ARTHUR MOXHAM: A BRILLIANT FAILURE*

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Business Historians have spent little time analyzing failure. There are many reasons for this. The traditional emphasis on growth has almost ruled out the study of unsuccessful enterprise. And it is an unchallenged axiom that only financially sound firms such as Standard Oil of New Jersey, or Imperial Chemical Industries sponsor company histories. Furthermore, corporate failures often do not leave records, and when they do they are quite likely unavailable to the scholar.

It is true that a few highly visable business failures have received considerable attention. However, most of these fall into a familiar category, that of financial speculation and its disastrous results. Every generation has had its share of spectacular losers; men like Robert Morris, Jay Cooke, William C. Durant, Samuel Insull, and C. Arnholt Smith. And there have been some celebrated corporate fiascos; in our own time Penn Central and Lockheed, for example, have provided grist for business observers. In all of these cases, individual and corporate, there is a common theme: the misuse of power and other people's money and the violation of commonly proclaimed business ethics. In these cases men and corporations had gained large-scale success only to come crashing down because of unwise speculation. Spectacular as they are, these men and firms represent only a portion of American business failure. Every year firms die or languish for a variety of reasons. Failure for some enterprises seems the result of outside forces, technological change, or sudden and unexpected shifts in the economic climate such as those produced by war, inflation, currency devaluation, financial panic, draught, and other natural disasters. For other businesses failure appears to result from internal causes, poor scientific and technological knowhow, inefficient administrative practices, and errors in entrepreneurial judgment. In many cases these business failures have been little noticed because they have been submerged in a general economic disaster such as the Great

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Depression, or have been obscured by the merger of the bankrupt enterprise into the structure of a healthy firm. Of course, there are the thousands of cases annually where men start businesses which do not prosper or grow. These are normally quietly liquidated, becoming mere statistics in Dunn and Bradstreet's record of business failures. In most of these instances, dishonesty and wild speculation play a negligible role.

Arthur Moxham, the subject of this essay, falls into the unspectacular category of business failures. He was not a financial manipulator or speculator. He controlled no banks or major corporations. His considerable expertise was technical and managerial. His personal honesty was beyond reproach, and he had a highly developed social consciousness unusual in business leaders either in his day or in ours. Moxham's concern for social reform led him to embrace Henry George's single tax program, a stand which must have made him an object of curiosity to many of the hard-headed businessmen with whom he dealt. Although little know, Moxham's career is of prime importance to the understanding of business history. His active life spanned the turbulent 1890s as well as the rapidly changing and generally prosperous first two decades of the 20th century. He was deeply involved in three industries, all of which were critical to American growth in his day, electric traction, steel, and explosives. He also played a vital role in the modernization of one of America's largest and most enduring firms, the Du Pont Company.

Furthermore, one cannot dismiss Moxham either as a fool or an incompetent. He had a brilliant mind and no less a person than Pierre du Pont paid tribute to his ability. Writing in 1949 Pierre remembered that he had first been introduced to modern managerial techniques by Moxham in the mid-1890s. This was at a time when Moxham ran the Johnson Company, a Johnstown, Pennsylvania, steel-making firm. Pierre recalled "Moxham. . . was a master of cost sheets and orderly management. He visited his plant frequently and was interested in details but he was always accompanied by the line man in charge through whom every question or recommendation passed. His cost sheets were fascinating to me and I became hopeful that the business of [the] Du Pont Company could be presented in such a clear manner."[1]

Moxham had an opportunity to help modernize the Du Pont Company. In January, 1902, Eugene du Pont, the then head of the family firm, died; and the following month three cousins, Alfred du Pont, Coleman du Pont, and Pierre du Pont combined to take control of the enterprise. Du Pont in 1902 was anything but a modern corporation. It, along with a friendly rival, Laflin & Rand, controlled the nation's black powder business through a cartel known as the Gunpowder Trade Association. This organization included most of the United States' small powdermakers as well as the two large firms. Du Pont and Laflin & Rand, through complicated financial and corporate arrangements, also dominated the manufacture of dynamite. The Du Pont Company, under the three cousins, purchased Laflin & Rand and then proceeded to absorb most of the smaller black powder firms, and the dynamite factories as well. Finally the three cousins purchased the firms

manufacturing the remaining major explosives product, smokeless powder. Within a short time, the three cousins succeeded in uniting about 70 percent of the entire American explosives industry under a single ownership.

