Vindicating Capitalism: The Real History of the Standard Oil Company

By Alex Epstein

Who were we that we should succeed where so many others failed? Of course, there was something wrong, some dark, evil mystery, or we never should have succeeded![1] —John D. Rockefeller

The Standard Story of Standard Oil

In 1881, *The Atlantic* magazine published Henry Demarest Lloyd's essay "The Story of a Great Monopoly"—the first in-depth account of one of the most infamous stories in the history of capitalism: the "monopolization" of the oil refining market by the Standard Oil Company and its leader, John D. Rockefeller. "Very few of the forty millions of people in the United States who burn kerosene," Lloyd wrote,

> know that its production, manufacture, and export, its price at home and abroad, have been controlled for years by a single corporation—the Standard Oil Company... The Standard produces only one fiftieth or sixtieth of our petroleum, but dictates the price of all, and refines nine tenths. This corporation has driven into bankruptcy, or out of business, or into union with itself, all the petroleum refineries of the country except five in New York, and a few of little consequence in Western Pennsylvania... the means by which they achieved monopoly was by conspiracy with the railroads... [Rockefeller] effected secret arrangements with the Pennsylvania, the New York Central, the Erie, and the Atlantic and Great Western... After the Standard had used the rebate to crush out the other refiners, who were its competitors in the purchase of petroleum at the wells, it became the only buyer, and dictated the price. It began by paying more than cost for crude oil, and selling refined oil for less than cost. It has ended by making us pay what it pleases for kerosene...[2]

Many similar accounts followed Lloyd's—the most definitive being Ida Tarbell's 1904 *History of the Standard Oil Company*, ranked by a survey of leading journalists as one of the five greatest works of journalism in the 20th century.[3] Lloyd's, Tarbell's, and other works differ widely in their depth and details, but all tell the same essential story—one that remains with us to this day.

Prior to Rockefeller's rise to dominance in the early 1870s, the story goes, the oil refining market was highly competitive, with numerous small, enterprising "independent refiners" competing harmoniously with each other so that their customers got kerosene at reasonable prices while they made a nice living. Ida Tarbell presents an inspiring depiction of the early refiners.

> Life ran swift and ruddy and joyous in these men. They were still young, most of them under forty, and they looked forward with all the eagerness of the young who have just learned their powers, to years of struggle and development... They would meet their own needs. They would bring the oil refining to the region where it belonged. They would make their towns the most beautiful in the world. There was nothing too good for them, nothing they did not hope and dare.[4]

"But suddenly," Tarbell laments, "at the very heyday of this confidence, a big hand [Rockefeller's] reached out from nobody knew where, to steal their conquest and throttle their future. The suddenness and the blackness of the assault on their business stirred to the bottom their manhood and their sense of fair play..."[5]

Driven by insatiable greed and pursuing his firm's self-interest above all else, the story goes, Rockefeller conspired to obtain an unfair advantage over his competitors through secret, preferential rebate contracts (discounts) with the railroads that shipped oil. By dramatically and unfairly lowering his costs, he slashed prices to the point that he could make a profit while his competitors had to take losses to compete. Sometimes he went even further, engaging in "predatory pricing": lowering prices so much that Standard took a small, temporary loss (which it could survive given its pile of cash) while his competitors took a bankrupting loss.

These "anticompetitive" practices of rebates and "predatory pricing," the story continues, forced competitors to sell their operations to Rockefeller—their only alternative to going out of business. It was as if he was holding a gun to their heads—and the "crime" only grew as Rockefeller acquired more and more companies, enabling him, in turn, to extract ever steeper rebates from the railroads, which further enabled him to prey on new competitors with unmatchable prices. This continued until Rockefeller acquired an unchallengeable monopoly in the industry, one with the "power" to banish future competition at will and to dictate prices to suppliers (such as crude oil producers) and consumers, who had no alternative

refiner to turn to.

Pick a modern history or economics textbook at random and you are likely to see some variant of the Lloyd/Tarbell narrative being taken for granted. Howard Zinn provides a particularly succinct illustration in his immensely popular textbook *A People's History of the United States*. Here is his summary of Rockefeller's success in the oil industry: "He bought his first oil refinery in 1862, and by 1870 set up Standard Oil Company of Ohio, made secret agreements with railroads to ship his oil with them if they gave him rebates—discounts—on their prices, and thus drove competitors out of business."[6]

Exhibiting the same "everyone knows about the evil Standard Oil monopoly" attitude, popular economist Paul Krugman writes of Standard Oil and other large companies of the late 19th century:

> The original "trusts"—monopolies created by merger, such as the Standard Oil trust, or its emulators in the sugar, whiskey, lead, and linseed oil industries, to name a few—were frankly designed to eliminate competition, so that prices could be increased to whatever the traffic would bear. It didn't take a rocket scientist to figure out that this was bad for consumers and the economy as a whole.[7]

The standard story of Standard Oil has a standard lesson drawn from it: Rockefeller should never have been permitted to take the destructive, "anticompetitive" actions (rebates, "predatory pricing," endless combinations) that made it possible for him to acquire and maintain his stranglehold on the market. The near-laissez-faire system of the 19th century accorded him too much economic freedom—the freedom to contract, to combine with other firms, to price, and to associate as he judged in his interest. Unchecked, economic freedom led to Standard's large aggregation of economic power—the power flowing from advantageous contractual arrangements and vast economic resources that enabled it to destroy the economic freedom of its competitors and consumers. This power, we are told, was no different in essence than the political power of government to wield physical force in order to compel individuals against their will. In the free market, through unrestrained voluntary contracts and combinations, Standard had allegedly become the equivalent of a king or dictator with the unchallenged power to forbid competition and legislate prices at whim. "Standard Oil," writes Ron Chernow, author of the popular Rockefeller biography *Titan*, "had taught the American public an important but paradoxical lesson: Free markets, if left completely to their own devices can wind up terribly *un*free."[8]

This lesson was and is the logic behind antitrust law, in which government uses its political power to forcibly stop what it regards as "anticompetitive" uses of economic power. John Sherman, the author of America's first federal antitrust law, the Sherman Antitrust Act of 1890, likely had Rockefeller in mind when he said:

> If we will not endure a king as a political power we should not endure a king over the production, transportation, and sale of any of the necessaries of life. If we would not submit to an emperor, we should not submit to an autocrat of trade, with power to prevent competition, and to fix the price of any commodity.[9]

But Rockefeller was no autocrat. The standard lesson of Rockefeller's rise is wrong—as is the traditional story of how it happened. Rockefeller did not achieve his success through the destructive, "anticompetitive" tactics attributed to him—nor could he have under economic freedom. Rockefeller had no coercive power to banish competition or to dictate consumer prices. His sole power was his earned *economic* power—which was no more and no less than his ability to refine crude oil to produce kerosene and other products better, cheaper, and in greater quantity than anyone thought possible.

It has been more than one hundred years since Ida Tarbell published her *History of the Standard Oil Company*. It is time for Americans to know the real history of that company and to learn its attendant and valuable lessons about capitalism.

The "Pure and Perfect" Early Refining Market

Any objective analysis of the nature of Rockefeller's rise to dominance—Standard Oil had an approximately 90 percent market share in oil refining from 1879 to 1899[10]—must take into account the context in which he rose. This means taking a thorough look at the market he came to dominate, before he entered it.

Traditional accounts of Rockefeller's ascent, which began in 1863, portray the pre-Rockefeller market as a competitive paradise of myriad "independent refiners"—a paradise that Rockefeller destroyed when he drove his competitors out of business and wrested full "control" of the oil refining business for himself.

This idealized view of the early oil refining market appeals to most readers, who have been taught that a good, "competitive" market is one with as many viable competitors as possible, and that it is "anti-competitive" to have a market with a few dominant participants ("oligopoly"), let alone one dominant participant ("monopoly"). This view of markets was formalized in the 20th century as the doctrine of "pure and perfect" or "perfect" competition, which holds that the ideal market consists of as many distinct producers as possible, each selling equally desirable, interchangeable products. Under "perfect competition," no one competitor has any independent influence on price, and the profits of each are minimized as much as possible (on some variants of "perfect competition," prices equal costs and profits are nonexistent). Although advocates of this view acknowledge (or lament) that it cannot exist in reality, they view it as a model market toward which we should at least strive.

By this standard, the early oil refining market was "perfect" in many ways. Many small, "independent," practically indistinguishable refiners were in business. No one threatened to drive the others out of business, and the market was extremely easy to enter; those with no experience in refining could buy the necessary equipment for three hundred dollars and start making profits almost immediately.[11] Some refiners recovered their start-up costs after one batch of kerosene.[12]

But the traditional perspective ignores the crucial aspect of markets relevant to their impact on human life: their *productivity*—how much it produces, the value of that which is produced, and the efficiency with which it is produced. By this standard, the oil refining market was anything but perfect—refiners were at an early, primitive stage of productivity, which happily ended.

