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DONALDSON BROWN (1885-1965): THE POWER OF AN INDIVIDUAL AND HIS IDEAS OVER TIME

ABSTRACT: Donaldson Brown developed the expanded Return on Investment (ROI) measure, or DuPont formula, in 1914. However, ROI was not Brown’s only contribution to financial management. His dealer ten-day reporting system was widely and rapidly adopted throughout the auto industry. His ideas to support a variety of forecasting and planning techniques supported decentralized corporate management and his pricing processes were cutting-edge developments that others tried to emulate. Flexible budgeting at General Motors, frequently unrecognized, also was in place during his financial administration in the early 1920s.
ROI remains Brown’s most prominent contribution and the technique achieved status as a dominant approach to financial management in industrial corporations by the 1950s. As a national standard-of-performance measure, it was supported by varying sources including the American Management Association as well as in the teaching materials of academics, especially Robert N. Anthony of the Harvard Business School. The impact of these forms of dissemination led to ROI being adopted eventually at the Ford Motor Company when its previously autocratic centralized style of Ford family management was replaced by a team known as the Whiz Kids, led by Harvard Business School alumnus Robert McNamara and a former GM vice president, Earnest Breech. This paper asserts the significance of the innovations developed by Brown as being among the most important of those initiated in 20th century corporate America, and thus among the most important in the development of 20th century accounting and financial management thought.

A January 1996 article in *Scientific American* noted the hearty timelessness of Donaldson Brown’s then 82-year-old return-on-investment (ROI) measure, also known as the DuPont formula [“How Much Bang for the Buck?,” 1996]. While it is
rare for any financial publication, professional or academic, to associate a financial management innovation so directly with a single individual, it is even more notable when such a respected science publication does so. Today, as well, if one performs an ad hoc ‘Google’ search under the name Donaldson Brown (in combination with DuPont/GM/General Motors) it yields over one million hits, affirming a broad awareness of Brown's pioneering, and if not legendary, role in industrial financial management. Although it was at DuPont that Brown developed many of his concepts, it was at General Motors Corporation (GM) where he was able to put them to work. Brown's title was officially that of chief financial officer, but he was also essentially what is known today as the chief information officer at both companies—a role that effectively supported GM's decentralization. This paper explores the many contributions of Donaldson Brown to the practice of accounting within corporate financial management.

While the contemporary acknowledgement of ROI seems widespread and established, there are circumstances that warrant revisiting Donaldson Brown today. First, accounting history has not provided a seminal study of Brown's work to complement the 1996 *Scientific American* recognition, which arguably reflected momentum from earlier studies such as those by Chandler and Salsbury [1971], Johnson [1978], Johnson and Kaplan [1987] and Johnson [1991]. Second, contemporary reinterpretation should be stimulated by the new and thoughtful works by business historians such as Freeland [1996; 2001] and Levenstein [1998] as well as added works that provide background about previous research, such as McDonald's [2002] memoir of his ghost writing assignment for Alfred Sloan's *My Years with General Motors* [1964]. This latter volume clearly, albeit indirectly, established that the management of General Motors was highly sensitive to both in fact and in appearance activities that might abet the Federal Government's interests in curbing the largest corporation in the world. Thus all the more reason that systems of governance and control, the legacies of Brown and his colleagues, are today viewed as important in a world where corporate governance has become a watchword. Further, Freeland's [2001] interpretation of governance change through several decades at General Motors affords fertile ground for reconsideration of the importance of ROI and accounting and financial control processes initiated by Donaldson Brown’s ‘Eureka’ in 1914 [Miranti, 1999].

Brown has yet to achieve singular recognition, such as in-
duction into the Accounting Hall of Fame, whereas comparable financial theorists of his era, such as Charles Ezra Sprague, who rationalized and popularized the proprietary basic accounting equation \((A=L+P)\) in a series of articles published in the late 19th century entitled “The Algebra of Accounts,” have been memorialized [1880 and 1908].

Brown has gained notoriety and recognition, but within limitations. There is little lasting literature as to the importance of his work. Now, recent research affords a new opportunity to reacquaint the financial community with Brown’s contributions, while updating the assessment of Brown’s contributions.

It is a premise of this paper that Brown’s “Eureka,” i.e., the ROI formulation \((R=TxP)\) or “Rate of Return on Capital Equals Rate of Turnover of Invested Capital times Percentage of Profit on Sales”, was and remains of essential significance, comparable to Sprague’s aforementioned contribution in the development of accounting thought, particularly from the view of financial management of 20th Century US corporations. This is illustrated in Exhibit I and will be discussed in detail later. Further, ROI was not Brown’s only contribution to financial management, as information provided below will explain his ideas on a dealer reporting system, flexible budgeting, and price setting.

