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THE DELAWARE AND HUDSON CANAL COMPANY: FORMING, FINANCING, AND REPORTING ON AN EARLY 19TH CENTURY CORPORATION

Abstract: This paper examines the case of the Delaware and Hudson Canal Company, chartered in 1823, to gain perspective on how a 19th century corporation obtained financing, communicated with shareholders, and sparked technological innovations in the years before the ascendance of railroads in America. Helping to expand the accounting history literature on canals, we examine the annual reports issued during the firm's first decade of existence. Despite early problems, management continually cast an optimistic view of the company's future in these reports. And, after initially increasing the amount of financial and other information disclosed, the annual reports subsequently became less forthcoming and transparent.

INTRODUCTION

Scholars have paid considerable attention to the contribution of the railroad industry to the development of accounting and auditing [Flesher and Previts, 2009]. In contrast, financial reporting in the canal industry has received little attention, despite the impact that canals have had on the industrial revolution, and on many of the practices that railroads would follow in the future [Arnold and McCartney, 2008; Edwards, 1985]. To further develop the literature on financial reporting in the canal industry, this paper examines the annual reports and history of the Delaware and Hudson (D&H) Canal Company during its first decade of existence.

The D&H Canal Co. was an early vertically-integrated firm: it owned and operated coal mines, built and managed the canal, and amassed a fleet of barges to transport coal on the Hudson

River. It is also associated with several feats of civil engineering, including the gravity railroad and the wire suspension bridge. The company was one of the first private firms to sell shares on the New York Stock & Exchange Board (NYS&EB), and to raise more than \$1 million of equity financing. D&H shares were a favorite of speculators, and among the most widely traded securities during the 1830s [Lowenthal, 1997; Werner and Smith, 1991]. Examining the formative years of the D&H Canal Co. gives us perspective on the formation of early corporations, growth of the securities market and of financial reporting and disclosure practices in the United States in the decades before the ascendance of the railroads.

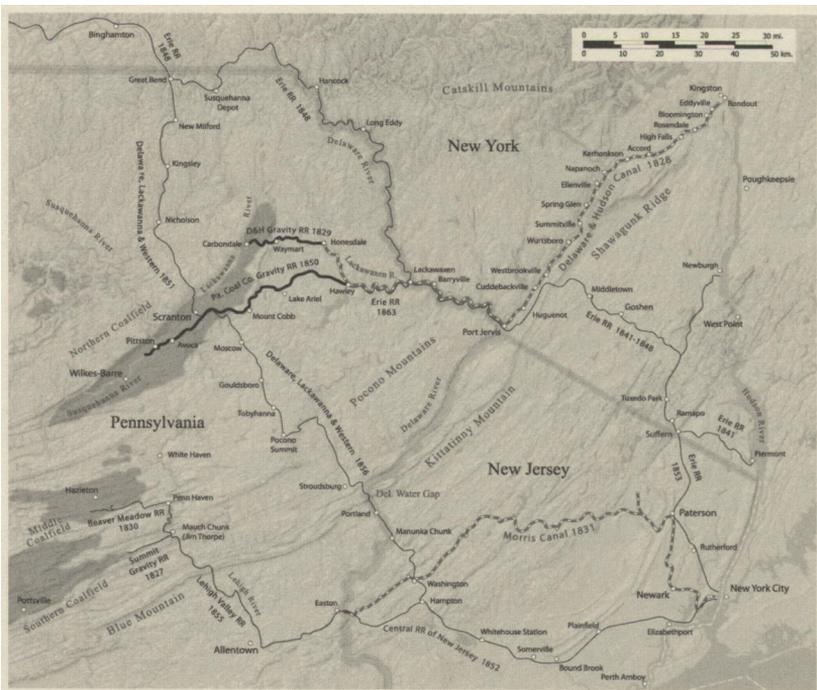
Although the use of artificial waterways for irrigation and drainage dates back to antiquity, they were not widely used for transportation until the canal lock—which allowed boats to be easily raised and lowered to different levels—was invented in the late 15th century. Canal building subsequently spread throughout Europe, and before the end of the 17th century, the French had built the 148-mile long Languedoc canal to connect the Bay of Biscay with the Mediterranean. British canal mania and speculation led to a financial crash in the late 18th century, but in North America, it was not until the early decades of the 19th century that a canal system began to emerge. Only at that point had difficulties associated with the sparse population, long distances to be traversed, and lack of engineering and management expertise finally been surmounted [Whitford, 1906, pp. 4-9; Howe, 2007, p. 216].

With the advent of canals, water transportation was no longer restricted to the rivers and oceans. The geography of industrial growth in Great Britain was materially altered as a result [Turnbull 1987, p. 557]. The same can be said of North America. New York's legendary Erie Canal, completed in 1825, joined the Hudson River and the Great Lakes, and provided a long-sought gateway to the West. It also triggered a boom in canal construction that produced 3,000 miles of canals by 1840. New York's population and industry both grew tremendously between 1825 and 1840, with cities along the Hudson River and the Erie Canal becoming major agricultural and industrial centers, assuring the commercial ascendancy of New York during the 19th century [Cochran, 1981; Lowenthal, 1997; Whitford, 1906].

As the Erie Canal was nearing completion, construction was beginning on the 108-mile-long D&H Canal. It would be built in less than three years, by an estimated 10,000 workers using only

picks, shovels, draft animals, and blasting powder. The D&H Canal used 108 locks to overcome a total change in elevation of 1,073 feet: an accomplishment exceeded by only four other U.S. canals. Mules pulled barges along the four-foot deep, 32-foot wide waterway, which operated from 1828 until 1898. The 1865 map in Figure 1 shows the route of the D&H Canal: from the coal fields in Carbondale, a gravity railroad carried the coal to the canal, which began in Honesdale, Pennsylvania. From there, it followed the Lackawaxen and Delaware Rivers to what is currently Port Jervis, NY, headed northeast through the valley between the Shawangunk Ridge and the Catskill Mountains, and ran alongside the Rondout Creek to the Hudson River [Lowenthal, 1997; Whitford, 1906].

FIGURE 1
Map of the D&H Canal and Gravity Railroad, Circa 1865



Source: Available on Wikipedia Commons, at [http://en.wikipedia.org/wiki/File:Delaware and Hudson Canal Map.png](http://en.wikipedia.org/wiki/File:Delaware_and_Hudson_Canal_Map.png)

Along with other anthracite canals, the D&H provided Americans with a steady supply of inexpensive coal, which had wide-ranging impacts on industrial development. The use of

steam power expanded and factories began to replace artisans in the manufacture of such products as glass, earthenware, beer, and spirits. Anthracite was used to produce iron and steel, which became critical materials for the development of mechanized agriculture, transportation and manufacturing [Hindle and Lubar, 1986, pp. 106-108].

This was a period characterized by exciting technological and industrial change. Economic development was initially financed by chartered banks, with the corporate form gaining in popularity as a means of raising capital. In an era without financial reporting regulation, it is interesting to examine the reporting practices of one early U.S. transportation corporation. In this paper, we examine the available annual reports issued by the D&H Canal Co. between 1825 and 1835—its first decade of existence—to gain a better understanding of how the Board of Managers communicated the company's past results and future plans to its stockholders. Digital copies of the D&H Canal Co. annual reports discussed in this paper are available on Google Books.

LITERATURE REVIEW

The accounting history literature related to canals is limited, particularly in the case of U.S. canals. Kistler [1980] analyzed the development and decline of the Middlesex Canal in Massachusetts, using data from original financial records during the period 1825 to 1845. This 27-mile long inland waterway was built between 1793 and 1804. By connecting Lowell with Boston and the sea, it allowed the region to develop into a major textile manufacturing center.

Russ, Previts and Coffman [2006] provided an historical perspective on corporate governance in the 19th century, based on the stockholder review committee of the Chesapeake and Ohio Canal Company (C&O). Using archival sources, they discussed this committee's influence on the development of the firm's corporate governance and financial reporting systems, and encouraged further accounting history research into canals.

Edwards [1985] described the accounting used by early canals and railways in Britain. He noted that the cash basis was commonly used until the late 1840s, with companies preparing a capital account and a revenue account. In both the canal and railroad industries, substantial investment in infrastructure was required before operations could begin. The capital account showed how money raised had been spent in constructing the

transportation network, documenting how managers had fulfilled their stewardship function. Once operations had begun, the capital account was commonly supplemented by a revenue account, which provided support for the amount of dividends declared. The distinction between capital expenditures and revenue expenditures had been made by Adam Smith in 1776, and would have been familiar to businesspeople during the subsequent century.