This is not a moral criticism of the early oil refining industry. The first five years of that industry, along with the crude production industry, from 1859 to 1864, were full of great achievements. It is almost impossible to overstate the dramatic and near-immediate positive effect of a group of scientists and businessmen discovering that "rock oil," previously thought to be useless, could be refined to produce kerosene—the greatest, cheapest source of light known to man. In 1858, a year before the first oil well was drilled, only well-to-do families such as that of 11-year-old Henry Demarest Lloyd could afford sperm whale oil at three dollars per gallon to light their homes at night.[13] For most, the day lasted only as long as did the daylight. But by 1864, just five years into the industry, a New York chemist observed:

> Kerosene has, in one sense, increased the length of life among the agricultural population. Those who, on account of the dearness or inefficiency of whale oil, were accustomed to go to bed soon after the sunset and spend almost half their time in sleep, now occupy a portion of the night in reading and other amusements; and this is more particularly true of the winter seasons.[14]

Still, the market's primitive methods of production and distribution at this early stage made it impossible for it to have anywhere near the worldwide impact it would have by the time Lloyd's famous essay damning Rockefeller was published.

A particularly problematic area was transportation, which was convoluted and extremely expensive. Oil was transported in 42-gallon wood barrels of spotty quality, costing $2.50 each. Each one had to be filled and sealed separately and piled onto a railroad platform (where barrels were prone to leak or fall off) or occasionally onto a barge (where barrels were prone to fall off and start fires).[15] The myriad small refiners each could ship only a handful of barrels at a time; this required the railroads to make many separate stops at different destinations for different refiners, which resulted in a lengthy and expensive journey for both railroads and refiners. And for some time, this was the *best* aspect of the process. In the early days, to get barrels of crude oil from assorted oil spots in northwest Pennsylvania onto railways headed for the refineries, oil was transported by horse and wagon by teamsters, often through roadless territory and waist-high mud, with barrels perpetually bouncing and frequently breaking or falling out. (Because of government intervention, the teamsters had a huge influence in politics and for years prevented the construction of local pipelines—an incomparably superior form of oil transportation.)[16]

The refining process, the core of the industry, was also at a primitive stage. To refine crude oil is to extract from it one or more of its valuable "fractions," such as kerosene for illumination, paraffin wax for candles, or gasoline for fuel. The heart of the refining process uses a "still"—a distillation apparatus—to heat crude oil at multiple, increasing temperatures to boil off and separate the different fractions, each of which has a different boiling point. Distillation is simple in concept and basic execution, but to produce quality kerosene and other by-products requires precise temperature controls and various additional purification procedures. Impure kerosene could be highly explosive; death by kerosene was a common phenomenon in the 1860s and even the 1870s, claiming thousands of lives annually. In fact, the spotty quality of much American kerosene is what inspired John Rockefeller to call his company Standard Oil.[17]

Some refineries in the early 1860s, such as those of famed refiners Joshua Merrill and Charles Pratt, produced safe, high-quality kerosene, but most did not. Tarbell's exalted "independent refiners" from the Oil Regions of Pennsylvania, incidentally, produced the worst quality kerosene.

“Deluded by petroleum enthusiasts as to the simplicity of refining,” write Williamson and Daum in their comprehensive history of the early petroleum industry, “individuals inexperienced in any form of distillation flocked into the new business…” But, they note,

> successful petroleum refining . . . called for the utmost vigilance… Real separation of the various components of crude oil was no objective at all; their major purpose was simply to distill off the gases, gasoline and naphtha fractions as fast as heat and condensation could permit. All condensed liquid that conceivably could be fobbed off as burning oil . . . was recovered and the tar residue was thrown away… Only in the provincial isolation of the Oil Region and nearby locations did such outfits receive serious designations as petroleum refineries.[18]

In a mature market, such operations, with their inferior, hazardous products, would never succeed. But in the early stages of the market, *anyone* could succeed, because the overall refining capacity was insufficient to meet the enormous demand for kerosene.Even lower-quality kerosene was spectacularly valuable compared to any other illuminant Americans could buy.

The supply-and-demand equation of kerosene even made it possible for refiners with low efficiency to profit handsomely. In 1865, kerosene cost fifty-eight cents a gallon; at one-fifth the cost of whale oil this was a great deal for consumers—and it was a price at which anyone with a still could make money. Even if the still was very small, requiring much more manpower and other expenses per gallon of output than a larger still; even if the still refined only kerosene and failed to make use of the other 40 percent of crude; even if the still was low-quality and needed frequent repair or replacement—the owner could turn a healthy profit.[19]

This stage of the industry was necessarily temporary. As more and more people entered the refining industry, attracted by the premium profits, prices inevitably went down—as did profits for those who could not increase their efficiency accordingly.

Such a process, which began in the mid-1860s, was more dramatic than almost anyone expected. Between 1865 and 1870, refining capacity exploded relative to oil production, and prices plummeted correspondingly. In 1865, kerosene cost fifty-eight cents a gallon; by 1870, twenty-six cents.[20] Refining capacity was increasing relative to the supply of oil; by 1871 the ratio of capacity to crude production was 2.5:1.[21] At this point, those who expected to make a livelihood with three-hundred-dollar stills found the market very inhospitable. A shakeout of the efficient men from the inefficient boys was inevitable. In the mid-1860s, no one imagined that the best of the men, by orders of magnitude, would turn out to be a 24-year-old boy named John Davison Rockefeller.

The Phenomenon

In 1863, the first railroad line was built connecting the city of Cleveland to the Oil Regions in Pennsylvania, where virtually all American oil came from. Clevelanders quickly took the opportunity to refine oil—as had the residents of the Oil Regions, Pittsburgh, New York, and Baltimore. Cleveland had the disadvantage of being one hundred miles[22] from the oil fields but the advantage of having far cheaper prices for materials and land (Oil Regions real estate had become extremely expensive), plus proximity to the Erie Canal for shipping.[23]

In 1863, Rockefeller was running a successful merchant business with his partner, Maurice Clark, when a local man named Samuel Andrews approached the two. A talented amateur chemist, Andrews sought their investment in a refinery. After investigating the industry, Rockefeller convinced Clark that they should invest four thousand dollars.[24] Rockefeller was attracted to the substantial—and then stable—profits of the refining industry, in contrast to the production industry, which alternated between incredible booms and busts. (When producers struck a “gusher,” whole towns were built up to the height of 1860s luxury; when they dried up, those towns faded into abject poverty.) He was not, however, impressed with the efficiency with which refiners ran their operations. He believed he could do better.

And he did—immediately. Instead of setting up a shanty refinery, Rockefeller invested enough to create the largest refinery in Cleveland: Excelsior Works. From the beginning, he encouraged Andrews to expand and improve the refinery, which soon produced 505 barrels a day,[25] as compared to some refineries in the Oil Regions that produced as few as five barrels a day.[26] Additionally, in a highly profitable act of foresight, Rockefeller carefully bought the land for his refinery in a place from which it would be easy to ship by railroad *and by water*, thus putting shippers in competition for his business; his competitors simply placed their refineries near the new Cleveland rail line and took for granted that it would be their means of transportation.[27]

Rockefeller's business background made him well-suited to run a highly efficient firm. His first interest in business had been accounting—the art of measuring profit and loss (i.e., economic efficiency). Rockefeller's first job had been as an assistant bookkeeper, and for his entire career he revered the practice of careful financial record-keeping. "For Rockefeller," writes Ron Chernow, "ledgers were sacred books that guided decisions and saved one from fallible emotion. They gauged performance, exposed fraud, and ferreted out hidden inefficiencies."[28]

Rockefeller was hardly the only man in the refining industry with a background in accounting or a concern with efficiency. But he was distinguished in this regard by his *degree of focus* on applying good accounting practices to his new business. Rockefeller, from a young age, exhibited an obsessive, laser-like concentration on whatever he chose as his purpose. At age sixteen he landed an accounting job after six weeks of repeated visits to top firms, shrugging off rejections until he finally convinced one of them, Hewitt and Tuttle, to hire him.[29] Applied to the task of minimizing costs and maximizing revenues in his refining operation, Rockefeller's focus brought Standard Oil phenomenal success.

While other refiners took any given business cost for granted—including the cost of barrels and the cost of crude—Rockefeller put himself and those who worked for him to the task of discovering ways to lower every cost while continuously seeking additional sources of revenue.

Consider the cost of transporting oil in barrels. Barrels were a major expense for everyone in the industry, and barrel makers were notoriously unreliable when it came to delivering barrels on time. Rockefeller at once slashed his costs and solved this reliability problem by having his firm manufacture its own barrels. He purchased forest land, had laborers cut wood, and—in a crucial innovation—had the wood dried in a kiln before using it to transport kerosene. (Others used green wood barrels, which were far heavier and thus more expensive to transport.) With these and other innovations, Rockefeller's barrel costs dropped from $2.50 a barrel to less than $1 a barrel—and he always had barrels when he needed them.[30]

Rockefeller further lowered his costs by eliminating the use of barrels altogether in receiving crude oil (barrels would remain in use for shipping refined oil to customers for some time). He did so by investing in "tank cars"—railroad cars fitted with giant tanks—shortly after they came on the market in 1865. By 1869, he owned seventy-eight of them, yielding huge cost savings over his competitors.[31]

Or consider the cost of buying crude, which most people took as entirely dependent upon current market prices. One way in which he cut this cost was by employing his own purchasing agents, which eliminated the need for paying "jobbers" (purchasing middlemen). A shrewd negotiator, Rockefeller trained his purchasing agents to obtain the best possible prices. Further saving money and improving his negotiating position, Rockefeller built large storage facilities to keep crude in reserve, so that he would not have to pay exorbitant prices in the event of a spike in its price. Accordingly, his purchasing agents developed comprehensive, constantly updated knowledge of the industry so that they could determine the most opportune times to purchase crude.