This paper is organized as follows. First a brief profile of Brown’s upbringing, education, and life are provided. Then in Brown’s own words, the formulation of ROI processes at DuPont is described and tracked through the applications at both DuPont and General Motors. Next, several passages explore the origins of Brown’s thinking and his early writings on a broader scale, offering evidence from published and other primary sources as to the significance of ROI as well as a number of other financial management practices that relate to Brown. The paper concludes with contemporary considerations about impact and continuing usefulness of the ROI method, including a 21st century ROI application as part of Value-Based Measurement (VBM). The concluding comments identify potential research opportunities and affirm that Brown merits recognition as an important historical figure in the accounting discipline.

AN OUTLINE OF BROWN’S LIFE

Frank Donaldson Brown was born in Baltimore on February 1, 1885, the son of J. Willcox Brown and Ellen Turner Macfarland. A twin sister died in infancy. He had ten older brothers and sisters, and a younger brother [Brown, 1977, p. 7]. His
family was descended from a Scotch-Irish family that had immigrated to Virginia from New Jersey in the 1700s. His father had grown up in a wealthy family and had held the rank of Colonel in the Confederate Army. As a boy, Donaldson Brown spent his summers at his maternal grandmother’s plantation near Greenbrier, West Virginia [Brown, 1977, p. 13]. He was a precocious youth, winning first prize at the age of 13 in a General Electric contest to identify a young person who could invent a new application of the new energy form—electricity. He invented a device that could distinguish the coins dropped into a slot.

Brown entered Virginia Polytechnic Institute (VPI) in 1898 at the age of 13, graduating four years later with a degree in electrical engineering. Today, the student union at VPI is named for him. He undertook postgraduate work briefly at Cornell, but did not graduate due to the death of his father.

Brown began his career in 1903 with the Baltimore & Ohio Railroad, but soon moved to the Sprague Electric Company, a subsidiary of General Electric. He stayed with that company until 1907 when he went into business for himself in a coal-moving company. Following a short stint in that business, he went to work in 1909 as a salesman of explosives for the DuPont Company. In 1912, DuPont general manager, Hamilton Barksdale, a first cousin who was married to a duPont, recognized Brown’s administrative abilities and asked him to join the general office staff [Brown, 1977, p. 25]. Later, in June 1916, Brown married Barksdale’s daughter, Greta duPont Barksdale, which gave him a kinship that some considered necessary for advancement at DuPont. He was elected to the DuPont board of directors in 1918 and remained thereon until his death 47 years later. He served on the DuPont board’s Finance Committee for 45 years. He died on October 2, 1965, at the age of 80 [“Obituaries,” 1965]. In his later years, he served on various boards including service as a trustee of Johns Hopkins University.

Brown apparently was well compensated at DuPont if a 1921 newspaper article is any indication. An April 26, 1921, article in the New York Evening Post noted that Brown’s 40-room home in Irvington-on-Hudson had burned. Fortunately, the servants were able to carry the children to safety. The home was described as one of the largest in the area. The damage to the home was estimated at $60,000 to $75,000 [“Donaldson…, 1921]. The move to GM enhanced Brown’s earnings even more;

1 Note that the name of the DuPont company is capitalized, but the surnames of the founding family members do not have an initial capitalization.
by the 1930s, he was one of the highest paid employees in America. In 1934, he earned $134,521, when the GM president Alfred Sloan made $201,693. The highest paid individuals in America that year were Thomas Watson of IBM ($364,432) and movie star Will Rogers ($324,314). A 1936 study reported that he owned nearly a quarter of a million shares of GM stock [“Big Share Holdings..., 1936] and his salary was $353,732 [“G.M. Slashes...,” 1938]. In the 1940s, the U. S. Treasury Department, which at that time reported the income of all taxpayers who earned over $75,000 annually, reported that Brown was the 19th highest paid person in America with a salary of $232,571 [“Show World..., 1945]. Note that this amount is his salary; it does not include dividends. Many of those above him on the list were Hollywood personalities such as Darryl F. Zanuck, Ray Milland, and William Bendix. By 1957, Brown was listed as one of the 76 wealthiest Americans with assets of over $75 million; this put him ahead of such names as Henry Ford II and just below John D. Rockefeller III and the other third generation Rockefellers [“List of 76..., 1957]. In summary, Brown was well compensated for his contributions to the company.
RECOUNTING THE DISCOVERY—BROWN’S 1914
“EUREKA!”