To own is one thing, to control another; and the new owners soon found they had very little real control over their vast new holdings. Within the pre-1902 Du Pont Company itself, there had been few attempts to create a modern management. Each plant purchased its own raw materials, and set its own standards for manufacturing powder. Individual agents, who often hated one another, managed sales. There was no centralized sales offices, nor any attempt to assure that orders were filled from plants nearest the consumer thus saving freight bills. The company collected no data that would enable management to determine which of their plants produced most efficiently, and there had been no attempt to plan expansion systematically in a way that best fitted demand. In short, under the old system, there was little way managers could intelligently determine which of their activities were most profitable and thus allocate future investments accordingly. The purchase by the three cousins of most of that portion of the American explosives industry not already owned by Du Pont only made managerial problems more complex.

Both Pierre du Pont and Coleman du Pont had been impressed with Moxham when he ran the Johnson Company; but it was Coleman who invited his former boss to join the new Du Pont management team. Moxham arrived in Wilmington in September, 1902; and he quickly became one of the key men in the firm's ensuing reorganization.[2] The years between 1902 and 1907 were undoubtedly Moxham's most successful. He was able to use his considerable talents to build a new Du Pont managerial structure and to establish new policies for dealing with sales and potential competition. At no time, however, did Moxham have final responsibility for his recommendations. He was merely one of seven votes in the company's newly established decision-making board, the executive committee.

Alfred D. Chandler, Jr., a careful student of the Du Pont Company between 1902 and 1907, gave Moxham much of the credit for the firm's successful transformation from an old-fashioned cartel to a modern industrial enterprise. He found that Moxham took a leading part in fashioning a new central managerial structure. Soon after Moxham's arrival, he submitted recommendations to Coleman. Coleman formalized these in a February 4, 1903, letter that "authorized a single Executive Committee to have 'charge of matters of all kinds pertaining to the powder and high explosives business of all the companies in which Laflin & Rand, Eastern Dynamite, or Du Pont & Co., are importantly interested.'"[3] In accord with Moxham's concepts each member of the Executive Committee took charge and was responsible for a department. These came to include three manufacturing departments, black powder, high explosives, and smokeless powder; and sales, financial and development departments that served the entire company. Purchasing was also soon centralized. However, its director did not sit on the Executive Committee.

The new executive committee, in line with Moxham's recommendations, formulated policies for the company as a whole. In particular, it specified that records would be kept in standard ways; therefore, it soon was possible to determine which factories were most efficient, and which least. In black powder and dynamite, this led to the closing of small outmoded plants and the construction of others. Also, for the first time top management could compare profits made in one line of business, such as black powder with those made in dynamite or smokeless powder. This led to the ultimate decision to concentrate on expanding dynamite production at the expense of the other two lines. Centralized purchasing enabled the company to make savings to buying in volume; and in the case of some key raw materials such as Chilean nitrates, large purchases reduced shipping costs by allowing the chartering of entire ships at the lowest rates. In the long run statistics gathered in the purchasing department made it possible for management to make rational decisions as to whether it would pay to integrate vertically backward to control the supply of strategic raw materials, such as nitrates, sulphuric acid, or glycerine. And it became possible to compare the opportunity for profit in vertical integration with that made in the production departments. In short, Moxham's cost sheets became the key to the Executive Committee's decisions in the allocation of resources.

Moxham also played a vital role in changing the Du Pont Company's concept of competition. Prior to 1902 the firm, through the Gunpowder Trade Association, attempted to stifle competition by setting prices and allocating production among the various association members. Such tactics created a number of serious problems. The Gunpowder Trade Associati on set prices so high that new entrants were encouraged. These either had to be driven from business by cutthroat pricing or bought out. In many instances powdermen started new mills for the express purpose of forcing the association to buy them out. But even if the Gunpowder Trade Association, or Powder Trust, as its enemies came to call it, were effective in dealing with competitors, its tactics were clearly illegal under the terms of the Sherman antitrust law.