During the late 1840s, this reporting approach evolved into what became known as the "double account" system, according to Edwards [1985]. By 1868, this method became a statutory requirement for British railroad companies. In the "double account" system, firms prepared two statements in place of the single balance sheet in use today. The *capital account* identified the capital raised by issuing shares or debentures, and the amount spent on fixed or capital assets. It was intended to provide an historical record of capital transactions, rather than a statement of current position. The *general balance sheet* included current, trading assets and liabilities whose balances fluctuated as a result of daily operations, such as cash, inventory (stock), payables (creditors), and receivables (debtors). The balance of the capital account was also carried to the general balance sheet, so users of the financial statement could conceivably combine the information from the two statements if they wished.

Arnold and McCartney [2008] reviewed the financial statements of seven canals that operated in England between the 1770s and the 1850s. This timespan included periods when the canals were under construction, had begun to operate, and were fully operational. During the initial construction phase, the statements reported on the financing raised and the amounts expended. More extensive financial statements were prepared during the later construction periods, when canal operations had also begun. Some were based on the "double account" approach described by Edwards [1985]. Assets financed with debt or stock were reported in the capital account, while those funded out of earnings were reported in a separate statement, with the operating expenditures.

After the initial construction was complete, the financial statements provided only revenue and expense information. Despite the need to continually raise capital for the improvements and extensions required to manage additional traffic, no financial position statements were prepared. Arnold and McCartney [2008] reported that all the statements were prepared

on a cash or funds basis, with limited accruals for some receivables. They concluded that the canal reports examined did not provide evidence of a shift towards modern financial reporting practices: firms were not presenting a profit figure or disclosing the information needed to compute a rate of return on capital. Instead, the focus was on reporting the cash surplus available for distribution.

Beyond canals, accounting researchers have studied the records left by 19th century railroads, mines, and manufacturers. For example, Michael [1996] provided a comprehensive example of the disclosure practices of the Quincy Mining Company in the unregulated environment of the 19th century. He found that although the firm initially included detailed schedules of operating costs and efficiency measures in its financial statements, these metrics were subsequently eliminated—possibly in an attempt by management to restrict the information provided to shareholders.

Boockholdt [1978] noted that the industrial revolution led to the need for corporate management to report on its custodianship to absentee owners. Railroads were among the first companies to require large amounts of fixed assets, which necessitated considerable outside financing. Regular communication with present and prospective stockholders facilitated raising capital, but there were no clear guidelines about the types of reports and disclosures that were appropriate. It wasn't until the final few decades of the 19th century that railroads were regulated and accounting methods became more sophisticated.

Previts and Samson [2000] cataloged and evaluated the early annual reports of the Baltimore and Ohio (B&O), one of the oldest U.S. railroads, and one of the first modern U.S. corporations. The annual reports detailed the company's formation in 1827, and provided information about the construction and operation of the railroad. "The B&O annual reports reflect the company's experimentation, evolution, and development in the process of disclosure to capital providers, potential investors, and the public" [Previts and Samson, 2000, pp. 3-4]. Similarly, the present study examines the beginnings of the annual reporting process for another early U.S. corporation in the transportation industry—the D&H Canal Company.

ANTHRACITE COAL AND THE WURTS BROTHERS

Pennsylvania's abundant geological deposits of anthracite coal had been used locally in blacksmith's forges as early as

1769. More widespread use became possible after development of an open grate in 1808—which made it possible to burn anthracite in an ordinary fireplace (without a forced draft). Anthracite coal, with its intense, slow-burning flame, produced a greater energy output than either wood or soft, bituminous coal. This hard “stone coal” had been burned for centuries in Scotland, South Wales, and Ireland, where deposits were also found [Powell, 1980; Lowenthal, 1997].

Prior to the War of 1812, the coastal cities in the young American republic used bituminous coal imported from Britain as an energy source. When these imports were interrupted by the British blockade, commercial development of Pennsylvania’s anthracite deposits was seen as a way to address the resulting fuel shortage. The D&H Canal was one of several anthracite canals built to transport coal from the Pennsylvania fields to coastal markets.

Accounts of how the four youngest Wurts (or Wurtz) brothers—Maurice, William, Charles Stewart, and John—became involved in the anthracite coal business vary. One version has it that William, a Philadelphia dry goods merchant, took title to some land in Pennsylvania’s Lackawanna Valley, likely in exchange for a customer’s defaulted note. Hiking and hunting in the area, he and Maurice began to explore the black stone outcroppings, and in the process, outlined the area’s anthracite coal fields. Around 1814, they began purchasing promising parcels of land, paying between \$.50 to \$3.00 per acre [Whitford, 1906; Lowenthal, 1997].

The brothers ruled out marketing the coal in their native Philadelphia, since transportation would be difficult, and their competitors’ coal fields were closer to the city. Instead, they set their sights on the New York City market. However, given the weight of the coal, transportation via waterways would be required to reach that market; the overland routes were few, and often difficult to traverse. The Wurts brothers sought and received legislative approval in both Pennsylvania and New York State to develop a water route linking the Delaware and Hudson Rivers [Lowenthal, 1997].

In March 1823, the Commonwealth of Pennsylvania passed *An Act to Improve the Navigation of the River Lackawaxen*, granting Maurice Wurts and his heirs and assigns the right to enlarge the river or its tributaries, and to erect dams, locks, or other devices needed to achieve a safe navigation [reprinted in Delaware and Hudson Company, 1906, p. 43]. The following month, the D&H Canal Company was granted a charter from the State

of New York (NYS), giving it broad powers to construct a canal, locks, tow paths, aqueducts, culverts, dams, waste weirs, toll houses and artificial harbors within the New York counties of Orange, Ulster and Sullivan. To finance the canal, the NYS charter also specified that “it shall be lawful to open books for receiving and entering subscriptions to the amount of five hundred thousand dollars, in shares of one hundred dollars each share . . .” [reprinted in Delaware and Hudson Company, 1906, p. 1].

Although NYS had passed a general incorporation statute for manufacturing firms in 1811, it was still common for firms to seek a state charter, which could convey additional benefits, such as a land grant, tax exemption, monopoly, or state aid. Ventures expected to benefit the public—like canals—might be granted privileges that would help them attract investors. Thus, the charter of the D&H Canal Co. also allowed the firm to operate a bank [Werner and Smith, 1991, pp. 27-129].

FINANCING AMERICA'S GROWTH

Prior to the 19th century, the main securities sold in the U.S. were bonds issued by federal, state, and local governments. They were liquid and offered a fixed return, which investors found attractive. Once banks were granted business charters, they became the first U.S. public corporations to raise capital by issuing shares. Shares in conservatively-managed banks made attractive investments, and provided greater liquidity than land or fixed assets. Banks of the era provided local financing in the form of long-term loans secured by mortgages or securities. In addition, banks issued their own notes, which served as currency in the young nation, since the federal government issued little coinage and no paper money before 1862 [Chandler, 1977, pp. 15-80; Werner and Smith, 1991, pp. 27-129].

Shares of well-managed insurance companies soon began to be regularly quoted and traded, given the industry's stable earnings and substantial dividends. The traders formally organized themselves as the New York Stock & Exchange Board (NYS&EB) in 1817, with a name that referenced their frequent meeting place: the board room of the Tontine Coffee House on Wall Street. By the following year, the issues listed on the exchange included six from government entities, ten from banks, and thirteen from insurance companies, in addition to several foreign exchange deals [Werner and Smith, 1991, pp. 27-129].

Inland transportation companies often depended on

government financing, since they initially found it difficult to raise capital through the securities market. Projects to build roads, bridges, canals, and wharfs were subject to engineering, labor and management problems, and could take years to complete. Further, once operational, the amount of tolls that could be collected was sometimes limited by the state charter. As a result, such projects were often intended to serve the public interest, rather than to generate a profit, and their investors were motivated by expectation of obtaining services, seeing their property values increase, or fulfilling their civic duty [Werner and Smith, 1991, pp. 27-129]. This fact may help to explain, in part, why profits were not reported in the financial statements of early canals and railroads.

Transportation companies—despite their drawbacks compared to investments in banks and insurance companies—would become the next growth sector on the stock exchange. The Erie Canal was financed with bonds issued and guaranteed by New York State. These bonds became quite popular, and 42 separate issues were floated between 1817 and 1825. Debt instruments issued by other states soon began to trade on the NYS&EB, which in turn paved the way for nonfinancial corporations to raise capital via the exchange. Procedures for buying and selling securities had now become familiar, and price quotations were being published by the press. By 1827, more than 100 securities were regularly traded on the NYS&EB, and a few non-financial firms, like the Delaware and Hudson Canal Company and the New York Gas and Light Company, appeared in the listings [Chandler, 1977, pp. 15-80; Larkin, 1998, pp. 16-40; Werner & Smith 1991, p. 27-129].