These improvements, along with many others, reflected a practice that characterized Rockefeller's firm for his thirty-five years at the helm: *vertical integration*—incorporating into a company functions that it had previously paid others to do. Time after time, Rockefeller found that, given his and his subordinates' talent and innovative spirit, many facets of the business could be done more cheaply if his firm undertook them itself.

Rockefeller also lowered costs in the refining process itself. One particularly innovative form of cost-cutting in which he engaged was self-insurance against fires. In the early refining industry, the danger of fire was omnipresent. Even in the 1870s, when safety improved significantly, premiums "varied from 25 per cent down to 5 per cent of valuation…"[32] Rockefeller determined that he could save money by self-insuring. He regularly set aside income to handle fire damage, while implementing every safety precaution he and his men could think of. The practice saved the company thousands and, eventually, millions of dollars; over time, its insurance funds grew to the point where they could be used to pay large dividends to shareholders. (In later years, Rockefeller contained the risk of fire even more by multiplying refineries across the country, so that one disaster could do only so much damage.)[33]

Another refining cost that Rockefeller minimized was the chemical treatment of kerosene. Samuel Andrews was skilled at determining the right quantity of sulfuric acid needed to completely purify distilled kerosene. This was important because sulfuric acid was expensive. Rockefeller saved money by getting ideal results with 2 percent whereas competitors often used up to 10 percent.[34]

And in building his refineries, Rockefeller used the highest quality materials to get maximum longevity from equipment—thus avoiding the reliability issues of early stills—and he built large facilities so as to lower his labor costs per gallon refined.

Rockefeller also worked to maximize the amount of revenue he could bring in, both by selling by-products of crude besides kerosene and by establishing marketing operations in major consumer states and overseas. Appalled at the idea of wasting the 40 percent of his crude that was not kerosene, Rockefeller extracted and sold the fraction naphtha, and he sold much of the remaining portion of the crude to other refiners who specialized in other non-kerosene fractions, such as paraffin wax and gasoline. (He also used fuel oil from crude to help power his plants, thereby saving money on coal.) Later, Rockefeller's firm refined and sold all these fractions—becoming what is called a "complete" refinery—but even before that development, he let no cost-cutting or value-creating opportunity go to waste.

In the mid-1860s, Rockefeller set up an office in New York City to focus on overseas sales. The overseas market for kerosene was larger than the American market and presented a great opportunity to Rockefeller since nearly all the world's known oil at the time was American. Recognizing the importance of having a steady stream of foreign demand, Rockefeller had his brother head the New York operation to keep tabs on the various markets and maximize sales.

These improvements in efficiency and marketing resulted in a company that was staggeringly more productive than most of its rivals, and well on its way to revolutionizing the oil refining industry.

Rockefeller's obsession with cutting costs has been called "penny-pinching"[35]—a term that aptly describes his desire and ability to cut costs to the smallest detail. But insofar as it conjures an image of a miserly businessman, the term does not apply. Rockefeller, by disposition and in action, was anything but averse to spending money; he recognized that spending in the form of *investing* was vital to the dramatic increases in efficiency he sought and achieved.

Many of Rockefeller's penny-pinching methods *required* investments, often large ones. He knew that although these would cut into his cash in the short run, they would prove profitable in the long run—if the company simultaneously invested in its growth. The greater the firm's output, the more it could leverage economies of scale, achieving greater efficiency by dispersing productivity-increasing costs over a greater number of units. By virtue of its size and output, Rockefeller's firm was able, for example, to purchase, maintain, and replant forests in order to more efficiently produce barrels—a strategy that would be utterly unprofitable for a small refiner producing, say, fifty barrels a day.

The bigger the company, the more it can invest in efficiency-increasing measures—from tank cars to forests to purchasing agents to self-insurance—when it makes financial sense. Recognizing this, Rockefeller reinvested profits in the business at every opportunity. Whereas other oilmen in the booming 1860s spent almost all of their profits on the premise that current market conditions would endure and therefore future revenue would easily cover their future costs, Rockefeller reinvested as much of the firm's profit as possible in its growth, efficiency, and durability.

Rockefeller also solicited large amounts of capital from outside the company. Early on, he borrowed money frequently, which he could do easily given his lifelong track record of perfect credit. Rockefeller's penchant for borrowing turned out to be his path to assuming full leadership of the company. His business partner, Maurice Clark, routinely complained during the refinery's first two years about Rockefeller's borrowing, and in 1865 threatened to dissolve the firm. Rockefeller called his bluff, announced the dissolution in the paper, and agreed to bid with him for the refinery business. The 26-year-old Rockefeller won, for a price of $72,500 (the equivalent today of about $820,000).[36] Clark thought he had gotten a bargain—but given what Rockefeller was to accomplish in the next five years, Clark would undoubtedly come to think twice.

In 1867, Rockefeller accepted an outside investment of several hundred thousand dollars from Henry Flagler and John Harkness.[37] The investment turned out better than anyone could have hoped; Rockefeller gained not only vital capital, but also Flagler, who would be his beloved right-hand man for decades to come.

By 1870, the firm of Rockefeller, Andrews, and Flagler was, thanks to Rockefeller's vision, a super-efficient refining machine, generating more than fifteen hundred barrels a day[38]—more than most refineries could produce in a week—at lower cost than anyone else. And in that year, the firm became the Standard Oil Company of Ohio—a joint-stock company, of the type used by railroads, that enabled Rockefeller to more easily acquire other refiners in the coming years.

Reflecting Rockefeller's profitable investments in efficiency, the Company declared assets including " . . . sixty acres in Cleveland, two great refineries, a huge barrel making plant, lake facilities, a fleet of tank cars, sidings and warehouses in the Oil Regions, timberlands for staves, warehouses in the New York area, and [barges] in New York Harbor."[39]

But Standard's most important asset was Rockefeller, followed by his close associates. Rockefeller's ambition for the expansion of the business was only growing, and he talked with Henry Flagler morning, noon, and night about possibilities and plans. Reflecting on the company nearly fifty years later, Rockefeller recalled: "We had vision. We saw the vast possibilities of the oil industry, stood at the center of it, and brought our knowledge and imagination and business

experience to bear in a dozen, in twenty, in thirty directions."[40]

The days of indistinguishably inefficient refiners were over. And Rockefeller, barely thirty, was just scratching the surface of his productive potential.

Having explored this much of Rockefeller's hard-earned success, let us turn to his most controversial form of cost savings and efficiency: railroad rebates.

The Virtuous Rebates

Historians overwhelmingly attribute Rockefeller's success to his dealings with the railroads, dealings that are almost universally viewed as "anticompetitive."

Here is Ida Tarbell's description of how Rockefeller advanced ahead of other refiners—as described from their perspective (with which Tarbell agrees).

> John Rockefeller might get his oil cheaper now and then . . . but he could not do it often. He might make close contracts for which they [other refiners] had neither the patience nor the stomach. He might have an unusual mechanical and practical genius in [Samuel Andrews]. But these things could not explain all. They believed they bought, on the whole, almost as cheaply as he, and they knew they made as good oil and with as great, or nearly as great, economy. He could sell at no better price than they. Where was his advantage? There was but one place where it could be, and that was in transportation. He must be getting better rates from the railroads than they were.[41]

This is an unforgivable evasion of Rockefeller's vast productive superiority over his competitors in the late 1860s. It is possible that some of Rockefeller's competitors believed this in the 1860s—as Rockefeller, to the extent possible, kept his business methods and the scope of his operations secret—but for Tarbell to write this in the 1900s is absurd.

Also absurd is the implication of the success-by-rebates story: that railroads arbitrarily gifted Rockefeller with rebates so enormous he was able to bankrupt the competition. No seller of the era (or any era) *gave* Rockefeller or anyone unnecessary or unprofitable discounts—certainly not railroads, which were often struggling financially. Rockefeller *earned* his rebates, by devising ways to make his oil cheaper to ship and by setting shippers in competition with one another so that he could negotiate them down to the best price.

The story of Standard's first known rebate illustrates the true nature of the phenomenon. In this case, Standard extracted a big discount by dramatically lowering a railroad's shipping costs.