When Moxham came to Wilmington, the Powder Trust had been in existence since the 1870s. Most of the Du Pont Company's men had grown up under the old system and felt easy with it. This included two important members of the Executive Committee, Hamilton Barksdale, who managed the High Explosives Department, and J. Amory Haskell, who headed sales. Moxham had little use for the old ways. He urged that the reorganized Du Pont Company get rid of the Gunpowder Trade Association and abolish all agreements to fix prices and restrict production. He was particularly critical of old-fashioned sales methods that allowed and indeed encouraged the creation of dummy corporations and brands for competitive reasons. In some cases the Powder Trust had secretly purchased competitors and retained the old managements who were urged to continue production under old trade marks while claiming to be independent. In this manner powder trust opponents could be deceived into believing that they were buying from independent firms. These were tactics similar to

those used by Rockefeller's Standard Oil and which had been so vividly exposed to public view in 1894 by Henry Demarest Lloyd in his muckraking book, Wealth Against Commonwealth. Moxham argued that these methods were immoral, illegal, and, worst of all, bad business.[4] In a minority report to the Executive Committee on January 2, 1904, Moxham wrote "The advocates of selling companies for the purposes of competition must admit that the arguments in. . . their favor are based on deluding the customer." He doubted that such deception could long be successfully maintained, and he worried about the effect that such practices would have on company employees. Said Moxham, "To successfully fool the customers somebody has got to do the fooling. . . .Therefore, for this plan to be successful we must have a whole staff of salesmen educated on unhealthy lines. . . . Trickiness must be placed at a premium." He concluded that the company would educate "a class of men whose loyalty we cannot count on, for trickiness and deceit are as universal in their application as honesty and frankness."[5] Moxham's recommendations were simple and straight forward. He knew that under the new managerial structure the company would have the advantages of efficiency and the economies of scale. These, he maintained, would be more than enough to insure that Du Pont would retain its position as the dominant American explosives maker.

Moxham's arguments, supported by the company's lawyers, quickly won over his fellow executive committee member, treasurer Pierre du Pont. At first Moxham's reasoning made little impact on Haskell and Barksdale. Coleman du Pont, the firm's president, respected the judgment of the experienced powdermen and he wavered. In the end most of Moxham's views triumphed. In November, 1905, the Executive Committee adopted a resolution "to the effect that anything in the nature of subterfuge or trade deceit would be done away with."[6] To the company's later sorrow, there were some minor exceptions to this policy. Largely at Haskell's urging, a few of the old selling companies were kept; and the Gunpowder Trade Association, instead of being quickly killed, was allowed to wither and die slowly. These points became important parts of the Government's successful antitrust prosecution of Du Pont which started in 1907.

It is hard to believe that a man with Moxham's ability and perception could fail, but in two widely separated cases where he had the predominant responsibility for an enterprise, fail he did. The first of these came in the period between 1892 and 1897 when he headed the Johnson Company. The second occurred in 1917 when he had left Du Pont to start with two of Pierre du Pont's cousins, Charles A. Belin and Lammot Belin, the Aetna Explosives Company. What is even more surprising is that both of Moxham's failures came about for similar reasons.

Moxham's experience with the Johnson Company is a classic case of how focusing upon internal company problems can lead to massive entrepreneurial error. The Johnson Company had a happy start. The enterprise was the creation of Tom Johnson, whose name it bore. Johnson had an interesting and varied career. In 1869 he started in the traction business working for Alfred Victor du Pont's Louisville horse car system. Johnson

soon became manager of the railway, and from there went on to start street railways in a number of major cities. By 1888 he managed horsecars and the newly developed electric streetcars in a number of important cities including Indianapolis, St. Louis, Cleveland and Johnstown. This was an age of rapid expansion for streetcars, and most of Johnson's efforts were expended on building new lines. He found conventional railway tracks unsatisfactory for trolleys and, in association with Arthur Moxham, he developed a new girder rail designed expressly for laying railways in public streets. The rail itself was Johnson's invention; Moxham devised the method for its manufacture. In 1889 the two started the Johnson Company to produce their new rails.

