AGE OF EXCESS

The United States From 1877 to 1914

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anatomy, without pay, at the Pennsylvania Academy of Fine Arts. There he tried to impart his conviction that art combines honesty with a capacity for taking infinite pains. Many of his practices with students—immediate drawing with a brush (Nature contains no lines, he insisted, "only form and color"), lack of prolonged study of classical busts, use of live models—were unique or almost so among American art schools of the time. A visiting art critic was stunned to learn that Eakins took his advanced classes to a bone-boiling establishment in suburban Philadelphia to dissect horses. When asked if students did not protest at such repugnant work, Eakins answered, "I don't know of one who doesn't dislike it. Every fall, for my own part, I feel great reluctance to begin it. It is dirty enough work at the best. . . ." But he defended the practice: ". . . no one dissects to increase his eye for, or his delight in, beauty. He dissects simply to increase his knowledge of how beautiful objects are put together to the end that he may be able to imitate them." "Distortion," he insisted, "is ugliness."

At a lecture on the structure of the leg, the critic scoffed, "Do you imagine that the pupil will be able to draw a leg better for knowing all that?"

Eakins replied, "Knowing all that will enable him to observe more closely, and the closer his observation the better his drawing will be."

After describing the course in artistic anatomy, which included some 30 lecture-demonstrations, the critic inquired of his readers, "It quite takes one's breath away, does it not? . . . Must a painter know all this, one asks himself in a kind of awe-struck bewilderment."

In 1877 Eakins finished a major work, "William Rush Carving His Allegorical Figure of the Schuylkill River." The central figure was a nude female model on a dais. Nine years later, in demonstrating to a class the action of the human pelvis, he asked a male model to remove his loincloth. Some women students objected. The ensuing scandal persuaded Eakins that he should resign his position, and he did. In 1886, as in 1877, ruling values in the United States placed prudery above art, and money above either.

Chapter 2

MAKING MONEY

"GET MONEY—honestly if you can, but at any rate get money! This is the lesson that society is daily and hourly dinning into the ears of its members," wrote Henry George in *Progress and Poverty*. Doubtless men tend to think always that an earlier time was a happier time, a more innocent time. But the universality of this apprehension does not prove that it is never true. The Mark Twain who wrote *The Adventures of Huckleberry Finn* was certainly aware of the human evil in the United States before the Civil War. But he recalled that nobody in his youth had worshiped money and that none of the well-to-do men of the neighborhood had been accused of getting rich "by shady methods." Twain, along with other observers so diverse that they would have agreed about little else—Henry Adams, Willa Cather, William Dean Howells, Edith Wharton, Walt Whitman—thought that the acquisitive spirit increasingly held dominion. Not only was the desire to make money checked by fewer other values, but men were able to make vastly more money by exploiting new products and new techniques.

By 1883, five million pounds of Bull Durham smoking tobacco were being sold, and president Julian S. Carr was spending $300,000 a year slapping posters of his famous bull on Egyptian

pyramids and elsewhere. The motto of the firm was: "Let buffalo gore buffalo, and the pasture go to the strongest." Less than two decades later, Carr's firm had been swallowed up by the American Tobacco Company of James Buchanan Duke. Buck Duke, a great admirer of John D. Rockefeller, analyzed as follows the policies that had guided his hero to virtual monoply: "First, you hit your enemies in the pocketbook, hit 'em hard. Then you either buy 'em out or take 'em in with you."

Milton H. Smith, for 38 years the president of the Louisville and Nashville Railroad, said that "society, as created, was for the purpose of one man's getting what the other fellow has, if he can, and keep out of the penitentiary." No personal feeling or humanitarian consideration should be allowed to interfere with the duty of making a profit. Labor relations were not important to the top executives of railroads until the great strikes of 1877 forced such problems on their attention.

State interference was regarded as unjust discrimination. President Charles E. Perkins of the Burlington, disgusted by Iowa regulations, wrote to one of its railroad commissioners in 1885: "Iowa people can make more money in farms and other industries than rrs [railroads]. If this were not true, farmers and merchants and manufacturers and newspapermen, who now put their money into cattle and hogs, manufacturing establishments and business generally would instead invest it in railroads. But they can do better, and it is only the Eastern capitalist, who cannot use his money to advantage at home who is willing to risk it in western railroads and take the low average return which he gets, a return very much lower than the average of other investments in this state."

Even movements to end political corruption in a town were motivated by a belief that a reputation for good government would increase the value of local real estate. To make a town better meant to make it more prosperous, and the essence of the program lay in the hope: "The more prosperous my beloved city, the more prosperous Beloved I!" A town eager to have its own college might want a rise in real-estate prices rather than a rise in civilization locally. Students too were pushed chiefly by commercial considerations. County teacher institutes in the Midwest, inexpensive though they were, were seldom attended for

reasons of idle curiosity. An institute usually ran for two weeks or a month in July and August, so as to precede the exams for renewal of rural teaching certificates.

From the Southern Methodist Publishing House in 1885 came William S. Speer's *The Law of Success*. It instructed readers on how to pick wives who would help them get ahead. It stressed "the commercial value of the Ten Commandments and a righteous life." The author, himself an educator, theorized: "The educator of the future will teach his pupils what will pay best. He will teach them the art of thinking, which, for the purpose at hand, I may define to be the art of turning one's brains into money."

A master of this art was Joseph Cook, graduate of Harvard and of Andover Theological Seminary. He was started on the road to fame as a public lecturer when the YMCA in Boston asked him to conduct noon-hour prayer meetings for the benefit of clergymen. In 1876 these became the Boston Monday Noon-Hour Lectures. Cook was a prominent if ignorant participant in the swelling debate about the relations of theology and evolution. The flavor surrounding his ecclesiastical and educational activities can be gleaned from letters written him by his father, William H. Cook, an aging but still diligent farmer in the Lake George region of New York. On 15 January 1877: "I like the ring of your last Letter. No more Lectures Short of fifty Dollars. It ought to of been Seventy five dollars, or one hundred occasionally. I dont want you to become a misor or Seek after money. The time is comeing that you will want means to do good. I do not forget for a moment the worth of Souls. . . ." Two months later: "If half the Press Says about you is tru you ought to have Ten thousand for your next year. Say Eight for the Noon lectures, and Two for outside labours. Anything less than this I shall not be Satisfide with. . . . Take care of your means, keep your Surplus on interest and go right Straight ahead. . . ."

It was assumed that a clergyman, so far from being the lifelong shepherd of any specific flock, would harken to the call of a more affluent congregation and a larger salary. The Reverend Jacob van der Meulen joined the Dutch farming colony in Campbell County, South Dakota, in 1889, as pastor of the Reformed Church; only 14 months later he retreated from frontier hard-

ships to a church at Baldwin, Wisconsin. The instability arising from American attitudes contrasts sharply with the example of the Swiss colony at New Glarus, Wisconsin, where in 1884 both the minister and the schoolteacher had held their positions for 18 years. And what of Gallatin, Missouri, which in that year had 6 churches but only 1,250 people? Doctrinal differences were doubtless involved in such splintering, but so was more than one theological imperialist who set out to capture his share of the market.

"Main Street's poor record in the arts," writes Lewis Atherton, "contrasted sharply with its encouragement of some professions. Banking was the outstanding example." It was fitting that so many banks had classic columns and pediments, like temples—the shrine where Americans came to worship.

Those who, in the 16 years after 1877, visited their banks often and deposited large sums were likely to be men who grasped one or more of three crucial developments of the time. The first was the national market, particularly in the growing cities, created by the expanding railroad network. The second was the coordinated nationwide sales force, made possible by railroad, telegraph, and then telephone, often making heavy use of advertising. The third was the augmented power of Federal and state governments, which could be bent to private commercial uses.

