The Beginnings of "Big Business" in American Industry*

The growth of big business in America in the last two decades of the nineteenth century was primarily a response to the rise of urban markets — a result, in turn, of the spreading railroad network. Then, as a new century began to unfold, the dominant influence upon big business development came to be technological. Discernible patterns of integration, combination, diversification, and administration influenced and were influenced by the rise of huge companies and oligopolistic industries. Price competition yielded to other weapons, and the economy adjusted to make room for the young giants in its midst.

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Criteria for Selection and Analysis

The historian, by the very nature of his task, must be concerned with change. What made for change? Why did it come when it did, and in the way it did? These are characteristically

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historians' questions. For the student of American business history, these basic questions can be put a little more precisely. What in the American past has given businessmen the opportunity or created the need for them to change what they were doing or the way they were doing it? In other words, what stimulated them to develop new products, new markets, new sources of raw materials, new ways of procuring, processing, or marketing the goods they handled? What encouraged them to find new methods of financing, new ways of managing or organizing their businesses? What turned them to altering their relations with their working force, their customers and competitors, and with the larger American public?

The question of what constitutes the dynamic factors in American business history, dynamic in the sense of stimulating change and innovation, can be more clearly defined if the country's land, natural resources, and cultural patterns are taken as given. Land and resources were the raw materials with which the businessmen had to work, and the cultural attitudes and values helped set the legal and ethical rules of the game they had to play. Within this cultural and geographic environment a number of historical developments appear to have stimulated change. These provide a framework around which historical data can be compiled and analyzed.

The following major dynamic forces are visible in the American business economy since 1815: the western expansion of population; the construction and initial operation of the national railroad network; the development of a national and increasingly urban market; the application of two new sources of power: the internal combustion engine and electricity, to industry and transportation; and the systematic application of the natural and physical sciences, particularly chemistry and physics, to industry through the institutionalizing of research and development activities.

The first, the westward expansion, appears to have provided the primary impetus, except possibly in New England, to business innovation in the years from 1815 to about 1850; the building of the railroads appears to have been the major factor from the 1850's to the late 1870's; the growth of the national and urban market from the 1880's until a little after 1900; the coming of electricity and the internal combustion engine from the early 1900's to the 1920's; and, finally, the growth of systematic and institutionalized research and development since the 1920's.

These five factors are essentially aspects of fundamental population changes and technological advances. There were, of course, other factors that encouraged business innovation and change. The

coming of the new machines and mechanical devices may have been a more important stimulant to innovation in New England than the growth of her markets and sources of supply in the expanding South and West. Wars usually precipitated change. The business cycle, flow of capital, government policy and legislation all played a significant part in business innovation. But such political and financial developments appear to have intensified or delayed the more basic changes encouraged initially by fundamental population shifts and technological achievements.

The purpose of making such a list is, however, not to argue that one development was more dynamic than the other. Nor are these five factors to be considered as "causes" for change; nor are they "theses" to be argued as representing reality, nor "theories" to provide an over-all explanation of change or possibly of predicting change. They are, rather, a framework on which historical information can be tied and inter-related. They provide a consistent basis upon which meaningful questions can be asked of the data.

This framework and these questions are, it should be emphasized, concerned only with fundamental changes and innovation in the business economy. They do not deal with the day-to-day activities to which businessmen must devote nearly all of their time. They are not concerned with the continuous adaptation to the constant variations of the market, sources of supply, availability of capital, and technological developments. Nor do they consider why some businesses and businessmen responded quickly and creatively to the basic population and technological changes and others did not. But an understanding of the continuous response and adjustment would seem to require first an awareness of the meaning of the more fundamental or "discontinuous" changes.

Since historical compilation and analysis must be selective, it is impossible to undertake any historical study without some criteria either implicit or explicit for selection. Further study and analysis, by indicating the defects of this approach and framework, will suggest more satisfactory ones. In the process, an analysis and interpretation of change in the American business past should come a little nearer to reality.

The purpose of this article then is, by using the framework of basic, dynamic forces, to look a little more closely at the years that witnessed the beginnings of big business in American industry. What types of changes came during these years in the ways of marketing, purchasing, processing, and in the forms of business organization? Why did these changes come when they did in the way they

did? Was the growth of the national market a major prerequisite for such innovation and change? If not, what then was? How did these innovations relate to the growth of the railroad network or the coming of electricity and the internal combustion engine?

In addition to secondary works on this period, the data used in seeking answers to these questions have been annual and other corporation reports, government documents, articles in periodicals, histories, and biographies concerning the 50 largest industrial companies in the country in 1909. Nearly all these companies, listed in Table I, had their beginnings in the last years of the nineteenth century.

Major Changes in American Industry at the End of the Nineteenth Century

Between the depression of the 1870's and the beginning of the twentieth century, American industry underwent a significant transformation. In the 1870's, the major industries serviced an agrarian economy. Except for a few companies equipping the rapidly expanding railroad network, the leading industrial firms processed agricultural products and provided farmers with food and clothing. These firms tended to be small, and bought their raw materials and sold their finished goods locally. Where they manufactured for a market more than a few miles away from the factory, they bought and sold through commissioned agents who handled the business of several other similar firms.

By the beginning of the twentieth century, many more companies were making producers' goods, to be used in industry rather than on the farm or by the ultimate consumer. Most of the major industries had become dominated by a few large enterprises. These great industrial corporations no longer purchased and sold through agents, but had their own nation-wide buying and marketing organizations. Many, primarily those in the extractive industries, had come to control their own raw materials. In other words, the business economy had become industrial. Major industries were dominated by a few firms that had become great, vertically integrated, centralized enterprises.

In the terms of the economist and sociologist a significant sector of American industry had become bureaucratic, in the sense that business decisions were made within large hierarchical structures. Externally, oligopoly was prevalent, the decision-makers being as much concerned with the actions of the few other large firms in the

industry as with over-all changes in markets, sources of supplies, and technological improvements.

These basic changes came only after the railroads had created a national market. The railroad network, in turn, had grown swiftly primarily because of the near desperate requirements for efficient transportation created by the movement of population westward after 1815.[1] Except for the Atlantic seaboard between Boston and Washington, the construction of the American railroads was stimulated almost wholly by the demand for better transportation to move crops, to bring farmers supplies, and to open up new territories to commercial agriculture.

By greatly expanding the scope of the agrarian economy, the railroads quickened the growth of the older commercial centers, such as New York, Philadelphia, Cincinnati, Cleveland, and St. Louis, and helped create new cities like Chicago, Indianapolis, Atlanta, Kansas City, Dallas, and the Twin Cities. This rapid urban expansion intensified the demand for the products of the older consumer goods industries – particularly those which processed the crops of the farmer and planter into food, stimulants, and clothing.

At the same time, railroad construction developed the first large market in this country for producers' goods. Except for the making of relatively few textile machines, steamboat engines, and ordnance, the iron and nonferrous manufacturers had before 1850 concentrated on providing metals and simple tools for merchants and farmers. Even textile machinery was usually made by the cloth manufacturers themselves. However, by 1860, only a decade after beginning America's first major railroad construction boom, railroad companies had already replaced the blacksmiths as the primary market for iron products, and had become far and away the most important market for the heavy engineering industries. By then, too, the locomotive was competing with the Connecticut brass industry as a major consumer of copper. More than this, the railroads, with their huge capital outlay, their fixed operating costs, the large size of their labor and management force, and the technical complexity of their operations, pioneered in the new ways of oligopolistic competition and large-scale, professionalized, bureaucratized management.

The new nation-wide market created by the construction of the railroad network became an increasingly urban one. From 1850 on, if not before, urban areas were growing more rapidly than rural ones.

[1] The factors stimulating the growth of the American railroad network and the impact of the earlier construction and operation of this network on the American business economy and business institutions is suggested in Chandler, *Henry Varnum Poor – Business Editor, Analyst, and Reformer* (Cambridge, 1956), especially chaps. 4, 6–9.

