United States when this country entered the war. The authority for the regulation of our own foreign trade was contained in the Espionage Act of June 15, 1917, which provided for the regulation of exports, and in the Trading with the Enemy Act of October 6, 1917, which conferred the power of control over imports. From time to time, the President by proclamation designated the officials whose duty it was to put into effect the provisions of these Acts, and named the commodities to which the license system was to apply. The Trading with the Enemy Act also contained provisions covering the regulation of enemy insurance companies doing business in the United States, for the appointment of an alien-enemy property custodian, for the use of enemy patents, trade-marks, etc., and for the regulation of certain financial transactions. The War Trade Board, es-

tablished by an executive order of October 12, 1917, became the body through which foreign-trade regulations were made effective. On September 7, 1917, the President issued a proclamation forbidding the export of coin, bullion, and currency to all countries named in a former proclamation; administration of this matter was placed in the hands of the Federal Reserve Board. Foreign exchange was brought under Federal control by an executive order of January 29, 1917.

As indicated above, the method of controlling foreign trade was through a system of licenses. The list of licensed commodities was rapidly extended until it included almost all the important articles of import and export. In enforcing its regulations the War Trade Board was often assisted by voluntary associations of American merchants and manufacturers, as was the case with rubber, wool, jute, and tin. These associations often acted as consignees of imported commodities and lent their assistance in the development of a system of rationing and allotting of the limited quantity of goods which the Board permitted to be imported.

400. Summary of War Control.—From the brief discussion contained in these pages the student may obtain some idea of the comprehensiveness of the system of control adopted in the years 1917 and 1918. This control was necessary in order to concentrate the industrial strength of the nation on the single purpose of winning the war. For this reason it was necessary to regulate the disposal of food, fuel, labor, and capital, to control means of transportation, and to regulate foreign trade. These regulations necessarily hampered the operations of industries which did not contribute immediately to the success of the war, and promoted the development of the war industries. Thus, industrial activities were largely diverted from the so-called peace industries to those engaged in production of mate-

rials and supplies of war. But it was always necessary to keep in mind the need of restoring life to the peace industries as rapidly as possible after the war was over, and thus an attempt was made to permit them a measure of prosperity.

401. War Taxes.—We have referred to the emergency revenue measure of 1914. Even the additional income provided by this Act proved insufficient to meet the growing expenses of the Government. In 1915 disbursements exceeded income by more than $26,000,000 and there was an immediate prospect of further deficits. New measures were therefore necessary to increase the income. The Act of September 8, 1916, was designed to produce the needed revenue. This law provided for an income tax both on citizens and residents of the United States and on non-resident aliens receiving an income in the United States. To the normal tax of 2 per cent on net incomes there was to be added a tax of 1 per cent per year on the amount by which the total net income exceeded $20,000 and did not exceed $40,000, grading from this amount up to 13 per cent on incomes in excess of $2,000,000. The law permitted personal exemption of $3,000 plus an additional $1,000 if the person making the return was the head of a family, or a married man living with his wife, or a married woman living with her husband; but in no event was this exemption to exceed $4,000. The law also provided a 2 per cent tax on the net income of corporations, but exemptions were made in the case of labor, agricultural and horticultural organizations, and fraternal beneficiary societies, domestic building and loan associations, and charitable institutions, among others. Other exemptions included the proceeds of life-insurance policies paid to individual beneficiaries, also the value of property acquired by gift, interest on the obligations of the States of their political subdivisions, obligations of the United States, and certain public officers.

The law also provided for the imposition of a tax on manufacturers of munitions, on tobacco and liquors, on bankers, brokers, and proprietors of places of entertainment.

With the entrance of the United States into the war it became necessary not only to increase the existing rates, but to find other sources of income. The provisions of the law of October 3, 1917, may be summarized as follows: (*a*) an addition of 2 per cent to the normal tax imposed by the Act of September 8, 1916, and a more minute gradation of surtaxes; also a reduction of the personal exemptions to $1,000 and $2,000 in the case of married and unmarried persons; (*b*) a war excess-profits tax which provided in addition to existing taxes a charge on the income of every corporation, partnership, or individual ranging from about 15 per cent up to 60 per cent, depending on the amount of capital invested in the business; (*c*) an additional war tax on liquors and beverages; (*d*) a war tax on cigars and other manufactures of tobacco; (*e*) war taxes on facilities furnished by public utilities; (*f*) war excise taxes, including automobiles, trucks, automobile wagons, piano players, phonographs, moving-picture films, sporting goods, perfumes, extracts, cosmetics, chewing gum, various medical preparations, and many others; (*g*) a war tax on admissions and dues, including "a tax of 1 per cent for each 10 cents or fraction thereof of the amount paid for admission to any place, including admissions by season ticket or subscription, to be paid by the person paying for such admission"; (*h*) war stamp taxes on instruments and documents of various kinds; and (*i*) war estate taxes in addition to those already imposed by the former law. The effect of the new taxes is shown in the increase in the income from "ordinary receipts" from $1,118,000,000 in 1917 to $4,174,010,000 in 1918, and in the increase of internal revenue from $809,000,000 in 1917 to $3,696,000,000 in 1918. Even at this the expenditures far outran the receipts and

it was necessary to make up the difference by Government loans.

402. The Growth of War Industries.—We have already discussed the measures by which the industrial efforts of the country were more and more directed to the industries which contributed to the success of the war. The effect of European demands began to be felt strongly before the summer of 1915. The metal industries were the first to feel the stimulus; but in the course of the year producers of cotton, wool, leather, lumber and their manufactures, and producers of food stuffs began to partake of the new prosperity. Number 1 Northern spring wheat which had been quoted as low as 89 cents a bushel in Chicago in 1914 sold for 1.66 in May, 1915, and fluctuated on higher levels the following year. Other cereals registered gains. In the case of iron and steel, the blast-furnace production of the United States Steel Corporation which was only 38.9 per cent of capacity on January 1, 1915, rose to 86.4 per cent on June 15, 1915, and the production of the steel works increased from 37.8 per cent of capacity on January 1, 1915, to 94.0 per cent on June 15, 1915. Producers of other metals were feeling the new prosperity. Some idea of the growth of the metal industries may be obtained from a statement of the production of the raw materials. This is shown in the accompanying table.