When the Lake Shore railroad built a connection to Cleveland in 1867, Flagler went to the railroad's vice president and offered to pay 35 cents a barrel for shipping crude from the Oil Regions to Cleveland, and $1.30 a barrel for kerosene sent to New York (usually for export). In exchange for these discounts, Flagler offered the Lake Shore a major incentive: guaranteed, large, regular shipments. This was a huge boon to the Lake Shore, and its vice-president James H. Devereux readily accepted the deal. As he explained:

> [T]he then average time for a round trip from Cleveland to New York for a freight car was thirty days; to carry sixty cars per day would require 1,800 cars at an average cost of $500 each, making an investment of $900,000 necessary to do this business, as the ordinary freight business had to be done; but [research showed] that if sixty carloads could be assured with absolute regularity each and every day, the time for a round trip from Cleveland to New York and return could be reduced to ten days, . . . only six hundred cars would be necessary to do this business with an investment therefore of only $300,000.[42]

Praising the rebate as a boon to the Lake Shore, Devereux said: "Mr. Flagler's proposition offered to the railroad company a larger measure of profit than would or could ensue from any business to be carried under the old arrangements..."[43]

Guaranteed, large shipments were a landmark, cost-cutting innovation in oil transportation—identical in nature to Rockefeller's use of tank cars or his cost-cutting in barrel production. As economic and antitrust historian Dominick Armentano summarizes, Standard also "furnished loading facilities and discharging facilities at great cost; . . . it provided terminal facilities and exempted the railroads from liability for fire by carrying its own insurance."[44]

In addition to lowering railroads' costs to obtain better prices, Rockefeller's firm was expert at setting railroads against one another and cultivating alternative means of shipping, such as waterways, to further lower shipping costs. Having established the location of his first refinery near the Erie Canal and having built up a large capital position he was able to take advantage of the lower rates of shipping by water; because it was slower than shipping by land it required a company to have, in addition to water access, the capital to handle the larger delay between paying for crude and being paid for kerosene. Of much of his competition, Rockefeller said: "The others had not the capital and could not let the oil remain so long in transit by lake and canal; it took twice as long that way…"[45]

Rockefeller's rebates, then, were an earned cost savings of the sort that any market competitor—and any consumer—should perpetually seek. The extent to which others could not match the low prices he was able to charge in the 1870s as a result of his many cost-cutting measures, including this one, is simply an instance of productive inferiority; nothing about it is coercive or "anticompetitive." To say that Rockefeller—by cutting his costs, thus enabling himself to sell profitably for lower prices and win over more customers—was rendering competitors "unfree" is like saying that Google is rendering its competitors unfree by building the most appealing search engine. To call Rockefeller's actions "anticompetitive" is to say that "competition" consists in no one ever outperforming anyone else. Economic freedom does not mean the satisfaction of anyone's arbitrary desires to succeed in any market regardless of ability or performance or consumer preferences; it means that everyone is free to produce and trade by voluntary exchange to mutual consent. If one cannot compete in a certain field or industry, one is free to seek another job—but not to cripple those who are able to compete.

True economic competition—the kind of competition that made kerosene production far cheaper—is not a process in which businessmen are forced by the government to relinquish their advantages, to minimize their profits, to perform at the norm, never rising too far above the mean. Economic competition is a process in which businessmen are free to capitalize on their advantages, to maximize their profits, to perform at the peak of their abilities, to rise as high as their effort and skill take them.

Rockefeller's meteoric rise and the business practices that made it possible—including his dealings with the railroads—epitomize the beauty of a free market. His story provides a clear demonstration of the kind of life-serving productivity that is the hallmark of laissez-faire competition.

The Missing Context of Standard's Rise to Supremacy

The 1870s was a decade of gigantic growth for the Standard Oil Company. In 1870, it was refining fifteen hundred barrels per day—a huge amount for the time. By January 1871, it had achieved a 10 percent market share, making it the largest player in the industry. By 1873, it had one-third of the market share, was refining ten thousand barrels a day and had acquired twenty-one of the twenty-six other firms in Cleveland. By the end of the decade, it had achieved a 90 percent market share.

Such figures are used as ammunition by those who believe in the dangers of acquisitions and high market share. These critics believe that Standard's growth and its ability to acquire so many companies so quickly "must have" come from some sort of "anticompetitive" misconduct—and they point to Standard Oil's participation in two cartels during the early 1870s as evidence of Rockefeller's market malice.

But the growing success of Standard did not flow from these attempted cartels—neither of which Standard initiated, and both of which failed miserably in very short order—but from the company's enormous productive superiority to its competitors, and from the market conditions whose groundwork had been laid in the 1860s. Without understanding these conditions, one cannot understand Rockefeller's exceptionally rapid rise.

Recall that in 1870 kerosene cost twenty-six cents a gallon, while three-fourths of the refining industry was losing money. A major cause of this was that refining capacity was at 12 million barrels a year, while there were only 5 million barrels to refine,[46] a disparity that had an upward effect on the price of the crude that refiners purchased—and a downward effect on the price of the refined oil they sold. On November 8, 1871, a writer for the *Titusville Herald* estimated that "at present rates the loss to the refiner, on the average, is seventy-five cents per barrel."[47] Rockefeller's firm, which was engineered to drastically lower production costs, could profit with such prices; few other firms could.

Even if there had not been a major excess of refining capacity, most of the refiners in America would have been unable to survive without drastically transforming their businesses. Rockefeller had raised the industry bar, and was expanding; anyone who hoped to compete with him would have to run a refining operation of comparable scale and efficiency.

Still, the excess capacity exacerbated the trouble for the lesser refiners—many of whom further exacerbated their own

trouble by refusing to close or sell their failing businesses. In 1870, the *Pittsburgh Evening Chronicle* described the "very discouraging" tendency of the industry to *increase* refining capacity "ad infinitum" even during difficult times.[48] One projection in 1871 put the rate of expansion at four thousand barrels per day.[49]

Refiners hoped that the old prices would come back. But the harsh reality for those refiners was that they could return to profitability only if they could restructure their businesses as modern, technological enterprises with the economies of scale on the order of those achieved by Standard. This reality became increasingly apparent over the decade as prices dropped from 26 cents a gallon in 1870, to 22 cents in 1872, to 10 cents in 1874.[50]

The failing refiners were neither the first nor the last businesses to be in such a situation. And, like many before and after them, they tried to solve their problems via cartels: agreements among producers to artificially reduce their production in order to artificially raise their prices. Rockefeller, hoping for stability in prices and an end to the irrationality of others refining beyond their means, joined and supported two cartels. This move was disastrous—the worst of Rockefeller's career.

Cartels are generally viewed as evil, destructive schemes because they are overt attempts by a group of businesses to increase revenues by raising consumers' prices across an industry. In and of itself, however, seeking higher prices for one's products is not evil; it is good. The problem with cartels is not that they seek higher profits, but that they shortsightedly attempt to generate them by non-productive means. So long as the economic freedom to offer competing or substitute products exists—as should be the case—such a scheme is bound to fail.

Cartels are more accurately viewed as ineffectual than evil. Cutting off supply in order to effect higher profits rewards those who do not participate in the scheme (as well as cheaters within the cartel) with the opportunity to sell more of their own products at inflated prices. And to attempt a cartel is to invite a boycott and long-term alienation from one's customers. These truths were borne out by both the South Improvement Company (SIC) scheme and the Pittsburgh Plan.

The Pennsylvania Railroad and its infamous leader, Tom Scott, a master manipulator of the Pennsylvania legislature, initiated the South Improvement Company cartel. Railroads, like oil refiners, were struggling financially; they too had overbuilt given the market. Having less traffic than they had anticipated, they sought to solve the problem by charging above-market prices. Here is the essence of their plan: The railroads would more than double the rates for everyone outside the cartel, including oil producers, to either bring all refiners into the SIC or drive them out of business. In turn, SIC refiners, which could constitute virtually all the refiners on the market, would impose strict limits on their output in order to raise prices. It seemed to be a "win-win" plan: The railroads would get higher rates and more revenue, and SIC refiners would raise prices and start profiting again.

This whole scheme, however, was delusional. For one, it presumed that the oil producers would accept catastrophic rate increases. They did not.

The oil producers—who were also the railroads' consumers and the refineries' suppliers—retaliated by placing an embargo on refineries associated with the South Improvement Company. The proposed rate increases were so dramatic and arbitrary that producers were strongly committed to the embargo—and it worked, cutting off Standard's operations while benefiting those who did not participate. Writes Charles Morris in *The Tycoons*, "By early March, [1872] the Standard was effectively out of business, and up to 5,000 Cleveland refinery workers were laid off… [In early April] the triumphant producers announced the end of their embargo."[51] The South Improvement Company never collected a rebate.

So much for Standard's and the SIC's "monopoly power."

The other cartel in which Standard participated, the Pittsburgh Plan, was an agreement between oil producers and refiners to inflate their respective prices. While the 1870s began with high crude prices due to low crude supply and excess refinery capacity, a series of gushers soon reduced the price of crude to about $3.50 a barrel. Oil producers wanted to reverse this trend. Again, the idea was to artificially restrict production, raise prices, and reap the profits while competitors and consumers idly complied. The participants agreed that refiners would buy oil at the premium price of $5 a barrel (in some cases $4) so long as the producers substantially limited their production. Refineries, also, would limit production to raise their prices. The deal was wildly illogical; part of it stipulated that producers in the Oil Regions would simply cease new drilling for six months.