In the four decades from 1840 to 1880 the proportion of urban population rose from 11 per cent to 28 per cent of the total population, or about 4 per cent a decade. In the two decades from 1880 to 1900 it grew from 28 per cent to 40 per cent or an increase of 6 per cent a decade. Was this new urban and national market, then, the primary stimulant for business innovation and change, and for the coming of big business to American industry?

Changes in the Consumers' Goods Industries

The industries first to become dominated by great business enterprises were those making consumer goods, the majority of which were processed from products grown on the farm and sold in the urban markets. Consolidation and centralization in the consumers' goods industries were well under way by 1893. The unit that appeared was one which integrated within a single business organization the major economic processes: production or purchasing of raw materials, manufacturing, distribution, and finance.

Such vertically integrated organizations came in two quite different ways. Where the product tended to be somewhat new in kind and especially fitted for the urban market, its makers created their businesses by first building large marketing and then purchasing organizations. This technique appears to have been true of the manufacturers or distributors of fresh meat, cigarettes, high-grade flour, bananas, harvesters, sewing machines, and typewriters. Where the products were established staple items, horizontal combination tended to precede vertical integration. In the sugar, salt, leather, whiskey, glucose, starch, biscuit, kerosene, fertilizer, and rubber industries a large number of small manufacturers first combined into large business units and then created their marketing and buying organizations. For a number of reasons the makers of the newer types of products found the older outlets less satisfactory and felt more of a need for direct marketing than did the manufacturers of the long-established goods.

Integration via the Creation of Marketing Organization

The story of the changes and the possible reasons behind them can be more clearly understood by examining briefly the experience of a few innovating firms. First, consider the experience of companies that grew large through the creation of a nation-wide marketing and distributing organization. Here the story of Gustavus F. Swift and his brother Edwin is a significant one. Gustavus F. Swift, an Easterner, came relatively late to the Chicago meat-packing busi-

ness. Possibly because he was from Massachusetts, he appreciated the potential market for fresh western meat in the eastern cities.[2] For after the Civil War, Boston, New York, Philadelphia, and other cities were rapidly outrunning their local meat supply. At the same time, great herds of cattle were gathering on the western plains. Swift saw the possibilities of connecting the new market with the new source of supply by the use of the refrigerated railroad car. In 1878, shortly after his first experimental shipment of refrigerated meat, he formed a partnership with his younger brother, Edwin, to market fresh western meat in the eastern cities.

For the next decade, Swift struggled hard to carry out his plans, the essence of which was the creation, during the 1880's, of the nation-wide distributing and marketing organization built around a network of branch houses. Each "house" had its storage plant and its own marketing organization. The latter included outlets in major towns and cities, often managed by Swift's own salaried representatives. In marketing the product, Swift had to break down, through advertising and other means, the prejudices against eating meat killed more than a thousand miles away and many weeks earlier. At the same time he had to combat boycotts of local butchers and the concerted efforts of the National Butchers' Protective Association to prevent the sale of his meat in the urban markets.

To make effective use of the branch house network, the company soon began to market products other than beef. The "full line" soon came to include lamb, mutton, pork, and, some time later, poultry, eggs, and dairy products. The growing distributing organization soon demanded an increase in supply. So between 1888 and 1892, the Swifts set up meat-packing establishments in Kansas City, Omaha, and St. Louis, and, after the depression of the 1890's, three more in St. Joseph, St. Paul, and Ft. Worth. At the same time, the company systematized the buying of its cattle and other products at the stockyards. In the 1890's, too, Swift began a concerted effort to make more profitable use of by-products.

Before the end of the 1890's, then, Swift had effectively fashioned a great, vertically integrated organization. The major departments – marketing, processing, purchasing, and accounting – were all tightly controlled from the central office in Chicago. A report of

[2] Swift's story as outlined in Louis F. Swift in collaboration with Arthur Van Vlissingen, *The Yankee of the Yards – the Biography of Gustavus Franklin Swift* (New York, 1928). The United States Bureau of Corporations, *Report of the Commissioner of Corporations on the Beef Industry, March 3, 1905* (Washington, 1905), is excellent on the internal operations and external activities of the large meat-packing firms. There is additional information in the later three-volume *Report of the Federal Trade Commission on the Meat Packing Industry* (Washington, 1918–1919). R. A. Clemen, *The American Livestock and Meat Industry* (New York, 1923) has some useful background data.

the Commissioner of Corporations published in 1905 makes clear the reason for such control: [3]

Differences in quality of animals and of their products are so great that the closest supervision of the Central Office is necessary to enforce the exercise of skill and sound judgement on the part of the agents who buy the stock, and the agents who sell the meat. With this object, the branches of the Selling and Accounting Department of those packing companies which have charge of the purchasing, killing, and dressing and selling of fresh meat, are organized in the most extensive and thorough manner. The Central Office is in constant telegraphic correspondence with the distributing houses, with a view to adjusting the supply of meat and the price as nearly as possible to the demand.

As this statement suggests, the other meat packers followed Swift's example. To compete effectively, Armour, Morris, Cudahy, and Schwarzschild & Sulzberger had to build up similar integrated organizations. Those that did not follow the Swift model were destined to remain small local companies. Thus by the middle of the 1890's, the meat-packing industry, with the rapid growth of these great vertically integrated firms had become oligopolistic (the "Big Five" had the major share of the market) and bureaucratic; each of the five had its many departments and several levels of management.

This story has parallels in other industries processing agricultural products. In tobacco, James B. Duke was the first to appreciate the growing market for the cigarette, a new product which was sold almost wholly in the cities.[4] However, after he had applied machinery to the manufacture of cigarettes, production soon outran supply. Duke then concentrated on expanding the market through extensive advertising and the creation of a national and then world-wide selling organization. In 1884, he left Durham, North Carolina, for New York City, where he set up factories, sales, and administrative offices. New York was closer to his major urban markets, and was the more logical place to manage an international advertising campaign than Durham. While he was building his marketing department, Duke was also creating the network of warehouses and buyers in the tobacco-growing areas of the country.

In 1890, he merged his company with five smaller competitors in the cigarette business to form the American Tobacco Company. By 1895 the activities of these firms had been consolidated into the manufacturing, marketing, purchasing, and finance departments of the single operating structure Duke had earlier fashioned. Duke next un-

[3] *Report of Commissioner of Corporations on the Beef Industry*, p. 21.

[4] Some information on James B. Duke and the American Tobacco Company can be found in John W. Jenkins, *James B. Duke, Master Builder* (New York, 1927), chaps. 5-7, 10. More useful was the United States Bureau of Corporations, *Report of the Commissioner of Corporations on the Tobacco Industry* (Washington, 1909).

dertook development of a full line by handling all types of smoking and chewing tobacco. By the end of the century, his company completely dominated the tobacco business. Only two other firms, R. J. Reynolds & Company and P. Lorillard & Company had been able to build up comparable vertically integrated organizations. When they merged with American Tobacco they continued to retain their separate operating organizations. When the 1911 antitrust decree split these and other units off from the American company, the tobacco industry had become, like the meat-packing business, oligopolistic, and its dominant firms bureaucratic.

What Duke and Swift did for their industries, James S. Bell of the Washburn-Crosby Company did during these same years in the making and selling of high-grade flour to the urban bakeries and housewives, and Andrew J. Preston achieved in growing, transporting, and selling another new product for the urban market, the banana.[5] Like Swift and Duke, both these men made their major innovations in marketing, and then went on to create large-scale, departmentalized, vertically integrated structures.