PRODUCTION OF GIVEN MINERAL PRODUCTS, 1914–1917

	Unit	1914	1915	1916	1917
Iron ore	long tons	39,714,000	55,493,000	77,870,000	75,573,000
Copper	pounds	1,150,137,000	1,388,000,000	1,927,850,000	1,886,120,000
Lead	short tons	512,700	507,000	552,000	540,000
Zinc	short tons	343,400	458,100	563,400	584,500
Bauxite	long tons	219,318	297,040	425,100	568,600
Manganese ore..	long tons	2,630	8,700	26,990	115,000
Bituminous coal.	short tons	422,703,000	442,624,000	502,519,000	551,790,000
Petroleum	barrels	265,762,000	281,104,000	300,767,000	335,315,000

403. Foreign Commerce during the War.—The war not only administered a tremendous stimulus to domestic industries but also to foreign commerce. The United States was the largest producer of the leading raw materials used in war manufactures, and was the largest and nearest source of food supply. Shortly after the beginning of the war the European countries, therefore, began to look to the United States as a source of supplies. Notwithstanding the commercial disturbances, and the loss of trade with central Europe, commerce began to expand in 1915 due to the demands of England, France, and the northern neutrals. Exports from this country to Europe amounted to $1,971,434,000 in 1915, to $2,999,305,000 in 1916, and to $4,324,512,000 in 1917; and the total export trade of the United States rose from $2,364,579,000 in 1914 to $7,749,815,000 in 1919. Although the import trade showed considerable gains the largest increase was in the export trade. The total favorable balance of this country for the four years from 1914 to 1917 inclusive was about $9,834,700,000. The growth of our foreign commerce during this period is shown in the accompanying table.[2]

FOREIGN COMMERCE OF THE UNITED STATES, 1914–1919

Year	Exports	Imports	Excess of Exports over Imports
1914.....	$2,364,579,148	$1,893,925,657	$470,653,491
1915.....	2,768,589,340	1,674,169,740	1,094,419,600
1916.....	4,333,482,385	2,197,883,510	2,135,599,375
1917.....	6,290,048,394	2,659,355,185	3,630,693,209
1918.....	5,919,711,371	2,945,655,403	4,016,061,000
1919.....	7,920,426,000	3,904,365,000	

The growth in our trade with Europe was particularly marked in the case of iron and steel, explosives, food prod-

2 Exports for 1919 are "domestic exports."

ucts, mineral oils, animals, copper, lead, zinc, leather and its manufactures, and cotton manufactures. The increase in several of these products is shown in the accompanying table.

EXPORTS OF CERTAIN COMMODITIES, 1914–1918

Year	Explosives	Chemicals, Dyes, Drugs, etc.	Iron and Steel
1914	$6,272,197	$21,924,337	$251,480,677
1915	41,476,188	43,223,330	225,861,387
1916	467,081,928	119,937,581	624,087,940
1917	802,789,437	181,028,432	1,133,746,188
1918	373,890,863	172,135,180	1,124,999,211

Year	Meat and Meat Products	Wheat	Wheat Flour
1914	$143,261,000	$87,953,400	$54,454,175
1915	205,785,000	333,552,226	94,869,343
1916	266,642,000	215,532,681	87,337,805
1917	353,812,000	298,179,705	93,198,474
1918	593,924,000	80,802,542	244,861,140

404. Facilities for Foreign Trade.—Among other results the war increased the interest of American merchants and manufacturers in foreign trade. Congress responded to the demands for increased commercial facilities by passing the Webb Export Act which we have referred to on a former page. The Jones Shipping Bill, also referred to, was designed to protect the new merchant marine. An amendment to the Federal Reserve Act dated September 7, 1916, extended the financial facilities of the country for foreign trade. Under certain conditions national banks with a capital and surplus of $1,000,000 or more were permitted to invest in the stock of banks or corporations chartered under the laws of the United States, or of any of the States, en-

gaged in foreign banking. In the Edge Act of December 24, 1919, Congress provided further means for the incorporation of organizations engaged in international commerce. National banks, as well as individuals, firms, and corporations were permitted to invest in the stock of such organizations. The real purpose of these laws has been described as follows:[3] "To provide for the establishment of a Federal system of international banking or financial corporations operating under Federal supervision with powers sufficiently broad to enable them effectively to compete with similar foreign institutions and to afford to American exporters and importers at all times a possible means of financing their foreign business."

405. Other After-War Measures.—After the signing of the armistice many of the war organizations wound up their affairs and passed out of existence. Food control, regulation of industries under the War Industries Board, war control of foreign commerce, among others, rapidly disappeared. Meanwhile the railroads and telegraphs were returned to their owners. In the spring of 1920 Congress repealed many of the war measures, but the President declined to sign the Act and thus the war laws remained on the statute books. Meanwhile Congress enacted a new Railway Act designed to put the roads on a permanent peace basis. The powers of the Interstate Commerce Commission were enlarged and the body was charged with new duties. The Commission was increased to eleven members and the jurisdiction of the body was extended to export rates used by any vessels registered under the laws of the United States. Recognizing the increased cost of operating the roads, Congress authorized the Commission to increase the railroad rates and to make other financial provisions for the roads. The Act provided for a general contingent fund to be accumulated from railway earnings after

[3] *Federal Reserve Bulletin*, April, 1920, p. 379.

the amount of interest or dividends had been paid. This contingent fund was under the control of the Commission. This fund is to be used in furtherance of the public interest in railroad transportation and may be employed either in making loans to the carriers to meet expenditures for rolling stock, equipment, etc., or to refund maturing securities. The unemployed funds which are not used in these ways are to be invested in obligations of the United States. The Act also contained provisions for the adjustment of disputes between the managers of the roads and the employees. The Railroad Labor Board, which is to undertake this duty, is to be composed of nine members, three from the carriers, three from the employees, and three representing the public. The law laid down a number of conditions which must be taken into account in the settlement of disputes, including the scale of wages paid for similar kinds of work, the relation between wages and the cost of living, the hazards of employment, the amount of training and skill required by the job, the degree of responsibility, and the character and regularity of employment. Provision was made also for the financing of the roads during the period of readjustment. In the future no railroad corporation will be permitted to construct a new line, or to extend an old one, unless it is clear to the Commission that such improvement is necessary. Under certain conditions the railway properties of the country, with the approval of the Commission, may be combined into a limited number of competing systems.

406. **Business Conditions, 1920–1922.**—That American business would encounter a serious depression after the disorganization of the war years was a foregone conclusion; but this did not come immediately. In fact the period from October, 1919, to October, 1920, was one of unusual prosperity.

The reaction from enforced economy during the war

years expressed itself in an orgy of spending. This phenomenon was not peculiar to the United States, but was observed in Europe, and in fact, in all countries which had been affected by the financial strain of the War. Optimism prevailed. It was generally believed that stocks of raw materials both at home and abroad were depleted, that European countries would still find it necessary to make large purchases in the United States and that domestic funds would now be released for building roads, schools, dwellings and for construction work of all kinds. Workmen, according to this opinion, would be fully employed at high wages. In addition, the non-essential industries, which had been repressed during the War, would come in for their share of prosperity.

Moreover, an appreciable amount of individual savings of the war period was released for the purchase of goods. Excess profit taxes added to the forces of extravagance, and expenditure for enlargement of factories increased the demand for certain classes of goods.

In October, 1919, the business situation was characterized by "great general prosperity throughout the country, with strong demand for commodities verging at times on recklessness in buying." During December, 1919, buyers' market reached enormous proportions. To use the words of one observer: "With no thought of price, with little provision for the future, our people, almost without exception, are demanding goods, especially luxuries." The Bureau of Labor index for wholesale prices rose from 207 in June, 1909, to 272 in May, 1920.