THE D&H CANAL COMPANY

In 1823, New York State granted a charter to the D&H Canal Co., which appointed eleven prominent men to oversee issuance of the company's shares. That same year, Benjamin Wright—chief engineer of the Erie Canal—was hired to survey a route for the D&H Canal. The initial cost estimate was in excess of \$1.2 million—more than double the \$500,000 capitalization initially granted in the company's charter. Consequently, New York State was petitioned to amend the company's charter, and two amendments were passed during 1824: in April, the subscription amount was tripled to \$1,500,000, and in November, the company was authorized to use \$500,000 of its capital to enter the banking business. The bank would be able to issue

negotiable bills and notes—useful for paying contractors—and could also promise investors a return more quickly than a canal that was years away from completion. To keep the company focused on the canal project, the legislators restricted the life of the banking operations to 20 years (or less, if the canal was not completed within seven years) and limited the interest that could be charged to 6% [Lowenthal, 1997, pp. 5-131].

On January 7, 1825, subscription books for shares of the D&H Canal Co. were opened following a demonstration of the heating capabilities of anthracite coal at the Tontine Coffee House on Wall Street. The warmth provided by the coal must have been appreciated during the New York winter, and the stock was fully subscribed, making the D&H Canal Company one of the first private enterprises in America with a capitalization in excess of \$1 million. However, given the usual practice of paying only 5% or 10% of the par value down at the time of subscription, with the balance payable in installments, only about \$74,200 was initially raised in cash. In fact, many early public corporations failed when they were unable to collect the balances due on stock subscriptions [Lowenthal, 1997, pp. 5-46; Werner and Smith, 1991, pp. 27-129; Wakefield, 1971, p.4]. As we will see in the following sections of the paper, the D&H Canal Co.'s reports to shareholders routinely projected a positive view of the firm's future prospects. Perhaps the managers of the D&H Canal Co. viewed this as a means to reduce the likelihood of failure.

EARLY REPORTS AND ACTIVITIES

In March of 1825, the D&H commissioners met and elected 13 managers, one of whom was Maurice Wurts. Philip Hone, a major investor, was elected president, but served in this role for only a year, at which point he became mayor of New York City. Nevertheless, Hone remained a prominent member of the D&H Board until his death in 1851. John Bolton, the first corporate treasurer, succeeded Hone as president. Presumably he was elected to the position because of his financial acumen—since he owned only 30 shares of the company's stock. Maurice Wurts was asked to resign his board seat after serving only one year—apparently so it could be filled by a New Yorker—and at that point became the company's agent, negotiating a variety of transactions on its behalf [Lowenthal, 1997, pp. 5-131].

The six earliest annual reports issued by the D&H Canal Co. that are included in the Google Books digital collection

are discussed in this section of the paper. Table 1 summarizes the contents of these reports, which cover the period from 1825 through 1835.

TABLE 1
Annual Reports Discussed

Report for the year	Date issued	Company officers		Number of text pages	Exhibits	
		President	Treasurer		number	types*
1825	3/7/1826	John Bolton	Samuel Flewelling	13	0	
1827	3/4/1828	John Bolton	Samuel Flewelling	17	2	Balances, Canal
1831	3/6/1832	John Wurts	John H. Williams	9	4	Business, Canal, Funds, Transported
1832	3/5/1833	John Wurts	John H. Williams	7	2	Anthracite, Business
1834	3/3/1835	John Wurts	John H. Williams	4	3	Business, Tolls, Transported
1835	3/1/1836	John Wurts	John H. Williams	5	4	Anthracite, Business, Tolls, Transported
*Types of exhibits						
	<i>Abbreviation</i>	<i>Statement Name</i>				
	<i>Anthracite</i>	<i>Statement of Anthracite Shipped</i>				
	<i>Balances</i>	<i>Statement of the Balances Due</i>				
	<i>Business</i>	<i>Statement of the Business</i>				
	<i>Canal</i>	<i>The Delaware and Hudson Canal Company</i>				
	<i>Funds</i>	<i>Statement of the Funds</i>				
	<i>Tolls</i>	<i>Statement of Tolls Received</i>				
	<i>Transported</i>	<i>Statement of Artides Transported (excluding coal)</i>				

Annual Report for 1825

The *Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1825* was issued on March 7, 1826, reflecting a fiscal year that ran from March through February. In its first annual report, the board discussed the company's creation, its activities to date, and plans for the future. Although no formal financial schedules were included in the report, the text incorporated various monetary disclosures and projections. One was related to the July 1825 merger between the D&H Canal Co. and the Lackawaxen Company. The latter had been formed by Maurice Wurts and his associates, and its assets included the coal mines and development rights in Pennsylvania. The merger agreement provided that the Lackawaxen interests would receive cash of \$40,000, plus \$200,000 in deferred stock,¹ with the provision that:

¹ Deferred stock, as the term was used at the time, paid its holders large dividends only after all other classes of stock had been paid and any other specific conditions met.

This stock is to be entitled to a ratable proportion of the dividends, after the Company shall have made two semi-annual dividends of three per cent each, and have a surplus of profits made within the same year amounting to twelve thousand dollars over and above the said dividends [D&H Canal Co., 1826, p. 4].

The board further reported that, coincident with the groundbreaking ceremony on July 13, 1825, contracts had been signed for construction of 34 sections of the canal within a 17-mile stretch. By that December, the remaining sections joining the Hudson and Delaware Rivers had been put under contract. Various revisions to the original plans were discussed, along with their projected costs, and Benjamin Wright's prediction that \$44,000 in savings could result from the modifications [D&H Canal Co., 1826, p. 5-7; Lowenthal, 1997, pp. 5-46]. As would become the norm, the D&H Board of Managers put a positive spin on the company's future prospects in the annual report. The board was prescient, however, as it envisioned the canal's impact on the region:

A great extent of fertile country will thus find its shortest, cheapest, and most certain route for the transportation of its products. [sic] and of the foreign supplies requisite for its consumption, through our canal. Its population will rapidly increase, and with it, the products of the soil, and the consumption of foreign supplies, furnishing a large and yearly increasing amount of transportation [D&H Canal Co., 1826, p. 8].

The 1825 annual report also identified various natural resources found along the canal route, including the recently discovered natural hydraulic cement. With a unique property that allowed it to harden under water, the cement would be used to hold together the locks of the D&H Canal. The discovery meant that the managers were able to purchase the stone locally for 16 cents per bushel—about half the cost of having it delivered from elsewhere. Other local resources expected to be transported on the canal included millstones, limestone, clay for bricks, and various types of marble and timber. In addition, various mills were expected to locate along the waterways feeding the canal, and produce goods that would be shipped to urban markets via the canal [D&H Canal Co., 1826, p. 8-9].

In February 1826, Benjamin Wright had certified completion of work costing \$68,006, clearing and excavating land for the canal. The treasurer's books showed total expenditures

through February 28 that amounted "to 123,000 dollars, which includes payments for excavations, culverts, bridges and fences, advances to contractors for materials for locks, salaries of engineers, etc." [D&H Canal Co., 1826, p. 11].

The 1825 annual report also included a discussion of the plan to use an inclined plane and a railway—rather than additional locks—to overcome the large change in elevation between the coal mines and the canal terminus—which was expected to produce an estimated cost savings of \$100,000. Based on an estimated cost of \$4 per ton to quarry the coal and transport it to New York, the managers forecast that:

If only 50,000 tons per annum be brought down the canal, a toll of 1½ cents per ton per mile will pay six per cent interest on the amount of capital invested, leaving the transportation of all other articles to pay expenses and add what it may to the profits of the company [D&H Canal Co., 1826, p. 13].

On the other hand, the board declined to reveal the canal's proposed route through Pennsylvania. By delaying the announcement, the managers hoped to secure gifts of land and privileges along various potential routes. The annual report concluded with a discussion of the banking business, to which \$500,000 of the capital had been appropriated. The managers indicated that, since it had been started at an unpropitious time, the bank might take some time to become profitable. After the expenditures on the canal, the \$40,000 payment for the Lackawaxen Co., and another \$29,000 spent to acquire a building on Wall Street, "the sum at the credit of the Treasurer [was] below the amount of the banking capital" [D&H Canal Co., 1826, p. 14]. The managers reported that the average unexpended banking capital was \$393,616, and postulated (with some lack of transparency) that:

The earnings upon this sum, and upon our deposits and circulation after deducting charges, losses, and an appropriation to the sinking fund, to pay off gradually our outfits, leaves for the net profits, a sum equal to 8 per cent per annum upon the average amount of our banking capital during a period of 8 months, and deducting therefrom the amount of discounts received on notes not due, leaves for the net earnings, a sum equal to six per cent per annum upon debts actually paid. On a doubtful debt, a loss is anticipated of about \$2,000 . . . Dividends are intended to be made out of the net earnings of the bank, conformably to the provision of the

Charter [D&H Canal Co., 1826, pp. 14-15].