The innovators in new consumer durables followed much the same pattern. Both Cyrus McCormick, pioneer harvester manufacturer, and William Clark, the business brains of the Singer Sewing Machine Company, first sold through commissioned agents. Clark soon discovered that salaried men, working out of branch offices, could more effectively and at less cost display, demonstrate, and service sewing machines than could the agents.[6] Just as important, the branch offices were able to provide the customer with essential credit. McCormick, while retaining the dealer to handle the final sales, came to appreciate the need for a strong selling and distributing organization, with warehouses, servicing facilities, and a large salaried force, to stand behind the dealer.[7] So in the years following the Civil War, both McCormick and Singer Sewing Machine Company concentrated on building up national and then world-wide marketing departments. As they purchased their raw materials from a few industrial companies rather than from a mass of farmers, their purchasing departments were smaller, and required less attention than those in the firms processing farmers' products. But the net result was the creation of a very similar type of organization.

[5] The story of Bell is outlined in James Gray, *Business Without Boundary, the Story of General Mills* (Minneapolis, 1954), and of Preston in Charles M. Wilson, *Empire in Green and Gold* (New York, 1947).

[6] The early Singer Sewing Machine experience is well analyzed in Andrew B. Jack, "The Channels of Distribution for an Innovation: the Sewing Machine Industry in America, 1860-1865," *Explorations in Entrepreneurial History*, Vol. IX (Feb., 1957), pp. 113-141.

[7] William T. Hutchinson, *Cyrus Hall McCormick* (New York, 1935), Vol. II, pp. 704-712.

Integration via Horizontal Combination

In those industries making more standard goods, the creation of marketing organizations usually followed large-scale combinations of a number of small manufacturing firms. For these small firms, the coming of the railroad had in many cases enlarged their markets but simultaneously brought them for the first time into competition with many other companies. Most of these firms appear to have expanded production in order to take advantage of the new markets. As a result, their industries became plagued with overproduction and excess capacity; that is, continued production at full capacity threatened to drop prices below the cost of production. So in the 1880's and early 1890's, many small manufacturers in the leather, sugar, salt, distilling and other corn products, linseed and cotton oil, biscuit, petroleum, fertilizer and rubber boot and glove industries, joined in large horizontal combinations.

In most of these industries, combination was followed by consolidation and vertical integration, and the pattern was comparatively consistent. First, the new combinations concentrated their manufacturing activities in locations more advantageously situated to meet the new growing urban demands. Next they systematized and standardized their manufacturing processes. Then, except in the case of sugar and corn products (glucose and starch), the combinations began to build large distributing and smaller purchasing departments. In so doing, many dropped their initial efforts to buy out competitors or to drive them out of business by price-cutting. Instead they concentrated on the creation of a more efficient flow from the producers of their raw materials to the ultimate consumer, and of the development and maintenance of markets through brand names and advertising. Since the large majority of these combinations began as regional groupings, most industries came to have more than one great firm. Only oil, sugar, and corn products remained long dominated by a single company. By World War I, partly because of the dissolutions under the Sherman Act, these industries had also become oligopolistic, and their leading firms vertically integrated.

Specific illustrations help to make these generalizations more precise. The best-known is the story of the oil industry, but equally illustrative is the experience of the leading distilling, baking, and rubber companies.

The first permanent combination in the whiskey industry came in 1887 when a large number of Midwestern distillers, operating more than 80 small plants, formed the Distillers' and Cattle Feeders'

Trust.[8] Like other trusts, it adopted the more satisfactory legal form of a holding company shortly after New Jersey in 1889 passed the general incorporation law for holding companies. The major efforts of the Distillers Company were, first, to concentrate production in a relatively few plants. By 1895 only 21 were operating. The managers maintained that the large volume per plant permitted by such concentration would mean lower costs, and also that the location of few plants more advantageously in relation to supply and marketing would still reduce expenses further. However, the company kept the price of whiskey up, and since the cost of setting up a distillery was small, it soon had competition from small local plants. The company's answer was to purchase the new competitors and to cut prices. This strategy proved so expensive that the enterprise was unable to survive the depression of the 1890's.

Shortly before going into receivership in 1896, the Distillers Company had begun to think more about marketing. In 1895, it had planned to spend a million dollars to build up a distributing and selling organization in the urban East – the company's largest market. In 1898, through the purchase of the Standard Distilling & Distributing Company and the Spirits Distributing Company, it did acquire a marketing organization based in New York City. In 1903, the marketing and manufacturing units were combined into a single operating organization under the direction of the Distillers Securities Company. At the same time, the company's president announced plans to concentrate on the development of brand names and specialties, particularly through advertising and packaging.[9] By the early years of the twentieth century, then, the Distillers Company had become a vertically integrated, departmentalized, centralized operating organization, competing in the modern manner, more through advertising and product differentiation than price.

The experience of the biscuit industry is even more explicit. The National Biscuit Company came into being in 1898 as a merger of three regional combinations: the New York Biscuit Company formed in 1890, the American Biscuit and Manufacturing Company, and the United States Biscuit Company founded a little later.[10] Its initial

[8] The major sources of information on combination and consolidation in the distilling industry are Jeremiah W. Jenks, "The Development of the Whiskey Trust," *Political Science Quarterly*, Vol. IV (June, 1889), pp. 296–319; J. W. Jenks and W. E. Clark, *The Trust Problem* (rev. ed.; New York, 1917), pp. 141–149. The annual reports of the Distilling and Cattle Feeding Company and its various successors provide some useful additional data, as does the Industrial Commission, *Preliminary Report on Trusts and Industrial Combinations* (Washington, 1900), Vol. I, pp. 74–89, 167–259, 813–849, and Victor S. Clark, *History of Manufactures in the United States* (New York, 1929), Vol. II, pp. 505–506. Changes in taxes on liquors also affected the company's policies in the early 1890's.

[9] *Annual Report of the President of the Distillers Securities Company* for 1903.

[10] The information on National Biscuit comes largely from its annual reports.

objective was to control price and production, but as in the case of the Distillers Company, this strategy proved too expensive. The Annual Report for 1901 suggests why National Biscuit shifted its basic policies: [11]

This Company is four years old and it may be of interest to shortly review its history. . . . When the Company started, it was an aggregation of plants. It is now an organized business. When we look back over the four years, we find that a radical change has been wrought in our methods of business. In the past, the managers of large merchandising corporations have found it necessary, for success, to control or limit competition. So when this company started, it was thought that we must control competition, and that to do this we must either fight competition or buy it. The first meant a ruinous war of prices, and a great loss of profit; the second, a constantly increasing capitalization. Experience soon proved to us that, instead of bringing success, either of those courses, if persevered in, must bring disaster. This led us to reflect whether it was necessary to control competition. . . . we soon satisfied ourselves that within the Company itself we must look for success.

We turned our attention and bent our energies to improving the internal management of our business, to getting full benefit from purchasing our raw materials in large quantities, to economizing the expenses of manufacture, to systematizing and rendering more effective our selling department; and above all things and before all things to improve the quality of our goods and the condition in which they should reach the customer.

It became the settled policy of this Company to buy out no competition. . . .

In concentrating on distribution, the company first changed its policy from selling in bulk to wholesalers to marketing small packages to retailers. It developed the various "Uneeda Biscuit" brands, which immediately became popular. "The next point," the same Annual Report continued, "was to reach the customer. Thinking we had something that the customer wanted, we had to advise the customer of its existence. We did this by extensive advertising." This new packaging and advertising not only quickly created a profitable business, but also required the building of a sizable marketing organization. Since flour could be quickly and easily purchased in quantity from large milling firms, the purchasing requirements were less complex, and so the company needed a smaller purchasing organization. On the other hand, it spent much energy after 1901 in improving plant layout and manufacturing processes in order to cut production costs and to improve and standardize quality. Throughout the first decade of its history, National Biscuit continued the policy of

[11] *Annual Report of the National Biscuit Company for the Year Ending December, 1901*, January 3, 1902. References to centralizing of manufacturing facilities appear in several early annual reports. As this was written before Theodore Roosevelt had started to make the Sherman Act an effective antitrust instrument and Ida Tarbell and other journalists had begun to make "muck raking" of big business popular and profitable, the Biscuit Company's shift in policy could hardly have been the result of the pressure of public opinion or the threat of government action.

"centralizing" manufacturing operations, particularly in its great New York and Chicago plants.