At this stage the Federal Reserve Board stepped in and put the brakes on runaway industry. The policy of curtailment was urged upon all member banks. Under this policy, liquidation of high priced stocks of goods which were carried on the basis of bank loans began to take place. It was a painful period and brought great losses and even

failures to many businesses; but gradually liquidation was completed. Toward the end of 1920 the country entered upon a period of dullness and depression which lasted for nearly two years.

Something of the distress through which industry was passing is revealed in the extent of commercial failures, which numbered 16,652 in 1921; the total liabilities were $627,401,800. In 1919 the failures were only 6,451 with liabilities of only $113,291,000.

The working classes, of course, shared in the burdens of hard times. Wage cuts were frequent. As early as December, 1920, it was reported that operations in some industries had been cut from 40 to 70 per cent and that unemployment was on the increase. According to a survey made by the Bureau of Labor, there were 3,473,400 unemployed in the United States on January 15, 1921. Some industries showed an exceptionally high degree of unemployment, including automobile production (55.2 per cent), building (60.4 per cent), iron and steel (41.5 per cent).

The decline in the price of farm products was notable. The average price of No. 3 corn in Chicago was $1.53 a bushel in August, 1920, and was 60 cents in July, 1921. No. 1 northern spring wheat (Minneapolis) was $2.55 in August, 1920, and only $1.43 in July of the following year. Although farmers harvested a large crop in 1920 (814,905,000 bushels), they obtained a smaller income than the year before, due to the decline in price. Thus both purchasing and debt-paying power diminished. Thereby hangs the story of "frozen credits" as applied to agriculture, and in this situation were the roots of the growing agricultural discontent.

The unfilled orders of the United States Steel Corporation stood at 11,118,400 in July, 1920; they declined steadily to 4,241,600 in January, 1922. The decline in other

manufacturing industries was as great as in iron and steel. This brief account gives some idea of the aftermath of the war and post-war prosperity.

407. Revival of Business, 1922–1925.—In April, 1922, signs pointed to a decided revival of business. The Bulletin of the Federal Reserve Board reported that a "pronounced increase in activity has been characteristic of many basic lines of industry during the past month." This journal ventured the statement that there is "evident promise of improvement even in those directions, such as foreign trade, in which hitherto prospects have been unsatisfactory." It was not long before prosperity spread to other industries. Iron and steel, automobile trades, building, wholesale and retail trade, soon benefited by the movement. The resumption of dividends in 1923 and 1924 by many industrial corporations, and numerous declarations of stock dividends were an indication of the return of good times. The rise of railway shares on the stock exchange, particularly after the election in November, 1924, was an evidence that railways also had begun to share in the increased earning power.

No doubt business methods have changed during the past six or eight years. Merchants and manufacturers are evidently buying much closer to their needs than in former years. One illustration is the large amount of business done by many industrial corporations on a relatively small booking of unfilled orders. From January, 1923, to April, 1924, for example, the United States Steel Corporation operated at from 83 to 97 per cent capacity while its unfilled tonnage was not in excess of 7,400,000 tons. With quiet prevailing in the labor world, and with railways restored to their former working efficiency, it is not necessary for merchants to carry large stock, because prompt deliveries are assured. In some industries, no doubt, capacity is in excess of present needs. Iron and steel, cop-

per, leather, textiles are in this class, and it may be some years before the industrial demands of the country grow up to this capacity. But for the country as a whole it may be said that stability has been restored after the disturbing effect of the War.

408. Railroads since 1920.—By the end of 1924 the railroads had completely recovered from the confusion of the after-war period. Numerous economies were introduced, in many cases labor forces were reorganized, and rolling stock was repaired. In 1922 and 1923 the roads were able to handle record traffic without congestion or delay. In 1923 they transported more freight than in any year in their history, namely, 1,387,942,000 tons. Earnings, also, showed decided improvement; the net operating income was higher in 1923 than in any year since 1916 and the return on railroad investment improved steadily after 1918.

Meanwhile, the adjustment of another troublesome matter was about completed. The Transportation Act of 1920 guaranteed to the roads for a period of six months after March 1, 1920, a net return, not less than one-half the annual rental paid during the period of government operation. A number of complications arose in interpreting the act, but by the end of 1924 most of the cases had been settled, the total awards amounting to about $507,494,000. There remained for settlement, according to the estimates of the Commerce Commission, only $28,505,000.

In other respects the transportation situation showed great improvement. Due to the numerous wage adjustments during the period of Federal control the railway labor world was in a state of confusion. Even after the War a number of crafts demanded an increase in wages. In July, 1920, awards were granted by the Railway Labor Board amounting to about $700,000,000. Subsequent demands for increases, however, met with resistance, and finally, in

1922, the Board ordered wage reductions in the case of a number of crafts. Naturally such action rendered the Board unpopular with railroad workmen. On the other hand, the relations of the Board with the employers were not always happy. The Pennsylvania Railroad, for example, denied the right of the Board to pass upon a system of collective bargaining which this road was working out with its men. During this period the public heard much of the Plumb Plan—a scheme by which the government was to buy the roads and operate them through the cooperation of railway employees and operators. Government ownership of railways was advocated by the La Follette Party in the election of 1924.

In another important respect the Transportation Act of February 28, 1920, blazes a new trail in the relation of government to the railroads. In prescribing rates by government authority it is impossible to put all roads—even those located in the same traffic area—on the same basis as to income; a rate which will yield a "fair return" to a "strong" road might result in loss to a "weak" member. The Transportation Act attacked this problem with the provision that a "fair return" was to be fixed temporarily for a two-year period by the Commission at 5½ per cent; to this ½ of 1 per cent might be added in case of betterments or improvements sanctioned by the Commission. One half of the excess over 6 per cent was to be turned over to the Commission for use as a "revolving fund" to be lent to the weaker roads.

The constitutionality of this provision was upheld by the Supreme Court in the case, Dayton-Goose Creek Ry. Co. *vs.* the United States, Interstate Commerce Commission *et al.* The court maintained that "By the recapture clauses Congress is enabled to maintain uniform rates for all shippers and yet keep the net returns of railways, whether strong or weak, to the varying percentages which

REVENUES AND EXPENSES OF STEAM ROADS
1908-1923

REVENUE, EXPENSES, WAGES, AND FREIGHT AND PASSENGER RECEIPTS OF STEAM RAILROADS, 1908–1923

are fair respectively for them. The recapture clauses are thus the key provision of the whole plan." The roads contended that "to cut down the operating profit of the stronger roads to a certain per cent is not cutting or reducing rates, since the net income of a carrier has no proper relation to rates and can not be used as evidence of their reasonableness." The court said in reply: "It is clearly unsound to say that the net operating profit accruing from a whole-rate structure is not relevant evidence in determining whether the sum of the rates is fair. The investment is made on the faith of a profit, the profit accrues from the balance left deducting expenses from the product of the rates, and the assumption is that the operation is economical and the expenditures are reasonably necessary. If the profit is fair, the sum of the rates is so. If the profit is excessive, the sum of the rates is so. One obvious way to make the sum of the rates reasonable so far as the carrier is concerned is to reduce its profit to what is fair."