New York State Financing Obtained

No annual reports for fiscal 1826 appeared in the collection accessed. However, we know that during that year the aqueduct over the Rondout Creek at High Falls was completed. That event was marked by a ceremony in September 1826 that included Masonic rituals with the placement of the keystone—containing a copper box with silver plates, coins, and an inscribed medallion—in one of the aqueduct's arches. Another ceremony was held at the end of November, marking completion of the tidewater lock at Rondout on the Hudson River. Although hopes of opening the canal that year had faded, the managers—as always, optimistic about the future—asked Wright to prepare plans for building the lock-tenders' houses [Lowenthal, 1997, pp. 5-131].

By the end of 1826, the company's capital was running low: nearly \$870,000 of the \$1 million originally allocated to the canal had been spent. The company petitioned NYS for aid, and in March 1827, the legislature passed *An Act to Loan the Credit of the People of the State of New York to the President, Managers and Company of the Delaware and Hudson Canal Company*. This act directed that up to \$500,000 in special stock certificates (each with a face value of \$1,000) be issued to the D&H Canal Co., in sums not to exceed \$100,000 at a time. Monthly accounts—bearing the signatures of the company agent, president, and treasurer—had to be filed prior to each subsequent stock issue, documenting the canal expenditures made with the funds previously received.

After receiving the special stock from New York, the D&H Canal Co. sold it at public auction to the highest bidder, with any premium on the sale to be paid into the state treasury. The securities were to pay quarterly interest at the D&H offices—based on a 5% annual rate—and would be redeemable after 1847, at the pleasure of the State. The credit of the State of New York secured the interest and redemption value of the stock, so, despite its name, the characteristics of this instrument would lead us to classify it as debt today. The state received a mortgage on the D&H Canal Co. property, and granted the D&H Canal Co. a six-year tax holiday, during which no tax would be assessed on the company until its average annual income, since inception, exceeded a 6% return on its capital [Delaware and Hudson Company, 1906, p. 20]. Some have argued that, having obtained state-secured financing, the D&H Canal Co. could no

longer be considered an entirely private enterprise [Lowenthal, 1997, pp. 5-131].

Annual Report for 1827

The *Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1827* was issued on March 4, 1828; John Bolton was president, and Samuel Flewelling treasurer—both having then completed two years of service. The board reported that:

The loan of the credit of the State relieved your Board of Managers from the pecuniary difficulties with which they were threatened, and assures the completion of the great work in which you are engaged—a work not inferior in quality to any other ... and when completed and in full operation, will furnish a liberal remuneration for your outlay of capital [D&H Canal Co., 1828, p. 4].

The Board discussed its hope that steamboats could eventually be powered with anthracite coal, and made encouraging development of this technology a company goal. The 1827 annual report also discussed the contracts made for completing the canal, and the decision to construct a railroad between the coal mines and the canal terminus, a distance of about 15 miles. Pending completion of this railroad, turnpike roads had been built to connect the coal mines with the canal, with the hope that these routes would later facilitate the area's settlement and growth.

John B. Jervis, who had replaced Benjamin Wright as chief engineer, presented the board with a plan for what became known as the "gravity railroad" in October 1827. As the managers noted in the annual report: "the construction and use of railroads was new in our country. Only one, of a few miles length, had been tested by a winter's cold, and another was a temporary and imperfect work" [D&H Canal Co., 1828, p. 8]. The gravity railroad was expected to transport 129,600 tons of coal annually, and it was hoped that it would serve as a model for future U.S. railroads. Relative to its estimated cost, the managers stated:

The expense of the railroad with iron plates, together with stationary engines, chains, friction rollers, and a new and ingenious application by the chief engineer, of a known power to the descending planes, (which may well deserve the name of an invention,) and allowing ten per cent for contingencies, is estimated at one hundred and seventy-eight thousand two hundred and twenty-eight dollars. The expense of transportation

upon it from the coal mines to the canal, is estimated at 29½ cents per ton ... being three-tenths of a cent more than the estimated cost of transportation on the Canal [D&H Canal Co., 1828, p. 8].

Since the British were more advanced in the development of railroad technology, John Jervis's assistant, Horatio Allen, was dispatched to Liverpool "to procure and superintend the manufacture of the plates. [*sic*] to procure the locomotive engines, and obtain information of all the latest improvements in works of the same kind in England" [D&H Canal Co., 1828, p. 9].

The board provided updates on the progress of the canal, lamenting the delays caused by bad weather the previous autumn, but optimistically predicting completion of the remaining sections by midsummer. The company's purchase of a 140-acre farm for \$2,000, located at the junction of the Delaware and Neversink Valleys was reported. This land would give the company control of an abundant water supply for the canal, and large basins for accommodating boats and a saw mill. The managers predicted that it would grow into a village of some importance. Known today as Port Jervis, NY, it was one of the many towns along the canal, including Wurtsboro and Honesdale, which were named for individuals involved in the waterway's creation.

It was not until late in the 1827 season that the portion of the canal between the Hudson and Delaware Rivers became navigable. However, the water let into the canal initially did not always stay there, and repairs had to be made, including raising and strengthening the banks, and, in some places, lining the canal with clay. Nor did operations go smoothly once the canal was open: the lock-tenders were inexperienced, and some incompetent ones had to be replaced; a shortage of lumber led to delays in constructing sluices and lock-tenders' cottages. (Lumbering had been neglected the previous year, as local residents and their teams were employed in constructing the canal.) Plus, the late opening of the canal meant that goods bound for market had already been transported overland.

The 1827 annual report of the D&H Canal Co. included two untitled schedules, the first of which appears in Figure 2. It resembles what Edwards [1985] identified as the capital account, since it reports the capital raised by issuing shares and the amount spent on fixed assets. The D&H Canal Co. reported total investments in fixed assets of \$1,478,000, which included \$1,370,000 of expenditures on the canal, \$61,000 spent on real

estate, \$40,000 paid to acquire the assets of the Lackawaxen Co., and the \$7,000 cost of canal boats. The sources of capital included \$1,500,000 of capital stock and \$500,000 of state stock. After deducting the \$500,000 allocated to the bank, total capital was reported at a par value of \$1,500,000. The \$22,000 excess of the par value of the stock over the cost of the assets was identified as a surplus. Although the par value of the stock is unlikely to have been equivalent to the cash proceeds actually received from its issuance, this surplus, when is carried to the subsequent schedule, appears to be treated as a source of funds available to pay contractual liabilities.

The next statement, which appears in Figure 3, begins by listing the amounts due on completion of existing canal and railroad contracts, which totaled \$488,704. From this amount, the \$22,000 surplus from the previous schedule was deducted, along with another \$49,000, vaguely identified as coming from surplus bank profits (which the board apparently intended to temporarily divert to this purpose) or from an increase in capital. The remaining \$367,704 was identified as "still to be provided for," which would probably be financed with a loan.

This schedule is similar to what Edwards [1985] described as the *general balance sheet* only insofar as it reported the amount payable to creditors. No cash balance appeared, nor did any inventory or receivables—although the latter is explained by the fact that canal operations had not yet commenced.

FIGURE 2
1827 Annual Report – Page 18

There have been expended on the line of canal and railroad, including salaries to agents and engineers, turnpike roads in Pennsylvania, and all other expenses,	\$1,370,000
In the purchase of real estate in Wall Street, and on the line of the Canal, and in improvements thereon,	61,000
Paid Messrs. Wurts and associates for their coal lands and privileges in Pennsylvania,	40,000
Canal boats,	7,000
	<u>\$1,478,000</u>
Capital Stock,	\$1,500,000
State Stock,	500,000
	<u>\$2,000,000</u>
Deduct Bank Capital,	500,000
	<u>\$1,500,000</u>
Leaving a surplus of	<u>22,000</u>

Source: *Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1827.*

FIGURE 3
1827 Annual Report – Page 19

The Agent and Engineer having been called upon for a statement of the balances that will be due on the completion of pending contracts, the following is the result of their report:	
On the Canal,	\$283,704
On the Railroad,	155,000
	\$488,704
From which may be deducted surplus of Capital and State Stock,	22,000
And surplus profits, which may be temporarily applied to this object, although intended to be divided among the Stockholders, when refunded by the Canal, or by an increase of capital,	49,000
	71,000
This deduct from the above,	
Leaving to be provided for,	\$367,704

Source: *Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1827.*

Towards the end of the 1827 annual report, the managers reassured the shareholders about the

attempts that have been made to alarm your fears by setting forth the superior advantages of other companies over yours, by alleged discoveries of coal more convenient to market, or deliverable at a less expense, and by various disingenuous comparisons to the prejudice of this Company [D&H Canal Co., 1828, p. 13].

