THE GROWTH OF AMERICA 1878–1928

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Chapter 1

Introduction

The main theme of this book is the growth and development of the United States: the filling out of the country by the settlement of the West, the subduing of the Western Indians, the building of the transcontinental railroads and the linking of the parts of the country to one another by a network of railroads, the development of nationwide businesses, the growth of the corporate mode of organizing the production and distribution of goods, the large-scale influx of immigrants, the rise of the city to a prominent place in America, and the development of large financial institutions. During the years from the 1870s through the 1920s, the United States also assumed an increasingly influential role in international affairs. Within little more than a century of coming into being, the United States had grown from a few colonies remote from the centers of world trade and power in Europe into an industrial and agricultural colossus. Both American agricultural and industrial products were competing for their share of world markets.

On the world scene, Great Britain was the leading naval and commercial power in the 19th century. From the 1820s onward Britain ceased to be a threat to the United States and became instead a great influence for freedom in the world. The British began to abandon mercantilistic policies in the 1820s, and by the 1850s were wholeheartedly committed to free trade. Britain's parliamentary government and constitutional monarchy served as a model for country after country in Europe, and was being imitated in other places in the world as well. Broadly speaking, the 19th century was the great age of expanding freedom, and quite often Britain was in the forefront. Population increased rapidly in many lands, but the prosperity which resulted from the spread of free trade and less restricted enterprise was more widespread than ever. Many things undoubtedly contributed to British pre-eminence, but the central one is the liberty to manage their own affairs which the people enjoyed. An English historian has noted that

Until August 1914 a sensible law-abiding Englishman could pass through life and hardly notice the existence of the state, beyond the post office and the policeman. He could live where he liked and as he liked. He had no official number or identity card. He could travel abroad or leave his country forever without a passport of any sort of official permission. He could exchange his money for any other currency without restriction or limit. He could buy goods from any country in the world on the same terms as he bought goods at

home. . . . An Englishman could enlist, if he chose, in the regular army, the navy, or the territorials. He could also ignore, if he chose, the demands of national defense. Substantial householders were occasionally called on for jury service. Otherwise, only those helped the state who wished to do so. The Englishman paid taxes on a modest scale. . . . ¹

British commerical supremacy had a worthy competitor in the United States by or before the end of the 19th century. And British parliamentary government and constitutional monarchy was challenged by the republican government and presidential system of the United States as a political system to be imitated by those seeking free institutions. Indeed, republican government as practiced in the United States had so far proved its worth that opposition to it by monarchists was no longer of any great significance. America, too, was a land of extensive freedom, individual liberty, and prosperity. The superiority of both systems as they limited government and freed men was widely acclaimed.

The material prosperity of the latter part of the 19th century provided the framework within which the Idea of Progress gained sway over the minds of many in Europe, and especially in the United States. The Idea of Progress refers primarily to the belief that things are getting better generally and, more broadly, that improvement with the passage of time is a virtual law of the universe. Much evidence appeared to support this belief in the latter part of the 19th century, particularly on the material side. New discoveries and inventions abounded; sanitation and health facilities were clearly improving; population was increasing, perhaps as never before in history; and people generally had the means for producing and had a greater variety of goods available than ever before. Indeed, this variety and abundance continued to increase into the 20th century, but before long other sorts of development began to cast doubt upon the universality of progress.

The Idea of Progress was not new to the 19th century. It had been around since the 17th century, at the latest, and more and more people championed it in the 18th century. Modern thinkers even ceased to believe that even the ancient Greeks were their superiors. The Idea of Progress was mightily bolstered by the material improvements and expansion of information in the 19th century, and by the 20th century was widely accepted by people generally. At its simplest level, it translated into the view that the latest is the best, or, as the French publicist of the 1920s, Emil Coué, put it "Every day in every way, we are getting better and better." By the 1920s, too, American automobile makers were taking advantages of the popular idea and bringing out new models annually, each year's model presumably an improvement over that of the preceding year. More deeply, the Idea of Progress got intellectual support from the idea of evolution which gained sway in the 19th century. This was especially the case with the Darwinian

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conception of the survival of the fittest. If the fittest survive in the struggle for survival, it would appear to tend to make some sort of progress inevitable. In any case, the Idea of Progress enjoyed great vogue in the midst of the growth and expansion of America in the late 19th and early 20th century.