The railroad revolutionized farming in Bell County, Texas, some 115 miles northwest of Houston. In 1879, farmers there grew all their own breadstuffs, including 84,267 bushels of wheat, which they took to numerous small local mills for conversion into flour. They grew feed for the stock that did not graze on the open range. They grew little cotton, only 9,217 bales in 1879, for it cost too much to haul cotton by wagon to Gulf ports. But the first patent for the manufacture of barbed wire had been issued in 1875, and it was becoming much cheaper to fence a field to keep livestock out. And, after 1880, railroads entered Bell County. They brought flour of higher purity and reliable quality, ground by mass-production methods in the Minnesota mills of Charles A. Pillsbury or Cadwallader C. Washburn from grain grown in the burgeoning wheat belt on the Western Great Plains, from Kansas or Dakota. By 1889 Bell County was producing only 20,936 bushels of wheat, a decline of 75 per cent in a decade. Cotton, now

shipped to market or to the Gulf ports by rail, had become the cash crop. The county's output was 37,473 bales in 1889, four times what it had been a decade earlier. Improved acreage in the county in 1889 was 13 times as great as in 1869. As a greater area was brought under cultivation, more machinery was likely to be necessary. This machinery was often bought on credit, and the farmer relied on the proceeds of his cotton crop to pay his debts. He counted on it too to buy his flour, and Rio coffee, and occasional cans of Columbia River salmon or Boston baked beans, and store-bought pants.

Most of the cotton and flour and other agricultural products flowed into the maw of Northern cities. Chicago, growing from 503,000 in 1880 to 1,100,000 in 1890, was only one dramatic instance of the swelling mass market provided by the cities. In the same decade, the number of people in places of at least 2,500 population went from 14 million to 22 million, of whom nearly 10 million lived in cities with more than 100,000 inhabitants. Meanwhile the rural population, although nearly twice as great as the urban population in 1890, went from 36 million to only 41 million.

And yet, some of the growth in rural population was due to migration from the cities. This happened especially during depression years, such as 1876, when immigrant workers might dream of starting a farming town and returning to the peasant existence most of them had lived in the Old Country. Some dreams came true. Catholic priests serving the 20,000 Poles in Chicago started the colony of New Posen, Nebraska. Intending to move there themselves, they negotiated well for the land. Such little towns, with their own churches and parochial schools, resembled towns in Poland. Farmers planted potatoes and sowed wheat as they had done in Poland. A peasant on the Nebraska prairie might weep as he struck his scythe on the whetstone, reminded by the sound of his native village.

But for the most part the frontier was settled by farmers from farther east, whether originally from New York State or from Europe. Hollanders had crossed the ocean in 1847 to find religious liberty, but after 1879 they left the Great Lakes and crossed the prairies into Dakota "to secure farming land, to get rich quickly." Perhaps 5,000 Hollanders, stimulated by propa-

ganda from the railroads and from Dakota Territory, set up four farming colonies in South Dakota. Each settler could get 480 acres of public lands: 160 acres each from a Homestead Act entry, a pre-emption claim, and a claim under the Timber Culture Act. If he had a mother-in-law or an aged parent, he could claim another 480 acres. There were no trees in Dakota to cut down, flax was worth $1.50 a bushel, wheat $1 a bushel. Men gladly borrowed money to buy teams and machinery, paying as high as 60 per cent interest a year on chattel security. Why not? They expected to be rich in a few years.

They weren't. Consider the group that moved in 1885 from Greenleafton, Minnesota, to northern South Dakota. In 1886 only a little ground was planted, and the crop was just fair. That winter, a blizzard. The next spring seed grain and horse feed were scarce. The Chicago, Milwaukee & St. Paul railroad promised free seed grain, but when it came, it was foul with mustard and cockle. They got seed grain from the Northern Pacific, to be repaid in the fall with 10 per cent interest. The crop that year was good, but the winter was very severe, and the crop in 1888 was a total failure. Many people had to apply to friends back east for help. The next three years the crops were partial failures. In 1892, as threshing was going on, lightning set fire to the prairie, and a swath 12 miles wide was burned out—grain, buildings, stock, machinery. Everybody suffered, and some were left destitute. Again they got help from back east. The next year crops were fair, but prices were so low that the farmer made little or nothing after he counted the cost of hauling the crop 40 miles to market. In 1894 the same story: fair crops, low prices. But the smarter men began to catch on. They learned that dent corn would not ripen in Dakota, but flint corn or squaw corn would yield up to 40 bushels an acre. They fattened hogs on the corn, and began shipping them to Eastern markets. They also turned to raising beeves. The next two winters were mild, so that stock could subsist on the open range, and cattle prices were rising in 1895 and 1896. The Hollanders learned that selling milk to creameries and raising cattle, sheep, and hogs were more profitable than growing wheat and other small grains. It had taken 12 years—plus luck and substantial amounts of aid from back east—to find out how to make money farming the plains in Dakota.

Many men had been wiped out and crushed before they had time to learn how to get ahead.

Gustavus Swift learned quicker, in large measure because he saw the transformation that the railroads were working. Unlike the automobile, which tends to erode cities away because it can be used to link together an infinite number of points, the railroad tends to concentrate population in a few places. No matter how many stations are strung along its route, no matter how many branches are built, the railroad works to depopulate the countryside while building up swelling cities. Swift, a native of Massachusetts, saw with his own eyes the growing market for food in the cities of the East. He also knew that the settlement of the plains would mean a constantly growing supply of meat.

Meat was cured in the West—salted or smoked or canned—before it was shipped eastward. But if the new refrigerator cars on the railroads could be improved so that a man could deliver fresh meat to New York or Boston, what limit could there be to his profits? Swift went to Chicago, where he had been preceded in the packing business by Philip D. Armour and others. But Swift set up a packing firm and made his first experimental shipment of refrigerated beef in 1878. The next decade saw his essential effort—the creation of a nationwide sales force built around a network of branch houses, each with its own storage plant and marketing organization. Having created this network, Swift had to make use of his sales force, so he gave up his exclusive concern with beef and instituted a "full line" policy: beef, lamb, mutton, pork, and, later, poultry, eggs, and dairy products. To break down consumer bias against eating meat that had been slaughtered weeks earlier and half a continent away, Swift turned to advertising.

His firm grew rapidly, and the marketing network needed more meat to sell. He set up new packing plants in Kansas City, Omaha, and St. Louis. By 1893 he had built up a giant company based on vertical integration: handling the product at every stage from raw material to the final sale to the retailer. The chief departments—purchasing of livestock, killing and dressing it, sales, and accounting—were all held tightly in the fist of the main office in Chicago. Swift was the archetype of the age, a systematizer, an organizer, a man who left nothing to chance.

A few men made fortunes by the opposite tactics, by being lone wolves and gamblers. Such a man was Ed Schieffelin, a wanderer and prospector from boyhood. On April Fool's Day in 1877 he reached the Huachuca Mountains in southern Arizona, and he spent the summer canvassing the hills along the San Pedro River. He found the Tombstone claim and the Graveyard claim, but the ore samples he carried back to Tucson did not impress anybody there. The next winter Schieffelin was back on the San Pedro with his brother and a mining engineer named Richard Gird. Staked by the governor of Arizona and by a Tucson gunsmith, the three men found silver ore that assayed as high as $9,000 a ton. They located the Tough Nut mine, the Lucky Cuss, the Contention, and others. Their backers got two brothers named Corbin, way off in New Britain, Connecticut, to put up $80,000 to build a ten-stamp quartz mill, in exchange for a 12½ per cent interest in the claims. The mill began operation in June 1879, and for the next 27 months the company paid dividends of $50,000 a month.

Long before that period ended, Ed Schieffelin had sold out; he was a prospector, not a mine operator. He and his brother got $600,000 for their half share in the mill and in the Tough Nut Mine. Among the buyers was a Philadelphian named Disston, who had inherited a big saw factory from his father and who was engaged in giant operations in Florida real estate as well as in Arizona silver mines.

Another silver mine was the Anaconda, up in the Butte district of Montana, and Marcus H. Daly took charge of it in 1882 for a syndicate consisting of himself and three other men. (One was George Hearst, whose mining fortune would be diverted by his son William Randolph to newspaper publishing.) In that silver mine, Daly hit the richest vein of copper sulphide yet found, 50 to 100 feet wide, assaying in places 55 per cent copper.