The old railroad policy of the United States was to maintain the lines as separate competing groups, but there are many indications that the country is favoring an abandonment of this policy. Already the Transportation Act authorizes the consolidation of railroads into a certain number of great systems. Plans for consolidation, of course, must be approved by the Interstate Commerce Commission. All in all, the new laws bring the carriers under much closer supervision of the Government. Even now the Commission exercises control over plans for new construction and the test to be applied is whether there is "need" for such new lines. Whether or not this is a wise provision is a question. Many parts of the country are even now not adequately served with railroads. If the Commerce Commission interprets "need" to mean service to population and industry already in a territory, then the unde-

veloped sections of the country will be deprived of railroads required for their growth. Under the old regime, railroads were built in advance of needs. Many evils grew out of this system, but at least it resulted in the rapid opening of the country to settlement and to industry. What will the outcome be under the new policy?

409. United States Shipping Board, 1920–1924.—The disposition of the great government-owned fleet built up during the War is still an unsolved problem. To June 30, 1924, the Shipping Board had acquired 2,541 vessels of various descriptions. Of these 1,051 had been sold, 86 lost, 18 scrapped, and 85 transferred to other government departments. Thus, on the date named above, 1,301 vessels with 8,921,833 dead weight tonnage were still owned by the Board. Upon several occasions the Board has recommended to Congress direct government aid for American flagships, and the late President Harding urged a subsidy, but Congress would not agree to this policy. Meanwhile the Board continues to operate directly or indirectly as many of these vessels as can be put into use. In June, 1924, 636 were in active service; the remaining ships, numbering about 900, were nested together in various harbors of the United States awaiting the development of some policy which will either lead to their use or to a journey to the scrap heap. In its *Annual Report, 1924,* the Board forecasts a policy as follows: "It is believed that the consolidation of lines constitutes the first essential step toward placing them on a practical business footing, and that in due time most of them may be expected to arrive at such a condition as will result in their sale or lease to private operators, or, failing that, will permit an accurate evaluation of differential that exists in the operating costs of American and foreign lines. This will afford a basis for the determination of the amount of government aid that should be given American vessels in order that the other-

wise unsalable lines may be taken over and maintained by private citizens of the United States."

410. Financial Changes.—From the beginning of our history as a nation wars have been the cause for the great additions to the national debt. This was the case with the War of 1812, the Mexican and Civil Wars, the War with Spain and the late War. So far as they related to finance, subsequent periods were devoted to the funding and consolidation of war debts, to reduction of taxes, and to provisions for the gradual reduction of the debt.

Congress enacted a new financial measure in 1921, but as yet it was too early to contemplate a serious reduction of taxes. In the latter part of 1923 and in the spring of 1924 the tax problem was widely discussed. The Mellon Plan was put forth by the Secretary of the Treasury as the basis for tax reform. Among other things, this plan provided simpler methods of tax administration and a reduction of surtaxes to a maximum of 25 per cent. The chief burden of the secretary's argument was that the high rates were driving capital into tax exempt securities. He urged that lower rates would do two things: (*a*) release new capital for investment in productive industries, (*b*) increase the government's income because in time new funds would be invested in tax yielding industries. The "progressive bloc" in Congress was opposed to the plan and was largely instrumental in bringing about its defeat. However, Congress enacted the revenue act of June 2, 1924. The act made important revisions in the tax system as applied to incomes, estates, excises, etc. With respect to income taxes, surtaxes began with net incomes in excess of $10,000 and progressed to a maximum of 40 per cent on net incomes in excess of $500,000. Progressive estate taxes ranged from 1 per cent on net estates not in excess of $50,000 to 40 per cent on estates exceeding $10,000,000. The law contained provisions for taxes on

gifts, and a levy on corporate incomes of 12½ per cent, after allowing certain deductions. The tax reduction question is still to the fore. Further reductions are probably in prospect and this is coupled with the policy of rigid economy adopted by the Coolidge administration.

411. **National Debt.**—The United States came out of the Civil War with a debt aggregating $2,846,000,000. Although this seemed to be an enormous burden the country soon realized that the payment of principle and interest imposed no hardship. With the rapid development of industries, and with the expansion of foreign trade, the wealth of the United States increased by leaps and bounds. Import duties yielded ever larger sums, and these, together with a few excise duties, provided even more revenue than was needed to pay interest and principle. In many of the years from 1870 to 1900 the national treasury was in possession of a large surplus over expenditures. In fact, the per capita debt steadily declined from $65.82 in 1866 to $9.80 in 1914. In the latter year the interest bearing debt amounted to about $1,000,000,000. The Great War added about $26,300,000,000 to the national burden. Considerable progress has been made in paying this amount. The figure given above was the total interest-bearing debt on August 31, 1919; the amount was reduced to $21,800,000,000 by October 31, 1923.

412. **Changes in Sources of National Revenue.**—A notable development in national finance has been the change in sources of national revenue—during the past 25 years. Of the total ordinary receipts of the Federal Government in 1900 ($567,240,000) more than 93 per cent was received from indirect taxation. Of this sum, taxes on imports yielded $233,164,000, and miscellaneous internal taxes $295,327,000—chiefly from tobacco and liquor. Since the introduction of income taxes, direct taxation has become one of the chief sources of national revenue. Thus in 1923

this source yielded 44 per cent of the total ordinary receipts, and customs and liquor and tobacco only about 23 per cent. One reason for the decline in relative proportion of these indirect taxes is the falling off of revenue in malt and spirituous liquors due to the Volstead Act. In 1918 the spirits and liquor taxes produced an income of $443,800,000 and in 1923 only $30,300,000. This change in source—from indirect to direct—is partly accounted for by the increased needs of revenue, but another factor is the changing idea with regard to property. Many persons believe that the taxing system should be used not only to obtain revenue, but to redistribute wealth—hence some of the popularity of income and inheritance taxes.

413. **Foreign Debts.**—An unusual financial feature of the late War was the direct lending by one nation to another. The United States and Great Britain were the chief sources of loans, but Britain was also a large borrower from the United States. During the War and post-war periods the United States extended loans to some twenty countries. The total indebtedness, including unpaid interest, on November 15, 1923, was $11,800,010,200. The principal debtors are shown in the annexed table.