This statement reflects the animosity that existed between the various anthracite canals (which included the Lehigh, Schuylkill, Delaware, Delaware & Raritan, and Morris Canals). After comparing the operations of the different canals, the managers concluded that the D&H would become the most cost-effective; a conclusion supported by a schedule that arrived at an estimated cost of \$2.62 per ton for delivering coal to tidewater, exclusive of any canal tolls.

The Gravity Railroad and the Stourbridge Lion

There are no annual reports in this collection for the years 1828 through 1830. However, we know that in April 1828, water was let into the canal between the Hudson and the Delaware rivers, and later that month, 15 boats and one raft arrived at tidewater. In October, a celebratory cruise marked the first full

length navigation of the canal, and on December 5, 1828, the first boats loaded with coal arrived at Rondout, with the first delivery made to New York City five days later. During this period, a freight line with three boats was established to traverse the canal, and a store was opened on the D&H dock in Kingston, which carried foodstuffs, dry goods, hardware, tableware, iron, and steel [Lowenthal, 1997, pp. 5-46; Wakefield, 1971, p. 7].

The 17-mile-long gravity railroad was completed during 1829. It allowed loaded coal cars to be raised about 950 feet on the western side of the Moosic Mountains, using five inclined planes and the power from stationary steam engines. The ascending cars were counterbalanced by the empty cars being lowered—which were attached to the opposite end of a chain. On the eastern side of the mountain there were three inclined planes, and the loaded cars were lowered using gravity alone—with their velocity controlled by friction brakes. As the loaded cars descended, empty cars at the other end of the chain ascended the incline. Horses provided the power to pull the cars across the stretches of level land that separated the inclined planes [Lowenthal, 1997, pp. 5-46; Wakefield, 1971, pp. 1-18].

Hoping to replace the horses with a steam locomotive, the company imported four such engines from England. One of these, the Stourbridge Lion, was tested on the rails on August 8, 1829—ostensibly, the first operation of a commercial steam locomotive on a track in the U.S. Unfortunately, the locomotive proved too heavy for the rails; at seven tons, it exceeded the weight limit specified by Jervis. When the news of the unsuccessful trial reached the market, the company's stock price fell from \$82 to \$74; further, the company apparently never recouped the more than \$12,000 spent on the locomotives. Nevertheless, by the autumn of 1829, the gravity railroad was carrying 120 tons of coal a day. But, by December, the iron chains used on the railroad had begun to break, and eventually had to be replaced with ropes. Technological advances sometimes led to unpredictable outcomes and setbacks: in this case, the use of steam locomotives and iron chains was eclipsed by the more traditional use of horses and ropes [Lowenthal, 1997, pp. 5-131].

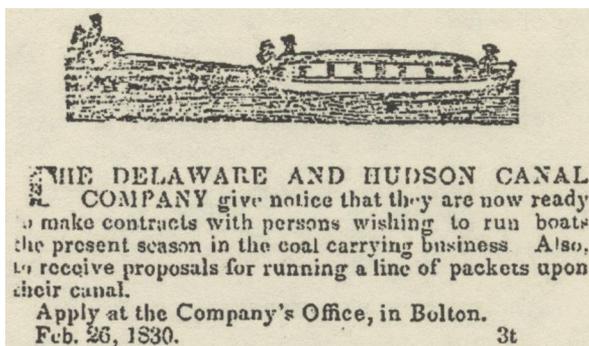
Construction of the gravity railroad had strained the D&H Canal Co.'s resources, and it again turned to NYS for a loan. An act passed on May 2, 1829, provided for the issuance of another \$300,000 in special stock certificates, secured by the inclusion of the gravity railroad in the company's mortgage to the state. Since this legislation had passed by only a narrow margin, the company subsequently sought only private financing [Delaware

and Hudson Company, 1906, pp. 20-24; Lowenthal, 1997, pp. 5-46; 87].

Around this period, the D&H Canal Co. was seeking individuals willing to operate canal boats, or to run a line of packets on the waterway,² as can be seen from the advertisement that ran in the April 6, 1830 issue of *The Ulster Palladium*, published in Kingston, NY, which appears in Figure 4. Several months later, the *New-York Spectator* ran the following announcement at the bottom of column one on the front page of its June 29, 1830 issue, attesting to the increasing efficiency of the canal:³

Coal.—The tow-boat Lackawanna, arrived yesterday having on board the largest cargo of Coal that has ever come to this city. On her last trip she brought 450 tons, and has now on board 500 tons, the same being from the Mines of the Delaware & Hudson Canal Company. She is discharging her cargo at the yard of E. Dunscomb Front-street, near the Navy Yard Ferry.

FIGURE 4
1827 Annual Report – Page 19



Source: April 6, 1830 issue of *The Ulster Palladium*, published in Kingston, NY. Part of the newspaper collection of the Huguenot Historical Society, New Paltz, NY.

Annual Report for 1831

The 1831 annual report was prefaced by the following statement of reporting objectives:

In presenting an exhibit of the affairs of the Company, it is alike the disposition and duty of the Board, to place

² Packet boats were so named because they typically carried packets of mail and passengers, rather than goods.

³ Available from *UPENN Libraries Historical Newspapers Online* at <http://ful-tonhistory.com/Fulton.html>.

the condition and prospects of the institution, distinctly and candidly before the Stockholders, so that everyone may with confidence, draw his own conclusions, as to the value of the property he holds [D&H Canal Co., 1832, p. 3].

In pursuing this goal of transparent reporting, the board summarized the year's events and discussed its future plans. Obtaining additional financing was still an issue for the company when its 1831 annual report was issued on March 6, 1832. At this point, John Wurts was the company's president, and John H. Williams its treasurer. The managers explained that, although the company's credit was depressed, a \$300,000, seven-year, 6% loan had been obtained, enabling the firm to repay all but \$75,500 of its debts, with the balance hopefully payable from the proceeds of current operations.

The decision to rent out most of the building on Wall Street—except for a small portion used by the bank—was announced. The managers explained that they wanted to refocus their efforts on the coal business, which had been languishing, due in part to the bad publicity associated with some inferior surface coal that had been marketed during 1829. A sales agent was hired to visit manufacturing firms to encourage trials of anthracite coal as a fuel source, and these efforts proved successful. Efforts to encourage the use of anthracite coal to power steamboats continued; anthracite had now been successfully used in several ferries operating in New York City, and was being tested in other boats.

During 1831, the railroad had transported 54,328 tons of coal, operating between March 20 and November 5. The canal delivered 51,578 tons of coal to Rondout during the year, and operated from May 1 until December 1, when an early frost shut down operations. An oversupply of anthracite coal on the market in the spring of 1831, led the board to limit the amount delivered during the remainder of the year—with the result that demand eventually outstripped supply. The managers reported the collection of \$19,394 in tolls on the canal (less than expected, due to the early frost), and \$1,161 on the railroad. Although disclosed in the discussion, these tolls do not appear as a separate line item in any of the statements presented.

The 1831 annual report included four schedules of financial and operational results. Notably, this was the first formal set of statements to appear in the reports in this sample—and also the most complete set of schedules that would be provided by the company for the next three decades.

Schedule No. 1, the *Statement of the Coal Business of the Delaware and Hudson Canal Company for 1831*, appears in Figure 5. Its format is similar to that of the revenue account discussed by Edwards [1985], which was used by the early British canals and railways. The left (or “to”) side of the statement starts with the more than 18,621 tons of coal in beginning inventory—broken down by location—and determined to be

worth what, by the experience of this year, it would have cost the Company to put a like quantity in the same places of deposit; ... It is to be remembered, however, that this stock was, (in general estimation at least), inferior to the coal of 1831; and a considerable portion of it was actually and avowedly sold as second quality Lackawanna Coal, at a lower price than that obtained for the coal mined last season [D&H Canal Co., 1832, p.8].