Granted that the theme of growth is the dominant one in this book, however, there are a good many important subthemes that emerge as well. New currents of ideas were emerging which would eventually challenge the dominent developments. Even as governments were being restricted and free men were demonstrating what they could do, the foundations of this order were coming under attack and a new outlook was coming to the fore. If, as is sometimes claimed, the ideas of one century are applied in the next, then it should not surprise us that there were new currents in the 19th century that would sweep all before them in many lands in the 20th century. There is abundant evidence that this was the case. Moreover, new developments cast doubt on the progressive course of history. The 20th century was hardly underway before much of the world was locked in a titanic conflict which we call World War I. In its wake came a new despotism: totalitarian governments with all power concentrated in a central government, governments which used modern devices to spread the tentacles of power more deeply into the lives of people than had been the case in the past. The hallmarks of the 20th century have been unleashed government power, total war, concentration camps, vast propaganda efforts and brainwashing by those in power, and government efforts to control everything both within and outside their borders. Another face of these developments has been government-engendered terrorism, both on their own peoples and those in other lands.

Indeed, the seeds of such practices were sown in the 19th century. It is not too much to say that 19th century thinkers sowed the wind, and the 20th century has reaped the whirlwind. Looked at in one way, evolutionary theories gave great impetus to the Idea of Progress. But from another angle, they tended to undercut the very foundations of individual liberty, limited government, and the bases of freedom and responsibility. The theory of natural law was abandoned by some thinkers, and with it the natural rights on which individual rights were based in the United States. (That does not necessarily mean that people ceased to believe in rights, but they tended to attribute them to other sources than nature and nature's God—usually government.)

A great wave of materialism swept through intellectual circles, and, supported by evolutionary theories, thinkers began to conceive of natural law as an active force rather than as neutral laws imbedded in the nature of the universe. Above all, evolutionary hypotheses were used in an attempt to explain the origin of life and of man without requiring or having a creative and providential God. On this view, man arose from nature and was wholly

a natural being, not a special being created by God to have dominion over the earth. Naturalistic explanations of all sorts of things became commonplace, a point that will be developed in its place.

The full impact of these hypotheses and theories were not felt in the 19th century. For one thing, those who advanced these theories did not have the power to impose their ideas on people usually. For another, those thinkers greatly influenced by these ideas, or who originated them, were by no means in agreement as to their significance or how they were to be applied. The materialistic and evolutionary ideas were interpreted by some as meaning that man was caught in the grip of natural forces which determined his conduct. He was powerless, in this view, to alter the course of development. On the other hand, some thought that in a universe without God man could do all things. The central belief to come out of this attitude was the belief that men working together could build a utopia. Indeed, utopianism undergirds many of the social and political beliefs of the 20th century.

The main point here, however, is that the seeds of the 20th century developments are to be found in the intellectual currents of the 19th century. The fruits of these seeds have often been such things as the massive uses of governmental power, uses based on naturalism, revolution, evolution, and a host of particular theories either for forcing men into the current of "progress" or remaking him. In the two decades before World War I, both Republican and Democratic parties, or at least their leaders, were shifting toward the belief in much more concentration of power in the federal government and its use more extensively. World War I was a fertile ground for those interested in ways to extend and totalize government power. The Bolshevik Revolution in Russia, getting underway just before World War I came to a close, was the brainchild of Karl Marx who lived in the 19th century. Very shortly, another totalitarian state had been formed in Italy, and in another decade Hitler was bringing his Nazi dictatorship to Germany. Totalitarianism was on the march, and it was being widely touted as the wave of the future.