The plan dissolved in short order. Producers outside the cartel did not play their role of not trying to make a profit; instead, they expanded their production to make money—as did cartel members once this started happening. Prices fell—indeed, they fell immediately to the market rate, $3.25; within two months, following more crude discoveries, prices fell again, down to $2.[52]

Historians try to outdo one another in denouncing the oil cartels as immoral. But given the desperation of many in the industry, and the relatively primitive understanding of how such arrangements pan out, it is more valuable to learn from the incidents, to gain a better understanding of the nature of cartels and other attempts to control markets under economic freedom.

Despite a huge percentage of refiners trying collectively to control market prices, they could not do so—because they had no means of *forcing* consumers to pay their prices or of forcing other producers not to compete by offering lower prices. The only thing they could control was their own production and whether it was the best it could be. Before the cartels, Rockefeller had relied solely on stellar production and efficiency to achieve great success; his participation in the cartels brought him failure and ire and was antithetical to his fundamental goal of *expanding production*.

In the wake of the South Improvement Company fiasco, Rockefeller claimed that he had never believed the cartel would work and that he had participated in it merely to show failing refiners that the only solution to their problems was to sell their businesses to him. Given his company's prominent role in the SIC, this is likely overstated. But it is undeniable that while planning the cartel, Rockefeller began an aggressive policy of acquisition and improvement that continued throughout the decade.

From 10 to 90 in Eight Years

Rockefeller had several motives for acquiring competitors. First, other refineries had talent and assets that he wanted—including facilities that produced not only kerosene, but a full range of petroleum products. Second, he wanted to eliminate the industry's excess refining capacity and its accompanying instability as soon as possible, rather than ride out the storm as the other ships sank.

Rockefeller made his first acquisition in December 1871. He proposed a buyout to Oliver Payne of Clark, Payne & Company, which was his biggest competitor in Cleveland (and which featured the same Clark family that initially had been involved in business with Rockefeller). Payne, suffering from the depressive industry conditions and without much hope of timely relief, was open to the possibility of selling. The decisive moment in the negotiations came when Rockefeller showed Payne Standard's books. Payne was "thunderstruck" by how much profit the company was making under conditions in which others were flailing.[53] Rockefeller bought the company for $400,000 (a "goodwill" premium of $150,000 more than its then current market value).

After acquiring Clark, Payne & Company, Rockefeller increased his company's capitalization to $3.5 million and went on an acquisition spree—later dubbed "The Conquest of Cleveland." By the end of March 1872, he had proposed to buy out all of the other refiners in Cleveland, and twenty-one of twenty-six had already agreed. During 1872, Rockefeller also bought several refineries in New York, a crucial port, at which point he owned 25 percent of the refining capacity there.[54]

According to many analysts, the rapidity of acquisition "proves" that Rockefeller was involved in devious activities. But it proves nothing of the sort. The basic reason so many sold was that Rockefeller's propositions made economic sense; if the second leading refiner in Cleveland was "thunderstruck" by the superiority of Standard's efficiency, imagine the relative economic positions of the smaller, even less efficient refiners.

Another common view is that the "threat" of the proposed South Improvement Company frightened Cleveland refiners into selling to Rockefeller. But, if anything, as has been shown, the SIC provided incentive for refineries to remain independent.

A better explanation of why so many sold to Rockefeller is that they were eager to be bought out; in fact, a problem later surfaced with frauds trying to set up new refineries just to be bought out by Rockefeller. Of course, it took only a handful of acquisition targets, resentful of a market that had superseded them, to make a "devastating exposé" and gain a place in the anti-capitalist canon.

What if a company Rockefeller wanted to buy was not willing to sell? Accounts differ, but one plausible account is that he gave the competitor "a good sweating" (an expression attributed to Flagler) by lowering prices to a point where Standard remained profitable but the competitor would go out of business quickly. This practice is labeled "predatory pricing"—but it is no such thing. If predatory pricing is taken to mean lowering one's prices below cost to drive a competitor out of business—and then raising those prices to artificially high levels once the competitor has been eliminated—then Rockefeller did not engage in "predatory pricing," at least not to any significant extent. If he had tried, he would have experienced the fact that, like cartels, this form of attempting to profit through unproductive measures fails. In general, large companies that attempt to profit by this means find that they lose money at alarming rates because they are selling

more units at a loss than their "prey" is selling. If they do manage to destroy an existing company, they have weakened themselves in the process, thus providing an opportunity for more substantial, more able competitors to enter the market.

Nothing is inherently wrong—either economically or morally—with temporarily selling at a loss in order to eliminate a rickety competitor. And the phrase "predatory pricing" is a misnomer in any event, because no force is involved in the practice of selling at a loss. But Standard Oil did not need to employ such measures to make its acquisitions. The company was so superior in its efficiency and economies of scale that it could price its product at a level at which it could profit but its competitors could not.

A study by John McGee published in 1958 shows that Standard generally did not lower prices below cost and take a loss; rather, it opted for temporarily smaller gains to demonstrate to unsustainable competitors that they were, indeed, unsustainable and would do well to join Standard and thrive.[55] Here is Rockefeller's description of how competitors came to see the situation:

> The point is, that after awhile, when the people, or, at least, the intelligent, saw that we were not crushing or oppressing anybody, they began to listen to our suggestion for a pleasing meeting at which we could quietly talk over conditions and show them the advantage of entering our organizations. One after another they joined us.[56]

Rockefeller used the Conquest of Cleveland to create the most impressive refining concern ever. He took twenty-four refineries and turned them into six state-of-the art facilities, selling the unusable parts for scrap. These refineries constituted a "complete" refining operation, which produced not only kerosene but several profitable by-products. In 1873, these refineries produced 10,000 barrels a day.[57] At this rate, which would only grow, Rockefeller would create nationwide markets for paraffin wax, petroleum jelly, chewing gum, various medicinal products (later found to be of dubious value), fuel oil, and many other products.

In answering a question about Lloyd's characterization of him, Rockefeller contrasted Standard with other refiners: "Here were these refiners, who bought crude oil, distilled it, purified it with sulphuric acid, and sold the kerosene. We did that, too; but we did fifty—yes, fifty—other things beside, and made a profit from each one." And: ". . . every one of these articles I have named to you represents a separate industry founded on crude petroleum. And we made a good profit from each industry. Yet this 'historian,' Lloyd, cannot see that we did anything but make kerosene and get rebates and 'oppress' somebody."[58]

In 1873, Rockefeller began vertically integrating the company to include the acquisition of gathering pipelines for crude oil. These pipelines connected new oil wells to transportation hubs. Managing these with its typical excellence, Standard made its stream of incoming oil more reliable and enabled drillers to quickly find a place to put newfound oil instead of letting it go to waste in an uncontrolled gusher.

Standard was no longer just a kerosene company; it was a full-fledged, integrated oil-refining giant. And, after the Conquest of Cleveland in 1873, Rockefeller, age thirty-three, was still just beginning.

Starting in 1874, Rockefeller focused on acquiring competitors in the rest of the country. He began, as he had in Cleveland, with the major players: Charles Pratt in New York; Atlantic Refining in Philadelphia; and Lockhart, Waring, and Frew in Pittsburgh. He bought out the largest refiners in the Oil Regions, including the refinery of a man named John Archbold, who later became president of Standard when Rockefeller retired.

Rockefeller's operation was so superior to others in every facet—from its marketing efforts, to its access to supplies of crude, to its ability to generate and profitably sell dozens of by-products—that the acquisitions occurred with relative ease, even when he was acquiring his most sophisticated competitors. Charles Morris writes of buying out the Warden interests in Atlantic Refining: "Warden's son recalled that his father was invited to examine the Standard's books and was astonished at its profitability, just as Oliver Payne had been in Cleveland a few years before."[59]

The most difficult acquisitions for Rockefeller were in Pennsylvania. The difficulties were not initiated by the refiners but by the Pennsylvania Railroad and its subsidiary, the Empire Transportation Company (ETC). ETC owned extensive gathering pipelines and tank cars in the region, and it attempted to freeze Standard out of the area and acquire a nationwide refining victory of its own by—of all things—lowering its prices and making transportation nearly free for its refiners. This attempt ended in disaster. Rockefeller, who had provided the Pennsylvania with two-thirds of its freight, first tried to convince the Pennsylvania's Tom Scott to stop his scheme. When that failed, he stopped shipping on the railroad and redirected his domestic and international traffic elsewhere. The Pennsylvania Railroad started hemorrhaging money and, facing terrified shareholders, Scott not only ended the scheme, but he sold ETC to Standard, making

Standard's onloading and offloading transportation network that much more extensive and efficient.