Although Johnson took the lead in the company's formation, he quickly turned his attention elsewhere. In 1890 Ohio's twenty-first district, which included Cleveland, elected him to Congress as a Democrat where he remained for two terms. Even after defeat in 1894, Johnson retained his interest in politics, and in 1900 he ran for Mayor of Cleveland on a reform ticket and won. Because of Johnson's varied interests, Moxham became president and manager of the new firm. He supervised the construction of a mill in Johnstown, Pennsylvania, and established a nationwide sales organization with nine branch offices.

The year 1889 could not have been a better time to start a firm catering to the electric railway industry. In 1890 there were scarcely 1,200 miles of trolley lines. The following twelve years would see the total mileage increase to 22,000 and the next decade would see that figure double. Virtually every mile of electric car line would need new tracks, even those street railways converted from horse cars, since the streetcars needed a much heavier rail.

At first the Johnson Company did well. By 1893 the company had a total investment of $2,750,000, and during that year it earned $528,000 and paid a 10 percent dividend on its stock. Moxham might well have been pleased at these results, and have opted to sit back, relax and let the profits roll in. However, he did not. He recognized that his firm had potential weaknesses. The first three years of the 1890s had been generally good for the steel industry, with rail mills often operating near capacity. As Moxham surveyed his company he saw that it was ill prepared to meet a recession in the rail business.

In 1893 the Johnson Company produced two main types of trolley track; special work--that is, the complicated switch assemblies, crossovers, and curved track--which were manufactured in the firm's switch works, and ordinary straight girder rail produced in the company's rail rolling mill. Every street railroad needed both special work and girder rail although the latter would account for between 90 and 95 percent of the physical volume of rails purchased. Moxham's carefully compiled statistics told him that nearly all of his company's net earnings came from the seitch works. The rail mill produced only a tiny margin of profit. The reasons for this were several. The company did not have a blast furnace, it purchased ingots from others and it was usually forced to buy shapes it did not want.

As a consequence, the firm had to stand the "extra cost of working cold steel 'with its great waste in fuel. . . and relatively smaller product.'" The company also "paid to others the profit on pig metal and converting."[7]

Moxham felt that his enterprise would be extremely strong if the rail mill were made profitable. To do this he proposed drastic changes. He made a careful survey of the rail market, and of location of the raw materials necessary for steelmaking. He concluded that Johnstown was not the best place to make steel or sell rails. The optimum location, he discovered, was on Lake Erie near Cleveland, Ohio. Moxham recommended that the Johnson Company phase out its Johnstown plant. He envisioned that the firm should transfer its operations to a site at Lorain, Ohio, on Lake Erie where it would build an integrated mill that would produce rails starting with coke and iron ore. His new facility would "combine all the 'economies known to the present state of the art, not only in saving of by-products from coke ovens and blast furnaces, but in the use of the direct process, never permitting the metal to get cold from start to finish.'"[8] He also proposed that his firm capture the value of land appreciation by purchasing nearly six square miles surrounding the mill where a new city could grow.

Moxham presented his plan, which called for raising of $4,000,000 in new capital, in 1893 just prior to the panic. He proposed to raise money through the sale of new stock and bonds. The shareholders, influenced by the large profits then accruing from the switch works, enthusiastically voted in favor of Moxham's plan. Most of them hoped to purchase new shares by investing the dividends they were receiving on their old securities. Elated by shareholder approval, Moxham plunged into the execution of his plans. The company bought 3,700 acres at Lorain, and construction was started on a rolling mill. Plans were drawn for the blast furnaces and coke ovens.