During the period covered by this book, the United States was usually on the periphery of these undercurrents of ideas and developments. In significant ways, America was set apart from Europe. Americans were less cynical than Europeans, did not suffer so much from World War I, were more optimistic, and less inclined to turn to extreme measures or adopt radical ideas. The instabilities of central and eastern Europe, as well as France, were not present in the United States, and it was these instabilities that paved the way for totalitarian solutions. Americans generally were still very much under the sway of the belief that they were progressing and would continue to progress under their constitutional system, nor did they waver much from this belief until after 1928. Indeed, rarely, if ever before had Americans enjoyed such widespread and expansive prosperity as in the

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1920s. And all about them were new inventions and devices which heralded progress: the radio, electric refrigerators, automobiles, motion pictures, and a great bounty of other goods. Americans generally were more disposed to insulate themselves from Europe than to copy the dismal political systems taking hold there.

Even so, America was not shut off from the currents of ideas and movements which had produced these developments in Europe. On the contrary, many of them had begun to have an impact in America even before the 1920s. Thus, while the growth and development of America is the overarching theme of this book, the undercurrent of ideas and movement which would erode the foundations will occupy our attention as well. Nor should it be forgotten that while change is more dramatic and often occupies the center of the stage, much changes very slowly, if at all.

Chapter 2

Economic Growth

To make a ton of steel one and a half tons of iron stone has to be mined, transported by a rail a hundred miles to the lakes, carried by boat hundreds of miles, transferred to cars, transported by rail one hundred and fifty miles to Pittsburgh. . . . How then could steel be manufactured and sold without loss at three pounds for two cents? This, I confess, seemed to me incredible . . . but it was so.

-Andrew Carnegie

Modern society has created a class of artificial beings who bid fair soon to be the masters of their creator... Everywhere..., they illustrate the truth of the old maxim of the common law, that corporations have no souls... The system of corporate life and corporate power... tends always to development—always to consolidation—it is ever grasping new powers....

—Charles Francis Adams

No percentage of the profits of the Standard Oil Company came from advantages given by railroads at any time. . . . The advantages to the Standard from low freight rates consisted solely in the increased volume of its business arising from the low prices of its products.

-John D. Rockefeller

Chronology

- 1852—Invention of the elevator.
- 1856—Bessemer process of making steel introduced.
- 1859—Oil discovered in Pennsylvania.
- 1864—Pullman sleeping car constructed.
- 1867—Practical typewriter developed.
- 1869—First transcontinental railroad completed.
- 1872—Improved air brake built.
- 1874—Invention of electrically powered street car.

1875—Tariff Act.

1876—Battle of Little Bighorn.

1878—Bland-Allison Act.

1879—Edison invents incandescent light bulb.

1881—Standard Oil Trust formed.

Generally speaking, politics did not occupy the center of the stage very often from the middle of the 1870s to the mid-1890s. Of the Presidents during these years, only one—Grover Cleveland—served two terms, and none of them captured the imagination of the American people very strongly. Nor did any great debates in Congress galvanize the American people. This should not be taken to mean that these were not lively days in America; they were indeed. But politics was not in the ascendant, which is rarely hardly to be lamented.

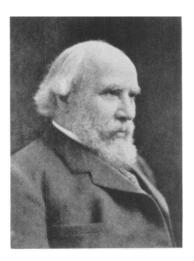
Rather than politicians, it was an age of inventors, entrepreneurs, speculators, daring investors, and builders—of Thomas A. Edison, John D. Rockefeller, Andrew Carnegie, James J. Hill, Leland Stanford, Jim Fisk, George Pullman, and P. T. Barnum. It was an age of growth, of the growth of the cities, of the filling out of the West, of the development of great businesses, and industrial expansion. It was such economic expansion as had never before occurred in America, if it had anywhere. America moved from whale oil to kerosene to electricity for lighting, from the use of wood and iron to steel in construction, from the horsedrawn carriage to the electrically propelled street car for city transportation, and shifted from a predominantly rural toward an urbanized country.