In the rubber boot, shoe, and glove industries, the story is much the same. Expansion of manufacturing facilities and increasing competition as early as 1874, led to the formation, by several leading firms, of the Associated Rubber Shoe Companies – an organization for setting price and production schedules through its board of directors.[12] This company continued until 1886. Its successor, the Rubber Boot and Shoe Company, which lasted only a year, attempted, besides controlling prices and production, to handle marketing, which had always been done by commissioned agents. After five years of uncontrolled competition, four of the five firms that had organized the selling company again combined, this time with the assistance of a large rubber importer, Charles A. Flint. The resulting United States Rubber Company came, by 1898, to control 75 per cent of the nation's rubber boot, shoe, and glove output.

At first the new company remained a decentralized holding company. Each constituent company retained its corporate identity with much freedom of action, including the purchasing of raw materials and the selling of finished products, which was done, as before, through jobbers. The central office's concern was primarily with controlling price and production schedules. Very soon, however, the company began, in the words of the 1896 Annual Report, a policy of "perfecting consolidation of purchasing, selling, and manufacturing."[13] This was to be accomplished in four ways. First, as the 1895 Annual Report had pointed out, the managers agreed "so far as practicable, to consolidate the purchasing of all supplies of raw materials for the various manufacturies into one single buying agency, believing that the purchase of large quantities of goods can be made at more advantageous figures than the buying of small isolated lots."[14] The second new "general policy" was "to undertake to reduce the number of brands of goods manufactured, and to consolidate the manufacturing of the remaining brands in those factories which have demonstrated superior facilities for production or advantageous labor conditions. This course was for the purpose of utilizing the most efficient instruments of production and closing

[12] The background for the creation of the United States Rubber Company can be found in Nancy P. Norton, "Industrial Pioneer: the Goodyear Metallic Rubber Shoe Company" (Ph.D. thesis, Radcliffe College, 1950), Constance McL. Green, *History of Naugatuck, Connecticut* (New Haven, 1948), pp. 126-131, 193-194, and Clark, *History of Manufactures*, Vol. II, pp. 479-481, Vol. III, pp. 235-237. The company's annual reports provide most of the information on its activities.

[13] *The Fifth Annual Report of the United States Rubber Company, March 31, 1897*, pp. 6-7.

[14] This and the following quotations are from the *Fourth Annual Report of the United States Rubber Company, May 25,1896*, pp. 4-5, 7-8.

those that were inefficient and unprofitable." The third policy was to consolidate sales through the formation of a "Selling Department," which was to handle all goods made by the constituent companies in order to achieve "economy in the distribution expense." Selling was now to be handled by a central office in the New York City headquarters, with branch offices throughout the United States and Europe. Of the three great new departments, actually manufacturing was the slowest to be fully consolidated and centralized. Finally, the treasurer's office at headquarters began to obtain accurate data on profit and loss through the institution of uniform, centralized cost accounting.

Thus United States Rubber, National Biscuit, and the Distillers Securities Company soon came to have organizational structures paralleling those of Swift and American Tobacco. By the first decade of the twentieth century, the leading firms in many consumers' goods industries had become departmentalized and centralized. This was the organizational concomitant to vertical integration. Each major function, manufacturing, sales, purchasing, and finance, became managed by a single and separate department head, usually a vice president, who, assisted by a director or a manager, had full authority and responsibility for the activities of his unit. These departmental chiefs, with the president, coordinated and evaluated the work of the different functional units, and made policy for the company as a whole. In coordinating, appraising, and policy-making, the president and the vice presidents in charge of departments came to rely more and more on the accounting and statistical information, usually provided by the finance department, on costs, output, purchases, and sales.

Changes in the Producers' Goods Industries

Bureaucracy and oligopoly came to the producers' goods industries somewhat later than to those making products for the mass market. Until the depression of the 1890's, most of the combinations and consolidations had been in the consumers' goods industries. After that, the major changes came in those industries selling to other businesses and industrialists. The reason for the time difference seems to be that the city took a little longer to become a major market for producers' goods. Throughout the 1880's, railroad construction and operation continued to take the larger share of the output of steel, copper, power machinery, explosives, and other heavy industries. Then in the 1890's, as railroad construction declined the rapidly growing American cities became the primary market. The

insatiable demand for urban lighting, communication, heat, power, transportation, water, sewerage, and other services directly and indirectly took ever growing quantities of electric lighting apparatus, telephones, copper wire, newsprint, streetcars, coal, and iron, steel, copper, and lead piping, structures and fixtures; while the constantly expanding urban construction created new calls on the power machinery and explosives as well as the metals industries. Carnegie's decision in 1887 to shift the Homestead Works, the nation's largest and most modern steel plant, from rails to structures, symbolized the coming change in the market.[15]

Also the new combinations and consolidations in the consumers' goods industries increased the demand for producers' products in the urban areas. Standard Oil, American Tobacco, Swift and other meat packers, McCormick's Harvesting Machinery and other farm implement firms, American Sugar, Singer Sewing Machine, and many other great consumer goods companies concentrated their production in or near major cities, particularly New York and Chicago.

The changes after 1897 differed from the earlier ones not only in types of industries in which they occurred but also in the way they were promoted and financed. Combinations and vertical integration in the consumer goods industries before 1897 had been almost all engineered and financed by the manufacturers themselves, so the stock control remained in the hands of the industrialists. After 1897, however, outside funds and often outside promoters, who were usually Wall Street financiers, played an increasingly significant role in industrial combination and consolidation. The change reflected a new attitude of investor and financier who controlled capital toward the value of industrial securities.[16] Before the depression of the 1890's investment and speculation had been overwhelmingly in railroad stocks and bonds. The institutionalizing of the American security market in Wall Street had come, in fact, as a response to the needs for financing the first great railroad boom in the 1850's.

The railroads, however, had made a poor showing financially in the middle years of the 1890's when one-third of the nation's trackage went through receivership and financial reorganization. The

[15] Clark, *History of Manufactures*, Vol. II, chap. 19.

[16] The story of the shift from rails to industrials as acceptable investments is told in Thomas R. Navin and Marian V. Sears, "The Rise of the Market for Industrial Securities, 1887-1902," *Business History Review*, Vol. XIX (June, 1955), pp. 105-138. Government securities were, of course, important in the years before 1850 and during and after the Civil War, but in the late 1870's and 1880's as in the 1850's, railroads dominated the American security exchanges. As Navin and Sears point out, some coal and mining firms were traded on the New York Exchange, but the only manufacturing securities, outside of those of the Pullman Company, were some textile stocks traded on the local Boston Exchange. The connections between the railroad expansion and the beginnings of modern Wall Street are described in detail in Chandler, *Poor*, chap. 4.

dividend records of some of the new large industrial corporations, on the other hand, proved unexpectedly satisfactory. Moreover, railroad construction was slowing, and the major financial and administrative reorganizations of the 1890's had pretty well stabilized the industry. So there was less demand for investment bankers and brokers to market new issues of railroad securities.

Industrials were obviously the coming field, and by 1898 there was a rush in Wall Street to get in on this new business. The sudden availability of funds stimulated, and undoubtedly overstimulated, industrial combination. Many of the mergers in the years after 1897 came more from the desire of financiers for promotional profits, and because combination had become the thing to do, and less from the special needs and opportunities in the several industries. Moreover, as the financiers and promoters began to provide funds for mergers and expansion, they began to acquire, for the first time, the same type of control over industrial corporations that they had enjoyed in railroads since the 1850's.

The changes in the producers' goods industries were essentially like those in the consumer goods firms before the depression. Only after 1897 the changes came more rapidly, partly because of Wall Street pressures; and the differences that did develop between the two types of industries reflected the basic differences in the nature of their businesses. Like the companies making consumer goods, those manufacturing items for producers set up nation-wide and often world-wide marketing and distributing organizations, consolidated production into a relatively few large plants and fashioned purchasing departments. Because they had fewer customers, their sales departments tended to be smaller than those in firms selling to the mass market. On the other hand, they were more concerned with obtaining control over the sources of their supply than were most of the consumer goods companies.