At this point, Rockefeller had earned a 90 percent market share—a 90 percent that was far different in nature than what 90 percent in 1870 would have meant. Rockefeller owned not a grab bag of mediocre operations, but an integrated, coordinated group of facilities in Cleveland, New York, Baltimore, and Pennsylvania, the likes of which had never been imagined. Near the end of the 1870s, he ran, to use the apt cliché, a well-oiled machine. Standard housed millions of barrels of crude in its storage facilities, transported that crude to its refineries by gathering line and tank car, extracted every ounce of value from that crude using its state-of-the-art refining technologies, and shipped the myriad resulting petroleum products to Standard's export facilities in New York—where its marketing experts distributed Standard products to every nook and cranny of the world.

Rockefeller oversaw all of this in conjunction with a team of great business minds (many of whom were obtained through the acquisitions) that understood every facet of the domestic and international oil market and that was always expanding and adjusting operations to meet demand.

It is important to note that as big as Standard was becoming, its leader's obsession with efficiency remained unabated. Rockefeller had a rare ability to conceive and execute a grand vision for the future, while minding every detail of the present. A story told by Ron Chernow in *itan* illustrates this well:

> In the early 1870s, Rockefeller inspected a Standard plant in New York City that filled and sealed five-gallon tin cans of kerosene for export. After watching a machine solder caps to the cans, he asked the resident expert: "How many drops of solder do you use on each can?" "Forty," the man replied. "Have you ever tried thirty-eight?" Rockefeller asked. "No? Would you mind having some sealed with thirty-eight and let me know?" When thirty-eight drops were applied, a small percentage of cans leaked—but none at thirty-nine. Hence, thirty-nine drops of solder became the new standard instituted at all Standard Oil refineries. "That one drop of solder," said Rockefeller, still smiling in retirement, "saved" $2,500 the first year; but the export business kept on increasing after that and doubled, quadrupled—became immensely greater than it was then; and the saving has gone steadily along, one drop on each can and has amounted since to many hundreds of thousands of dollars.[60]

Rockefeller and his firm were as active-minded and vigilant as could be, but in the late 1870s one development in the industry took it by surprise: long-distance pipelines.

A group of entrepreneurs successfully started the Tidewater Company, the first long-distance pipeline. This posed an immediate threat to the railroads' oil transportation revenue, because pipelines are a far more efficient, less expensive means of transporting oil. With sufficiently thick or plentiful pipelines, enormous amounts of oil can be shipped at relatively low cost twenty-four hours a day.

Initially, Rockefeller, the allegedly invincible "monopolist," aided the railroads in fighting Tidewater (including using commonly-practiced political tactics that should have been beneath him) but failed. Realizing the superiority of pipelines, he entered the pipeline business in full-force himself, creating the National Transit Company.

Describing Rockefeller's excellent pipeline practices, oil historian Robert L. Bradley Jr. writes:

> Right-of-way was obtained by dollars, not legal force. Pipe was laid deep for permanence, and only the best equipment was used to minimize leakage. Storage records reflected "accuracy and integrity." Innovative tank design reduced leakage and evaporation to benefit all parties. Fire-preventions reflected "systematic administration." The pricing strategy was to prevent entry by keeping rates low. While these business successes may not have benefited certain competitors, they benefited customers and consumers of the final products.[61]

By 1879, Rockefeller was the consummate so-called "monopolist," "controlling" some 90 percent of the refining market. According to antitrust theory, when one "controls" nearly an entire market, he can restrict output and force consumers to pay artificially high prices. Yet output had quadrupled from 1870 to 1880. And as for consumer prices, recall that in 1870 kerosene cost twenty-six cents per gallon and was bankrupting much of the industry; by 1880, Standard Oil was phenomenally profitable, and kerosene cost nine cents per gallon.[62] It had revolutionized the *method* of producing refined oil, bringing about an explosion of productivity, profit, and improvement to human life. It had shrunk the cost of light by a factor of 30, thereby adding hours to the days of millions around the world. This is the story Henry Lloyd and Ida Tarbell should have told.

The 1880s and the Peril of the "Monopolist"

If antitrust theory was correct, Standard's "control" of 90 percent of the oil refining market, should have made the 1880s its easiest, least-challenging decade—one in which it could coast, pick off competitor fleas with ease, and raise prices into the stratosphere.

In fact, the company struggled mightily in that decade to lower its prices even more—while facing its greatest competitive challenges (foreign and domestic), as well as a bedeviling technological challenge.

In the mid-1880s, Standard executives, like many others in the industry, feared that the world would run out of oil for them to refine. As late as 1885, there were no significant, well-known oil deposits in America outside of northwest Pennsylvania, and those appeared to be drying up. In 1885, the state geologist of Pennsylvania declared that "the amazing exhibition of oil" for the past quarter century had been only "a temporary and vanishing phenomenon—one which young men will live to see come to its natural end."[63] Some executives at Standard even suggested, of all things, that Standard Oil exit the oil business.

Others did not feel this desperation but did wonder where new oil could possibly come from; Pennsylvania was the only known oil source in America, and prospecting technology was still primitive. In 1885, when top executive John Archbold was told of oil deposits in Oklahoma, he said that the chances of finding a large oil field there "are at least one hundred to one against it" and that if he was wrong, "I'll *drink* every gallon produced west of the Mississippi!"[64]

Rockefeller, however, having seen expectations of an oil apocalypse defied again and again in different parts of Pennsylvania, not only remained in the refining business; in a crucial vertical integration involving enormous risk, he also entered Standard Oil into the business of exploration and production.

Happily, by 1887, Standard's new exploration and production division, along with other oil producers, found an abundant oil supply in Lima, Ohio. But there was a problem: The oil was virtually useless.

All crude oil is not created equal—different kinds contain different fractions of potential petroleum products, as well as other elements that can make it harder or easier to refine. The oil discovered in Lima was the worst oil known to man. Its kerosene content was lower than Pennsylvania oil, and the kerosene that could be produced did not burn well, depositing large amounts of soot in any house it was burned in. Worse, due to high sulfur content, the oil emitted a skunk-like odor (it came to be called "skunk oil"). "Even touching this oil," writes historian Burton Folsom, "meant a long, soapy bath or social ostracism."[65] Obviously, kerosene with even a whiff of skunk smell would not appeal to consumers seeking to light their homes—and no known process could remove the smell from the oil.

Rockefeller was undeterred. He proceeded to pump or purchase millions of barrels of the virtually useless oil, confident that with enough effort and science it would be possible to extract marketable kerosene and other products. (In the meantime, he was able to sell some as cheap fuel oil to railroads carrying cargo, for which the smell was not as prohibitive.)

As Rockefeller bought millions of barrels of oil at fifteen cents per barrel, his board, with whom he always collaborated, began to blanch. At one point, a showdown ensued between Rockefeller and Charles Pratt (the son of the great refiner), who said that they could no longer fund this costly experiment. Rockefeller calmly offered to risk $3 million of his own money. Pratt acquiesced, but Rockefeller no doubt would have invested the money, about $65 million in today's dollars, himself if need be.

Standard had accumulated 40 million barrels of skunk oil, when, in 1888, there came a breakthrough. On October 13, Rockefeller's team of scientists, led by a famous German chemist he had hired named Herman Frasch, announced that they had discovered a way to refine the oil.[66] This was a landmark in the history of petroleum. Just as previous refiners discovered how to transform ordinary crude oil from useless glop into black gold, so Standard Oil transformed crude skunk oil into odorless black gold.

At the onset of the 1880s, Standard Oil was known only as a refiner. Thanks to the Lima discovery, Standard would be the leader in crude oil production in the 1890s. In 1888, Standard was responsible for less than 1 percent of crude oil production; in 1891, that number had jumped to 25 percent.[67]

The triumph at Lima was crucial in providing Standard cheap oil during the late 1880s and the 1890s—which it needed in

the face of new, unprecedented competitive challenges from foreign and domestic sources.

As was discovered in the late 1880s, large deposits of oil existed far beyond Pennsylvania and Ohio, most notably in Russia. Locals in Baku, Russia, had known for hundreds of years that *some* oil was there; in the 1880s, explorers from Russia and abroad discovered that there was a lot of it.

The road to this discovery was paved in the 1870s, when the czar opened up the then state-controlled region to free, economic development, and small drillers and refiners got involved. Over time, these men realized that Russia contained oil deposits larger than any known American source—and that the oil was relatively easy to extract. Men from two families, the Nobels and the Rothschilds, having learned from Rockefeller's example, started two soon-to-be formidable firms. Although these producers faced challenges of their own, they posed a huge challenge to Standard Oil on the international market—which comprised most of Standard's customers.

Domestic competitors did not stand still, either. We have already seen how the Tidewater Company challenged Standard in the realm of oil delivery—a challenge that Standard met with the National Transit Company subsidiary and an expansion resulting in three thousand miles of long-distance and gathering pipelines and 40 million barrels of storage capacity.[68] But after Lima, Standard was also challenged in the realms of production and refining. The Lima discovery inspired the emergence of competitors who sought similar discoveries in Kansas, Oklahoma, Texas, and California. And these were not the shanty refinery "competitors" of decades past; they were large, vertically integrated, technologically advanced companies.

Rockefeller faced further competition from sources outside the oil industry. Any producer of any product competes not merely with those businesses selling the same type of product he does, but also with any seller of any product that serves a similar purpose and thus can be its substitute.