Much of this change occurred swiftly; the old was replaced by the new nearly as soon as the technology was available. Often, the changes were propulsively introduced, growth occurred by leaps and bounds, and plans were executed almost as quickly as they were conceived. The pace of change was sometimes so quick that recent improvements were outmoded before they could be exploited. The telegraph lines had hardly been strung before they were being outdated by the telephone. Steam power had hardly reached full utilization before it began to be replaced with electricity, and hard on the heels of this came the internal combustion engine fired with gasoline. The swiftness of changes in technology were on a scale that never occurred before in history.

The development of the railroads illustrates both the great growth and the swiftness of so much of the change. As recently as 1840, say, some had feared that the human could not withstand exposure to such speeds as 30 miles per hour. In 1893, a New York Central locomotive traveled at the speed of 120 miles per hour! The following figures indicate the rapidity of the railroad building: the rail mileage in the country in 1866 was approx-

imately 37,000 miles; by 1880, it had grown to 93,000, and by 1890 to 163,500 miles. Mileage continued to increase until in 1910 it stood at over 250,000 miles, and except for the Rocky Mountains there were few places in the country more than a few miles from a railroad track. As building feats, the transcontinental railroads were among the wonders of the world. James J. Hill built his Great Northern route through the Rockies in less time than it would take nowadays to get the approval of governmental bodies for such a project. Technological changes came swiftly to aid railroading: the telegraph to make the use of single track lines by numerous trains practical; cheap steel which could withstand the battering of heavy trains; the air brake which made it possible to stop long trains within short distances.

None of the growth was more dramatic than that of the railroads, but there was much that paralleled it or followed in its wake. Before telling of these, however, it will be helpful to examine the conditions within which this growth and development occurred.



Photograph by Pach Brothers

James J. Hill (1838–1916)

Hill was a railroad builder and magnate. He was born in Ontario province in Canada, but eventually settled in St. Paul, Minnesota. He began work in a village store at the age of 14 and eventually got involved in transportation as a clerk in a steamboat company. His earliest interest was in river transportation between Minnesota and Canada, but his future lay with the railroad, as did that of the country. He joined with other investors to buy the St. Paul and Pacific railroad, a company operating in Minnesota, and this road became the nucleus for his vast Great Northern system. The Great Northern reached from Lake Superior to the Puget Sound on the Pacific, was a landmark for free enterprise in transcontinental railroad building because he received no government aid, and was remarkably successful for such undertakings. Hill was known as the "Empire Builder" of the Northwest for his contribution to railroad building in that region.

Conditions of Growth and Development

Some historians have attempted to explain the economic growth of the latter part of the 19th century as being the result of the stimulation provided initially by the Civil War. They usually emphasize the great demand by the Union Army for goods during the war and the expansion by manufacturers to fill it. In the course of doing this, some large businesses emerged, meatpacking, for example, and some entrepreneurs accumulated fortunes. In 1865, Senator John Sherman of Ohio wrote his brother, General William T. Sherman, "The truth is," he said, "the close of the war with our resources unimpaired gives an elevation, a scope to the leading capitalists, far higher than anything ever undertaken before. They talk of millions as confidently as formerly of thousands." One history text, for example, says: "In the economic history of the United States the Civil War was extremely important . . . In the North it speeded the Industrial Revolution and the development of capitalism by the prosperity which it brought to industry."

On the other hand, there is considerable evidence that the Civil War may have actually retarded some industrial development. Economic growth in general and the development of manufacturing in particular was well underway before the Civil War. The general statistics indicate that growth was not nearly so great in the decade 1860–1869 as it had been for the past two decades.⁴ Moreover, war is generally an economically wasteful undertaking, and certainly the Civil War was highly destructive. That is not to say that war demand did not stimulate some enterprises and bring profit to their investors. Surely, it did. Other industries, however, were probably retarded. But the Southern economy was devastated by the war and Reconstruction; any gains in the North were offset by these. During the late sixties and early seventies agricultural production in the South was far below what it had been before the war. The destruction of cotton gins, factories, and other equipment, such as that of railroads, left the South in much worse condition at the end of the war than at the beginning. Moreover, the capital investment in slaves was wiped out by the uncompensated abolition of slavery. The South was a capital-poor region for the remainder of the century.