In 1914, Brown was asked for a report on the performance of several operating departments at DuPont. It was at this point that he developed the procedure now known as the DuPont formula. Brown recounted the event in his memoirs as follows:

“An event occurred in 1914 which proved to be the turning point of my business career. The circumstances which led up to it were accidental, and I have often wondered what might have been my fate and fortune in industrial management if I had not, that summer, hit upon the mathematical equation (R=T x P)….

Mr. Barksdale was in bad health and was forced to take extended time off, which he spent with his family in Westport, New York. During a period of such absence from the office, the President of the company, Coleman duPont called for a study and report on the performance and accomplishments of the several operating departments. I undertook the job. …

The basis of my report gauging the performance of the various operating departments was a simple mathematical formula: R = T x P. The factor R represented the rate of return on capital invested, which is a final and fundamental measure of industrial efficiency in terms of management’s primary responsibility. The T stood for the rate of turnover of invested capital, and P for the percentage of profit on sales. On the investment side T was broken down into components, embracing plant and other fixed investment items, as well as amounts tied up in working capital in various categories such as raw materials, work in process, finished product, accounts receivable and required operating cash balances. …

A chart room was set up where these statistical data pertaining to each segment of the company’s operations were displayed. Meetings were held regularly with department heads, and extended discussions were held regarding the possibility of improving specific cost and expense items, in relation to the end-result of return on invested capital.” [Brown, 1977, pp. 26-27]

According to Brown’s posthumously published memoirs, that chart room was still in existence forty years later [Brown, 1977, p. 27]. A similar room was established at General Motors when Brown moved to Detroit.
Brown's published memoirs are introduced by Ernest Dale of the Wharton School who puts Brown's contribution, resulting in the chart room, into perspective.

The charting technique that the DuPont Company utilizes for financial control of its operations constitutes one of the best measures of management effectiveness ever devised. [Brown, 1977, p. i].

DUPONT AND GENERAL MOTORS

Brown's career at General Motors began following the du Pont family investment in the automaker, with the family gaining a controlling interest by 1921. He became Vice President of Finance at GM in that year and Vice Chair of the GM Board in 1938. He remained an active executive until 1946, and a member of the Board and its Financial Policy Committee until 1959.

Alfred Sloan, recalling Brown's experience at DuPont and then GM, notes:

Mr. Brown took upon himself the job of developing a method to reveal the desired facts about the several activities under the general manager. The method he chose emphasized the importance of capital turnover as well as profit margin in calculating return on investment. ...

The duPont group, after coming into the corporation in 1917 had made an effort to apply the principles of return on investment in appropriating funds to the operating side of the corporation.

I have described in an earlier chapter how, during the expansion of 1919 difficulties arose owing to the loose manner in which appropriations were made.... It was in the effort to meet these specific emerging problems that new methods of financial co-ordination and control were developed in General Motors [Sloan, 1964, II7-8].

While he developed the ROI concept at DuPont, it was at struggling and troubled General Motors, which was attempting to expand in the growing automobile business, that Brown's metric of ROI became an important device for the duPonds to exercise control over the capital allocations, and thus establish an important governance process. Indeed Pierre duPont insisted on some key controls as part of the investment in General Motors. "The Finance and Executive Committees at General Motors and the appropriations procedures must be patterned after..."
those at DuPont.” (emphasis supplied) [Chandler and Salsbury 1971, 451].

An advantage of Brown’s appropriations technique was that it not only calculated return on investment (ROI), it also identified the elements of that measure. The formulation permitted easy viewing of the effects of changes in prices, asset levels, and sales volume. As Brown noted in his memoirs:

“This approach resulted in a specific disclosure of causes and effects for the return on investment shown for each department. Effective control or the lack of it, for any item on either side of the equation could be identified, thus making possible efforts to improve conditions….. [Brown, 1977].

Alfred P. Sloan, Jr. affirms this view as follows:

The early return-on-investment form, which with some modifications is still used in General Motors, was the first step in educating our operating personnel in the meaning and importance of rate of return as a standard of performance. It... laid the foundation for what was to be one of General Motors’ most important characteristics, namely, its effort to achieve open-minded communication and objective consideration of facts [Sloan, 1964, p. 143].

And Sloan adds:

The divisional return-on-investment reports, ultimately based on a uniform accounting system, were constantly studied by the top executives. If the indicated results were not satisfactory, I or some other general executive would confer with the division managers about the corrective measures to be taken. [Sloan, 1964, p. 207].

The assessment of satisfactory ROI at GM was seen by Brown to be “a return on investment consistent with long-term sustainable growth. He clearly recognized that a simplistic model of performance measurement, particularly when it is used in an executive compensation scheme, could have negative long-term effects on the firm – causing an executive whose salary is tied to ROI to sacrifice long-term prospects for short-term profit.” [Garstka and Goetzmann, 1999, p. 10].