The discovery was perfectly timed. Since the Crime of '73, the Act of Congress that stopped coinage of the standard silver dollar, the market for silver at the U. S. mints had contracted. But a whole congeries of industries based on electricity would form a swelling market for copper. Telegraph wires were following the railroads everywhere. In 1876 Alexander Graham Bell had first transmitted speech through a copper wire; in 1880 Thomas Alva

Edison had patented the incandescent light; in 1882 the first electric generating plant to light the streets of New York was opened. Meanwhile, copper production in Great Britain, 16,000 tons in 1860, was 3,800 tons in 1881; Chile's output was also declining; production of the United States in 1882 was only 44,000 tons.

Butte in 1882 had no railroad, and proper facilities to reduce the ore did not exist anywhere in this country. Daly shipped the ore by ox team to Corinne, Utah, thence by rail to Atlantic ports, and by ship to Swansea, Wales. Five years later the Great Northern reached Butte, and thereafter it hauled ore to the smelter and refinery at Great Falls, and copper to the Midwest.

The copper and silver mine became the basis of an empire. Daly bought coal lands and coal mines. He bought forests in northwestern Montana to provide timbering for the mines. He set up the Blackfoot Land & Development Company to settle farmers on the land that was logged out. In 1891 the Anaconda syndicate bought the Butte City Water Company from another big mine operator and future United States Senator, William A. Clark. The next year Anaconda produced 100 million pounds of copper, more than the whole country had produced a decade earlier.

With his firm the world's biggest copper company, Daly undertook to provide a comfortable home for himself in Butte. He built the Montana Hotel, equipped it lavishly, kept it fully staffed. Often he was the only guest, and ate alone in a dining room that sometimes accommodated 500 guests at a banquet. It was the Dalys and the Clarks and men like them who financed and tried to manipulate two political parties, the Democrats and the Populists, in their effort to recapture the Federal mints as a market for their silver.

Conquer those markets was the watchword, and, then as now, advertising played a part. As early as the 1790's, manufacturers of patent medicines had begun to turn out standardized bottles with a brand name and to advertise their wares widely. The nostrum-makers were true social pioneers pointing toward our own day: the first manufacturers to advertise directly to consumers and to aim for a national market, the first merchandisers to experiment at manipulating psychology. During the Civil War the heavy

excise taxes on whiskey gave them a new opportunity, and such products as Drake's Plantation Bitters appeared. Soon its slogan—"S.T. 1860–X"—was appearing in newspapers, on fences, on barns, on billboards, on rocks. It was painted in letters 400 feet high on a mountainside, and then a forest was cut down so the letters could be seen by passengers on the Pennsylvania Railroad. After Drake retired, very wealthy, about 1890, he explained that the slogan meant "Started trade in 1860 with $10."

Some of the consequences of these methods of getting rich can be seen in an entry of 1889 in a diary in Muncie, Indiana: "Elixir of life is all the talk. Claims to make old people feel young, etc. Great many have experienced bad effects of it, sore arms, abscesses, erysipelas, and blood poisoning." But medicine shows continued to tour the country in wagons, and millions of farmers and their wives continued to pay a dollar or so for a bottle of patent medicine (often alcoholic) plus blackface that was played, sung, and joked off the tailgate.

Other manufacturers and retailers were slow to follow the lead of the patent medicine kings, but when Jacques Offenbach made a triumphal tour of the United States he was amazed by the passion for advertising. Everywhere the composer came upon the word "Sozodont," the name of a dentifrice. In an almost inaccessible spot at Niagara Falls he saw a sign:

Gargling Oil
Good for man and beast

In Philadelphia he watched the parade of a voluntary organization. The bass drummer in the band was pounding his instrument as hard as he could while trying simultaneously to hold it so that spectators could read, in fine black lettering on the skin, an ad for a drugstore. "Decidedly," Offenbach concluded, "the American advertising men play upon the human mind as a musician plays on his piano."

By 1880, manufacturers of durable goods—sewing machines, farm machinery, pianos—were advertising their brands, offering goods on trial to customers, hiring local salesmen, offering agencies to local stores, and otherwise bypassing the retailers. Even so, shopkeepers were glad to see them assume advertising costs, and country editors welcomed them as a source of revenue that

would compensate for the decline in political advertising. And customers liked the standardization of quality: as the railroads expanded and thus lowered the transportation costs on flour, Pillsbury and other big manufacturers conquered one market after another by means of advertising and good quality. In less than 50 years they knocked the village flour mills out of business.

Standard Oil, Chase and Sanborn coffee, Bayer aspirin, Wrigley's chewing gum, Postum, Grape Nuts—all were perfecting their sales techniques. But it was tobacco men like Buck Duke who worked on the frontiers of promotion.

His father, Washington Duke, had started a tobacco factory in a log shack near Durham, North Carolina, after the Civil War, and James Buchanan Duke became the father's right-hand man. Although cigarettes in 1881 were still hand-rolled in factories, more than 240 million a year were being sold, and Duke decided to gamble on them. He brought ten Russian and Polish Jews from New York City to roll them. His key salesman Edward F. Small, trying desperately to create a market, got the idea in Atlanta of asking a touring French actress, who was currently the rage there, to endorse Duke cigarettes. She did, and he slapped her picture with the smokes on billboards all over town. He hired lady salesmen to visit tobacco dealers. The chief element in creating trade, he said, was "judicious advertising, especially if the same is novel and astounding in magnitude."

Meanwhile Duke was experimenting with the tobacco machine invented by a young Virginian, James Bonsack. By 1884 they had two machines working well in Durham, each turning out 200 or more cigarettes a minute. They figured they could produce 250,000 cigarettes a day, and the cost should fall from 80¢ per thousand to 30¢. Even more important, Congress in 1883 had cut the revenue tax from $1.75 to 50¢ per thousand. A thousand cigarettes took 3½ pounds of tobacco at 25¢ a pound, and the cost of packing and shipping brought the total cost per thousand to about $1.85. Price to jobber, $4, less a 10 per cent discount. With that sort of margin, Duke could afford to spend money to convince smokers that cigarettes were not effeminate.

He sent his partner to Europe, and in the spring of 1884 Duke went to New York City and started plastering posters and billboards. He offered premiums to retail dealers for selling his

product—camp chairs, clocks, crayon drawings. A master stroke was to put a picture of a famous actress or an athlete or a national flag in each pack. The pictures came in numbered sets, and children started pestering their fathers for them. Duke opened a loft factory in New York, installed four Bonsack machines, and jumped his capacity to 500,000 cigarettes a day.

Push that product! Small, directing sales in the Midwest, sponsored a polo club that played on roller skates. He placed street urchins in front of tobacco shops to give a free pack to each person entering the store. Duke topped that by putting men at the Immigration Station in New York to hand out samples to every immigrant. "These people will take our cigarettes all over the country. It's whopping good advertising," he claimed.

He was right. In 1889 the United States consumed 2.1 billion cigarettes, and Duke sold nearly half of them. His gross sales were more than $4 million, and net earnings were 10 per cent of that. He was spending $800,000 a year on promotion, twice his net earnings. He gave secret rebates and cash bonuses to key retailers. He extended his system of premiums to consumers, giving coupons that could be exchanged for prizes ranging from floor mops to gaudy stickpins. And he brought his competitors to the wall. In 1890 he got together with four of them to form the American Tobacco Company, which controlled 90 per cent of the cigarette market.

By guaranteeing to Bonsack's company an annual royalty of $250,000, Duke got exclusive right to use its cigarette machine. He welded the five companies into one. Concentrating manufacture in three plants, New York, Durham, and Richmond, he drove labor costs down to less than 10¢ a thousand cigarettes. Now a virtual monopoly, he could cut promotion costs, and he did, by more than $1 million a year. He bound wholesalers and retailers by contract to maintain the prices he set. Just as Gustavus Swift had moved to set up a full product line, so did Buck Duke, buying a large plug factory, a cigar plant, two manufacturers of chewing and smoking tobacco. The full line cut sales expenses. Duke explained further: "I wanted to make every style of tobacco the public might demand. . . . And I wanted him to take our kind in place of the other fellow's." In 1894, in the midst of the worst depression in the United States up to that time, American Tobacco showed a net profit of $5 million.