In 1878, a man entirely outside the oil industry invented a product that would transform the illumination industry. That man was Thomas Edison; his invention was the electric lightbulb. Although the oil market involved many more products than kerosene, kerosene was still its main product and illumination its primary purpose. Thus, as soon as the lightbulb was announced, the stock prices of publicly traded refiners plummeted. The lightbulb would become a cheaper, safer alternative to kerosene, just as kerosene had become a cheaper, safer alternative to whale oil. (Because of the efficiencies Standard had achieved with kerosene, however, it did take more than a decade for Edison and company to improve the lightbulb to the point that it was economically competitive with Rockefeller's cheapest kerosene.)

Rockefeller's basic response to these competitive challenges was to continue doing what he had been doing to make his company the world leader: He continued to make Standard as efficient as he could, and he kept a vigilant eye on changes in the market. During the 1880s and into the 1890s, Standard Oil, through its continuing productive achievement, remained dominant in an ever-growing market.

Contrary to the antitrust expectation, Rockefeller did not artificially restrict supply and dictate higher prices. He neither had nor sought such power. But he did have the power to be very profitable by producing an excellent product at low cost and by selling it at low prices. In 1880, kerosene cost 9.33 cents/gallon; in 1885, 8.13 cents; in 1890, 7.38 cents. As for the industry's total output, it increased steadily throughout the late 1800s; for example, between 1890 and 1897 kerosene production increased 74 percent, lubricating oil production increased 82 percent, and wax production increased 84 percent.[69]

The fact that Standard Oil faced such stiff competition and was driven to expand output and lower prices even further demonstrates the myth of Rockefeller's "control" of the market. Markets are not possessions that one can acquire or control. They are dynamic, evolving systems of voluntary association, in which competing producers have no ability to force customers to buy their product, nor any ability to prevent others from offering their customers superior substitutes. The expression "control a market share," translated into reality, means simply that at a given time one has persuaded a given group of individuals to buy one's product—a state of affairs that can quickly change if someone offers a superior substitute.

Standard Oil enjoyed high market share because it produced a highly desirable product and offered it at a price that the vast majority of people were willing to pay. If someone else had made cheaper kerosene or a better illuminant than kerosene, or if Rockefeller had lowered his standards or raised his prices significantly, his customers would have purchased their goods elsewhere. Such is the nature of the so-called "monopolist's" control. And such is the nature of economic power.

Contrast this with the genuine coercive power commanded by governments—which can create real monopolies by granting

certain companies exclusive rights to produce a certain type of product. For example, state governments long gave horse-and-buggy-driving teamsters a monopoly on the local transportation of crude, forbidding the construction of local pipelines—and they long gave railroads a monopoly on long-distance transportation, forbidding the construction of long-distance pipelines. Where Rockefeller's competitors failed because they could not match his quality and prices, railroads' and teamsters' competitors failed because the government forbade others from building a higher-quality, lower-priced product. If one wants an example of monopoly in the 19th century, this is it—and its lesson is this: Keep political power out of the markets.

People have long regarded Standard Oil's ability to maintain a 90 percent market share for twenty years as evidence of coercive evil. But if one understands what it took to achieve and maintain that share, one can see that it is evidence only of Rockefeller's productive virtue.

The Standard Oil Trust and the Science of Corporate Productivity

Standard's success in the face of the tremendous competitive challenges of the 1880s was made possible by strategic decisions (such as the Lima venture), by continued improvement in the company's operations, and by Rockefeller's remarkable leadership.

In 1882, the Standard Oil Company became the Standard Oil Trust. As the company had grown across state lines, it needed a corporate structure that could enable it to function as a unified, national corporation. The Trust—officially combining disparate branches of Standard Oil under common ownership and control—was an ingenious way of achieving such integration. As Dominick Armentano explains:

> Choosing an effective legal structure was proving particularly bothersome. Almost all states, including Ohio, did not permit chartered companies to hold the stock of firms incorporated in other states. Yet Standard, by 1880, effectively controlled fourteen different firms, and had a considerable stock interest in about twenty-five others, including the giant National Transit Company. How were these companies to be legally and efficiently managed? In addition, Pennsylvania had just unearthed (with the help of Standard's competitors and some producers) an old state law that allowed a tax on the entire capital stock of any corporation doing any business within its borders; other states threatened to follow suit. Thus, a new organizational arrangement was mandatory to allow effective control of all owned properties and to escape confiscatory taxation without breaking the law.
>
> Standard chose to resurrect an old common law arrangement known as the *trust*. In a trust, individuals pool their property and agree to have a trustee or trustee group manage that property in the interests of all the owners. Just as incorporation allows incorporators to pool their property and choose their directors and managers, trusts in the 1880s allowed the same convenience with entire corporate holdings. Thus, a trust was a modern holding company, but frequently without the formalities of legal incorporation and the necessity of any public disclosure.
>
> The Standard Oil Trust was formed in 1882... The forty-two stockholders of the thirty-nine companies associated with Standard agreed to tender their stock to nine designated trustees; in return, the ex-stockholders received twenty trustee certificates per share of stock tendered. The original Standard Oil Trust was capitalized at $70 million, and John D. Rockefeller himself held over 25 percent. Rockefeller, his brother William, Henry Flagler, John D. Archbold, and five others then managed Standard's entire operations, setting up committees on transportation, export, manufacturing, lubricating, and other affairs to advise the executive committee.[70]

The Trust, often thought of as an economically destructive device, enabled Standard to achieve still greater productivity—every bit of which the company needed in order to face continuing challenges. Let us examine several important aspects of the Standard Oil Trust to appreciate how productively it functioned.

One cardinal aspect was specialization, the process of assigning employees to areas of special focus where they could concentrate their time and effort to become experts at one thing (rather than masters of none). The more Standard Oil grew, the more specialized Rockefeller made his divisions and employees. The Standard Oil Trust featured separate divisions and personnel for every aspect of the productive process—buying, transporting, refining, marketing—and for the different regions of the business. The company operated on the premise that there are always better ways of doing things, often involving machinery, and Rockefeller had an insatiable thirst for new ideas.

In particular, Standard pioneered and excelled at scientific research and development—the key to successes such as that at Lima. Rockefeller's investment in Lima became spectacularly profitable and value-creating—but only because Rockefeller had the vision and courage to also invest, heavily, in scientists.

Most historians overlook Rockefeller's advances in corporate science and focus exclusively on discounts he received from railroads, but this must be rectified. Today, we take R&D for granted as an inherent aspect of business, but it is not; someone pioneered it, and that someone was Rockefeller. Rockefeller pioneered both integrated, large-scale businesses, and the investment of large amounts of capital into scientific research and technological application. As historian Burton Folsom notes:

> When Frasch cracked the riddle of Lima crude, he was probably the only trained petroleum chemist in the United States. By the time Rockefeller retired, he had a test laboratory in every refinery and even one on the top floor of 26 Broadway. This was yet another way in which he converted Standard Oil into a prototype of the modern industrial organization, its progress assured by the steady application of science.[71]

Standard's focus on science led to many other profitable breakthroughs—including the ability to "crack" crude for maximum gasoline. ("Cracking" is changing the molecular structure of crude to increase the amount of a given fraction.) In science, as in many other areas, Standard's internal specialization paid off. Just as specialization under the division of labor in a society makes the society incomparably more productive than a society in which each individual has to produce everything for himself, specialization under the division of labor within Standard Oil had similar results for the company.

The heart of Standard's corporate management structure was its *committee system*. Its goal was to maximize individual autonomy and creativity, while ensuring that all elements of the company were integrated in the direction Rockefeller chose.

An executive committee comprising Rockefeller's top associates was in charge of the general direction of the company. This committee oversaw and monitored various specialized subcommittees that dealt with all different aspects of the business: manufacturing, transportation, purchasing, pipelines, export trade, and so on. And these subcommittees oversaw various subsidiaries in their line of the business, giving them basic direction and enabling them to share and grow their knowledge. As Rockefeller expressed the value of this arrangement:

> A company of men, for example, were specialists in manufacture. These were chosen experts, who had daily sessions and study of their problems, new as well as old, constantly arising. The benefit of their research, their study, was available for each of the different concerns whose shares were held by these trustees.[72]

These subsidiaries even competed with one another, circulating their performance figures and always seeking to improve their performance. As a result, every realm of Standard's productive process got better and better.

Giving the various aspects of the company both independence and an integrated purpose were vital to Standard's ability to take on increasingly more functions of the oil refining industry. A case in point is Standard's entry into the business of *distributing* refined oil, a business that it had long left to middlemen.

Standard's pre-integration approach to distribution was simply to pay three cents a gallon for existing, antiquated distribution methods. Middlemen would remove barrels of kerosene from trains, pile them onto a horse-drawn carriage, and make their rounds selling them to retailers. The efficiency of this process was comparable to the efficiency of transporting crude oil before the advent of tank cars. The quantity, cost-effectiveness, and safety of the arrangement were far less than they could have been. So Standard invested in and utilized high-capacity *tank-wagons*, delivering crude straight to customers in the precise quantities they wanted, cutting out both the middlemen and the barrels.