The importance of return on investment as a long-term measure of corporate productivity reflected Brown’s view that business owes its existence to its owners and should be expected to operate for their benefit. His writings often reiterated the con-
cept that “there is just one central motive in industrial management, i.e., the permanent welfare of the owners of the business” [Brown, 1927, p. 5]. Despite the importance of the owners, the ROI measure was also used as a standard measure for GM’s executive bonus plan. Managers who met their ROI goals were rewarded, while those who failed to meet goals “might well find themselves looking for work” [Tedlow, 1988, p. 54].

Knowledge of the rate of return on investment was particularly important at DuPont and GM because these companies were among the first to use discounted-cash-flow analysis to evaluate the attractiveness of future investment alternatives. By combining the rate of return of all corporate components, management was able to employ the price of capital within the company. DuPont’s ROI reporting compared all of the company’s operations with alternative capital investments. The result was a financial management system that “significantly decreased the cost of managing complex integrated firms and the cost of discovering new profitable investments within the firm” [Dulman, 1989, p. 564]. The system:

enabled top management to communicate its performance goals to operating managers clearly. Combined with a multidivisional structure, it allowed senior executives to maintain centralized control but encouraged operating managers to decide how to employ their division’s resources most profitably [Dulman, 1989, p. 565].

In other words, as the title of a 1927 article by Brown indicated, the use of the DuPont formula provided “Centralized Control with Decentralized Responsibility” [Brown, 1927]. Kaplan summarized this contribution as follows:

The functionally departmentalized DuPont system is the first example of applying local profit measures to evaluate the performance of operating departments. It was successful in coordinating and rationalizing the operations of the large industrial corporations that formed in the early 1900s. The basic functional organization is still used in many worldwide corporations today, more than 70 years after its introduction. The development of the ROI criterion, applied at a departmental level, seems to be the origin of the profit and investment center concept used in most modern corporations. It is remarkable to note these lasting legacies of Pierre duPont and Donaldson Brown on modern industrial enterprises [Kaplan, 1984, p. 398].
Brown’s complete formula was displayed in a 1950 American Management Association publication as displayed in Exhibit I [Davis, 1950].

**EXHIBIT I**

**RELATIONSHIP OF FACTORS AFFECTING RETURN ON INVESTMENT**

The Du Pont formula was a major contribution to systematic management, but it was only one of many contributions by Brown. Over his long career he worked to address a broad range of financial management information issues. The following sections provide a recapitulation of some of the other examples of his financial management thought and writings, including those related to pricing policy, dealer inventory control, decentralized controls, flexible budgeting, forecasting, and planning.

**PRICING POLICY**

Brown’s thoughts on pricing policy were based on a standard factory volume designed to produce an average rate of return of acceptable level over a period that included both bad and good years. This standard volume was defined as 80% of capacity. As applied, this policy was essentially a form of what is

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(From Davis, 1950, p. 7)
now known as target pricing. Writing in 1924, Brown described a ‘theory’ of pricing supporting this policy.

“...General Motors theory of pricing has a definite objective: to gain, over a protracted period of time, a margin of profit representing the highest attainable return commensurate with capital turnover and wholesome expansion, with adequate regard to the economic consequences of fluctuating volume.” [Brown, February, 1924].

Principles to guide the pricing of automobiles were adopted in the early 1920s and summarized in a series of articles published by Brown in 1924 in the journal *Management and Administration*. A fundamental concept of the GM pricing policy was the establishment of a standard volume that would take cyclical fluctuations into account. Without such a standard volume, management might consider raising prices in slow years to maintain a normal profit margin. But, to raise prices during a recession would be counter productive, so the GM policy was to normalize returns over a long period of time that included both seasonal and cyclical changes in volume. The resulting prices tended to lessen the problem of deep troughs and raised the peaks in the course of the business cycle. During the depression following 1929, this pricing principle was adhered to in spite of subnormal profits. Still, the company remained profitable—even though at a lower level.

The pricing strategy began with a base price, which was a ratio to factory cost and included a rate of return on capital employed. That base was then modified by a number of factors, including nature of the business and its stage of development, degree of difficulty in meeting a continued growth in demand, productivity of capital in the industry, susceptibility of demand to price variation (elasticity), availability and cost of capital, advantages over competition, level of demand, and goodwill in the business [Brown, March 1924, p. 286; Brown, April 1924, p. 417].