Money could be made by using the railroads to reach unexploited raw materials in the West. Money could be made by tapping the urban markets created by railroads in the East and Midwest. Money could also be made by using the power of government to further your own purposes. Milton H. Smith claimed: "The only inducement for railroad companies to enter politics—become parties to the dirty work—is to protect their property." But companies might also enter politics to extend their property, to take money out of other pockets and put it into their own, to, in Smith's words again, "get what the other fellow has, if you can. . . ."

The tariff was a good example. In 1865 the import duty on kerosene—the chief product of Standard Oil two decades later—was fixed at 40¢ a gallon, and domestic producers of kerosene enjoyed tariff protection continuously until 1909. And what protection: The wholesale price of illuminating oil at New York City in 1890 was less than 10¢ a gallon. Or consider steel, in which Andrew Carnegie was piling up his colossal fortune. An act of 1870 fixed the tariff on steel rails at $28 per gross ton. When railroad expansion jumped upward in 1879, American steel men could kick the price of rails sky high without fear that foreign mills would take their customers. In 1881 the price of steel rails in England was about $31 a ton, and a man could pay the import duty of $28 a ton and still make money shipping rails here because the American price was more than double the price in England; it reached as high as $67 a ton. Men like Carnegie were earning net profits of 100 per cent a year and more on the capital invested in their plants. It was not just the tariff, of course: Carnegie and a few others got added help from the government, for they controlled the American patents on the Bessemer process for making steel.

So Carnegie owed a considerable part of his fortune to the generosity of Congressmen who were giving him somebody else's money. It came from the users of steel, from the railroads, from the makers of farm equipment. They priced their products accordingly, raising their freight rates, charging more for a reaper or a plow. So, finally, the consumer paid and the Carnegies got fat. Especially did the farmers pay. The United States had an export surplus in wheat and in cotton and in other farm products, and farmers got no protection from the tariff. It served rather for

decades to siphon income and wealth out of the rural areas and into the cities, into the bank accounts of a few men in the cities.

Influence in Washington was good, influence in states and cities could also be good. In 1881 Chicago journalist and reformer Henry Demarest Lloyd commented: "The Standard has done everything with the Pennsylvania legislature, except refine it." But the agents of Standard Oil were not deterred by such remarks. In order to protect its control of the pathways from the oil wells in Pennsylvania to the railroads, Standard Oil opposed the right of eminent domain for pipelines, thus virtually insuring that no competing pipeline could be built. The company reportedly used venal methods in this effort, and successfully so. Pennsylvania in 1882 failed in its effort to collect taxes from Standard Oil of Ohio on the property it owned outside the state; the man who had collected much of the material on the tax case for the state ceased his attacks on Standard Oil. The Billingsley Bill in the Pennsylvania legislature sought to make pipelines into common carriers and to force sharp reductions in their rates for carrying and storing oil. It was defeated in the state senate in April 1887. Its supporters accused Standard Oil of having bribed at least five senators. The following month another Standard Oil executive wrote to Rockefeller that while their firm had met with "unparalleled success in commercial history" its public reputation was "not to be envied."

Access to governmental power was of special importance in the South, where the desperate poverty of the region posed special problems for men seeking their fortunes. But even the general poverty could create glittering opportunities for men who had the political influence to seize them. For instance, poverty made farmers and businessmen receptive to any measure that promised to reduce the taxes they paid. One consequence was the deterioration of the public schools in many Southern states. Another was to make taxpayers amenable to proposals that offered not only to remove from their backs the burden of supporting the state penitentiary but also to convert the prisoners into a source of revenue for the state. Thus arose the convict-lease system—the practice of hiring out the state's convicts to private companies as a conscript labor force.

The larger the conscript labor force, the greater the revenue to

the state, and appropriate changes in the criminal laws were made. In 1874 there were 272 prisoners in Mississippi. Then the "pig law" was enacted, defining as grand larceny the theft of any property worth $10 or of any cattle or hogs regardless of their value. Violations brought a prison term up to 5 years. At the end of 1877 the state had 1,072 prisoners—an increase of nearly 400 per cent in 4 years. In Georgia, where the number of convicts rose from 432 in 1872 to 1,441 in 1877, Senator Joseph E. Brown had a 20-year lease that guaranteed him 300 able-bodied convicts to work in his Dade Coal Mines. He paid the state about 8¢ per man per day.

The deal that the Tennessee Coal, Iron, and Railroad Company got from Tennessee was not so good. In 1883 the company leased the entire penitentiary, holding some 1,300 convicts, for $101,000 —over 20¢ a man per day. The company, if not nonpolitical, was certainly nonpartisan: its president was Thomas C. Platt, Republican leader of New York; its general counsel was Arthur S. Colyar, Democratic leader of Tennessee. Colyar explained that his firm had turned to the convict-lease system in large part because of "the great chance which it seemed to present for overcoming strikes."

Considering that the tariff gave Colyar's firm an artificially high price for its output of pig iron, and that the convict-lease system gave it artificially low labor costs, the Tennessee Coal, Iron, and Railroad Company derived much of its profit from these governmental beneficences. Perhaps it even owed to them its survival.

Among the founders of Colyar's company was James H. Inman, who was also president of the largest railroad system in the South, the Richmond and West Point Terminal Railroad. Along with four other directors of Richmond Terminal, including two brothers who were grandsons of the revered John C. Calhoun, Inman bought stock in the Central of Georgia. In 1889 they sold it to Richmond Terminal for $7,500,000—about double what they had paid for it. Less than five years later, Richmond Terminal was bankrupt.

The tactic of looting your own company was no more reprehensible than the various types of industrial blackmail. Such railroads as the West Shore or the Toledo, Peoria, and Warsaw were

built not so that their owners could try to operate them at a profit—but so that existing lines would buy them out at an exorbitant price to avoid the threatened competition. The work of launching the construction of telegraph lines so that the partially completed line could be sold to Western Union grew to be an industry in itself. As William H. Forbes, president of the National Bell Telephone Company, explained it: "The Western Union is composed of many companies which have successively been brought forward as competitors. Each of these companies has posed for a time as a public benefactor, organized to fight the Western Union. Under this plea, each has demanded and obtained rights of way and other privileges throughout the country. The footsteps of all lead into the Western Union cave; not one has ever returned."

Businesses whose profits depended on the maintenance of a monopoly position were preyed upon by politicians as well as by other businessmen, and many was the nuisance bill introduced into city councils and state legislatures by men who had no intention of passing it but who wanted to be paid for not passing it.

Although other business strategies might lead to quicker results and more spectacular ones, perhaps the most common route to workaday reputability was that followed by Asa Call in Algona, Iowa, trading in real estate. The United States was growing, and as local communities grew in size, real-estate values moved upward. In Muncie, Indiana, for instance, when natural gas was brought in at local wells in 1886, real estate began to change hands at amazing speed. In 1888 a man hesitated to pay $1,600 for an 8-acre tract on the outskirts of town. He bought instead a 60-day option on the property. Before the option expired, the piece of land was sold 5 times. The last time it brought $3,200.

Chapter 3

HOW THE STRUGGLE FOR WEALTH RESHAPED THE ECONOMY

ADAM SMITH contended that competition will act as an "invisible hand" to convert the self-seeking activities of individual men into general if unforeseen consequences that promote the well-being of all. Competition among producers will force them to be efficient and will drive their prices down to reasonable levels.