Here a distinction can be made between the manufacturers who made semi-finished products from raw materials taken from the ground, and those who made finished goods from semi-finished products. The former, producing a uniform product for a few large industrial customers, developed only small sales departments and concentrated on obtaining control of raw materials, and often of the means of transporting such materials from mine to market. The latter, selling a larger variety of products and ones that often required servicing and financing, had much larger marketing and distributing organizations. These makers of finished goods, except for a brief period around 1900, rarely attempted to control their raw materials

or their semi-finished steel and other metal supplies. They did, however, in the years after 1900, begin to buy or set up plants making parts and components that went into the construction of their finished products.

Except in steel, integration usually followed combination in the producers' goods industries. And for both makers of semi-finished and finished goods, integration became more of a defensive strategy than it was in the consumers' goods industries processing agricultural products. In the latter the manufacturers had an assured supply of raw materials from the output of the nation's millions of farms. In the former, on the other hand, they had to consider the threatening possibility of an outsider obtaining complete control of raw materials or supplies.

Integration and Combination in the Extractive Industries

By the early twentieth century nearly all the companies making semi-finished product goods controlled the mining of their own raw materials. The industries in which they operated can, therefore, be considered as extractive. This was also true of two consumers' goods industries: oil and fertilizer. The experience of these two provides a good introduction to the motives for integration and the role it played in the coming of "big business" in steel, copper, paper, explosives and other businesses producing semi-finished goods.

In both the oil and fertilizer industries, control over raw materials came well after combination and consolidation of groups of small manufacturing firms. The Standard Oil Trust, after its formation in 1882, consolidated its manufacturing activities and then created a domestic marketing organization. Only in the late 1880's, when the new Indiana field began to be developed and the older Pennsylvania ones began to decline, did the Trust consider going into the production of crude oil. Both Allan Nevins in his biography of John D. Rockefeller and the Hidys in their history of Standard Oil agree that the need to be assured of a steady supply of crude oil was the major reason for the move into production.[17] Other reasons, the Hidys indicate, were a fear that the producers might combine and so control supplies, and the desire of the pipeline subsidiaries to keep their facilities operating at full capacity. Although neither Nevins nor the Hidys suggest that the desire to obtain a more efficient flow

[17] Ralph W. Hidy and Muriel E. Hidy, *Pioneering in Big Business, 1882–1911* (New York, 1955), pp. 176–186. Allan Nevins, *Study in Power, John D. Rockefeller, Industrialist and Philanthropist* (New York, 1953), Vol. II, pp. 1–9. Nevins adds that another reason for the move into production was "partly to limit the number of active wells and reduce the overproduction of crude oil," Vol. II, p. 2, but he gives no documentation for this statement.

of oil from the well to the distributor was a motive for this integration, both describe the committees and staff units that were formed at the central office at 26 Broadway to assure more effective coordination between production, refining, and marketing.

What little evidence there is suggests somewhat the same story in the fertilizer industry. Shortly after its organization in the mid-1890's, the Virginia-Carolina Chemical Company, a merger of many small southern fertilizer firms, began, apparently for the same defensive reasons, to purchase phosphate mines. Quickly its major competitor, the American Agricultural Chemical Company, a similar combination of small northeastern companies formed in 1893, responded by making its own purchases of mines. As the latter company explained in a later annual report: "The growth of the business, as well as the fact that available phosphate properties were being fast taken up, indicated that it was the part of wisdom to make additional provision for the future, and accordingly . . . available phosphate properties were purchased, and the necessary plants were erected and equipped, so the company now has in hand a supply of phosphate rock which will satisfy its growing demand for 60 years and upwards." [18] However, neither of these companies appeared to have set up organizational devices to guide the flow of materials from mine to plant to market; nor did the managers of a third large integrated fertilizer company, the International Agricultural Corporation, formed in 1909.

Defensive motives were certainly significant in the changes in the steel industry. Here the story can be most briefly described by focusing on the history of the industry's leader, the Carnegie Steel Company.[19] That company's chairman, Henry C. Frick, had in the early 1890's consolidated and rationalized the several Carnegie manufacturing properties in and about Pittsburgh into an integrated whole. At the same time, he systematized and departmentalized its purchasing, engineering, and marketing activities. The fashioning of a sales department became more necessary since the shift from rails to structures had enlarged the number of the company's customers.

Then in 1896 the Carnegie company made a massive purchase of

[18] *Annual Report of the American Agricultural Chemical Company, August 14, 1907* also the same company's *Annual Report* dated August 25, 1902. In addition to the annual reports of the two companies, Clark, *History of Manufactures*, Vol. III, pp. 289-291, provides information. There is a brief summary of the story of the International Agricultural Corporation in Williams Haynes, *American Chemical Industry – A History* (New York, 1945), Vol. III, p. 173.

[19] The information on the Carnegie Steel Company is taken from Burton J. Hendrick, *The Life of Andrew Carnegie*, 2 vols. (New York, 1932), George Harvey, *Henry Clay Frick, the Man* (New York, 1928), James H. Bridge, *The Inside Story of the Carnegie Steel Company* (New York, 1903.)

ore lands when it joined with Henry W. Oliver to buy out the Rockefeller holdings in the Mesabi Range. As Allan Nevins points out, the depression of the 1890's had worked a rapid transformation in the recently discovered Mesabi region.[20] By 1896, the ore fields had become dominated by three great interests: the Oliver Mining Company, the Minnesota Mining Company, and Rockefeller's Consolidated Iron Mines. A fourth, James J. Hill's Great Northern Railroad, was just entering the field. Frick's purchases, therefore, gave the Carnegie company an assured supply of cheap ore, as well as providing it with a fleet of ore ships. Next, Frick and Carnegie bought and rebuilt a railroad from Lake Erie to Pittsburgh to carry the new supplies to the mills.

Yet the steel company's managers did little to coordinate systematically the mining, shipping, and manufacturing units in their industrial empire. These activities did not become departments controlled from one central office but remained completely separate companies under independent managements, whose contact with one another was through negotiated contracts. This was the same sort of relation that existed between the Frick Coke Company and Carnegie Steel from the time Frick had joined Carnegie in 1889. If the Carnegie company's strategy had been to provide a more effective flow of materials as well as to assure itself of not being caught without a supply of ore and the means to transport it, then Frick and Carnegie would have created some sort of central coordinating office.

The steel industry responded quickly to the Carnegie purchases.[21] In 1898, Chicago's Illinois Steel Company, with capital supplied by J. P. Morgan & Company, joined the Lorain Steel Company (with plants on Lake Erie and in Johnstown, Pennsylvania) to purchase the Minnesota Mining Company, a fleet of ore boats, and railroads in the Mesabi and Chicago areas. Again, little attempt was made to coordinate mining and shipping with manufacturing and marketing. In the same year, many iron and steel firms in Ohio and Pennsylvania merged to form the Republic and National Steel Companies. Shortly thereafter, a similar combination in the Sault Sainte Marie

[20] Nevins, *Rockefeller*, Vol. II, p. 252.

[21] The experience of the other steel firms comes primarily from their annual reports and from prospectuses and other reports in the Corporation Records Division of Baker Library. A company publication, *J & L — The Growth of an American Business* (Pittsburgh, 1953) has some additional information on that company. Also, books listed in footnote 26 on the United States Steel Corporation have something on these companies. Two other steel companies listed in Table I made major changes somewhat before and after the period immediately following 1898. One, the Colorado Fuel & Iron Co., established in 1892, quickly became an integrated steel company in the Colorado area. The Bethlehem Steel Corporation was formed in 1904 when Charles F. Schwab, formerly of the Carnegie company and the United States Steel Corporation, reorganized the finances, corporate structure, and administrative organization of the bankrupt United States Shipbuilding Company.

area became the Consolidated Lake Superior Company. These three new mergers began at once to set up their marketing organizations and to obtain control by lease and purchase of raw materials and transportation facilities. In 1900, several small firms making high-grade steel did much the same thing by the formation of the Crucible Steel Company of America. In these same years, the larger, established steel companies, like Lackawanna, Cambria, and Jones & Laughlin obtained control of more supplies of ore, coke, and limestone and simultaneously reorganized their manufacturing and marketing organizations. Like Carnegie and Federal, they at first made little effort to bring their mining and coke operations under the direct control of the central office.