INVENTORY AND DECENTRALIZED CONTROLS

Brown’s recommendations to identify hidden inventory (i.e., in the hands of dealers) led to a plan to get inventory reports from dealers every ten days. The entire industry soon adopted this reporting schedule. Brown also was responsible for a concept at General Motors known as “decentralized operations and coordinated control.” This meant a uniform system of account-
ing for all auto dealers. He willingly delegated power as far down in the decentralized hierarchy as possible. Because each division's accounting system was uniform with all other divisions, the data facilitated comparisons among dealers; thus, GM was in a better position to evaluate its dealer system than was Ford, which often undercut its own organization by packing too many dealers into a particular market region [Clarke, 1996, p. 189].

Prior to 1921, inventories had gotten out of control at many of GM's divisions—the result being heavy borrowing to finance unneeded inventories. One of the causes of the inventory problems was the hazard of basing commitments on inaccurate forecasts and of losses from price changes or obsolescence [Brown, 1977, p. 47]. The 1921 imposition of a budgeting system was the first step toward reducing those inventories. Brown's later 1924 requirement that dealers report inventories every ten days was a step toward eliminating inaccurate forecasts of future sales. The purpose of the reports was to learn whether inventories were accumulating on dealer lots [O'Brien, 1989, p. 80]. The policy of requiring dealers to submit reports at 10-day intervals was a lasting one, eventually adopted by all firms in the automobile industry [Brown, 1977, p. 53]. Using these periodic reports (initially from 20,000 dealers), management was able to base production schedules and material commitments on the trend of retail sales. The result was that Brown was able to use a centralized budgeting system to control decentralized operations. Every division made its own production decisions, but Brown's budget and accounting system were policy tools that guaranteed goal congruence throughout the decentralized structure.

The aforementioned dealer reports were also used by Brown to gauge how profitable sales were for retailers. For example, sales made at little or no profit may indicate a tightening market; consequently, production might be curtailed even though sales trends, in units, were holding steady. Brown stated:

In the past, overproduction has been defined as a maintenance of production out of proportion to the retail sales rate. In the future we must define overproduction as being that quantity of cars in excess of the production that would be required to insure a proper stability and provide equitable profits to both the manufacturer and his dealer organization [Brown, 1930, p. 354-355].

Brown did not personally dictate to division managers when the use of the dollar-volume figures should overrule the basic budget
figures, but he did discuss the implications with division managers and urged them to consider the implications of forced sales on the near-term market. Brown was a believer in the power of knowledge: “As a fundamental requisite in the work of coordination, it should be remembered that the bringing of men’s minds together in connection with a given problem can always be greatly facilitated through a presentation of facts” [Brown, 1927, p. 12].

Business historian Alfred Chandler identified not only decentralized structure, but also sophisticated financial management systems as essential to the multidivisional organization [Chandler, 1962]. Basically, General Motors had a decentralized structure before the arrival of Donaldson Brown, but it was not effective. According to Johnson:

Remarkably alert to the importance of management accounting to GM’s new structure was a former DuPont executive, Donaldson Brown. Brown, the chief architect of the accounting procedures introduced at GM, applied to GM the DuPont Company’s advanced and sophisticated financial control techniques. These techniques made possible what GM officials described as “centralized control with decentralized responsibility;” they enabled GM’s top management to control the performance of each division without becoming involved in the general manager’s administration of his divisional operation [Johnson, 1978, p. 493].

Johnson concluded his praise for Brown with the following comments about GM’s accounting system and its contribution to the success of decentralization.

Year in and year out, despite many radical fluctuations in the national demand for automobiles, GM recorded a positive return on investment. During the post-1929 depression it was one of very few major U. S. corporations that did not register losses. Undoubtedly one important cause of GM’s success in dealing with the problem of fluctuating annual demand was Donaldson Brown’s accounting system [Johnson, 1978, p. 510].

Brown’s awareness of and obsession with the power of information was somewhat unusual for his time; his ideas are more typical of today’s chief information officers. His broad conception of GM’s information needs and an information network were yet other contributions that would impact generations to come.
Despite the success of his approaches, in 1953, in a letter to Sloan, Brown lamented that his greatest fear was that future General Motors managers might abandon his decentralization ideas [Brown, 1977, p. iv].