Even so, there were developments during the Civil War that did give impetus to some kinds of economic growth, particularly to manufacturing and transportation. The Republican Party, which dominated the government, was favorably disposed to promoting manufacturing, transportation, and the settlement of the lands west of the Mississippi. Domestic manufacturing was promoted by the protective tariff, which was not only raised to high levels during the war but also was kept high (with brief reductions from time to time) for the rest of the 19th century. So far as the tariff was successful, it tended to reduce the importation of manufactured goods and make it much easier for American manufacturers to compete with those that

did come in. In general, the protective tariff benefited manufacturing, but not farming, trade, or sea transport. There was little world competition in the domestic market for farm goods produced in quantity in America. Moreover, farmers, and other consumers, were hurt by the tariff to the extent that they had to pay higher prices for manufactured goods. Since the protective tariff tended to discourage foreign trade, it also reduced the foreign market for American farm products.

The federal government promoted the development of transportation as well as manufacturing. It did this mainly by providing grants and subsidies, or loans, in the building of the railroads. Large acreages of land were granted by the federal government for the building of railroads in the West. The largest grants were made to such transcontinental roads as the Union Pacific and Central Pacific. Generally, the government granted unoccupied land on either side of the projected lines, in alternate sections. That is, the government kept one section and granted one to the railroad alternately. That way, as the value of the land appreciated (rose), the government could benefit by the rise in price due to the building of the railroads. The federal government also secured loans to aid in the building of some of the railroads, permitted the railroads to exercise the right of eminent domain to acquire privately owned lands, and extended the privilege of cutting timber on government lands for construction purposes. The main period of these grants of land and loans was from the mid-1860s to the early 1870s. For a time, then, the federal government promoted the building of railroads vigorously, mainly in the West.

Both federal and state governments promoted the concentration of wealth and its deployment in business enterprises in a variety of ways. The federal government facilitated the private concentration of wealth in several ways, especially during the Civil War. One was in the way it went into debt to finance the war. The federal government issued a large number of Greenbacks (paper money) which it caused to circulate as money by making them legal tender for most purposes. These Greenbacks declined in value in relation to gold or other specie. Second, government bonds were sold, and the interest on them was payable in specie. It was possible, then, to buy the bonds with Greenbacks, which were worth much less than their face value, draw interest in gold, and possibly have them redeemed later in much more valuable money. Thus, bondholders might be enriched.

The other major means by which the federal government aided concentration of wealth was by the national banking system set up in 1864. Banks by receiving deposits are by their nature devices for concentrating wealth. As they make business loans and investments they also foster various kinds of enterprises. The National Bank Act, and supplementary legislation, gave the national banks a monopoly of the issuance of paper money currency, since notes (paper money) issued by state banks were subjected to a 10 per cent tax. On the other hand, the national banks were used by the federal

government as devices for obtaining loans. National banks were required to back their paper money issues with government bonds equal in value to the bank notes issued. This national currency was supposed to be issued throughout the United States on the basis of population, but actually it was concentrated in New England and the northeastern states more generally. Thus, monetary holdings tended to be concentrated in those areas where industrialization was being most vigorously pushed.