INDEBTEDNESS OF FOREIGN NATIONS TO THE UNITED STATES, NOVEMBER 15, 1923

Nation	Principle	Interest	Total
Great Britain	$4,600,000,000	.....	$4,600,000,000
France	3,340,606,377	$650,051,229	3,990,657,606
Italy	1,647,997,050	367,082,347	2,015,079,397
Belgium	377,029,570	77,433,603	454,463,173
Russia	192,601,297	49,301,775	241,903,072
Czechoslovakia	91,879,671	19,026,053	110,905,724
All others	328,395,375	58,605,897	387,001,272
Total	$10,578,509,340	$1,221,500,904	$11,800,010,244

In 1923 Great Britain made arrangements for the settlement of her obligations to the United States and has begun making payment. Thus far, however, the other larger debtors have made no arrangement for settlement.

The repayment of this debt is one of the most troublesome economic problems. It involves not only the means of raising revenue within the debtor countries, but the transfer of this income to the creditors. The latter is probably the most serious of the two problems, because it involves the export of goods from the debtor countries, or the rendering of valuable services—or both, equal to the debts to be paid. The many difficulties inherent in the settlements have led many people to believe that it will be necessary eventually to cancel the larger part of our foreign debts.

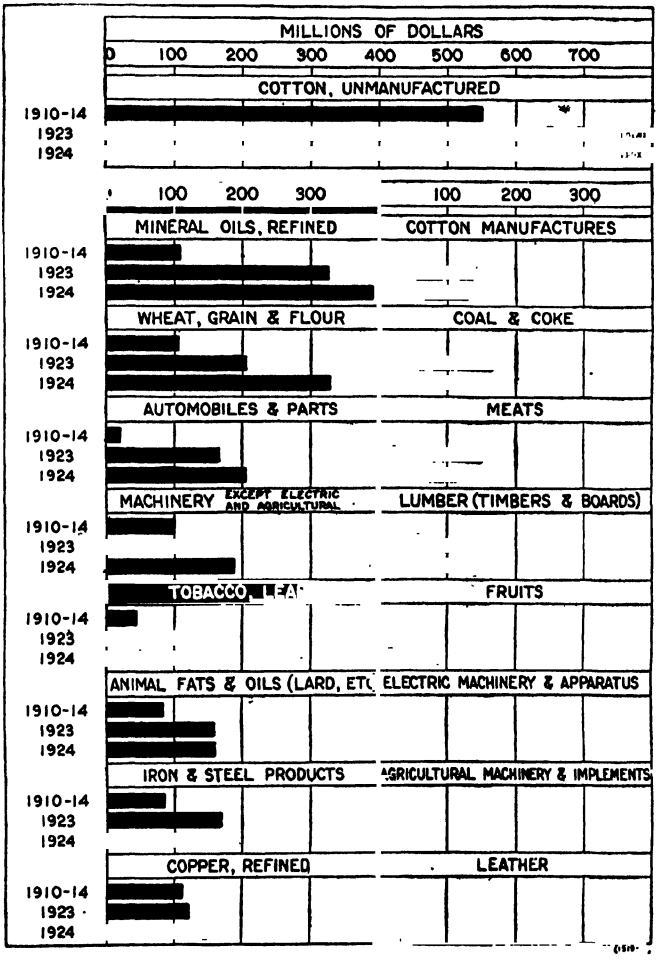
414. The Dawes Plan.—The international debt situation is intimately connected with German reparation payments, and with the restoration of stable economic life in Germany. France, for example, has urged that she cannot discharge her foreign obligations unless Germany makes payment. Moreover, the industrial stability of Europe is closely related in the industrial and financial condition in Germany, and the restoration of normal trade throughout the world.

Recognizing the helplessness of the European countries, former Secretary of State Hughes intimated in 1923 that the United States would be willing to take part in an economic conference. The Dawes Commission of 1924 was the outcome. Among other things, the Dawes Plan provided for: (*a*) the stabilization of German currency by the creation of a new bank of issue with a capital of about 400 million gold marks; (*b*) annual reparations payments from all sources rising from $250,000,000 in the first year to about $625,000,000 the fifth year, and varying thereafter with the "index of German prosperity;" (*c*)

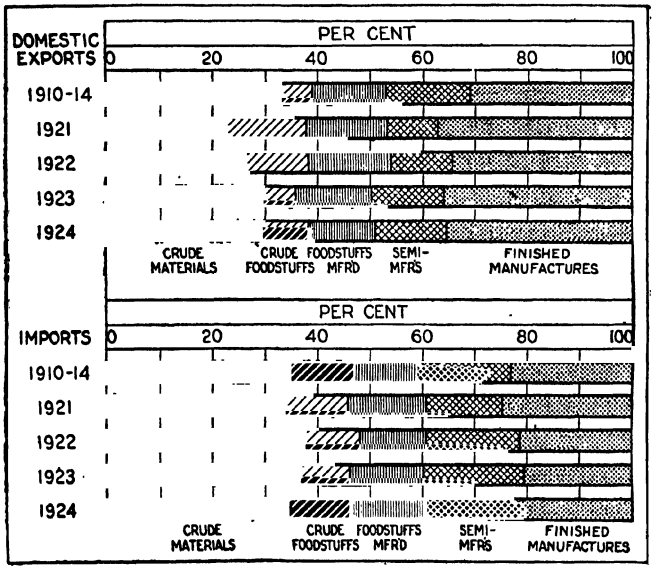
mortgage of Germany's railways for about $2,750,000,000; (*d*) mortgage of certain industrial companies for about $1,250,000,000; (*e*) raising of German taxation to the level of allied countries; and (*f*) arrangement for the payment of all reparations into the new bank to the credit of the Reparations Commission. As to the transfer of such sums to outside countries—one of the most troublesome problems —the report says: "Experience and experience alone can show what transfers into foreign currencies can in practice be made."

415. Restoration of Gold Standard in England.—World commerce is seriously affected by exchange relations among the various countries. The rise of sterling exchange to nearly the old par in May, 1925, after ten years of sale at a discount, and the announcement by the Chancellor of the Exchequer that England would return to the gold standard, are important steps in the restoration of the world currencies. These changes promise more stable commercial relations, from which the United States, along with other countries, will obtain a benefit in time.