In copper, defensive motives for integration appear to have been somewhat less significant. In the 1890's, mining, smelting and refining were combined on a large scale. During the 'eighties the railroad had opened up many western mining areas, particularly in Montana and Arizona; a little later the new electrical and telephone businesses greatly increased the demand for copper. Mining firms like Anaconda, Calumet & Hecla, and Phelps Dodge moved into smelting and refining, while the Guggenheims' Philadelphia Smelting & Refining Company began to buy mining properties.[22] In the copper industry, the high cost of ore shipment meant that smelting and – after the introduction of the electrolytic process in the early 1890's – even refining could be done more cheaply close to the mines. Of the large copper firms, only Calumet & Hecla and the Guggenheims set up refineries in the East before 1898, and both made use of direct water transportation.

After 1898, several large mergers occurred in the nonferrous metals industries. Nearly all were initially promoted by eastern financiers. Of these, the most important were Amalgamated Copper, engineered by H. H. Rogers of Standard Oil and Marcus Daly of Anaconda, the American Smelting and Refining Company which the Guggenheims came to control, and United Copper promoted by F. Augustus Heinze. United Copper remained little more than a holding company. Amalgamated set up a subsidiary to operate a large refinery at Perth Amboy and another, the United Metals Selling Company, with headquarters in New York City, to market the products of its mining and processing subsidiaries. The holding company's central offices in New York remained small and apparently did comparative-

[22] Information on the mining companies came from their annual reports and from Isaac F. Marcosson's two books, *Magic Metal – the Story of the American Smelting and Refining Company* (New York, 1949), and *Anaconda* (New York, 1957), also Clark, *History of Manufactures*, Vol. II, pp. 368-369.

ly little to coordinate the activities of its several operating companies. The Guggenheims formed a much tighter organization with direct headquarters control of the company's mining, shipping, smelting and marketing departments. On the whole, there appears to have been somewhat closer coordination between mining and processing in the large copper than in the major steel companies.

Lowering of costs through more effective coordination appears to have been a major motive for consolidation and combination in three other businesses whose raw materials came from the ground: explosives, paper, and coal.[23] The mergers that created the Pittsburgh Coal Company in 1899 and greatly enlarged the Consolidation Coal Company in 1903 were followed by a reorganization and consolidation of mining properties and then by the creation of large marketing departments which operated throughout most of the country. The merger of close to 30 paper companies, forming the International Paper Company in 1899, was followed first by consolidation and reorganization of the manufacturing plants, next by the formation of a national marketing organization with headquarters in New York City, and then by the purchase of large tracts of timber in Maine and Canada. These three activities were departmentalized under vice presidents and controlled from the New York office. In all these cases, the central office was responsible for the flow of materials from mine or forest to the customer or retailer.

The explosive industries underwent a comparable sweeping change in 1902 and 1903. Since the 1870's, price and production schedules had been decided by the industry's Gunpowder Trade Association, and almost from its beginning, that Association had been controlled by one firm, the E. I. DuPont de Nemours & Company. However, the member concerns had retained their own corporate identities and managements. In 1902, the DuPonts bought out a large number of these independent companies through exchanges of stock, and then consolidated them into a single centralized organization. In the process, plants were shut down, others enlarged, and new ones built. A nation-wide selling organization was created, and centralized accounting, purchasing, engineering and traffic departments formed. Once the new organization was com-

[23] The story of the leading explosives, paper, salt and coal companies comes from annual reports and also from Charles E. Heechley, *History of the Consolidation Coal Company 1864–1934* (New York, 1934), George H. Love, *An Exciting Century in Coal* (New York, 1935), the company-written, *The International Paper Company, 1898–1948* (n.p., 1948), William S. Dutton, *DuPont – One Hundred and Forty Years* (New York, 1940), and *U.S. v. E. I. DuPont de Nemours & Company et al. in Circuit Court of the United States for the District of Delaware, #280 in Equity (1909), Defendants' Record Testimony*, Vol. I, and for the paper industry, Clark, *History of Manufactures*, Vol. III, pp. 245–252. The American Writing Paper Company, though less successful, had many parallels to International Paper.

pleted, then the company's executives obtained control of their raw materials through the purchase of nitrate mines and deposits in Chile.

Except possibly in paper, the control of price and production does not appear to have been a major motive for the initial combinations in the extractive industries making producers' goods. In steel before 1901, and in nonferrous metals and coal, there were several combinations, but none acquired as much as 20 per cent of the market. Nor is there any evidence that the creators of the different mergers, while they were forming their organizations, were arranging with one another to set over-all price and production schedules. In explosives, control of competition could not have been a significant reason for the 1902 changes since the DuPont company had enjoyed such control since the 1870's. In coal and explosives, and possibly in copper, the major motive for combination, consolidation, and the integration of supply with the manufacturing and marketing processes seems to have been an expectation of lowered costs through the creation of a national distributing organization, the consolidation of manufacturing activities, and the effective coordination of the different industrial processes by one central office. In steel and possibly copper, the desire for an assured supply of raw materials appears to have been more significant in encouraging combination and integration.

Changes and Integration in the Finished Producers' Goods Industries

Control of price and production was, on the other hand, much more of an obvious motive for combination and resulting consolidation in the industries manufacturing finished products or machinery from the semi-finished materials produced by the extractive firms. Concern over supply, however, was also a cause for change, for after 1898 the users of steel, copper, coal, and other semi-finished materials felt threatened by the growing number of combinations among their suppliers. In any case, between 1898 and 1900 there was a wave of mergers in these industries, largely Wall Street financed, which led to the formation of American Tin Plate, American Wire & Steel, American Steel Hoop, National Tube, American Bridge, American Sheet Metal, Shelby Steel Tube, American Can, National Enameling & Stamping Company and a number of other combinations among steel-fabricating firms.[24] At the same time, there were many amalga-

[24] The best brief summary of these mergers and the formation of the United States Steel Corporation is in Eliot Jones, *The Trust Problem in the United States* (New York, 1924), pp. 189-200. The companies' annual reports and prospectuses provide additional material.

mations in the power machinery and implement businesses, such as American Car & Foundry, American Locomotive, Allis-Chalmers, International Steam Pump, and International Harvester. The largest combination among the copper users, the American Brass Company, came a little later, in 1903, after the Guggenheims, Rogers, and Heinze had completed the major copper mergers.

Nearly all these combinations quickly consolidated their constituent companies into a single operating organization. Manufacturing facilities were unified and systematized, over-all accounting procedures instituted, and national and often world-wide distributing organizations formed. Many set up central traffic and purchasing departments; some even began to assure themselves control over supply by building up their own rolling mills and blast furnaces. As American Wire & Steel and National Tube began to make their own steel, they cancelled contracts with Carnegie and other semi-finished steel producers. This development, in turn, led Carnegie to develop plans for fabricating his own finished products.[25]

The resulting threat of overcapacity and price-cutting led to the formation of the United States Steel Corporation.[26] This giant merger, which included Carnegie, Federal and National Steel, and the first six of the fabricating companies listed above, continued on as a combination. Although the activities of the various subsidiaries were re-formed and redefined, there was no consolidation. United States Steel remained a holding company only, and the central office at 72 Broadway did comparatively little to coordinate the operations of its many subsidiary companies.

After 1901, the fabricators and the machinery manufacturers made little attempt to produce their own steel or copper. Nor did the makers of semi-finished products try, for some years to come, to do their own fabricating. Possibly the metal users realized that even with the formation of United States Steel they were fairly certain of alternative sources of supply. Also they may have found that once they had combined they had enough bargaining power to assure themselves of a supply of steel and other materials more cheaply than they could make it themselves.