States facilitated the concentration of wealth for business enterprises particularly by authorizing limited liability corporations. The business corporation came into being as a device for concentrating wealth to provide capital for various undertakings. The corporation promotes such concentration by offering limited liability to investors in organizations which have a corporate charter. Limited liability makes investment less hazardous than it would otherwise be. Ordinarily, the owner of a business is individually liable (legally responsible) both for all the debts of the business and for any injury done to others in the conduct of the business. These liabilities also usually extend to each member of a partnership. By contrast, investors in a corporation are commonly liable only for the actual amount of their investment and, unless they serve the corporation in a managerial capacity, have no direct liability for injury done to others in the conduct of the business. Moreover, ownership consists in shares in the corporation, which shareholders may sell at will. Organized stock exchanges, such as the New York Stock Exchange, provide a ready market for such buying and selling. Thus, the limited liability corporation encourages investment and the concentration of capital because the owners need not concern themselves with the running of the business, are not liable as investors beyond the amount of their investment, and can usually dispose of their shares as they choose.

The limited liability corporation was authorized by states in the early years of the Republic as a special privilege to investors to encourage them to invest in companies engaged in some project, such as bridge or road building, which governments supposed to be needed for the public benefit. They were usually authorized by special acts of state legislatures, and limited liability was such an asset for those seeking capital that it was sought as a special privilege and advantage. The Jacksonians attacked it as a special privilege, and legislatures in the 1840s and 1850s began to pass general incorporation laws, making it possible to incorporate simply by filing the necessary papers with the appropriate state authorities. When that change had been made, incorporation ceased to be a special privilege, but retained its advantages over other forms of organization. So it was that the states made available a device for the concentration and deployment of wealth in business enterprise. Incorporation was ever more widely used after the Civil War.

In a variety of ways, then, governments gave positive encouragement to enterprises after the Civil War, especially in manufacturing and transportation, but also in the settlement of the West. These government actions provided a part of the framework of this Age of Enterprise, as it has been called, but not all. America was also free of most restraints on productive activity; there were few government regulations to be complied with, except in banking. With the abolition of slavery, all the inhabitants of the country were usually free to dispose of their labor as they would and to get the rewards from it. As the zeal to make over the South lessened, property was generally secure, and by the 1880s the Federal courts signified their intent to protect the property of corporations as well as individuals against intrusions which violated the Fourteenth Amendment.

There was yet another factor in the economic growth of the United States during this period. It could be called the spirit of enterprise: the drive to build, to make companies grow, to succeed, to get ahead. Undergirding this spirit was the belief that this was a land of opportunity, that if a man would apply himself diligently he stood a good chance of getting ahead, prospering, even becoming wealthy. Indeed, men did go from poverty to riches sometimes, and there was a literature and a lore, containing both fact and fiction, encouraging efforts to forge ahead. Horace Greeley said, "Young men, I would have you believe that success in life is within the reach of every one who will truly and nobly seek it." Or, as Russell Conwell put it in his popular work, Acres of Diamonds: "To secure wealth is an honorable ambition, and is one great test of a person's usefulness to others. . . . I say, get rich, get rich! But get money honestly, or it will be a withering curse." The British writer, Samuel Smiles, whose numerous books were read in America as well as Britain, emphasized the importance of the individual and of individual striving. "'Heaven helps those who help themselves' is a well tried maxim," he said, "embodying in a small compass the results of vast human experience. The spirit of self-help is the root of all genuine growth in the individual; and, exhibited in the lives of many, it constitutes the true source of national vigor and strength. Help from without is often enfeebling in its effects, but help from within invariably invigorates."5

Nor should there be any doubt that many Americans took these admonitions to heart. Men built factories, bridged rivers, crossed mountains, brought land under cultivation, and sought in hundreds of ways to improve and better their condition. Some hoped to grasp wealth quickly, of course, and they rushed to those places where gold, silver, or other mineral wealth had been discovered. Others were more plodding in their quest, breaking the sod and irrigating prairie land to make it grow food. But whatever path they followed, either to sustain themselves or to prosper, there should be little doubt that Americans generally were busily trying to help themselves.