Taking a swath of the industry that had been the province of others for years and quickly revolutionizing it was a common practice at Standard, one made possible by the organizational system that achieved both autonomy and unity among the company's employees.

Rockefeller's management techniques attracted great minds to Standard, for it gave them work that stimulated their intellect and excited their passions. Rockefeller recognized that nothing mattered more to his organization than talented, thinking men who could generate and execute new ideas. "Has anyone given you the law of these offices?" he asked a new executive. "No? It is this: nobody does anything if he can get anybody else to do it… As soon as you can, get some one whom you can rely on, train him in the work, sit down, cock up your heels, and think out some way for the Standard Oil to make some money."[73]

Of his ability to attract and coordinate talent, Rockefeller said: "It is chiefly to my confidence in men and my ability to inspire their confidence in me that I owe my success in life."[74] "I've never heard of his equal," said Thomas Wheeler, one of his oil buyers, "in getting together a lot of the very best men in one team, and inspiring in each man to do his best for the enterprise."[75]

A key trait Rockefeller exhibited enabled him to bring out greatness in his employees: He communicated in every way he could the importance of the work they were doing—its importance to him, to Standard Oil, and therefore, as he always stressed, to the advancement of human life. He paid higher than market wages to attract the best employees. He awarded shares in the company to employees, explaining: "I would have every man a capitalist, every man, woman and child. I would have everyone save his earnings, not squander it; own the industries, own the railroads, own the telegraph lines."[76] He called Standard Oil a "family"—and he meant it. Wheeler describes how Rockefeller

> sometimes joined the men in their work, and urged them on. At 6:30 in the morning, there was Rockefeller, this billionaire, rolling barrels, piling hoops, and wheeling out shavings. In the oil fields, there was Rockefeller trying to fit 9 barrels on an 8 barrel wagon. He came to know the oil business inside and out and won the respect of his workers. Praise he would give, rebukes he would avoid. "Very well kept, very well indeed," said Rockefeller to an accountant about his books before pointing out a minor error, and leaving.[77]

Rockefeller commanded a huge amount of respect, but did not need to demand it. Burton Folsom tells a story that illustrates how unconcerned Rockefeller was about deference:

> One time a new accountant moved into a room where Rockefeller kept an exercise machine. Not knowing what Rockefeller looked like, the accountant saw him, and ordered him to remove it. "Alright," said Rockefeller, and he politely took it away. Later when the embarrassed accountant found out whom he had chided he expected to be fired. But Rockefeller never mentioned it.[78]

Everyone in the family was valued, but none more than his leading thinkers, the top managers:

> Rockefeller treated his top managers as conquering heroes and gave them praise, rest, and comfort. He knew that good ideas were almost priceless. They were the foundation for the future of Standard Oil. To one of his oil buyers Rockefeller wrote, "I trust you will not worry about the business. Your health is more important to you and to us than the business." Long vacations at full pay were Rockefeller's antidotes for his weary leaders. After Johnson M. Camden consolidated the West Virginia/Maryland refiner for Standard Oil, Rockefeller said, "Please feel at perfect liberty to break away 3, 6, 12, 15 months, more or less. Your salary will not cease, however long you decide to remain away from business." But neither Camden nor the others rested long. They were too anxious to succeed at what they were doing and to please the leader who trusted them so.[79]

Would you want to work for such a manager? That so many did and were inspired to be their best was no doubt indispensable to making the company as innovative and efficient as it was. It is no wonder, then, that many people who are intimately familiar with Rockefeller believe that, in the words of one of his biographers, "Rockefeller must be accepted as the greatest business administrator America has produced."[80] Without such innovative administration, surely no oil company would have achieved anywhere near Standard's degree of success.

Lessons Not Learned

Given the tenuous, voluntary nature of Standard's market share, it was inevitable that at some point the market would expand beyond its reach. Given the explosion of possibilities in the oil industry—the rise of the automobile and the need for gasoline, the discovery of oil in all corners of the planet—not even Standard Oil could be the best at everything. It certainly did not help that Rockefeller became progressively less involved in the company's affairs starting in the 1890s.

The fact that Standard was bound to lose market share did not prevent it from growing. It could and did continue to grow, while others grew, too. Its market percentage shrank, even as its market grew—and changed.

Between 1899 and 1914, the market for kerosene shrank with the rise and continuous improvement of Edison's lightbulb, and with the rise of the automobile. Kerosene dropped from 58 to 25 percent of refined products, whereas gasoline rose from 15 to 48 percent. The age of kerosene, which Standard had dominated, was over.

In the early 1900s, many more competitors came on the scene, some of whom remain household names: Associated Oil and Gas, Texaco, Gulf, Sun Oil, and Union Oil, to name a few. Whereas the number of refineries had once shrunk due to a glut of inefficient ones, new demand across a wide variety of locations along with better business organization and better technology led to a growth in the number of separate refineries—from 125 in 1908 to 147 in 1911.

Between 1898 and 1906, Standard's oil production increased, but its market share of oil production declined from 34 to 11 percent. Similarly, in the realm of refining, Standard's market share declined, while its volume increased steadily from 39 million barrels in 1892 to 99 million in 1911.[81]

By the early 1900s, Standard Oil had provided the world with an illustration of the magnificent productive achievements that are made possible by economic freedom. It had shown that when companies are free to produce and trade as they choose, to sell to as many willing customers as they can, a man or a company of extraordinary ability can make staggering contributions to human life—in this case, lighting up the world, fueling transportation, and pioneering corporate structures that would make every other industry more productive in the decades to come. And, with the emergence of highly profitable competitors in the early 1900s, the notion that Standard "controlled" the market should have been scrapped once and for all.

Unfortunately, blinded by bad ideas and bad motives, the most prominent reporters on Rockefeller and his company did not see this illustration of the glory of laissez-faire—and did not depict it for others to see. Instead, they painted the false picture that has, to this day, tarnished a great man, a great company, and a great economic system.

In 1902, Ida Tarbell began publishing her *History of the Standard Oil Company* as a series of articles in *McClure's* magazine. Meanwhile, Rockefeller critics in the press and in politics called for an end to this "menacing monopoly." According to antitrust historian Dominick Armentano, "Between 1904 and 1906, at least twenty-one state antitrust suits were brought against Standard Oil subsidiaries in ten states. And on November 15, 1906, the federal government filed its Sherman Act case and petitioned for the dissolution of Standard Oil of New Jersey."[82]

The intellectual and political groundwork for a breakup of Standard Oil—and for preventing potential future Standard Oils from reaching its degree of success—had been laid more than a decade earlier when, in 1890, the Sherman Antitrust Act was made law. The act was a fundamental attack on economic freedom—on the premise, as Chernow later put it, that "Free markets, if left completely to their own devices can wind up terribly *un*free." Freedom, in other words, requires government force.

Consider the key clause of the Sherman Act: "Every contract, combination . . . or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal."[83] This explicitly denies businesses the freedom to associate with other businesses and with customers on terms of their choosing; it means that any voluntary arrangement deemed by the government to be in "restraint of trade" can be stopped and punished. And the standard story of Standard Oil gave (and continues to give) supporters of this law ample ammunition.

Thus it is not surprising that, in 1911, the U.S. Supreme Court ruled that Standard Oil had violated the Sherman Act—and broke up the company into thirty-four pieces. The only problem with the proceeding, most believed and still believe, is that it had not taken place many decades earlier, when Standard was "monopolizing" the market in the 1870s.

But having seen the benevolent, life-giving process that actually constituted this "monopolization," we should feel intensely relieved that the Sherman Act was not a factor during Rockefeller's rise. Had it been, his company would have been stunted in its infancy. The original interpretation of the Sherman Act regarded *any* combination or merger as a "restraint of trade" and thus illegal. Recall that Rockefeller's investments in science, his abilities to hire diverse minds and deliver the cheapest, highest-quality petroleum products to people across the nation depended on Standard being a national corporation—and for that, given the legal framework at the time, the Trust was necessary. And under today's interpretation of antitrust law, a company "controlling" more than 30 percent of the market is often considered "anticompetitive" and thus criminal. Standard had a 30 percent market share in the early 1870s, when it had achieved only a fraction of what it would later achieve. Where would we be today if the young genius from Cleveland had had his vision quashed in his youth? How much would corporate efficiency, research and development, and effective management have suffered, not just in the petroleum industry, but in all of American industry? And, most importantly, how unjust would that have been to a man who wanted nothing more than to earn a living by producing kerosene and gasoline as cheaply and plentifully as possible?

All men—including exceptional men such as Rockefeller—have a right to take their enterprises as far as their vision and effort will take them. To throttle an individual because he is a superlative producer who supplies an abundance of life-serving goods to people eager to pay for them is to assault the central requirement of human life: the virtue of

productivity.

It is time to bury the myth of Rockefeller the "robber baron" and to replace it with the truth about this paragon of production. And it is time to repeal the assault on such men that is antitrust law and replace it with the full legal recognition of individual rights.

Endnotes

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