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THE EVOLUTION OF ACCOUNTING FOR CORPORATE TREASURY STOCK IN THE UNITED STATES

Abstract: Is treasury stock an asset or a reduction of net equity? This study is concerned with the process of accounting for treasury stock from as early as 1720 to date. It illustrates the many methods which have been used to create funds by the purchase and sale of treasury stocks and concludes with a consideration of the effects of the Internal Revenue Act of 1934 and the Security Exchange Act of 1934 on the treatment of treasury stock.

In 1919, William A. Paton stated that treasury stock is a reduction of equity, not an asset. Fifty years later he reaffirmed this view, pointing out that treasury shares have substantially the same status as unissued shares and, like unissued shares, can never be construed as owned property. Paton asserted that acquisition of treasury stock is a partial liquidation of equity and must be so recorded.[1]

Some financial writers hold that treasury stock may be an investment.[2] Others state that the repurchase of stock can not be treated as an investment decision as the term is commonly defined. Since repurchasing stock does not add to the earning power of a concern, theorists hold that the decision by a firm to buy its own stock should be regarded either as a financing decision or a dividend distribution decision.[3]

Part of the confusion in accounting over the nature of treasury stock has been caused by the practice of reporting treasury stock at cost, first on the asset side of the balance sheet and later as a reduction of shareholders' equity in a contra-equity account. To improve our understanding of current practice, this paper traces the history of accounting for treasury stock and shows how its valuation at cost evolved—and created problems.

Early Accounting & Financial Practices

Prior to 1925 the "treasury stock device" was frequently used to obtain working capital in new and speculative enterprises. Organizers received fully-paid shares for their contributions of property or services, and they in turn donated some of these shares back to the corporation. The donated shares were recorded at their expected reissue price to the public which added to contributed capital even if the recorded amount was below par value. The acquisition of treasury shares without consideration did not change the amount of the recorded assets. The procedure circumvented the legal requirement of full liability on par value stock, but was considered a legitimate practice.[4] The use of the method can be traced back to England where it was used as early as 1720 by the York Buildings Company.[5]

Another early use of treasury stock occurred primarily in bank and insurance companies. Treasury shares of a debtor corporation were acquired by acceptance of the corporation's shares in settlement of a debt owed. This occurred when debtor corporations were required to purchase treasury shares as security for a loan or mortgage, and then defaulted.[6]

During these early times, the use of the par value method for recording treasury shares was advocated by accounting textbooks writers.[7] If the treasury shares were recorded at par, any difference between par and the amount paid would have to be charged to the other contributed capital accounts on a pro rata basis and the remainder charged to retained earnings. The par amount of the treasury shares would then be subtracted from the total par of issued shares to derive the net total par value of the shares outstanding. The treasury stock was a direct reduction of the shareholders' equity, and therefore not an asset. This method, although theoretically sound, was not generally followed. Because of legal considerations, many corporations preferred to report treasury stock at cost, as an asset, to avoid the explicit reduction of the owners' equity.

Corporations acquiring their own shares ran a risk of an illegal reduction of capital. But by classifying the treasury stock as an asset there was no reduction of capital. It is not surprising to find in a 1932 survey of 587 firms listed on the New York Stock Exchange that 197 of 404 firms with treasury shares classified them as assets. Thirty-four showed treasury shares in both the asset section and the net worth section of the balance sheet.[8] This inconsistency in balance sheet classification caused confusion as to the nature of treasury stock.

A spate of treasury stock activity started in late 1929 and continued into the early 1930's. The emphasis was on the purchase of treasury shares to support the market price of the stock, to effect corporate adjustments, particularly when a retained earnings deficit existed, and finally, as an "investment" because of the decline in prices.[9] This increase in treasury stock activities, along with legal and tax developments, caused a reconsideration of the asset classification for treasury shares.

Legal and Tax Developments

Most early state laws in the U.S. implied that in the absence of an express prohibitory provision, the corporation had power to purchase and hold treasury stock.[10] Not all states had originally recognized the right of the corporation to acquire its own shares, but by 1925 its legality was generally recognized.[11]

With general acceptance, certain limitations were placed on treasury share acquisitions. The limitations were designed to safeguard the positions of creditors and of other shareholders.[12] Court cases evolved two legal tests—the "surplus" test and the "solvency" test. Under the surplus test, the corporation is said to have a surplus and may acquire its own stock when, after the purchase, its assets exceed its total liabilities and capital stock. The surplus test provides that no distribution may be made beyond the amount of such surplus. The solvency test is more liberal and allows a treasury stock acquisition unless the purchase renders the corporation insolvent or makes its insolvency imminent.[13] The intent of these treasury stock laws was the maintenance of legal capital for the protection of the creditors.