416. Foreign Trade.—The foreign trade of the United States in 1920 even exceeded the value in the war years. Exports and imports combined amounted to $13,500,000,000. Due to the high prices at the time it is difficult to compare the volume of freight which moved in this and in the war years, but in 1920 this country exported to Europe large quantities of breadstuffs, meat products, cotton, leather, mineral oils, lumber and tobacco, among others. At this date the European countries were not able to recapture their trade which had been lost to the United States during the War, and thus trade with Asia, South America, to say nothing of the North American country, still added greatly to our foreign commerce. The disordered state of Europe, especially in the years from 1920 to 1923, and the depression in the United States seriously



VALUE OF LEADING DOMESTIC EXPORTS OF THE UNITED STATES

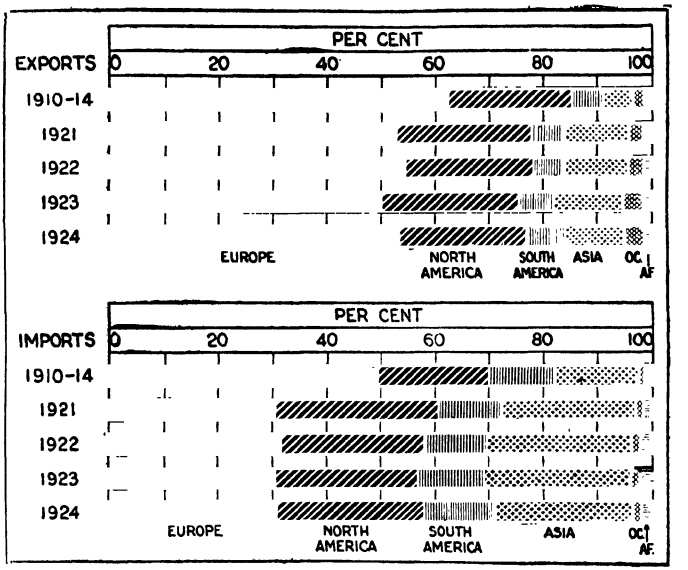


PERCENTAGE DISTRIBUTION OF FOREIGN TRADE BY GREAT GROUPS

affected our foreign trade. Both exports and imports declined, and our favorable balance was cut to much smaller figures. These facts are indicated in the accompanying table.

FOREIGN COMMERCE OF THE UNITED STATES, 1920–1924

Year	Exports	Imports	Excess Exports and Imports
1920	$8,228,016,000	5,278,481,000	2,949,535,000
1921	4,485,031,000	2,509,148,000	1,975,883,000
1922	3,831,777,000	3,112,747,000	719,030,000
1923	4,167,493,000	3,792,066,000	375,427,000
1924	4,590,981,000	3,610,552,000	980,429,000



PERCENTAGE DISTRIBUTION OF FOREIGN TRADE BY CONTINENTS

Since the War, marked changes have taken place in the direction of our foreign commerce. Great Britain is still our best customer, but the trade with Germany has not recovered its former position, and the Russian trade has dropped to very small amounts. Moreover, there are some indications that with the return of European competition, American merchants will not be able to maintain the large volume of trade with South America and the Far East.

417. **Freight Carried in American Vessels.**—In a former section we indicated that less than 12 per cent of the imports of this country and less than 9 per cent of the exports were carried in American vessels. The building of the large merchant fleet during the War has restored somewhat the volume of our carrying trade. In 1923, 31.4

per cent of the imports and 38.4 per cent of the exports were transported in vessels flying the American flag.

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CHAPTER XXVIII

ECONOMIC PROGRESS; SUMMARY AND CONCLUSION

Throughout the preceding chapters our theme has been economic development. In its material and social aspects the country was very different in 1860 from 1790, and still more different in 1925 from 1860. In external forms this development expressed itself in the reduction of waste places to habitation, in the spread of farms, in the growth of population, in extension of roads, in improvement of streams, in building of railroads, and in the expansion of manufactures. In a less material way it found expression in the growth of innumerable facilities which made this development possible—and more important still, in the growth of wealth, in the multiplication of wants, and in the discovery of countless methods for their satisfaction. But was this progress? The answer depends on what the reader means by this term.

418. Meaning of Progress.—If one seeks fixed, immutable standards with which to test progress the search will be in vain. To say that it means "development," or "evolution," or "achievement" means nothing, because one queries: "What is the measure of development? What are its qualities and dimensions?"

The test of progress is found in the judgment of people, as well as in changes in material things. In the last resort the people of the times decide what constitutes their progress and there is no other court in which the case may be tried. The thinkers of another century may pass quite a different judgment, as we know full well from the opinions we hold of the civilizations of the past. Judgments

are ephemeral. With the passage of centuries will come more facts and relations and different methods of reasoning about them. But no liberal person will venture to say that the judgments of any people, in any time, are immutable and final.

One writer has defined progress as "the growth of social life in respect of those qualities to which human beings can rationally attach value." Unfortunately, this definition contains one troublesome word—"rationally." Methods of reasoning, the premises upon which they are based, and sympathies and prejudices which color all our judgments, are in the process of change. Critics of the classical doctrines of economics maintained that there was no "economic man"; no more is there a "logical man," for the reasons given above.

Purely from an economic point of view, our people seem to demand of their economic system a greater variety and abundance of goods; they desire an increase in all forms of wealth with the greater satisfaction which flows from them; they want wide diffusion of social well-being—more physical comforts, less grueling labor, more certain livelihood, and greater participation in the fruits of invention and discovery. They regard the achievement of these goals as economic progress. Has the course of our economic development pointed in these directions?

On the whole the answer is in the affirmative. The substance of the foregoing chapters indicates that living is better with respect to the tests named in the last paragraph. It does not follow, however, that the people are more contented. Ambition grows with progress. Wants multiply, the social horizon is broadened, and ideas are lifted to a different plane. The discontent which is a product of change is not in itself an indication of regress. Progress imposes a great tax on thoughts and energies; it is a source of restlessness; but at the same time, it brings a higher

quality of endeavor, greater satisfaction of wants, and greater respect for self. If life today is much more strenuous than in 1860, it is because the people of the times elect this form of living and find in it a large measure of gratification.

But still it must be urged that it is not an easy matter to answer the question whether our economic development has been productive of progress. Certainly the answer will not be entirely satisfactory to those who command a vast volume of figures relating to the growth of wealth and its distribution.

419. Productive Equipment.—On the purely mechanical side there is no question that progress has taken place, as will be shown presently. One means for rendering living more easy and certain is the improvement of tools, machines, and equipment of all descriptions. On this score, no one can gainsay the fact that great progress has taken place. We may take a few illustrations. The increasing use of power devices is a most significant feature of our industrial history. It indicates the substitution of some other energy than that of human muscles, and indicates a gain in the natural forces applied to industry. It signifies, also, a better application of power than could be accomplished with unaided human labor. Thereby, both the sum-total of industrial energy is increased and a more effective use of power is obtained. The use of primary horsepower in manufacturing industries in this country increased from 2,346,000 in 1869 to 29,422,000 in 1919. The growth by decades is shown in the accompanying table:

Year	Primary Horse-Power
1869	2,346,142
1879	3,410,837
1889	5,938,635
1899	10,097,893
1909	18,675,376
1919	29,422,101

The table above applies only to manufactures. In transportation both by rail and water, in mining and quarrying, and in agriculture, power derived from steam, from petroleum oils and from electricity has added enormously to our capacity for production. In mines and quarries, for example, the aggregate horse-power in 1919 amounted to 6,723,700. In rail transportation in the United States in 1922 there were over 68,500 locomotives with a total tractive capacity of more than 2,400,000,000 pounds. This represents an enormous gain over the transportation system which employed men and animals as the means of carrying freight.

Power devices, of course, are used in connection with machinery which uses or transmits power. Thus there has been built up a most complicated system which manifolds power, which speeds production, and which increases the output far beyond the productive capacity of a people working without power devices.