The panic of 1893 and the subsequent lengthy depression in steel ruined Moxham's carefully laid scheme. In order to start the Lorain complex, he borrowed considerable money, most of it on short-term loans which he proposed to refinance by the sale of stock and longterm bonds. The depression prevented this. The rail business was cyclical. As steam railroad construction slowed and came to a near standstill, major rail producers such as the Pennsylvania Steel Company and Illinois Steel had whole plants idle. These could easily manufacture girder rail. However, since as much as 50 percent of many street railway lines were laid on private rights of way, large numbers of traction companies could and did order conventional rail. Cutthroat competition turned marginal profits at the Johnston Company's rail mill into losses. Moxham hoped that the depression would be short-lived, but conditions worsened in 1895, became more critical in 1896, and failed to improve in 1897. Hard times had still another impact on the firm. Moxham depended upon profits to raise his capital. But with dividends suspended, the market for stock vanished. Nor was the company able to sell long-term bonds at an acceptable interest rate. Although the Lorain rolling mill went into operation, the blast furnaces and coke ovens remained unfinished. Thus the firm never achieved the cost advantages Moxham desired.

The end for the Johnson Company came slowly but certainly. To remain in business the firm acquired an ever larger floating debt, which became progressively harder to refinance. Therefore, in 1898, when J. P. Morgan suggested that the Johnson Company be included in his proposed Federal Steel combination, Moxham was only too glad to sell out. Most of the shareholders took a substantial loss. Pierre du Pont lost nearly 75 percent of a $120,000 investment.

Interestingly enough none of the company's chief backers, Tom Johnson, T. Coleman du Pont or Pierre du Pont, all of whom had struggled for four lean years to put the company on a sound financial footing, blamed Moxham for the firm's failure. They all agreed that unlucky timing was the villain. Indeed Moxham so impressed Coleman and Pierre that they, as has been previously mentioned, invited him to Wilmington to take a leading role in reorganizing the Du Pont Company. When Moxham came to Delaware he applied with great success the strategies he tried to use at the Johnson Company, and at Du Pont his ideas worked brilliantly.

Moxham succeeded at Du Pont and failed at Johnson because the problems of the two firms were so different. One might be tempted to blame the panic of 1893 for Moxham's failure in steel. Hard times in the 1890s could easily be contrasted with the good times that characterized the era during which Du Pont was reorganized. To do this would be misleading. Du Pont under the three cousins was the dominant firm in its industry, controlling as much as 70 percent of America's explosives output. The company was well financed, faced little competition, and could benefit mightily from Moxham's cost analysis which helped create more efficient production and a better allocation of the firm's resources. The Johnson Company was totally different. It was a pigmy among giants. Johnson lacked solid financial backing. It had but one clear advantage, its ability to specialize in products for the newly emerging street railway market. Its major volume output, girder rail, however, was highly vulnerable to competition from mills that produced rail for the steam roads. Moxham's own data gave him all the information he needed. It plainly indicated that the switch works were highly profitable, and the rail mills were marginal even at a time when the steel industry as a whole was prosperous. Moxham's mind, however, did not take into account his firm's major problem, that is its relationship to the steel industry as a whole. Instead Moxham's fascination with accounting led him to try to save his rail mill by lowering its production costs. Had his plant been dominant in the industry, and supplied with ample capital as was Carnegie, his strategy might have worked as brilliantly at Johnson as it later did at Du Pont. But given the Johnson Company's weak financial position and tiny output, the Moxham program held little chance for success. His mill probably could not have competed in a depression even had full vertical integration been realized. Specialization was the only hope for a new entrant that was also a small firm. Tom Johnson's good connections with the rapidly expanding street railway industry insured that the switch works could retain their markets, and even during the recession's depths the specialized works turned a small profit. It was the rail mill and the ill advised expansion program that sunk the company.

One might have expected that Moxham would have learned his lesson, but he did not. Moxham left the Du Pont Company in 1915 and organized the Aetna Explosives Company which was a consolidation of several firms. He brought with him all of his considerable managerial talent augmented by

over twelve years experience as an executive in the world's largest and most successful explosives enterprise. Yet Aetna's problems were far different from Du Pont's. Aetna, like the Johnson Company, was small and poorly financed. Aetna quickly devoted most of its efforts to the production of smokeless powder for military use. Needless to say there was a good market for this during World War I; but even so, by April, 1917, Aetna teetered on the brink of receivership. Its fortunes could only be revived by merger with Du Pont or outright government subsidy, neither of which were forthcoming.