The 250 tons in the Pelham Street Yard, dating to 1829, were reported at a cost of only \$3.00 per ton, while the 6,000 tons at Rondout, mined during 1830, were valued at \$3.50 per ton. Transportation costs may well explain the higher carrying amounts per ton for the coal inventoried at more distant locations: it was priced at \$4.75 at Boston and Providence and \$4.25 at Albany. Added to the beginning inventory were various costs incurred during the year for mining and transporting coal, making repairs, and paying salaries and interest on the three loans—with another \$948.62 identified as “discounts for anticipated payments on coal,” which likely represented expected amounts of sales discounts or allowances.

The sum of the beginning inventory and current period costs was \$311,906.74—although the cost of goods available for sale does not appear on the statement. Ending inventory, rather than being subtracted from this amount to calculate cost of goods sold, was shown as an addition on the right (or “by”) side of the statement. The total of the ending inventory plus the proceeds received from selling coal and renting property was \$352,107.14. This amount exceeded the costs listed on the left side of the statement by “a balance of \$40,186.¹⁸/₁₀₀ in favor of the Company, after paying interest on loans and all expenses, and a clear profit of, \$34,183.⁵⁰/₁₀₀, after deducting doubtful debts” [D&H Canal Co., 1832, pg. 8]. The deduction of bad debts of \$6,002.68 prior to determining a “clear profit” acknowledges that uncollectible accounts would reduce the amount otherwise available for dividends. Note the transposition

error apparently made in recording the pennies in the balancing amount, which was reported on the left side of the statement as \$40,186.81. Despite the company's reported profit, the managers did not feel justified in declaring a dividend, citing the prior years' losses resulting from high expenditures and limited operations.

Figure 6 shows the *Statement of the Funds of the Delaware and Hudson Canal Company for March 1, 1832* (also identified as No. 2). This statement includes only financial assets and liabilities, so it may relate solely to the banking business. The left side lists the company's liabilities, including the money on deposit at the bank, the notes in circulation, interest, and unpaid dividends. The financial assets appear on the right side of the statement, and include cash on hand, amounts due from other banks, and various receivables. The board notes that this statement represented the present fiscal condition of the firm, and indicates that "the Company possesses ample means for the prosecution of its business" [D&H Canal Co., 1832, p. 9]. The assets reported exceed the liabilities by \$80,293.46, which is labeled the balancing amount. Adding \$14,155 in prepaid expenses to the net financial position yielded a total of \$94,448.46, which could be viewed as the net current asset position.

A third statement included in the 1831 annual report, titled simply *The Delaware and Hudson Canal Company, March 1, 1832*, appears in Figure 7, and is similar to the capital account described by Edwards [1985]. The board described this statement as providing "information as to the amount of capital employed by the company and the mode of its investment" [D&H Canal Co., 1832, p. 9]. The sources of capital appear on the left, or debit, side of the statement, while the assets, designated as credits, appear on the right side. The sources of capital included nearly \$1.45 million that had been paid-in on capital stock, the two NYS loans for \$500,000 and \$300,000 respectively, two additional loans totaling \$325,000, and nearly \$8,500 in debts payable—apparently representing down payments received on village lots in the process of being sold.

The company's assets included the canal and gravity railroad, real estate in several locations, various receivables, boats (including packets, steamboats, and barges), coal inventories, and prepaid expenses. These were primarily the fixed assets—plus the receivables, inventory, and prepaid expenses. The liabilities and equity reported as sources of capital exceeded the assets by \$3,455.18. This amount, labeled "profit and loss," appeared on the asset side of the statement, apparently representing the firm's retained earnings deficit.

FIGURE 6
Statement of Funds - March 1, 1832

[No. 2.] *Statement of the Funds of the Delaware and Hudson Canal Company, March 1, 1832.*

Notes in Circulation.....	\$42,446 00	Cash on hand.....	\$ 8,608 85
Interest due on State Loans.....	402 00	Balance due from City Banks.....	52,971 87
Unpaid Dividends.....	788 00	" Country Banks.....	248 66
Deposits.....	88,149 60	Loans on Stock, etc, payable on demand.....	
Balance.....	80,363 46	Discounted Notes, good.....	
		Notes Receivable, ".....	
		Debits ".....	
		Payments to be received on Canal boats in 1832.....	
	\$182,085 01		\$182,085 01
		Balance.....	\$80,898 46
		Payments made on account of the business of 1832, viz:	
		Paid on Account of Mining Coal.....	\$8,800 00
		" Sundries for Railroad.....	1,153 00
		" Ropes for ".....	4,500 00
			14,153 00
			\$94,448 46

Source: *Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1831.*

In the years that followed, no comparable statements appeared in the annual reports, which focused on the results of operations. This is consistent with the findings reported by Arnold and McCartney [2008, p. 1197] for their sample of British canal companies, which ceased issuing the “capital account” after construction was complete, and prepared only periodic operating statements.

The board characterized the 3,500 acres of coal lands owned by the company as “an unfailing source of revenue” [1832, p.9]. Always striking a positive note, the managers concluded that—after the previous year’s embarrassments and weak market—coal could now be marketed with “confidence and energy;” with the infrastructure now well-established, mining and transporting costs were expected to “be 40 to 50 cents a ton less than it cost the Company during the past year” [D&H Canal Co., 1832, p. 10].

The quality of the coal had reportedly improved as the mines were further penetrated. Mining had continued over the winter, and coal could be transported as soon as the gravity railroad was open for the season and the flood damage had been repaired on the canal. The board also noted the ongoing economic development along the canal route—with its promise of increased fares. *A Statement of Articles Transported on the Delaware and Hudson Canal during 1831 (exclusive of coal)* appears in Figure 7 under the heading “schedule No. 4,” and identifies the quantities of lumber, cement, plaster, hoop poles and staves, stones, cord wood and other merchandise shipped on the canal during the year.

Annual Report for 1832

In contrast, the 1832 annual report, issued on March 5, 1833, contained only one financial statement. The bulk of the report consisted of management’s discussion, beginning with the reassurance that the firm “will hence-forward be able to remunerate its stockholders, by a continuance of semi-annual dividends” [D&H Canal Co., 1833, p. 3]. During 1832, the railroad operated from April 2nd until December 31st, and the canal from May 7th until December 20th. More than 84,000 tons of coal were transported on the canal, and over \$28,700 in tolls collected (87% of which came from the canal, and the remainder from the gravity railroad). Tolls had increased \$8,000—or nearly 40%—compared to the previous year. The increase would have been even larger, the managers believed, had not both miners and boats been in short supply, and had a cholera epidemic not interrupted business.

These factors also explained the higher than anticipated costs. The insufficient supply of miners led to higher wages and, the managers claimed, to decreased efficiency. In response, additional miners had been hired from abroad. Similarly, the shortage of boats led the boatmen to charge higher freight rates than their contracts specified. However, until more boats could be built, the managers wanted to encourage those already on the canal to deliver as much coal as possible. As a result,

it was deemed expedient to yield so far to the measures of the boatmen, as to give them an opportunity to earn additional freight in the form of a premium for short trips. This created a necessity for having the locks tended both night and day, which of course added considerably to the ordinary annual expense of superintendence of the canal [D&H Canal Co., 1833, pp. 5-6].

The managers also bemoaned the higher-than-expected repair costs on the canal that resulted from a severe winter frost. On a more positive note, tolls were expected to continue growing, reflecting the increase in population, businesses, and wealth along the path of the canal. The managers boasted that “Carbondale and Honesdale, the sites which, in 1827, were covered with forest trees, are now thriving and busy towns—the former containing a population of upwards of 2,000, and the latter of upwards of 1,200 persons” [D&H Canal Co., 1833, p. 4].

Looking forward to the coming season, the board noted the improved quality of the coal, the good state of repair of the railroad and canal, and the acquisition of a steamboat and barges for transporting the coal down the Hudson River from the canal terminus to New York. The annual report also pointed out that customers could save money by buying coal directly from the company’s barges during the navigation season. Once the coal had to be stored in a yard until winter, the company’s costs, and the price to consumers would increase.

Interestingly, although the board acknowledged its responsibility for reporting to shareholders, it believed that physical inspection of the firm’s assets, rather than financial reporting and analysis, would lead to more accurate valuation of the company’s shares. The board was

aware that the Stockholders look to them for light and information as to the prospects of the Institution, and the consequent value of their stock; and the Managers are equally desirous, that the Stockholders should possess sound and correct views on the subject. It is a

matter of much regret to the Board, that so few of the Stockholders have been induced, by either interest or curiosity, to visit the works and improvements of the Company, as by so doing, they would form a more correct estimate of their value than can be acquired in any other way [D&H Canal Co., 1833, p. 8].