FLEXIBLE BUDGETING: FORECASTING AND PLANNING

Flexible budgeting at GM was also one of Brown’s innovations. Many of Brown’s innovations had a major impact not only on DuPont and General Motors, but on American Industry as a whole. Such was not the case, however, with his invention of flexible budgeting. The concept of business budgeting was unknown before the 1920s. The first important book on business budgeting by J. O. McKinsey, founder of the consulting firm and a faculty member at the University of Chicago, appeared in 1922 [McKinsey]. His volume, however, included nothing on flexible budgeting. One general history of accounting attributes the development of flexible budgeting to Westinghouse Corporation in 1928, and states that the Westinghouse method was widely imitated in the 1930s [Chatfield, 1977, p. 179]. However, Brown had implemented a flexible budgeting system at General Motors at least as early as 1923. Brown described his system in a series of three articles on GM’s pricing and budgeting procedures published in early 1924. In fact, the budgets shown in the articles depict standard costs at each of four volume levels. For some reason, readers seemed to focus on the pricing aspects of the articles and not on budgeting. Brown did not call his system “flexible budgeting,” but that is what it was. His phraseology was “analysis of commercial expenses at various volumes” [Brown, 1924a; 1924b]. Perhaps in the future, researchers will address this question, namely whether Westinghouse or other companies who were early adopters were influenced by Brown and his writings. In addition to his article publications, Brown shared his thoughts on budgeting in the foreword to a 1928 book by Fred W. Shibley, entitled The New Way to Net Profits. Although it did not use the term, the Shibley book did refer to a flexible budget [pages 143-144], with variable costs being calculated as a percentage of sales. Terminology mirrored that in Brown’s 1924 article. It was pointed out that such a budget emphasized the fact that profits increased substantially when sales were greater than shown in the master budget. Brown, too, referred to the concept without going into detail with the following words:

Budgetary control is an apt phrase except that it is likely to imply a rigidity that must be guarded against.
Flexibility is a prime requisite so that there may be a quick response, and thus the possibility of adjustment throughout the system to the requirements of changes of situation that are inevitable. The focal point of the system is the sales outlet. The flow at this point must be gauged, and every other activity must be coordinated with it [Brown, 1928b, p. viii].

Brown introduced a budgeting system at GM shortly after moving to that firm in 1921. Sales forecasts were used to plan production and acquisition of production resources. Divisions were required to submit monthly forecasts of production schedules four months ahead. Such planning required forecasts of sales to which production was tied. Procurement of materials could not deviate from the needs specified in the forecast. A reading of Brown's explanation of the GM system gives one a feeling of something closely akin to a modern Materials Requirement Planning (MRP) system [Brown, 1928a, p. 9]. Actually, Brown's budgeting innovations had begun at DuPont, where he brought into the staff a full-time political economist to provide consultation and advice on forward trends of the national economy that might affect demand for the company's products [Brown, 1977, p. 28]. The economist later moved to GM at the request of Brown. Use of such planners became common practice among large companies.

Brown's budgeting work at DuPont was the likely source of his process implementations at GM, but the objectives of budgeting were different at the two companies. At DuPont, budgeting was designed to control cash and major financing requirements, but at GM the objective was oriented more toward controlling sales and costs, particularly given the unpredictable changes that often occurred with respect to automotive demand. Thus, Brown modified the DuPont budgeting procedures to serve another purpose, i.e., production planning versus cash planning. Brown recognized that budgeting could be used for multiple purposes long before most managers realized budgeting could serve any purpose. At DuPont, Brown's forecasting objective had been balance-sheet oriented; at GM the objective was income-statement oriented. In fact, his writings make it clear that forecasts were designed to reduce the impact on income of changes in the business cycle.

Perhaps Brown's budgeting thought can best be summed up in his own words published in a 1928 monograph published by the U. S. Chamber of Commerce: “Forecasting and planning is the essence of modern-day business management” [Brown,
CONTEMPORARY CONSIDERATIONS

Writing in 1999, Professor David Hounshell of Carnegie Mellon University made an important accounting history observation in a footnote to his paper “Assets, Organizations, Strategies, and Traditions: Organizational Capabilities and Constraints in the Remaking of the Ford Motor Company, 1946-62.” His study relates the post WWII transition of Ford Motor Company from a Unitary centralized form of family controlled business that was identified with Henry Ford’s autocratic management style to a Multi-division decentralized form that was the signature form of GM under Sloan and Brown.

In 1922, Henry Ford had observed: “That which one has to fight hardest against in bringing together a large number of people to do work is excess organization and consequent red tape. To my mind there is no bent of mind more dangerous than that which is sometimes described as the ‘genius for organization’” [Ford 1922]. Ford’s own “genius” was to run the business according to his experience and whim. He eventually bought out all outside owners to avoid competing proprietary interests. And he took unilateral and drastic steps such as closing down the company for a year to allow for complete rebuilding of Ford’s production facilities. Such unprecedented action was consistent with his unilateral style and authority.

What Hounshell helps accounting historians understand is how it came to be that a dramatic shift from the Unitary form to the Multi-division form could be accomplished in Ford Motor Company. To put this into perspective, H. Thomas Johnson, points out that “Financial management information arose before World War I primarily to simulate market prices that disappeared when companies internalized … management transactions….” [Johnson 1991]. Thus, as larger complex units sought a consistent process of creating internal information for control purposes, financial management systems were required, since market prices were not available within large organizations to inform decision makers.