In the labor markets of the United States, employers competed not only with each other but with the large quantities of unoccupied and cheap land. Although relatively few city laborers had the specialized knowledge and the thousand dollars or so in capital that were needed to succeed as a farmer, there can be no doubt that the frontier kept the general level of wages higher than it would have been otherwise, and far higher than it was anywhere in Europe. This fact had two crucial results. First, it encouraged manufacturers to substitute machinery for labor whenever possible. Although their purpose was to reduce their costs of production, the fruit of their efforts was an increase in the output per man-hour, an increase in efficiency. Since this in turn facilitated increases in wages, the process was self-reinforcing. Second, the relatively high level of wages meant a wide dispersion of purchasing power. Whereas in Europe buying

power was in the hands of an aristocracy that wanted individualized and often hand-made goods, the mass market in the United States called for standardized goods turned out by mass production using labor-saving methods. Out of this situation came the industrial supremacy of the United States, which was clearly established by 1892.

From 1877 to 1892 the United States grew—in population, in wealth, in output per man-hour, in the value of real estate. In these years the economy became industrial. The society became urban. Vast corporate bureaucracies were forged. Power was caught up into the hands of a few men as never before in this country. The men in government were increasingly housebroken, until to many contemporaries they seemed lap-dogs to the barons of business.

The population of the country was 47 million in 1877; 67 million in 1893. The rate of growth was just over 1 million per year in the late 1870's; thereafter until 1893 it was about 1.3 million per year. In most years from a third to a half of the population increase was due to immigration, and much of the growth of the American economy can be attributed to this flow of immigrants. Children were born in Great Britain or Germany or Scandinavia (or increasingly after 1880 in Italy or Eastern Europe), supported and fattened in the land of their birth until they were old enough to go to work, when they would obligingly cross the Atlantic and present themselves at the employment offices of American railroads and factories. Year after year more than 60 per cent of the immigrants were male and more than two thirds of them were age 15 to 40.

Many of the Scandinavian and German immigrants brought not only their skill as farmers but also modest amounts of wealth with which to establish themselves on the prairies. In the anthracite region of Pennsylvania and other mine fields, many of the foremen and skilled miners had learned their trade in England or Wales. The Farr Alpaca Company had only followed a common practice in the textile industries in importing its skilled workers from Canada and England. Nor was it the only company to immigrate here, lock, stock, and barrel, because of the tariff. After the McKinley Act of 1890 imposed import duties on tinplate coming from South Wales, thousands of workers there were suddenly without work. Large groups came here, and Welsh manufacturers moved all or part of their factories to such towns as New Castle, Pennsylvania.

Many immigrants were attracted by the unrelenting propaganda of railroads eager to populate the countryside along their recently extended lines. In 1877 the Union Pacific–Central Pacific complex was the only railroad to reach the West Coast. The Great Northern, running out of St. Paul, reached Everett, Washington, in 1893, and by that time the Northern Pacific also had touched the Pacific Ocean. The Southern Pacific, running east from San Francisco, reached New Orleans in 1882. Railroad construction had continued on a small scale throughout the depression of the 1870's, but after 1879 it zoomed ahead. In 1880 10,000 miles of track was opened; the following year, even more; in 1887, a record 13,000 miles. The miles of track in operation doubled from 1877 to 1892.

While the railroad network was being extended, it was also being integrated physically. Most of the railroads in the East before the Civil War were built as short lines to serve the commercial interests of one or two cities. Gradually ownership of several short lines came into a single set of hands, and the lines were integrated into trunk lines such as the New York Central. But each of the three railroad systems serving New York City in 1861 had its rails set a different distance apart. Since rolling stock could not pass from one system to another, goods often had to be transshipped from one freight car to another at great cost in time and money. Similar variations pertained elsewhere: the gauge of a railroad might be 6 feet or it might be 4 feet 8½ inches. But Eastern interests, their eye on the possible carrying trade in grain from the plains, had decreed the latter as "standard gauge" for the first transcontinental railroad. One railroad after another made the conversion, until by 1880 four fifths of the railroad track in the country was standard gauge. The chief deviants were the railroads of the Southeast, which made the change in 1886.

As the railroads pushed into unsettled regions, millions of acres were opened to cultivation. While the population of the country increased about 40 per cent, the number of cattle increased 60 per cent and their average value declined 10 per cent. The output of wheat rose more than 50 per cent, and the price of wheat per

bushel fell from $1.08 in 1877 to 62¢ in 1892. Such huge increases in many crops resulted not only from virgin land but also from the mechanization of agriculture. An estimated 61 hours of labor were needed to produce one acre of wheat with the hand methods in vogue before the Civil War; with the machine methods of the 1890's the same job could be done in 3 hours and 19 minutes.

The new types of farm machinery were best adapted to use on the open prairies, and thus further increased the competitive pressure on the erstwhile farming areas of the East. Although the industrial cities of New England offered a growing market for farm products, the region had no more persons in agricultural pursuits in 1890 than in 1880, and its farmers were likely to be turning their attention to fruit culture or dairying. In New England as in Texas, flour was coming from the Midwestern mills, and the wheat for it was coming from Kansas or Dakota. The latter had only 135,000 people in 1880. Then a few years of good rainfall there, plus rising real-estate prices in other areas, sent the population shooting upward to 330,000 in 1883.

Such boom stages of growth occurred in more than one place when the coming of the railroad first tied it into the national economy. In Washington state in the decade of the 1880's, for example, population grew over 4 times; value of farms, nearly 5 times; value of farm products, 3 times; value of output of fisheries, 6 times. Manufacturing grew even more rapidly: employment, 17 times; value of output, 12 times. But the number of men involved in manufacturing at the end of the decade was only 17,000, and what manufacturing existed in such a raw if booming area was likely to be chiefly the primary processing of raw materials. Thus the value of the lumber pouring out of Washington sawmills increased 9 times in the 10 years after 1880; this surge accounted for most of the growth in value of manufactures.

Construction of buildings in such boom areas and in the Eastern cities became even more important than railroad construction in furnishing a market for the iron and steel mills—a change symbolized by Carnegie's decision in 1887 to shift the nation's largest steel mill, at Homestead, Pennsylvania, from production of rails to structural steel. The flood of steel into the American economy swelled incredibly; from 569,000 long tons in 1877 to 4,927,000 in 1892. Just as construction of railroads and bridges

and buildings created a demand for steel, so did production of steel create a demand for bituminous coal, and the tonnage mined went from 35 million in 1877 to 127 million in 1892, to which we can add 52 million tons of anthracite used chiefly for heating homes.

In those 16 years an industrial society was created. Output of copper rose 7 times; of crude oil, 4 times, passing 50 million barrels of 42 gallons each, of which the major part continued to be refined into illuminating oil, and the major part of the illuminating oil was still being shipped to foreign markets. The electrical manufacturers, who did not even exist before 1875, turned out $23 million worth of goods in 1892. The value of industrial machinery and equipment produced in that year was double what it had been in 1879. The number of active spindles in cotton mills in 1890 was twice what it had been 20 years earlier. Manufacturing production as a whole in 1892 was 2½ times the level of 1877. The number of persons in manufacturing was 2¼ times as great in 1890 as in 1870; in mining, 2½ times; in transportation and other public utilities, 2½ times; in construction, 2 times.

But in agriculture, the labor force increased only 50 per cent, and the United States by 1890 had ceased to be primarily a farming country. In 1870 there were nearly 7 million persons in agricultural pursuits, slightly over 6 million in other activities. In 1890, 13,379,000 were engaged in nonagricultural pursuits, while agriculture could claim fewer than 10 million workers. But developments in different sections were very different. In Massachusetts the number of persons engaged in farming stayed almost constant from 1880 to 1890, while the number engaged in manufacturing rose a third, and employment in trade and transportation rose by half. The same general pattern holds, surprisingly, in Illinois, where employment in manufacturing rose 70 per cent while it doubled in trade and transportation but rose hardly at all in farming. But in the four states from Kansas on the south to North Dakota on the north, employment in farming rose two thirds in those ten years.

Such regional comparisons point to a wavelike process by which the American economy expanded westward. As better farming areas farther west were opened up, Eastern areas lost part of their markets, and the labor force began shifting into

manufacturing and other industrial jobs. States such as Ohio and Illinois were passing through this stage in the 1880's. Manufacturing was still growing in New England, but its textile mills were facing increased competition from the cotton industry of the Southern Piedmont. As farming and cotton manufacturing declined in New England, the labor force there shifted increasingly into the service industries.