On the matter of government involvement, it should be noted that the government actions described above, such as land grants and loans to some railroads, the protective tariff, national banks, issuance of Greenbacks, and others, were, in effect, government intervention in the economy. While they

promoted some kinds of economic development, such as rail transportation and manufacturing, they retarded others, such as foreign trade and water transport. Government intervention produces distortions in an economy, makes for uneven and often wasteful development, sets the stage for booms and busts, tends to enrich some and impoverish others. During and immediately after the war, the federal government greatly increased the money supply with Greenbacks and national bank notes. However, as the federal government began to retire its bonds in the 1870s, the banks began also to reduce the bank notes in circulation. In addition, the government began to redeem the Greenbacks. The result was a reduction of the money supply, a deflation, and a depression. Some railroads were in bad shape, too, during this period, attributable in some measure to overbuilding fostered by government. Many of the economic difficulties of these years, which will be reviewed later, can be traced back to these government interventions.

Development of Nationwide Business

A major development in the economic growth in the United States after the Civil War was large nationwide businesses. Prior to the war, most businesses had been relatively small and had catered to local or, at most, regional customers. Indeed, until a decade or so before the war, most goods, except specialty items had been made in the home or on the farm. What set the stage for the major change was inventions and developments in technology. The development of rail transportation, regular and fast mail delivery by trains, and even swifter communication by telegraph, made nationwide businesses feasible. Government promotion of closer national connections gave impetus to national businesses. The national banks provided a more convenient, though less stable, national currency than had coins or precious metals. And certainly, the national bank notes provided a better national medium of exchange than did the notes of state banks. The concentrations of wealth achieved by using the corporate device provided the financial structure of many of these large businesses.

The railroads were among the largest of large businesses themselves. With their hundreds, and sometimes thousands, of miles of track, numerous locomotives, boxcars, switching equipment, passenger cars, stations and freight depots, and reserves of wood and coal for fuel, they often represented huge capital investments. The larger systems were often forged from many short lines. For example, Commodore Cornelius Vanderbilt put together the New York Central system reaching from New York City to Chicago from shorter lines. James J. Hill, who extended the Great Northern from Minnesota to the Pacific, without benefit of government grants or loans, began by linking small lines in Minnesota before thrusting across the Rockies with his road. However, no single rail system was ever nationwide on its own rails. Those that were called transcontinentals extended only

from the Midwest or mid-South to the Pacific—the Union Pacific from Omaha and Kansas City to the Pacific, the Northern Pacific and Great Northern from Minneapolis to the Pacific, the Santa Fe from Chicago to the Pacific, and so on. Even so, the railroad did provide a national transportation system by the 1880s. The main lines had standard width tracks, and boxcars were exchanged from railroad to railroad so as to make it possible to ship goods across the continent without unloading and reloading shipments.

Some of the railroad spawned industries did, however, become nation-wide in scope under single companies. George Pullman constructed a workable sleeping car in 1864. Three years later he organized the Pullman Palace Car Company and was soon manufacturing luxury railway cars. Instead of selling them to the railroads, however, he leased them, and before long his sleeping cars were being pulled by passenger trains throughout the United States.

The telegraph was very essential to railroading almost from the beginning. By the use of it, railroads could make effective use of their tracks by keeping up with the progress of trains and scheduling them. Western Union had emerged by the time of the Civil War as the leading telegraph company; it had been formed by combining more than fifty small companies. The company grew rapidly in the 1870s by absorbing other telegraph companies as well as extending its own lines as new railroads were built. In 1878, Western Union had 76,955 miles covered by lines, and in 1881 it absorbed its two largest competitors. In 1883 Western Union transmitted forty million messages over 400,000 miles of wire. There was still some competition, but the company was doing business all across the nation.

The rapid growth and expansion of railroads in the latter part of the 19th century spurred the explosive growth of the steel industry. Until the time of the Civil War, steel had been used primarily for the making of cutlery and fine tools. It had been much too expensive and difficult to make for ordinary uses. That changed rather quickly after 1857, when Henry Bessemer in England devised an inexpensive process for refining steel. While his process is better known, a few years earlier an American, William ("Pig Iron") Kelly, had patented a process for the conversion of pig iron to steel. These rival claims were resolved, or compromised, in 1866, and thereafter steel making burgeoned in the United States. In 1865, for example, only a few thousand tons of steel were produced. In 1875, 375,000 tons were produced, and by 1879 production had risen to 929,000 tons. While steel was produced in many places, Pittsburgh, because of its proximity to the coal field and its location on the rivers, became the leader in steel production. Andrew Carnegie was the leading steelmaker there.