420. **Control over Nature.**—One of the reasons why the quest of a living is less precarious now than a hundred years ago is because men have learned how to control many of the forces of nature, or at least, to adjust themselves to these forces.

Consider the case of agriculture. There is probably no industry which demands more individual work, which taxes energy and patience to a greater extent, and which presents more risks than farming. But this industry shows a vast improvement over a century ago. Many of the operations are now performed by machinery; agricultural science has revealed methods of preventing, or at least of reducing, many of the losses due to weather and insects; experiments have produced a better adjustment of crops to soil and climatic conditions; agriculture has been greatly diversified; many new crops have been introduced, so that, on the whole, American agriculture is on a much more certain

basis now than it was some years ago. Modern machinery makes possible rapid planting and harvesting, and thus the farmer is enabled to overcome many of the handicaps of nature, and to escape some of the uncertainties. Rapid transportation enables him to market vast quantities of perishable commodities in distant markets; methods of preserving and storing his products free him from some of the destructive forces of nature. This control has been further secured by diffusion of intelligence among the farming classes, by agricultural education, and by improved systems of management and marketing.

Control over natural forces is even more notable in the manufacturing industries. We have just discussed the increase in use of power as a factor in economic progress. In many cases today human labor is used in factories chiefly for the purpose of directing and watching the operation of machines, in turning valves and shifting levers. Machinery is thus made to utilize the forces of nature on a very large scale. Chemical and physical research in the factories enables the producer not only to produce better goods and to secure economies in production, but greatly to increase the variety of commodities for consumption, to lower their prices, and to eliminate innumerable wastes.

Thus the increasing economies of man power by the substitution of machines and tools may be set down as an important element in industrial progress. The system of production which prevailed sixty years ago was wasteful both of machines and of human labor. As we have pointed out in a former chapter, one of the great benefits of production on a large scale is the growing division of labor which makes possible numerous economies in production. Men are directed to the kinds of employment which suit their mental and physical powers; they obtain greater skill and proficiency in their specialized tasks; work becomes

automatic and thus reduces physical and mental strain; power is employed more effectively; and finally, the machine economizes the use of human labor force. Much may be said against the system of minute division of labor in industry, but, at least, it contributes greatly to the productive power of industries.

In the transportation industries, the control over natural agencies, or better, the adjustment of man to natural conditions, has likewise been a factor in progress. By the old methods, goods were carried on the backs of men or beasts, or floated in streams which were interrupted by falls or rapids, or impeded by snags or other barriers. In many cases up-river navigation was accomplished by the most laborious process of dragging the boat against the stream by pulling cords which had been tied around trees along the bank. The application of steam to both water and land transportation eliminated much of the hard labor connected with the transportation industries. In addition, the skill of the engineer has enabled the railroad builder to tunnel mountains, to reduce grades, to bridge streams, and to increase the speed of travel. Distance is of much less significance now than it was years ago when travel was beset by innumerable handicaps.

In these improvements in transportation are found many of the features of our marketing development—such as the concentration of industry in favored areas, the widening of markets tributary to the industrial centers, the marketing of perishable products long distances, and the localization of industries in places which are favored by nature. Thus the beneficial outcome of this development has been a great increase of commerce and industry, a reduction of the costs of production, and a great increase in the variety of goods offered for consumption.

421. Various Economies.—Along with the introduction of productive equipment and the growing control over

nature as factors in industrial progress should be added economies in the wastes of production and in the methods of exchange. In one way or another, waste imposes a burden both on the labor and capital of a community, and its elimination releases these elements for more productive work.

As we have already said, where manufacture and transportation were carried on largely by direct application of labor, large quantities of that element were required to do a relatively little work. The steam engine, the machine, the locomotive, to mention only a few of the labor saving devices, have been great factors in the elimination of labor waste.

But industry has also been enormously wasteful in its use of materials. As shown in former chapters the growth of the by-product industry is one of the conspicuous features of modern industrial development. We have cited as illustrations of this point the recovery of small quantities of precious metals as by-products in the refining of lead, copper and zinc, the removal of oil from the cotton seed, the industrial use of the gas that escapes from the top of the blast furnace, the recovery of the waste in the packing and petroleum oil industries. Labor and capital are economized by such processes, and the wealth of society is greatly increased and diversified.

The substitution of artificial for natural products often accomplishes the same result, as is the case of the production of paper from wood pulp, the production of artificial leather, of synthetic dyes, of various textile products as so-called "artificial silk," and now rayon.

Notable economies have also been made in the processes of exchange, as is the case of the substitution of money for barter, and the later development of credit instruments as a substitute for money. The development of banks and clearing houses are agencies for rendering these improvements more effective.

422. Greater Variety of Goods.—Notwithstanding the admonitions of the prophets of the simple life, the general consumer believes that industrial progress is manifested in a greater diversity of products. That industry is yielding this result is amply proved by the vast variety of commodities which are exposed for sale within a modern department store. Whether it is fabrics of silk, cotton, or wool —or their numerous substitutes—or clothing, or ornaments, house-furnishings, or simple kinds of food, the market is supplied with a bewildering list of merchandise. Manufacturers and merchants see to it that wants shall not languish; by means of skillful salesmanship, and by alluring advertising, they continually call attention to their wares and suggest how these may serve some hitherto undiscovered desires. No doubt in many cases this process has been carried too far, but it renders a kind of "service" which the consumer desires, and for which he pays in one way or another.

423. The Fruits of Progress.—To whom do the fruits of progress go? Some persons have maintained that the rich are the chief beneficiaries; it is true some classes, by virtue of their large incomes, share in the benefits of every invention and improvement, while others share to a less degree, and some do not share at all. Yet there is a very wide diffusion of such benefits.

We may take three typical illustrations. The radio is one of the most recent of the modern inventions. Within a brief space of a few years its use has become the general property of the public. It is impossible to estimate the pleasure which the radio brings to millions of people, but the rapidity with which the benefits have been transmitted to all classes is a matter of common knowledge.

The automobile began to come into use as a pleasure vehicle about 1900. In 1924 there were more than 15,000,000 pleasure cars in the United States. Practically every-

body obtains the benefit of the moving picture inventions, which came into existence about 1910. The "nickelodeon" of that time has developed into a more expensive show, housed in handsome theaters; and it has now lifted its plebeian head to such an extent that it claims to be an art.

We should not overlook the fact that inventions which yield their benefits less directly also contribute enormously to the welfare of all classes of people. That is, their benefits are diffused. This is the case with the so-called "capital goods," such as steam engines, power machinery, cotton gin, electric motors, rotary printing press, wireless telegraph, hard-surfaced roads, and thousands of other improvements which speed production, diminish waste, reduce the burden of work, and otherwise make life more comfortable and pleasing.