The development of the American economy showed a second type of wavelike process—the cycle of prosperity and recession. And in the business cycles of the late 19th century, the pace of railroad construction often played a key role. Not only did the railroads themselves employ vast quantities of labor and capital in the expansive years when they added 10,000 miles of new track plus great numbers of new locomotives and freight cars, but they also provided, directly or indirectly, a chief market for the output of other key industries such as steel and coal. This marked dependence of the economy on railroad construction was most unfortunate, for the nature of the railroad business at the time was such that a line's extension was highly erratic.

Many key railroads were dominated by general entrepreneurs; that is, by businessmen whose access to giant amounts of liquid capital gave them the ability to control companies in many different industries. One such man was Commodore Vanderbilt, who multiplied a fortune made in shipping by investing it in the New York Central. Another was John Murray Forbes of Boston, who made money in the years around 1835 in the overseas trade with China, made more money in the early years of cotton manufacturing in New England, made yet more in the Michigan Central Railroad and the Burlington. Another was Jay Gould, who controlled the Erie, left it and acquired first the Union Pacific and then the Wabash. He came to control Western Union and the Manhattan Elevated in New York City. He took over the Texas Pacific. The Northern Pacific was controlled in 1873 by the banker Jay Cooke; it was controlled 15 years later by the former newspaperman Henry Villard.

These men fought intricate wars for control of the future traffic of the Great Plains. Their lines west from the Mississippi paralleled each other, being a hundred or two hundred miles apart. Who would benefit from the traffic that in years to come

would pour out of the yet unsettled lands lying between two trunk lines? In prosperous years when money capital could be gotten, each railroad would become afraid that a rival would beat it into a region that either could penetrate. In the effort to get into the region first, each road would plunge ahead. Railroads were built into many areas years before they could reasonably hope to carry any substantial amount of traffic. Much of the construction was financed by issue of bonds, but when the hoped-for traffic failed to materialize, the revenues of the road were not great enough for it to pay interest on its debt. The railroad went into bankruptcy and reorganized its capital structure, the value of its debt being reduced in the process. The bankruptcy of a major railroad or two might trigger a financial panic, leading to a more or less protracted depression in the country as a whole. During a depression, with money capital hard to come by, the general entrepreneurs in command of the railroads felt that their rivals could not finance new construction. Without the threat of competition to force its hand, each railroad slowed its own construction to a standstill.

The results of this process were manifold. First, it forced such roads as the Northern Pacific into bankruptcy repeatedly, and each time millions of dollars in values that had been invested in the road were wiped out in the recapitalization. It is an interesting speculation whether, if we could calculate the total dividends and interest that have been paid on all the capital put into railroads in American history, the average return on the investment might not be negative.

Second, the West was settled much faster than it would have been if the railroads had built only into areas that would clearly be profitable in the near future. Having built a line, the railroad tried desperately to settle its environs quickly. Many a settler was lured by railroad propaganda into a region that did not have enough rainfall in the average year to support farming or that could not be farmed by the methods he knew. After a few years the farmer, beaten, would retreat from the area. As late as 1910, more than half of the farm population of the United States lived on land they had not occupied five years earlier.

Third, the impact of railroad construction on other sectors of the economy tended to lead the entire country into wild excesses.

Every prosperity tended to become a runaway boom, culminating in far-reaching collapse, followed by years of bad times. During periods of rapid railroad extension, steel mills worked overtime, coal and iron mines extended their operations, farmers poured into the West, country towns were built and cities grew in the hope of capturing the farmers' trade, thousands of immigrants streamed through New York and fanned out over the country. Then came financial panic, railroad construction slowed, steel mills and coal mines laid off men and cut back production, immigration fell to a quarter of what it had been, urban demand for farm products declined and prices fell.

The longest period of economic contraction in American history—lasting five years and five months—began in the fall of 1873. The banking firm of Jay Cooke, famous for his part in financing the Union armies, had taken on the job of financing the Northern Pacific. Having spent over $15 million, the road had only 500 miles of track in operation in May 1873, and Cooke was trying to float a bond issue of $100 million. But 25 other railroads defaulted in interest on their bonds in the first eight months of 1873, and Cooke was unable to make a deal. He began to borrow money at short term to finance the road, hoping to sell his bonds before the notes came due. This effort failed, and his firm announced on September 18 that it could no longer pay its depositors on demand. Other banks became panicky and called in loans. Stock prices swooped downward. Other banks failed. Businessmen could not get cash to meet their payrolls, and they cut employment. Railroad construction, some 4,000 miles in 1873, was only half that the next year.

Yet, although the ensuing depression lasted a long time, it was relatively mild in terms of actual physical output. Manufacturing output turned upward as early as 1875, and by 1877 railroad investment, construction of buildings, and mining output had all revived. In spite of the long depression, real income per capita rose by a third from 1869 to 1879. But the depression lasted until the latter year because money wages and prices continued to decline.

In 1879 the economy spurted ahead for several reasons. After January 1 of that year all legal-tender notes in circulation could be turned in at the Treasury in exchange for gold; this return to the gold standard, combined with low prices in the United States,

tended to reduce imports and stimulate exports. Farmers benefited from the coincidence of bountiful crops here with poor ones in Europe. New farming areas in the West had come into production, and agricultural output by 1879 was 50 per cent higher than it had been in 1873. The resulting increase in railroad traffic brought renewed investment in railroads, and until 1882 there was an orgy of railroad extension. Main lines which had been stopped by the panic of 1873 were completed. More important, feeders and branch lines were built. Repairs and improvements that had been deferred were undertaken.

In the three years from 1880 through 1882 more than 28,000 miles of railroad were built. The stimulus given to industries supplying the railroads was huge, and, as one commentator pointed out, "every railroad which is constructed, and especially in the West and South, creates fresh opportunities for investment in agriculture, mining, mills and foundries." The Louisville and Nashville, for instance, owned a half million acres of land in central Alabama, and the road needed more freight. It built lines connecting Birmingham to new coal and iron towns—Bessemer, Helena, Anniston, Talladega—with spurs to coal mines, iron mines, and mills. It sent agents everywhere seeking immigrants. By 1888 the tonnage of minerals and pig iron over the L. & N. was greater than the average annual weight of the cotton crop of the United States for the preceding 15 years. The pig iron output of Alabama in 1889 was more than 10 times what it had been in 1880.

But the national bubble had long since burst. By 1883 capitalists had become convinced that further investment in railroads would not prove profitable. The decline in employment in railroad building from 1882 to 1883 came to 500,000 men, of a total national labor force of only 18 million. Steel rails, worth $71 a ton in January 1880, were selling for half that in December 1883. Until 1885 the economy sagged. In that year the Chicago *Tribune* looked back to 1879-1881 and asked:

> Why is it that in such a time as that, funds are contributed by all classes of people for almost any enterprise whose promoters promise great returns? It is because they see business active all around them, people in enterprises already established winning large profits, and everything apparently inviting them to be rich. They are seized with the craze of money making, and become

> incapable of reasoning on any project that is presented for their consideration. It is easy for unscrupulous men to humbug them at such a time. Even the promoters of enterprises often half-believe the lies they tell, and partake of the prevailing mania. . . . It is appalling to consider how many of the corporate enterprises of the country have secured their capital by taking advantage of these investment—or, rather, speculative—epidemics.

Once again, however, as in 1873-1879, the recession was chiefly marked by severe reductions of prices and wages, while physical output was affected relatively little. The preceding railroad extension had opened up many new areas, and construction of new buildings continued high throughout the recession. This in turn stimulated industries producing building supplies—such as the lumber industry of Washington. In 1885 prospects for profits from railroad investment began to look good again, and the economy in general turned upward, with the result that railroad construction shot upward in 1886 and even more so in 1887. The boom was on once more.