How did this impact Ford after WWII? The decision facing Ford in the late 1940s, as noted by Hounshell, was the need to depart from the single geographic production facility that fit the Unitary model of Ford, wherein all operations were conducted at one massive plant in Michigan. The proposal in 1946 to build an Engine Plant near Cleveland versus expanding the existing
home plant gave rise to the issue of how, in a former Unitary operation, internal financial information could be established to support what would become a decentralized multi-geographic entity, a completely new experience for Ford.

The resolution to their development of a financial management information system was found in the mental habits or ‘software’ of the new team of managers employed by the Ford family to run the post WWII business. Leading the team, eventually as board chairman was Ernest Breech, a former GM vice president who had been an assistant to Donaldson Brown. Breech had been indoctrinated in the GM way of doing things. At the same time, Henry Ford II brought in a group of lower-level managers who came to be known as the “Whiz Kids.” Leading this group of Whiz Kids was Robert McNamara, who would later become the first non-family member to hold the title of President of Ford Motor Company and would later become the U. S. Secretary of Defense during the Viet Nam War. As a student of Professors Robert Anthony and Ross Walker at the Harvard Business School, McNamara had learned Donaldson Brown’s ROI formulation and as a consultant, presumably, had experience applying it.2 By employing Brown’s metric and bringing into the top levels of Ford management other executives from GM who were familiar with the ROI approach to financial management, Ford became sufficiently likeminded to operate as a decentralized operation.

Hounshell emphasized how profoundly McNamara had been influenced by Brown via Anthony.

He had studied and taught business management at Harvard Business School, where he had become a disciple of Robert Anthony, a professor of accounting whose philosophy was that accounting should provide the principal means of control and decision making in the corporation. Under Anthony, McNamara had mastered the case on return-on-investment calculations and decision criteria that Donaldson Brown had developed

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2 Hounshell [1999, p. 203], based on a 1994 interview with McNamara, asserts that Anthony was the source of McNamara’s knowledge of GM’s techniques. Alternatively, Zeff [2008, p. 180; Anthony, 1989, p. 2], based on a 2007 interview with McNamara, argues that Walker was the source of the knowledge about GM. Shapley [1993, p. 24], in her biography of McNamara, simply states that Walker was the instructor who taught much of the material. Since both Anthony and McNamara had Walker as a professor, both may have learned the concepts from Walker, but then McNamara may have gained additional insight from Anthony when the two later shared an office together from 1940 to 1942.
at the DuPont Company.

Then, in a footnote, Hounshell continues:

In an interview with me in Washington DC, 7 September 1994, Robert McNamara was still able to recite chapter and verse of the principal aspects of Donaldson Brown's ROI formulation [Hounshell 1999, p.203].

There are other recent demonstrations of the durable and resilient attractiveness of the DuPont formula as well, including both appreciative and critical comments made in the late 1990s. Robin Blumenthal, writing in CFO magazine in January 1998, noted that some critics felt that the DuPont model falls short because it is not an effective tool for predicting the future or for tracking costs. The model also lacks the means to include increasingly prominent intangible assets in its return calculations, an issue in the dot.com era of the late 1990s. However, one consultant had adapted a cash flow metric to ROI providing for a Cash Flow Return on Investment, or CFROI, to address such concerns. With competing measures available, such as EVA (Economic Value Added), which has gained recognition and popularity in recent years, ROI now may be seen as one among many options, versus having been the principal option in the past [Blumenthal, 1998, p. 61].

Assessing the increasing number of metrics available for today's Value-Based Management (VBM) approaches, research provides findings that indicate that “standard financial ratio analysis as expressed in the DuPont formulation are significantly related to market performance metrics” and therefore meaningful to implementing VBM. For example, Weaver and Weston conclude that traditional (ROI) and alternative methods such as Discounted Cash Flow (DCF), Economic Value (EV) or Economic Value Added (EVA) and Return to Shareholders (RTS-capital gains plus dividends), each have particular merits that should be assessed in accordance with a firm's strategic objectives. Furthermore, the researchers provide a clinical analysis centered on Hershey Foods Corporation. Their ROI schematic for Hershey Foods is provided in a related paper “Implementing Value Based Management” [Weaver and Weston, June 3, 2003a]. It employs elements that compare fully to the American Management Association 1950 monograph construction of the DuPont ROI formulation.