Steel, because of its greater flexibility and durability, quickly replaced iron for rails and much of the rolling stock of the railroads. Thus, for the remainder of the century and in the early years of the 20th century, railroads provided an almost insatiable market for steel. But there were other markets



Andrew Carnegie (1835–1919)

Carnegie was born in Scotland, came with his family to the United States as a boy, and settled in western Pennsylvania. His was truly the story of a man who went from poverty to great wealth. He started as a bobbin boy in a cotton mill, became a telegraph operator, served as secretary to a manager of the Pennsylvania Railroad, and eventually became superintendent of a division of it. He purchased some oil-rich land during the Civil War and afterward established an iron works. The demand for steel rails provided the opportunity for his meteoric rise, and he expanded his business around Pittsburgh until it was the largest steel company in the United States. Carnegie sold his steel business in 1901 to United States Steel and retired as one of the wealthiest men in the world. Thereafter, he devoted himself to his numerous philanthropies, by which he attempted to help those who were intent on improving and helping themselves. Among the best known benefactions are: Carnegie libraries, Carnegie Tech (now Carnegie-Mellon University), and Tuskegee Institute.

as well. It was not long before bridges, farm equipment, and numerous other implements were being made mainly of steel. Moreover, structural steel made it possible to build multistoried buildings for the first time in history. That, and the invention of the elevator by Elisha Otis in 1852, made the skyscraper both possible and practical.

A meat-packing industry, centered in Chicago and Kansas City, emerged as a large-scale industry after the Civil War, and was soon shipping its products across the nation. It rested upon the location of large-scale cattle growing in the Western plains, the expansion of the railroad toward the places where they were grown, the invention of refrigeration, and the vigor of strong men who organized the preparing of meat and shipping it to the markets. Philip D. Armour went into meat packing in Milwaukee during the war, but contracts to provide meat for the Union Army soon led him to expand the business to Chicago and Kansas City. In the early days of the



Philip D. Armour (1832–1901)

Armour was a merchant, a leader in the meat-packing industry, and a philanthropist. He was born in New York, was educated at an academy, and worked for several years on his father's farm. He went to California in the 1850s to seek his fortune, but came back to the Midwest when he did not succeed, and there he did make a fortune in the meat-packing industry. Armour went into that business with a partner in Milwaukee during the Civil War. Chicago, however, was a better location, and after the war he founded his own company, Armour and Company, there. The company continued to grow over the years and to be a leader in the field.

war, Nelson Morris went into meat-packing in Chicago at the age of 22, and by the end of the war he had become a leading packer. Gustavus Swift had been in the meat-packing business in New England, but by 1875 he realized that Chicago provided a much better location, and he built a plant there. He began the practice of shipping fully dressed beef from Chicago to the East in refrigerator cars. So it was that these midwestern centers began to provide meat for more and more of the country.

But perhaps the best example of a mushrooming industry which swiftly became national in the sales of its products was oil. Colonel E. L. Drake brought in oil from a well he sunk near Titusville, Pennsylvania in 1859. In 1864, the district around it produced over two million barrels of oil, and in the following years it became a nationwide and a worldwide business, providing not only oil for the lamps of America but also oil for the lamps of China. Kerosene for lamps and lanterns was the most immediately valuable product of oil. Oil lamps were in use before 1860, but they had been most commonly lit by whale oil. Lubricants, too, were important early as byproducts of oil. The increasing use of machinery made good lubricants a necessity, and those made from petroleum were generally best and least expensive. Oil was initially shipped from wellheads to refineries in barrels, but before long tank cars replaced these, and pipe lines were also being built.

Perhaps the most spectacular story in oil was the rise of John D.