But this one lasted less than two years. From a record 13,000 miles in 1887, railroad construction fell nearly 50 per cent the next year, and building construction fell also. Since the boom had been brief and relatively mild in many ways, so was the down swing that followed, and business revival came in April 1888. The cyclical swings for the next few years continued mild, until a banking panic early in 1893 brought in its train the worst depression that had yet occurred in the United States.

Many features of the crisis that struck American society in the years from 1893 to 1898 can be attributed to the growth of huge corporations in the 16 years before 1893. In trying to get hold of the factors that explain why these corporations developed when they did, it is useful to distinguish between the growth of individual plants to a size where one factory might employ thousands of men, such as the McCormick reaper works in Chicago or the Homestead works, and the growth of multi-plant companies, such as Standard Oil or the Distillers' and Cattle Feeders' Trust.

The appearance of the giant plant can often be traced to the effects of the railroad plus technological changes that gave large-scale production a great advantage in costs over small-scale production. Prior to the railroad, inland transportation costs were

so high that only the most valuable and least bulky goods could be shipped long distances. Each plant in an industry tended to serve a strictly limited market, within which it was protected by virtue of the wall of transportation costs. The country was dotted with tiny plants producing pig iron or nails or flour, and selling to a local market.

Railroads changed all that. Freight rates have never fallen to zero, and consequently the competitive disadvantage suffered by a factory still increases as it buys raw materials from more distant sources or sells its output in more distant markets. But the railroad did greatly reduce the margin of this disadvantage for any given distance from raw materials and markets.

The most dramatic reduction in costs came when a region was first connected with the interregional railroad network. The introduction of a railroad into an area might well reduce transportation costs to 10 per cent of what they had been with wagons over poor roads. Thereafter, costs per ton-mile continued to decline as the volume of traffic increased and technical improvements were made. Competition of a railroad with other railroads or with water transportation accelerated the decline in rates on many lines. Thus the cost of shipping a bushel of wheat by rail from Chicago to New York fell from 19¢ in 1877 to 10¢ at the end of the century, but in 1900 the cost by water over the Great Lakes, the Erie Canal, and the Hudson River was less than 5¢. On the Lake Shore and Michigan Southern the average freight charge per ton-mile fell from 1.5¢ in 1870 to 0.5¢ in 1900.

In considering how flour milled in Minneapolis could be sold in markets from Texas to New York, the second principal factor was the advance in productive techniques in flour milling and many other industries. These improvements sometimes greatly increased the economies of large-scale production so that—in the language of the economist—average costs continued to fall until the factory's daily output was very large. When the new technical possibilities were seen in conjunction with the fall in transportation costs, enterprising manufacturers were struck with the opportunity to reach out to ever more distant markets.

To capture a market, a manufacturer had to be able to sell his goods there at a lower price than his competitors. His selling price would consist of his costs of production, plus the cost of

delivering the goods to the market in question, plus his profit. The railroad had reduced the cost of delivering his product to distant markets. If he could only get his costs of production somewhat below the cost of firms selling the same commodity in those markets, he could capture them on a price basis. And so it happened.

In industries where the economies of large-scale production were great—sewing machines, farm implements, bicycles, typewriters, sugar, illuminating oil, tobacco, steel—the factories that seized the new technical possibilities expanded rapidly at the expense of those which did not. During the 1880's, for example, the capital invested in the manufacture of farm machinery more than doubled, but the number of companies in the industry declined by half. Meanwhile the number of employees in the industry rose very little. Taken together, these facts suggest that some plants, using more capital for every worker, were able to drive others out of business. The average firm was four times as large in 1890 as in 1880, and by 1890 two Chicago plants together were producing 200,000 harvesting machines per year. As early as 1881 the Singer Company alone was selling an average of 1,700 sewing machines a day. Thereafter the torrent of low-wage Jewish immigrants into New York helped to expand the ready-made garment industry and to build even further the market for sewing machines. To symbolize the triumph, the 47-story Singer Building was erected; when completed in 1908 it was twice as high as any other building on Manhattan Island.

In general, a small plant became a big one by effecting genuine economies in production. As a plant grows in size, each of its elements can be used more nearly to full capacity: machines that are not feasible in a small plant where they would be idle most of the time become economical in a large plant. This makes it possible to extend the specialization of machines and men, both of which often come in indivisible units with a large capacity. Managerial and technical talent can be economized as the size of plant increases; so can generators and railroad rights-of-way. Savings can be effected in buying raw materials, since it costs little more to place a large order than a small one, and since the supplier will find it more economical to fill a large order than a small one.

As we turn to the growth or combination of individual plants into large multi-plant firms, a new range of considerations comes into view. The formation of a large multi-plant firm might bring an increase in the ratio of output to input, for the economy as a whole as well as for the individual firm. But this process in other instances resulted in higher costs and a reduction in efficiency.

Whether concentrated in a single plant or split up among several factories, a large firm enjoyed competitive advantages of several types over small rivals, even though some of these advantages might not be socially beneficial in the sense of increasing the ratio of output to input for the total economy. A large company has more bargaining power to use in buying raw materials, and perhaps also in selling its products. It has advantages in raising capital funds which can be summarized under the rubric, "greater prestige." These advantages in financing may combine with technical talent in a research and development program. Research may lead to patents, and the large company has the financial resources to prosecute (or to defend against) patent suits. Its patents may then become the basis of further growth. This happened conspicuously in the telephone industry and in electrical manufacturing, in both of which multi-plant corporations developed from a process of horizontal and vertical integration.

In electrical manufacturing, for instance, Edison General Electric and Thomson-Houston were some 80 per cent of the industry in 1891, each having sales slightly above $10 million. The product lines of the two companies were in general noncompetitive except in the electric street-car field, and their patents were neatly complementary. The two firms merged in 1892 to form General Electric, which was more than four times as big as its leading rival, Westinghouse.

Crucial to the formation of many multi-plant firms was the growing importance of those costs of production that do not vary as the quantity of output changes—variously called fixed costs, or sunk costs, or overhead costs. If the technical advances of the late 19th century brought increased advantages of large-scale production to many industries, they also, depending as they did on extensive use of machinery, changed the composition of total costs of production, increasing the proportion of fixed costs and reducing the proportion of variable costs. The merchant-

capitalists of the early 19th century had hardly known the meaning of fixed costs; John Jacob Astor, during a prosperous time, could have turned all his assets into cash in twelve months without suffering a capital loss. But in railroads and many types of manufacturing this degree of liquidity did not exist. On railroads, in addition to such fixed costs as taxes and the interest on bonded debt, an estimated 55 per cent of the operating expenses were fixed costs. Most of the expenses of a railroad simply cannot be evaded, even if its receipts drop to zero; conversely, it can greatly expand its sales without anything approaching a proportionate increase in costs.

The high ratio of fixed costs to total costs need not occasion any difficulty so long as demand remains constant. But from 1877 to 1893 demand for most products was subject to sharp drops during recessions and to random drops as competitors from neighboring areas bit into your market. When demand fell, a firm's receipts fell much more than its costs. It fought back by striving to capture a larger share of a shrinking market, and the usual technique was to cut prices. Just here did the high ratio of fixed costs to total costs become crucial. To make a profit, a firm's receipts must more than cover its total costs. But if a company with high fixed costs is losing money, it can minimize its losses by selling at any price that covers variable costs and leaves a margin, however small, to apply against fixed costs. In this situation the selling of goods at a price that did not cover total costs became so common as to give rise to the term "cut-throat competition."

A firm with large fixed costs simply must keep its plants in operation; otherwise, it goes into bankruptcy. Thus a premium attaches to stability and certainty, and the integration movement arose as an effort to eliminate uncertainty. A company reached backward to control its suppliers so that it could have a dependable supply of raw materials at predictable prices. It reached forward to control its distribution outlets so that it could promote sales and dispose of the ceaseless flow of goods from its factories. It fought all efforts to establish trade unions because it could not afford to lose control over its labor costs. It opposed government regulation of business because the impact would be unpredictable and beyond its control.