Why did Moxham fail at Aetna? Certainly the first world war offered an opportunity to make money in military explosives. Du Pont's history testifies to that. However, it was unlikely that high profits could be realized by a new, underfinanced entrant into the business. A quick analysis of the Du Pont story sheds light on the problem. When the war started, the British and French suddenly needed smokeless powder in vast quantities. No factories in the world existed which could produce the amounts required. Pierre du Pont, who by this time was Du Pont's key policy maker, hesitated to bid on allied orders because he feared that the war might end before his company could fulfill any contract. This had been the case in the Spanish-American War, and the danger was particularly great in the first world war since French and British orders necessitated the construction of vast new works. It would take a year to build new plants and make initial powder deliveries. Pierre was determined to avoid risk; he would not invest Du Pont capital in mills for the Allies, particularly since smokeless powder plants had no commercial use. Pierre insisted that if the Allies wanted powder they would have to advance the capital to build new factories. Du Pont's reputation and its vast resources loomed so large that the Allies were willing to advance the firm the money for new smokeless powder plants. Only a major company, soundly financed, and with a highly regarded technical reputation could have extracted such terms; no new entrant whose main resource was the expertise of two or three of its executives could hope to win similar contracts.

Aetna entered the market after the Allies had made their agreements with Du Pont. British and French needs were no longer critical. Aetna faced stiff competition. The new Du Pont plants, whose capital costs were totally written off after the delivery of the first orders, had falling costs. Du Pont with large orders, paid for in advance, could buy raw materials in vast quantities at the best possible prices.

Aetna's situation could not have been less favorable. Whereas the Allies came to Du Pont, Aetna went seeking orders to the British and French. Moxham was not in a position to demand advance payments. His firm had to invest its own capital for any factory improvements needed to meet orders. Furthermore, Moxham's costs would have to include the price of capital. Finally Moxham had to purchase raw materials after Du Pont had bought its needs; and as it turned out, material costs rose sharply starting in mid-1916.

Aetna's position, therefore, was almost hopeless. It invested its own capital to remodel its plants. It had contracts which provided for the delivery of powder at fixed costs. Not only did Aetna assume the risk that the war would not end before it could deliver powder, but Moxham assumed that raw materials and labor costs would remain stable or not rise rapidly. Although Moxham's firm won its gamble that the war would not end suddenly, it lost the bet that the costs of production would remain stable. Just as in the case of the Johnson Company, Moxham spent too much time worrying about the internal problems of management, and gave not enough effort to a consideration of the externals.

Moxham is a fascinating case. He was brilliant. He was methodical and well organized. But as an entrepreneur he had fatal flaws. His forte was internal management. When he looked outside his interests were political. Acutely aware of capitalism's critics -- afterall, he was one himself -- he saw that the old ways at Du Pont were a liability. However, his analysis of the outside world and his firm's position in it were never methodical. He could not transfer the analytical abilities that he applied internally to size up the external world. This led him to failure. Both at Johnson and Aetna he pitted pigmies against giants. In both cases he borrowed capital to produce goods in a high risk situation. In both cases he could not pay his firm's debts. His record was consistent. He did not seem to learn from experience. One is tempted to summarize "once a failure, always a failure." Certainly corporations would do well to look hard at men who have failed once when they hire managers.

Footnotes

[1] Pierre S. du Pont to E. Paul du Pont, January 31, 1949, Eleutherian Mills Historical Library, P. S. du Pont Collection No. 918.

[2] Alfred D. Chandler, Jr., and Stephen Salsbury, Pierre S. du Pont and the Making of the Modern Corporation (New York, Harper & Row, 1971), p. 73.

[3] Ibid., pp. 73-74.

[4] Ibid., p. 114.

[5] Ibid.

[6] Ibid., p. 271.

[7] Ibid., p. 29.

[8] Ibid., p. 30.