While such firms no longer sought to control their basic materials, many, particularly the machinery makers like General Electric, Westinghouse, American Car & Foundry, International Harvester

[25] Hendrick, *Carnegie*, Vol. II, pp. 116-119.

[26] The beginnings and the operation of the United States Steel Corporation are outlined in Abraham Berglund, *The United States Steel Corporation: A Study of Growth and Combination in the Iron and Steel Industry* (New York, 1907), Arundel Cotter, *The Authentic History of the United States Steel Corporation* (New York, 1916), Ida M. Tarbell, *The Life of Elbert H. Gary, the Story of Steel* (New York, 1925).

and, a little later, General Motors, began to purchase or set up subsidiaries or departments to make parts and components.[27] Here again the motive was essentially defensive. Since much of their manufacturing had now become mainly assembling, they wanted to be sure to have a supply of parts available at all times. The lack of a vital part could temporarily shut down a plant. However, they expected to take only a portion of the output; a major share was sold to outsiders. One outstanding exception to this pattern was Henry Ford. He came to control his raw materials as well as his parts and components, and rarely sold such parts to outside companies. But Ford's insistence on having a completely integrated organization from mine to market, concentrated largely in one huge plant, proved to be one of the most costly mistakes in American business history.

Control of parts and accessory units led to a diversification of the types of products these manufacturing companies made and sold. Such diversification brought, over time, important changes in business organization. Even more significant for stimulating product diversification was the new "full line" strategy adopted by a number of these recently consolidated concerns. Such a policy, initiated largely to help assure the maximum use of the new departments, encouraged technological as well as organizational change.

Pioneers in developing "full lines" in the producers' goods industries were the two great electrical companies: General Electric and Westinghouse. Unlike almost any other of the leading American industrial companies in 1900, these two had begun as research and development rather than manufacturing organizations. Because of their origins, they had the skilled personnel and the necessary equipment to move, in the mid-1890's, from making lighting equipment alone to manufacturing many lines of electric traction and power machinery products.[28] Allis-Chalmers, International Steam Pump, and American Locomotive began, shortly after their formation and subsequent consolidations, to develop new lines using electric and gasoline engines.[29] International Harvester, building up a number of farm implement lines, also started to experiment with the use of the gasoline engine for machinery on the farm. In this same first decade of the twentieth century, rubber, explosive, and chemical

[27] This generalization is based on the annual reports of the several companies.

[28] As is well described in Harold C. Passer, *The Electrical Manufacturers* (Cambridge, 1953).

[29] The development of new lines by Allis-Chalmers, International Steam Pump, and American Locomotive is mentioned in their annual reports in the first decade of the twentieth century. International Harvester's similar "full line" policies are described in Cyrus McCormick, *The Century of the Reaper* (New York, 1931), chaps. 6-9, and United States Bureau of Corporations, *The International Harvester Co., March 3, 1913* (Washington, 1913), especially pp. 156-158.

companies began to turn to industrial chemistry in their search to develop broader lines of products.

Continuing diversification came, however, largely in industries where science, particularly chemistry and physics, could be most easily applied. And it was in these industries, and in those which were directly affected by the coming of two new sources of power, electricity and the internal combustion engine, that the major innovations in American industry came after 1900. The chemical, automotive, power machinery, rubber, and petroleum industries led the way to the development of new processes and products, new ways of internal organization and new techniques of external competition as the new century unfolded. The metals industries and those processing agricultural goods have, on the other hand, changed relatively little since the beginning of the century. In these industries, the same firms make much the same products, use much the same processes, and compete in much the same manner in the 1950's as they did in the 1900's. For them the greatest period of change came in the last decade of the nineteenth century.

Conclusion: The Basic Innovations

The middle of the first decade of the new century might be said to mark the end of an era. By 1903, the great merger movement was almost over, and by then the metals industries and those processing agricultural products had developed patterns of internal organization and external competition which were to remain. In those years, too, leading chemical, electrical, rubber, power machinery and implement companies had initiated their "full line" policy, and had instituted the earliest formal research and development departments created in this country. In this decade also, electricity was becoming for the first time a significant source of industrial power, and the automobile was just beginning to revolutionize American transportation. From 1903 on, the new generators of power and the new technologies appear to have become the dominant stimuli to innovation in American industry, and such innovations were primarily those which created new products and processes. Changes in organizational methods and marketing techniques were largely responses to technological advances.

This seems much less true of the changes during the 20 to 25 years before 1903. In that period, the basic innovations were more in the creation of new forms of organization and new ways of marketing. The great modern corporation, carrying on the major indus-

trial processes, namely, purchasing, and often production of materials and parts, manufacturing, marketing, and finance – all within the same organizational structure – had its beginnings in that period. Such organizations hardly existed, outside of the railroads, before the 1880's. By 1900 they had become the basic business unit in American industry.

Each of these major processes became managed by a corporate department, and all were coordinated and supervised from a central office. Of the departments, marketing was the most significant. The creation of nation-wide distributing and selling organizations was the initial step in the growth of many large consumer goods companies. Mergers in both the consumer and producer goods industries were almost always followed by the formation of a centralized sales department.

The consolidation of plants under a single manufacturing department usually accompanied or followed the formation of a national marketing organization. The creation of such a manufacturing department normally meant the concentration of production in fewer and larger plants, and such consolidation probably lowered unit costs and increased output per worker. The creation of such a department in turn led to the setting up of central traffic, purchasing, and often engineering organizations. Large-scale buying, more rational routing of raw materials and finished products, more systematic plant lay-out, and plant location in relation to materials and markets probably lowered costs still further. Certainly the creators of these organizations believed that it did. In the extractive and machinery industries integration went one step further. Here the motives for controlling raw materials or parts and components were defensive as well as designed to cut costs through providing a more efficient flow of materials from mine to market.

These great national industrial organizations required a large market to provide the volume necessary to support the increased overhead costs. Also, to be profitable, they needed careful coordination between the different functional departments. This coordination required a steady flow of accurate data on costs, sales, and on all purchasing, manufacturing, and marketing activities. As a result, the comptroller's office became an increasingly important department. In fact, one of the first moves after a combination by merger or purchase was to institute more effective and detailed accounting procedures. Also, the leading entrepreneurs of the period, men like Rockefeller, Carnegie, Swift, Duke, Preston, Clark, and the DuPonts, had to become, as had the railroad executives of an earlier

generation, experts in reading and interpreting business statistics.

Consolidation and departmentalization meant that the leading industrial corporations became operating rather than holding companies, in the sense that the officers and managers of the companies were directly concerned with operating activities. In fact, of the 50 companies with the largest assets in 1909, only United States Steel, Amalgamated Copper, and one or two other copper companies remained purely holding companies. In most others, the central office included the heads of the major functional departments, usually the president, vice presidents, and sometimes a chairman of the board and one or two representatives of financial interests. These men made major policy and administrative decisions and evaluated the performance of the departments and the corporation as a whole. In the extractive industries a few companies, like Standard Oil (N.J.) and some of the metals companies, were partly holding and partly operating companies. At Standard Oil nearly all important decisions were made in the central headquarters, at 26 Broadway, which housed not only the presidents of the subsidiaries but the powerful policy formulating and coordinating committees.[30] But in some of the metals companies, the subsidiaries producing and transporting raw materials retained a large degree of autonomy.

The coming of the large vertically integrated, centralized, functionally departmentalized industrial organization altered the internal and external situations in which and about which business decisions were made. Information about markets, supplies, and operating performance as well as suggestions for action often had to come up through the several levels of the departmental hierarchies, while decisions and suggestions based on this data had to be transmitted down the same ladder for implementation. Executives on each level became increasingly specialists in one function – in sales, production, purchasing, or finance – and most remained in one department and so handled one function only for the major part of their business careers. Only he who climbed to the very top of the departmental ladder had a chance to see his own company as a single operating unit. Where a company's markets, sources of raw materials, and manufacturing processes remained relatively stable, as was true in the metals industries and in those processing agricultural goods, the nature of the business executive's work became increasingly routine and administrative.