RESEARCH OPPORTUNITIES AND CONCLUSION
This paper has considered the power of an individual and his ideas over time by reviewing the role of F. Donaldson Brown, whose ROI formulation, development of flexible budgeting, and other contributions to financial management information represent a fundamental component of financial literature. The business historian Hounshell put Brown's ROI innovation in perspective in the following terms:

The DuPont innovation of ROI calculations represents one of the most significant turning points in the history of modern accounting and management. ...it allowed for the first time the integration of financial accounting, capital accounting, and cost accounting.... I call attention to Brown's ROI formula not only because of its importance but because it was merely one analytical method developed at DuPont to guide its executives in making decisions about the allocation of assets. Brown's work was done in the context of DuPont's bold program of diversification, which over little more than a decade moved the company from being predominantly an explosives manufacturer to becoming a diversified chemical giant. The company's executives needed objective methods to guide their resource allocation decisions. Would DuPont realize a greater return by investing in this business rather than that one? Should executives fund the expansion of this plant rather than that one? Brown's methods helped guide these executives, and it also allowed them to measure the performance of existing DuPont businesses [Hounshell, 1998, p. 8].

The practices initiated and or implemented by Donaldson Brown enabled DuPont and General Motors to cope with the challenges of large companies seeking to balance centralized vs. decentralized decision making. Brown's ideas were made known through his writings, publications, and speeches, and ultimately by incorporation in textbooks, classrooms, and academic literature. Trade organizations and financial publications, for decades up to the present, have disseminated ROI materials. Furthermore, his disciples also helped in spreading his influence far beyond GM and DuPont.

Nevertheless, there has been no attempt to collect and publish Brown's papers in a fashion consistent with other major contributors to the financial discipline. Further, there has been no substantive biographical study that reaches beyond the mere outline of his personality and his activities, which might help
people to understand more about how Brown’s mind worked. For example, was this ‘thinker upper’ a creative genius, or a simulator and collaborator? The purported Donaldson Brown archives at the Hagley Museum and Library in Delaware could offer support to scholars interested in deeper study and examination of Brown.

The 1957 U.S. Supreme Court edict ruling that DuPont’s controlling interest in GM had resulted in restraint of trade led to E. I. du Pont de Nemours divesting itself of GM stock and removing its representatives from GM’s board and governing committees [Freeland 2001, p. 254]. However the habitual, long standing relationships among leaders of the two corporations, as discoverable under social network analysis, suggests a method and an area of inquiry that accounting and business historians alike could find important in identifying informal networks that reveal relationships among major corporate leaders. Potential research opportunities include reviewing and explicating Brown’s social and professional networks using diagram analysis. Such a diagram would display the names that appear commonly on the same printed page with Brown’s name using selected publications that have studied the super rich, DuPont and GM, as well as the most financially powerful individuals in the nation from a critical perspective.

Although many of Brown’s contacts bear the surname of duPont, there are also many who have automotive backgrounds, such as Alfred P. Sloan, Walter P. Chrysler, and Charles F. Kettering (the founder of Delco and director of research at GM for 27 years). Brown’s corporate network included, besides auto companies, Westinghouse Corporation, U. S. Steel, and General Electric. Beyond social networks, it would seem of interest to attempt to employ this mapping process with regard to the financial management literature or to similar materials involving Brown’s contributions to control and governance to establish a perspective on Brown’ relationships and influence in corporate administration. This would seem to have potential to improve the understanding of his conceptual and personal relationships at both DuPont and General Motors. Actually, the companies themselves should be lauded for allowing Brown the opportunity to be recognized—something that probably would not have occurred had he worked for Ford instead of GM. O’Brien suggested as follows:

The detailed accounts in the contemporary business and management literature of the formulation and
implementation of production and inventory control systems that are available for General Motors are not available for Ford. This is because Henry Ford was reluctant to allow any member of his organization, other than himself, to receive publicity. Donaldson Brown, for instance, never would have survived at Ford if he had been receiving the sort of publicity and acclaim that he did during the 1920s while at GM [O’Brien, 1989, p. 83].

Today, ROI continues to be employed in the writings of established and promising authors. The example of ROI as a particular traditional application of Value-Based-Management suggests that the formulation continues to add value to industrial financial management. Similarly, Brown’s thoughts on flexible budgeting form the basis for that concept today.

In summary, as Ernest Dale indicated, Donaldson Brown was GM’s original “thinker-upper” [Brown, 1977, p. vii]. The explication of Donaldson Brown’s contributions to the development of accounting thought and practice in this paper support that he warrants formal recognition such as has been made to peers acknowledged for their achievements and contributions to the discipline. Those trusted with bestowing such recognitions, in particular the nominators of the Accounting Hall of Fame, are encouraged to acknowledge Brown and rectify a long standing oversight. Thoughtful innovation and adaptation on the part of the nominators seems in order; and if GM’s “thinker upper” were available to consult with us today, he might well agree.

REFERENCES

Publishing Company.