No company became so big that it could feel safe from others, not even Standard Oil. In the late 1880's output of crude oil in the Pennsylvania oil region began to decline, and the Lima-Indiana fields came into production. What if somebody else seized control of the new fields? What if the producers of crude oil combined to raise prices? Standard Oil, to ensure a steady supply of crude oil at its refineries, embarked on aggression for purposes of defense. For the first time it went directly into the production of crude by swooping into the Lima-Indiana fields to buy properties. It also set up committees and staff units to coordinate a more efficient flow of oil from the wells all the way to the customer.

Thus integration, especially vertical integration that reached backward or forward to other stages of production, could result in genuine economies. A manufacturer of steel wire knew exactly the kind of steel that his firm needed; if his firm merged with a manufacturer of ingot steel, his knowledge became available to both firms. Also sales costs were reduced, the quality of the steel became more certain, the production schedules of steel mill and wire mill could be coordinated with resultant savings in inventory costs and reduction in number of shutdowns. Integrated plants in the steel industry brought huge savings in fuel costs because the material could be moved without cooling from blast furnace to Bessemer converter to rolling mill. In other companies the integration of sales outlets with the factory meant goods that were better aimed at the market, lower inventory costs, availability of specialized knowledge to all the retail outlets, preparation of point-of-sale displays on a mass basis, and so on.

Thus vertical integration often looked toward the creation of a firm that could compete more effectively because it increased efficiency by reducing costs. But an increase in efficiency was far less likely to result from horizontal integration; that is, creation of a multi-plant firm from the combination of several companies at the same stage of production and competing more or less directly with each other.

In 1887 the Distillers' and Cattle Feeders' Trust was formed by several Midwestern firms with more than 80 small plants. Some rationalization of production was effected, and by 1895 only 21 plants were being operated. But the company was also careful to keep the price of whiskey from falling. Unfortunately for it, the

cost of starting a distillery was low; entry into the industry was too easy. The Trust's answer to new competitors was to buy some out and to cut prices of whiskey in order to put pressure on the others. This strategy proved fatal. Unable to survive the depression that began in 1893, the firm went into bankruptcy in 1896. Thus mergers between erstwhile competing firms were a substitute for cartels or other agreements among independent firms to divide the market and fix prices. After 1890, when cartels and other combinations "in restraint of trade" were made subject to legal prosecution by the Sherman Act, the merger of competing firms became even more attractive as an alternative means to the same end. Such mergers aimed at increasing profits, not by reducing costs, but chiefly by maintaining prices at a level that would more than cover total costs. Would-be monopolists often burdened themselves with useless plants; useless plants were even built for sale to them as a form of industrial blackmail. So horizontal integration often meant the creation of a giant firm that was less efficient than smaller firms that had been merged into it.

The creation of a giant corporation brought with it serious legal and organizational problems, and Standard Oil pioneered in devising solutions in both areas. Under its charter from the state of Ohio, it could not own plants in other states nor could it own stock in other companies. So when another company was acquired secretly, its stock was turned over to an officer of Standard Oil acting as trustee for the stockholders of Standard Oil. This arrangement could lead to difficulties if an important trustee died, and it left open the possibility that a trustee could embark on an aberrant course. The answer found was the Standard Oil Trust Agreement, signed in 1882, under which nine trustees had control over all the properties associated with Standard Oil of Ohio.

An even more important legal innovation than this first trust was the amendment by New Jersey in 1889 of its general incorporation law to permit one corporation to buy stock in another. Some railroads and other utilities had done so earlier, but usually their action was authorized by their individual charters. The laws of some states specifically forbade intercorporate stock purchases. Now New Jersey had provided a general legalization of the holding company, and in 1899 the Standard Oil Company (New

Jersey) became the parent over the entire Rockefeller combination.

Every company that grew substantially in size also met with problems of internal organization. The usual solution was to set up an administrative hierarchy, which, to be workable, had to give a proper balance of coordination and flexibility, of centralization and decentralization. As messages flowed upward toward the chief executives from salesmen on the road or foremen in the plant, some were cut out of the flow at every stage of the hierarchy, decisions were made, and orders given. The remaining messages continued upward, sometimes in their original form, sometimes condensed into reports. In addition to creating such a hierarchy, the company had to fill each job with a suitable person —an incredible task considering that most of these administrative jobs were new in character, that nobody had experience in them, and that professional training of administrators was unknown.

Changes in technology helped this organizational revolution along. Railroads carried company officials from one city to another, and the telegraph carried messages back and forth. In 1884 the Bell telephone system began to make intercompany connections, but really long-distance use of the telephone came only after the turn of the century. In local communication, however, the change occurred earlier; in 1893 more than 300,000 telephones were in use, and typewriters were in the front offices of most corporations.

Other and equally vital inventions were administrative ones. The top executives of most manufacturing concerns had been accustomed to supervising production by walking through their plants to see what was going on. When firms became so large and were scattered over so many cities that this technique was physically impossible, statistics and cost accounting developed as a substitute for direct observation. The intra-firm memo and the weekly report replaced conversation as a technique of information and discussion. But these devices did not dictate any particular structure for the company, and the early big firms suffered long periods of trial and error. At first several tried to apply rigidly the notion of hierarchical delegation of powers. This structure proved to have three main disadvantages: it delayed or distorted information, it inclined subordinates toward conven-

tionalized rather than imaginative actions, and it failed to make full use of the advantages of specialization.

Some firms then turned to a functional delegation of powers. In the marketing apparatus of General Electric in the 1890's the vice-president in charge of sales supervised four or five product sales managers, each the boss over a sales force handling a particular line of product such as lighting equipment or street railway equipment. The product sales managers were all at the home office in Schenectady, but each product sales force had its separate local sales offices and local salesmen. Such functional specialization could also have its drawbacks: the inflation of expenses due to duplication of personnel, or a splitting of command so that a person might get conflicting orders from his various superiors.

Most companies ultimately arrived at what is known as the line-and-staff system of delegating power. In the line organization—the men actually engaged in buying raw materials or processing them or selling the output—the principle of hierarchical delegation was preserved. But staff specialists were given the job of collecting data, analyzing them, advising the line officers, and checking up on the operations of the firm. At the top of the company, the tasks of making general policy and of coordinating the enterprise were likely to be discharged by committees rather than by an all-purpose executive. Already by 1886 a "galaxy of committees" shone in the heavens above Standard Oil.

True, much remained to be done by later administrative experts: Alfred D. Chandler has argued that at Standard Oil "the lines of authority and communication were particularly unclear and confused." But much had been achieved. Several huge firms had devised structures that, if sloppy, were not fatally so. To that extent they provided models for other men to follow in other industries. But they also made it vastly more difficult for others to follow in their own industries. A new oil company, for instance, would need years to build up a workable organization, and during that period it would have to compete against Standard Oil which had built its organization and filled each job with a suitable person. The advantages of being a going concern were added to those of being a large company, and it happened with Standard Oil, as with other giants, that that the rich got richer.

Chapter 4

THE RESTLESS, AND THEIR DISCONTENTS

BUT EVEN the successful had their anxieties. At the core of the economic worries of many businessmen was the problem of overproduction; that is, the inability of the American market to grow fast enough to absorb at profitable prices all that American producers could turn out. At times the overproduction was latent, in the form of excess capacity that was kept idle; at other times it was actual, in the form of cut-throat prices. Doubtless the falling level of prices for three decades was due partly to mechanization and the resultant lower costs, and partly to Federal fiscal and monetary policies. But it was also due partly to the failure of demand to increase as rapidly as productive capacity. Doubtless too, excess capacity from time to time in specific portions of an economy is a necessary price of economic progress, an indication that equipment becomes obsolescent under conditions of rapid technological advance. But from 1873 to 1898, excess capacity in the American economy was chronic and it afflicted virtually every industry (in marked contrast to the years from, say, 1843 to 1861). The sole important exception that I have found was raw wool, the price of which rose through this period. A major reason seemingly was the inability of sheepmen in many coun-