When the internal situation had become bureaucratic, the external one tended to be oligopolistic. Vertical integration by one

[30] Hidys, *Pioneering in Big Business*, chap. 3 and pp. 323–388.

manufacturer forced others to follow. Thus, in a very short time, many American industries became dominated by a few large firms, with the smaller ones handling local and more specialized aspects of the business. Occasionally industries like oil, tobacco, and sugar, came to be controlled by one company, but in most cases legal action by the federal government in the years after 1900 turned monopolistic industries into oligopolistic ones.

Costs, rather than interfirm competition, began to determine prices. With better information on costs, supplies, and market conditions, the companies were able to determine price quite accurately on the basis of the desired return on investment. The managers of the different major companies had little to gain by cutting prices below an acceptable profit margin. On the other hand, if one firm set its prices excessively high, the other firms could increase their share of the market by selling at a lower price and still maintain a profit. They would, however, rarely cut to the point where this margin was eliminated. As a result, after 1900, price leadership, price umbrellas, and other evidences of oligopolistic competition became common in many American industries. To increase their share of the market and to improve their profit position, the large corporations therefore concerned themselves less with price and concentrated more on obtaining new customers by advertising, brand names, and product differentiations; on cutting costs through further improvement and integration of the manufacturing, marketing, and buying processes; and on developing more diversified lines of products.

The coming of the large vertically integrated corporation changed more than just the practices of American industrialists and their industries. The effect on the merchant, particularly the wholesaler, and on the financier, especially the investment banker, has been suggested here. The relation between the growth of these great industrial units and the rise of labor unions has often been pointed out. Certainly the regulation of the large corporation became one of the major political issues of these years, and the devices created to carry out such a regulation were significant innovations in American constitutional, legal, and political institutions. But an examination of such effects is beyond the scope of this paper.

Reasons for the Basic Innovations

One question remains to be reviewed. Why did the vertically integrated corporation come when it did, and in the way it did? The creation by nearly all the large firms of nation-wide selling and distributing organizations indicates the importance of the national

market. It was necessary that the market be an increasingly urban one. The city took the largest share of the goods manufactured by the processors of agricultural products. The city, too, with its demands for construction materials, lighting, heating and many other facilities, provided the major market for the metals and other producers' goods industries after railroad construction slowed. Without the rapidly growing urban market there would have been little need and little opportunity for the coming of big business in American industry. And such a market could hardly have existed before the completion of a nation-wide railroad network.

What other reasons might there have been for the swift growth of the great industrial corporation? What about foreign markets? In some industries, particularly oil, the overseas trade may have been an important factor. However, in most businesses the domestic customers took the lion's share of the output, and in nearly all of them the move abroad appears to have come after the creation of the large corporation, and after such corporations had fashioned their domestic marketing organization.

What about the investor looking for profitable investments, and the promoter seeking new promotions? Financiers and promoters certainly had an impact on the changes after 1897, but again they seem primarily to have taken advantage of what had already proved successful. The industrialists themselves, rather than the financiers, initiated most of the major changes in business organization. Availability of capital and cooperation with the financier figured much less prominently in these industrial combinations and consolidations than had been the case with the earlier construction of the railroads and with the financing of the Civil War.

What about technological changes? Actually, except for electricity, the major innovations in the metals industries seem to have come before or after the years under study here. Most of the technological improvements in the agricultural processing industries appear to have been made to meet the demands of the new urban market. The great technological innovations that accompanied the development of electricity, the internal combustion engine, and industrial chemistry did have their beginning in these years, and were, indeed, to have a fundamental impact on the American business economy. Yet this impact was not to be really felt until after 1900.

What about entrepreneurial talent? Certainly the best-known entrepreneurs of this period were those who helped to create the large industrial corporation. If, as Joseph A. Schumpeter suggests, "The defining characteristic [of the entrepreneur and his function]

is simply the doing of new things, and doing things that are already done, in a new way (innovation)," Rockefeller, Carnegie, Frick, Swift, Duke, McCormick, the DuPonts, the Guggenheims, Coffin of General Electric, Preston of United Fruit, and Clark of Singer Sewing Machine were all major innovators of their time.[31]

TABLE I

The Fifty Largest Industrials

(Numbers indicate relative size according to 1909 assets)

Consumers' Goods Companies

Agricultural Processing	*Extractive*	*Manufacturing*
3. Am. Tobacco	2. Standard Oil	4. Int'l. Harvester
8. Armour & Co.	26. Va.-Carolina Chem.	10. U.S. Rubber
9. American Sugar	35. American Agri. Chem.	12. Singer Mfg. Co.
13. Swift & Co.		
30. Nat'l. Biscuit		
33. Distillers' Securities		
50. United Fruit		

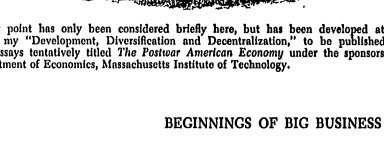
Producers' Goods Companies

Agricultural Processing	*Extractive*	*Manufacturing*
6. Central Leather	1. U.S. Steel	7. Pullman
18. Corn Products Co.	5. Amalgamated (Anaconda) Copper	15. Gen. Elec.
21. Am. Woolens	11. Am. Smelting & Refining	16. Am. Car & Foundry
	14. Pittsburgh Coal	19. Am. Can
	17. Colo. Fuel & Iron	22. Westinghouse
	20. Lackawanna	24. DuPont
	23. Consolidation Coal	29. Am. Locomotive
	25. Republic Steel	36. Allis-Chalmers
	27. Int'l. Paper	44. Int. Steam Pump
	28. Bethlehem Steel	46. Western Electric
	31. Cambria Steel	
	33. Associated Oil	
	34. Calumet & Hecla	
	37. Crucible Steel	
	38. Lake Superior Corp.	
	39. U.S. Smelting & Ref.	
	40. United Copper	
	41. National Lead	
	42. Phelps Dodge	
	43. Lehigh Coal	
	45. Jones & Laughlin	
	48. Am. Writing Paper	
	49. Copper Range	

[31] Joseph A. Schumpeter, "The Creative Response in Economic History," *Journal of Economic History*, Vol. VII (May, 1947), p. 151, and also his *Theory of Economic Development*, trans. Redvers Opie (Cambridge, 1934), pp. 74–94.

And their innovations were not in technology, but rather in organization and in marketing. "Doing a new thing," is, to Schumpeter a "creative response" to a new situation, and the situation to which these innovators responded appears to have been the rise of the national urban market.

There must be an emphasis here on the words "seem" and "appear." The framework used is a preliminary one and the data itself, based on readily available printed material rather than on business records are hardly as detailed or accurate as could be desired. More data, more precise and explicit questions, and other types and ranges of questions will modify the generalizations suggested here. For the moment, however, I would like to suggest, if only to encourage the raising of questions and the further compilation and analysis of data, that *the* major innovation in the American economy between the 1880's and the turn of the century was the creation of the great corporations in American industry. This innovation, as I have tried to show, was a response to the growth of a national and increasingly urban market that was created by the building of a national railroad network – the dynamic force in the economy in the quarter century before 1880. After 1900 the newly modified methods of interfirm and intrafirm administration remained relatively unchanged (as did the location of major markets and sources of raw materials) except in those industries directly affected by new sources of power and the systematic application of science to industry. In the twentieth century electricity, the internal combustion engine, and systematic, institutionalized research and development took the place of the national urban market as the dynamic factor in the American industrial economy.[32]



[32] This point has only been considered briefly here, but has been developed at some length in my "Development, Diversification and Decentralization," to be published in a book of essays tentatively titled *The Postwar American Economy* under the sponsorship of the Department of Economics, Massachusetts Institute of Technology.