424. Protection.—One great test of industrial progress is improvement in the means of protection against want, famine, or possibly death. Industrial development in the United States has been characterized by the rapid growth of protective devices. The expansion of industries, and the development of adequate systems of transportation, are in themselves most effective protective measures. Agriculture, manufacture and mining provide the means for an increase of products, and transportation affords the facilities for the conveyance of these products to the communities which need them.

Individuals and families have increased their means of protection through savings of various kinds. Thereby they have been increasingly enabled to tide over periods of out-of-work, sickness, or other misfortune. Indeed it may be said that the social importance of an industrial system is measured by the ability to build up a surplus which is the source of protection.

The growth of deposits in savings banks, the development of life insurance, and of building and loan associa-

tions is one indication of the extent to which the individual members of society are making provision for protection. The growth of savings accounts and of building and loan associations is shown in the accompanying tables:

SAVINGS BANKS

Year	Number of Depositors	Deposits
1860	38,000	$149,278,000
1870	251,000	549,874,000
1880	2,336,000	819,107,000
1890	4,259,000	1,550,024,000
1900	6,107,000	2,389,720,000
1910	9,143,000	4,070,486,000
1923	13,340,000	7,897,301,000

BUILDING AND LOAN ASSOCIATIONS

Year	Associations	Members	Assets
1893	5,838	1,745,725	$528,853,000
1900	5,490	1,495,136	614,119,000
1910	5,937	2,216,912	945,569,000
1922	10,009	6,364,144	3,342,531,000

The total amount of life insurance in force in life insurance companies in the United States on December 31, 1922, amounted to more than fifty billion dollars, and this did not include insurance by fraternal orders. The amount in force on the same date of 1900 was about eight and a half billion.

425. Growth of Wealth.—In a general way the growth of wealth is an indication of social and industrial progress. The following table contains a statement of the increase of the total and per capita wealth of the United States since 1850:

INCREASE OF TOTAL AND PER CAPITA WEALTH OF THE U. S.[1]

Year	Total Wealth	Per Capita Wealth
1850	$7,135,780,000	$307.69
1860	16,159,616,000	513.93
1870	30,068,518,000	779.83
1880	43,642,000,000	870.20
1890	65,037,091,000	1,035.57
1900	88,517,307,000	1,164.79
1912	186,299,664 000	1,950.00
1922	320,803,800,000	2,918.00

[1] *Statistical Abstract, 1923*, p. 790.

All that these figures can be taken to mean is that the people of the country possessed much more wealth in 1922 than in 1850—in fact, more than forty times as much. But the table does not show that all classes have shared in this increase. Even if there were no data bearing on the question of wealth distribution it would be safe to say that some classes are very large claimants to this total wealth, others have a very modest claim, and some even now are in actual want—that is, they have no claim at all.

Numbers of attempts have been made by students of social problems to learn how the income of society is distributed. Such studies are valuable, but they are very often unsatisfactory because of the inaccurate data upon which they are based. Moreover, such studies are apt to make the test of social well-being the value of the property owned, or the amount, or value, of the income (a purely objective test)—whereas to the ambitious, willing, hopeful worker progress is often as much a matter of the kind of opportunities offered for his advancement as of the present possession of wealth or income.

426. Income Classes.—Taking into account some of the difficulties with figures, mentioned in the last paragraph,

the Federal income tax returns will give a cross section of the income classes of the country. It will be observed that about 36 per cent of the persons who made returns were in the group which received from $1,000 to $2,000 a year, and that about 31 per cent received from $2,000 to $3,000 a year. In fact, about 91 per cent of all the people who made returns reported incomes of $5,000 or less. Or to put the statement in a different form, of all those who made returns about 6,193,000 persons obtained $5,000 and less, and the remainder, about 594,000, received incomes ranging from a little more than $5,000 to over $1,000,000 a year. The table shows that 67 persons in 1922 received an income of over $1,000,000.

Viewing the table from the point of view of total income received by the classes who made returns, about 9 per cent of the persons received about 35 per cent of the total incomes reported; or to take one more illustration, taking into account particularly the higher incomes, 0.14 per cent of the persons received 7.9 per cent. It is apparent from a study of the table that not only is there a wide difference in the amount of income received by the various classes, but that a very large amount of the total income is received by a relatively small number of persons in the upper tax classes. The income tax returns for the year 1922 are given in the table on the opposite page.

The causes for these inequalities of distribution are found partly in our system of industry. A system which leads to the rapid creation of wealth will inevitably produce great inequalities. One reason is the rapidity with which fortunes can be made by producing some commodity which meets with popular favor. Considering the vast number of consumers, a small profit will build up a handsome fortune in a brief period for the producer of the favored commodity.

But other reasons are involved. We may summarize

INCOME TAX RETURNS FOR THE YEAR 1922

Income Classes	Number of Personal Returns	Per cent of Total	Net Income	Per cent of Total
Under $1,000	402,076	5.92	$247,564,383	1.16
$1,000 to $2,000	2,471,181	36.41	3,630,570,922	17.02
2,000 to 3,000	2,129,898	31.38	5,153,497,468	24.15
3,000 to 5,000	1,190,115	17.53	4,500,557,809	21.09
5,000 to 10,000	391,373	5.77	2,641,904,702	12.38
10,000 to 25,000	151,329	2.23	2,255,871,780	10.57
25,000 to 50,000	35,478	.518	1,208,273,932	5.65
50,000 to 100,000	12,000	.180	805,223,854	3.77
100,000 to 150,000	2,171	.033	260,203,553	1.22
150,000 to 300,000	1,323	.0206	266,814,381	1.26
300,000 to 500,000	309	.0049	116,672,075	.55
500,000 to 1,000,000	161	.0025	107,670,678	.51
1,000,000 and over	67	.001	141,386,993	.67
Total	6,787,481	100.00	$21,336,212,530	100.00

some of the more important: (*a*) differences in business ability; (*b*) differences in industrial opportunities; (*c*) chance; (*d*) the system of inheritance; (*e*) private or public favors; (*f*) lack of proper education; (*g*) in some cases, individual indifference as to large income; (*h*) monopoly advantages. In the case of individual success, or failure, a combination of causes is often involved.

Possibly there would be no serious criticism of the present system of industry with its many inequalities if so many people were not left without a comfortable living—whatever that may mean. In spite of the great industrial achievements in this country poverty has not been eliminated. It is, of course, impossible to learn how many persons are in this unfortunate state, but estimates have placed the number at from five to ten per cent of our total population. However, poverty is not a peculiar fea-

ture of this age, nor of this system of industry. One hopeful sign of the times is that our people realize that there is a problem of poverty, and many persons are directing their efforts to its study and prevention. Certainly the helpful ministrations of thousands of trained social workers are doing much to relieve the hardships of the unfortunate classes. Moreover, out of the abundance of the present system of industry it has been possible to supply many excellent services free to all classes; among these are free education, libraries and museums, and health service. Many cities have provided parks and playgrounds. Thus, in one way or another, directly or indirectly, the fruits of progress are gradually shifting to all classes.

INDEX