The 1832 annual report included a table listing the tons of anthracite coal that had been brought to market annually by the local industry between 1820 through 1832, along with the yearly increase in tonnage. A single financial statement was presented, entitled the *Statement of Business*, which was similar to the 1831 *Statement of the Coal Business* that appears in Figure 5. However, by 1832, additional sources of revenue and profits appeared on the right (“by”) side of the statement, including \$431,136.52 from sales of over 80,000 tons of coal, tolls on the canal and railroad, interest and rent received, a profit of \$12,985.78 from the sale of the house and lot on Wall Street, and a small profit from sales of limestone. The revenue side of the statement also included ending inventory of \$46,790.77.

On the left or “to” side of the 1832 *Statement of Business*, various operating expenses were added to the cost of the beginning inventory—which, unlike the previous year, was not broken down by location. Operating costs were classified as related to: mining and transporting coal, repairing the railroad and the canal, paying salaries at the canal terminals, running the steamboats and barges, paying commissions, and covering the interest on the loans outstanding. The total of the revenues and ending inventory exceeded the sum of the beginning inventory and current period expenses by \$108,141.92, which was reported as the balancing amount. A final line labeled “to Dividend in December” appeared below the double-underlined column total, in the amount of \$51,950.50 [D&H Canal Co., 1833, p. 12].

Annual Report for 1834

The annual report for the 1834 fiscal year was introduced with the following statement:

In accordance with former usage, the Board embrace [sic] the present opportunity to present to the Stockholders a view of the Company's business during the past year, its present condition, and its prospective operations [D&H Canal Co., 1835, p.3].

Unfortunately, the news was not good, with the statement of the business showing a loss for the year of \$23,955.57, which the

managers attributed to volatility in the currency markets:

The general derangement of the currency, which commenced in the fall of 1833, and the consequent paralysis of every species of domestic trade and industry, continuing until late in the year 1834, exercised a pernicious influence on the prosperity of the Company, and may be regarded as the primary and leading causes of the unproductive character of the last year's business [D&H Canal Co., 1835, p.3].

The previous year's slowdown meant that the D&H Canal Co. began 1834 with a large beginning inventory. This not only negatively impacted the market value of the coal, but led the firm to restrict its mining and transportation operations during the year. The decreased output, in turn, resulted in a greater amount of fixed cost being allocated to each ton delivered to market. As the managers described it:

The effect of this state of things was to throw into the sales and consumption of 1834, the over-stock of 1833, burthened with its proportion of the charges of 1833, and to accumulate on the small additional quantity brought to market during the year 1834, the whole of the expenses of that year, thereby enhancing its cost per ton considerably beyond what it would have been, had the whole quantity sold been mined and brought to market during the year 1834 [D&H Canal Co., 1835, p.4].

The year's statement of tolls received shows a small decrease compared to the prior year—a change from the previous pattern of annually increasing amounts. Nevertheless, the board noted the excellent condition of the canal and railroad, and the returning economic prosperity. A subsequent event expected to greatly expand the market for the company's coal was disclosed in a note appended to the 1834 annual report. It quoted a news clipping dated March 18, 1835, which recounted the maiden voyage of the steam ferry Essex, which had been outfitted with Dr. Nott's Patent Tubular Anthracite Coal Boilers, and had just completed a successful excursion of about 40 or 50 miles on the Hudson River, fueled by Lackawanna coal.

Annual Report for 1835

The annual report for 1835 noted that "the Managers regret that the anticipations in which they indulged when last addressing the Stockholders have not been fully realized" [D&H Canal Co., 1836, p. 3]. As it turned out, the coal market remained depressed during the spring of 1835, due to the oversupply from

previous years. Facing a buyer's market, the managers had found it necessary to meet their competitor's prices.

And while, on the one hand, the Company has been selling its coal at a reduced rate, it has been paying more than the ordinary price for every article entering into the production of it. Labor and provisions have been unusually high during the past year, and miners have been so scarce as to be able to make almost their own terms. Hence, it is, that although the Company's sales have been greater during the last year by about one-fifth than during any preceding one, still, the aggregate amount of profit is in proportion less [D&H Canal Co., 1836, p 4].

As always, the managers remained optimistic about the future, anticipating that increased consumption of coal would alter the supply-demand relationship. During 1835, with inventory levels finally reduced, the managers decided to "abandon the retail trade in the city, and have accordingly disposed of the yards which they held" [D&H Canal Co., 1936, p. 6]. Instead, the company planned to sell coal by the cargo load at its Rondout dock.

The managers also reported that they had "contracted for the erection of a suitable building," given their intent to resume the company's banking operations [D&H Canal Co., 1936, p. 7]. The board had entered into a contract with Messrs. H. Nott & Co. to run a steam boat using Lackawanna coal to power its patented boiler. The shareholders were asked to approve issuance of 1,000 shares of the company's stock at par to Messrs. Nott upon performance of the contract.

The statements included in the 1835 annual report were representative of the schedules that the D&H Canal Co. would provide to stockholders during the coming decade. Schedule A, the 1835 statement of the business, has been reproduced in Figure 8. It shows that the revenues received from coal sales, tolls, rent and interest—plus the ending inventory balance—exceed the sum of the beginning inventory and current period costs for mining, transportation, maintenance, operations and interest by \$73,034.90. This amount, labeled "balance," represents the profit for the year.

FIGURE 8
Statement of the Business – 1835 Schedule A

A.

Statement of the Business of the Delaware and Hudson Canal Company, for the year 1835.

To Coal of 1834 on hand March 1st.....	\$ 81,500 00	By Sales of Coal.....	\$473,040 94
Payments for Mining Coal.....	62,643 32	Canal and Railroad Tolls.....	41,978 88
Transportation, Repairs and Improvements of Railroad.....	67,903 66	Rents.....	11,583 80
Labor, Salaries, etc., at Rondout.....	11,560 70	Interest Received.....	11,978 65
Freight of Coal to Rondout.....	116,898 16	Coal on Hand in New York, Sold, but not Delivered.....	12,000 00
Repairs and Superintendence of Canal.....	83,337 25	do at Rondout, Honesdale, etc.....	12,975 00
Collectors' Salaries.....	1,650 00		
Steamboat and Barges.....	4,880 84		
Rents of Coal Yards and Office in New York.....	4,345 00		
Salaries, Stationary, and Current Expenses in ditto.....	8,140 11		
Interest on State Stock and Company Loans.....	64,880 67		
Balance.....	73,034 90		
	\$532,854 61		\$532,854 61
		By Balance.....	\$73,034 90

Source: Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1835.

FIGURE 9
Statement of Articles Transported – 1835

B.	
<i>Statement of Articles transported on the Delaware and Hudson Canal, during the year 1835, exclusive of Coal.</i>	
Merchandise,	6,645
Leather,	597
Plaster,	1,544
Cement,	1,744
Tanners' Bark,	539
Stone, Bricks and Lime,	1,704
Mill Stones,	238
Staves and Hoop-poles,	807
Manufactured Lumber,	1,031
Window Glass,	238
	15,087 Tons.
Cords of Wood,	9,428
Shingles,	460,500
Ship Timber,	24,011 Cubic feet.
Square Timber,	26,922 " "
Hard Lumber,	2,513,017 feet.
Hemlock Lumber,	2,062,807 " "
Pine "	8,014,195 " "
<i>Statement of Tolls Received on the Delaware and Hudson Canal and Railroad, in each year since the completion of the Works, viz:</i>	
In the year 1830,	\$16,423 44
1831,	20,554 64
1832,	28,717 51
1833,	37,004 58
1834,	36,946 07
1835,	41,976 82
	\$181,623 06
The number of Vessels loaded at Rondout with Coal during the year 1835, was 1,049.	

Source: *Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1835.*

Schedule B appears in Figure 9. It includes a statement of articles transported on the canal during 1835, other than coal. Compared to the similar schedule reported four years earlier—which appears in Figure 7—the variety and quantity of goods transported on the canal had expanded considerably. As had been predicted, various industries had developed along the path of the canal to exploit local resources. The cement industry that developed when hydraulic cement was discovered along the canal route created a demand for barrels in which to ship the cement. This gave rise to a local cooperage industry, whose raw materials were the staves and hoop-poles transported on the canal for that purpose. In the future, millions of barrels of hydraulic cement would make their way to market, and be widely used in the construction of structures that included the Brooklyn Bridge, Statue of Liberty, and Washington Monument [Lowenthal, 1997, Piwonka, 2005].

The D&H Canal also spurred development of the Hudson Valley brick industry. An innovation patented in 1829 added pulverized anthracite coal to the clay or loam used to fashion the bricks, helping to fire the bricks from the inside. This method substantially reduced firing time and fuel usage, while improving quality. The demand for Hudson River bricks exploded after hundreds of wooden structures in New York City were destroyed by the Great Fire of 1835.

FIGURE 10
Coal Shipped through 1835

C.

The following is a Statement of the quantity of Anthracite Coal shipped from the three principal mining districts in Pennsylvania, since the commencement of the Coal trade, to January 1st, 1836.

Years.	Sch'kill & Union.	Lehigh.	Lackawanna.	Total.	Increase.
1820	365	365	Tons.
1821	1,073	1,073	708
1822	2,240	2,240	1,167
1823	5,823	5,823	3,583
1824	9,541	9,541	3,718
1825	6,500	28,398	34,898	25,352
1826	16,767	31,280	48,047	13,154
1827	31,360	32,074	63,434	15,387
1828	47,284	30,232	77,516	14,082
1829	79,973	25,110	7,000	112,083	34,567
1830	89,984	41,760	43,000	174,734	62,651
1831	87,854	40,966	54,000	182,820	8,086
1832	209,271	75,000	84,600	368,871	186,051
1833	250,588	122,621	111,777	484,986	116,115
1834	224,242	106,244	43,700	374,186	Decrease. 110,800
1835	335,685	131,250	90,845	557,780	Increase. 183,594

Source: *Annual Report of the Board of Managers of the Delaware and Hudson Canal Co. to the Stockholders, for the Year 1835.*

Figure 9 also includes the statement of tolls received since completion of the canal. It shows that tolls increased from \$16,423.44 in 1830 to \$41,976.82 in 1835. "Schedule C," which appears in Figure 10, was the final statement presented in 1835, and shows the number of tons of coal shipped from the three principal mining districts in Pennsylvania between 1820 and 1835. The right hand column shows the net change from year to year, with annual increases reported in all years except for 1834. This statement, interestingly, did not just reflect the operations of the D&H Canal Co., but reported the amounts for the Pennsylvania anthracite industry as a whole.

LOOKING INTO THE FUTURE

The D&H Canal was part of the transportation revolution that would transform the primarily agricultural society of early America into a modern, diversified, market economy. Kingston, New York, for example, had been a stable agricultural community of about 3,000 people in 1820, with about 70% of the residents belonging to farming families. Construction of the D&H Canal turned Kingston into the leading commercial port on the Hudson River between New York City and Albany. During the decade following the opening of the canal, the Kingston population grew, as Irish and German immigrants arrived to supply labor for the canal. By 1855, only 30% of the town's 13,000 residents had been born in the county, and only 10% supported themselves by farming [Gunn, 2001; Wermuth, 2001, pp. 115-134].

Output of anthracite coal would continue to soar. In the 1830s, it was just coming into use for fabricating wrought iron axes, shovels, wire, and other products. By the middle of the decade, the anthracite reverberatory furnace and the anthracite coal blast furnace were being used to make additional types of wrought iron (bars, sheets, rods) and pig iron, respectively. The abundant supply of inexpensive coal and iron gave rise to metal-working factories, and fabrication and assembly of interchangeable parts expanded beyond guns and small arms to the production of clocks and locks, and then to new inventions, such as the sewing machine and reaper. The large steam-driven factories powered by cheap coal supplanted artisans and craftsmen in the manufacture of sugar, spirits, chemicals, glass, and earthenware. After 1840, the railroad and telegraph would further transform distribution and communications, and these changes gave rise to American industry and the modern business enterprise [Chandler, 1977, p. 75-78].

During the 1840s, another technological innovation associated with the canal—the wire suspension bridge—was designed by John Roebling. Roebling built four suspension aqueducts for the D&H Canal Co., and later applied the same method in building the Brooklyn Bridge. As the railroad era began, the D&H Canal Co. transformed itself with the times, and added rail lines to its transportation network. During the 1840s and 1850s, the D&H expanded its delivery of coal by building tracks from its Carbondale mines to existing railroads, and obtaining rights to build and operate railroads in Pennsylvania and NYS. Further expansion occurred in the 1870s as the company leased several

railroads and completed a line to Canada. The canal, now technologically outdated, was sold in 1898 and the word "canal" was dropped from the company's name. Additional lines of business were added around the turn of the century, with hotels, steamboats, iron mines, and orchards among the various business ventures pursued by the company [Shaughnessy, 2005].

The D&H became one of the financially strongest and most technologically advanced railroads of its size (less than 1,000 miles) in the U.S. As the use of coal declined around World War II, the railroad moved forest products, manufactured goods, and raw materials around the Northeast. By the 1950s, improved highways and the expanded use of trucks eroded rail traffic, leading to railroad mergers and abandonments. After several ownership changes, the Delaware and Hudson Railroad Company, Inc. became a wholly-owned subsidiary of the Canadian Pacific Railway in 1991 [Shaughnessy, 2005].

TRADING IN D&H SHARES

Shares of the D&H Canal Co., originally issued at a par value of \$100, were first quoted on the NYS&EB on Jan. 26, 1825 at \$101.75, and rose to a high of \$112 by the following May. However, by 1828, with the canal still not completed and its prospects uncertain, the price had dropped to \$71 per share. Reports that the gravity railroad was not functioning properly, and public complaints about the price and quality of the company's coal, triggered reductions in the firm's stock price. In January 1831, the company's shares were selling for \$70, considerably less than the market price of shares in the rival Schuylkill Navigation Company. Although the D&H managers attributed the soft stock price to its rivals' attempt to shed an unfavorable light on the company, poor operating performance must have also been a factor.

The managers responded by summarizing the virtues of the company and its product in a pamphlet to shareholders, forecasting a share price exceeding \$200 within two years. Although reality did not live up to this optimistic forecast, John Wurts, the newly elected president, did take several steps to reverse the company's course: he embarked on a financial austerity program, sold nonessential properties, and obtained loans from private parties. Efforts were also made to stimulate coal sales for manufacturing and steamboat use, and by the end of 1831, the D&H Canal Co. was selling an acceptable product at a price lower than the competition. An operating profit of \$34,000 was

par), and bearing the parenthetical notation "15 days, and interest." Second, is an entry for 32,000 Delaware & Hudson bonds sold at 98½, and finally an additional sale of shares, also at 65, with the notation "30 days, five per cent." Although more than one firm had failed as a result of wild speculation in its shares, the D&H Canal Co. survived, and was able to sell several small issues to investors during the 1830s at or near par [Werner and Smith, 1991, pp. 89-93].

SUMMARY AND CONCLUSIONS

In this paper, we used the case of the D&H Canal Co., chartered in 1823, to provide perspective on how a 19th century canal company obtained financing, communicated with shareholders, and sparked technological innovations in the decades before the ascendance of railroads in America. The D&H Canal Company was one of the first private firms to sell shares on the New York Stock & Exchange Board (NYS&EB), and one of the first to raise more than \$1 million in equity capital. An early vertically-integrated firm, the D&H Canal Co. owned and operated coal mines, built and managed the canal, and amassed a fleet of barges to transport coal on the Hudson River.

When the Board of Managers of the D&H Canal Co. issued its first annual report to shareholders—for the 1825 fiscal year—the textual discussion concerned the company's activities to date and future plans. Although no formal financial schedules appeared in the report, various monetary disclosures and projections were incorporated into the text. The managers—as they would continue to do in the coming years—consistently put a positive spin on the firm's future prospects, particularly when addressing existing problems. Maintaining shareholder confidence was clearly a primary concern of the board.

The 1827 annual report included one untitled schedule that identified the uses and sources of funds. By 1831, the annual report included four titled schedules presenting financial and operational results. This was the first time a formal set of statements appeared in the annual reports in this sample, and it was also the most complete set of schedules that would be provided by the company for the next three decades. Information about the company's assets and liabilities, as well as its operations, was presented.

By contrast, the 1832 annual report contained only a single financial statement. This was consistent with the reports issued by British canals that were already in the operating stage. Simi-

larly, Michael [1996] noted that the 19th century Quincy Mining Company later eliminated the detailed schedules of operating costs and efficiency measures that had once been reported. The D&H Canal Co.'s 1835 annual report included statements that were representative of what the firm would present to stockholders during the coming decade. The report included a statement of the business, a statement of articles transported on the canal during the year, a statement of tolls received since completion of the canal, and a schedule of the number of tons of coal shipped annually from the three principal mining districts in Pennsylvania from 1820 to the present year. As Table 1 shows, throughout the D&H Canal Co.'s first decade of existence, there was a steady decline in the number of pages of the annual report devoted to management's textual discussion.

The digital collection of D&H annual reports available from Google Books provides a rich set of historical accounting information that could yield more insights with additional study. An expanded analysis of the annual reports could illuminate trends in financial reporting as the firm evolved into a railroad company and continued to expand over the course of the 19th century.

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