The 1918 Revenue Act made treasury stock transactions nontaxable. Gains on sale of treasury stock had been treated as taxable under the Revenue Acts of 1916 and 1917, but the 1918 Act prescribed that the sale of treasury stock was a capital transaction and thus did not constitute income to the corporation. Without substantial change, the provision was continued in the regulations under subsequent acts until 1934.[14]

Treasury stock activity during the 1929-1933 period brought on a wave of regulatory action designed to diminish the extent of such transactions. The New York Stock Exchange required regular reporting of treasury stock activity by listed corporations. The Federal Securities Act of 1933 included treasury stock in its definition of securities which required full disclosure by registered corporations.[15] But probably the most important influence in the reduction of treasury stock purchasing was the 1934 Internal Revenue regulations. These established that gains on sales of treasury stock were taxable income to the selling corporations. Paton called this one of the real errors in income tax history because a switch in accounting methods could nullify the effect of the regulations.[16]

Under the 1934 Internal Revenue regulations, when the treasury shares were first recorded at cost and later sold at a price unequal to the cost, a gain or loss resulted from the transaction. For the next twenty years, such gains were to be considered taxable corporate income although it could be avoided by cancelling the treasury shares and issuing other authorized shares. In the 1954 Internal Revenue Code the taxation of such capital transactions was again eliminated.[17] This 1954 revision provided incentives for various uses of treasury stock in stock option plans and in acquisitions and mergers.

Accounting Developments

Regulatory actions following the 1929-1933 surge in treasury stock activity were accompanied by a change in accounting presentation on the corporate balance sheet by many corporations. After 1933, treasury stock was reported as a reduction of stockholders' equity by many firms previously reporting treasury stock as an asset. Two methods of presentation were suggested: 1) as a deduction from total net worth; or 2) as a deduction from retained earnings.[18] In both cases, the treasury stock was to be shown on the balance sheet at cost. Treasury stock at cost deducted from total shareholders' equity became the most popular method for presenting treasury stock in the balance sheet.

To avoid the tax consequences of the 1934 Revenue regulation, reacquired shares were often held, in treasury, indefinitely and the related asset valuation principles such as the "lower of cost of market" rule were applied. For example, in 1955, two firms (of 238 holding treasury common stock) valued shares at the lower of cost or market. In 1963, another firm with stockholder approval, reduced the carrying value of the treasury stock from an average cost of over $25 per share to the then approximate market value of $12 per share. At the end of 1965, there were four firms (of 377 with treasury common stock) showing the shares at a carrying value less than cost.[19] Of course, had the shares been recorded at par, these capital adjustments would not have been necessary.

With the more recent use of treasury shares for stock options, acquisitions and mergers, another aspect of the cost method has become a problem. What method of cost determination should be used? Does the FIFO rule generally applicable to investments apply? Or are cost determinations methods used for inventories applicable? A 1965 survey of cost methods disclosed that seven of twenty-four corporations derived the cost of the issued treasury shares by specific identification, ten used an average cost method, six corporations used the first-in, first-out method and one company used the last-in, first-out method.

Each firm justified its method for determining the cost of reissued shares. For example, the firm using the last-in, first-out method had acquired treasury shares over an interval of fifteen years. Using the latest purchase cost first seemed to be the most logical, just as it would be in some instances of inventory purchases. But what difference did it make? The shareholders were no longer interested in the price paid for the treasury shares fifteen years previously. There was no capital gain in the accounting sense nor any gain for income tax purposes.

The presentation and valuation of treasury shares as an asset is still permissible as a generally accepted accounting principle, although only a few firms still use it (8 of 600 in 1975).[20] When shares are acquired for the specific purpose of resale to employees or others, corporations have the option of recording the shares separately at cost on the asset side of the balance sheet, provided the reason for the treatment is fully disclosed. This asset treatment of treasury shares is a continuation of the pre-1934 classification. However, such shares cannot be considered an investment in marketable securities because treasury shares cannot be readily sold in the open market. An issue of treasury shares of listed stocks in the open market requires the same registration procedures as an issue of previously unissued shares. The definition of "security" in Section a(1) of the Federal Securities Act of 1933 includes treasury stock.

A Concluding Remark

In the context of the historical cost system, assets are recorded at cost upon acquisition. When treasury stock was reported as an asset, recording the balance at cost was consistent with asset recording principles.

The Securities Act of 1933 defined treasury stock as an owner's equity security. This means that treasury shares may not be sold in the open market unless SEC registration procedures are followed. Further, stock exchange reporting requirements in listing agreements today require that the stock exchange be notified promptly of any direct or indirect purchase of treasury shares at a price in excess of the prevailing market price. In addition, all treasury stock activity must now be reported to the Securities and Exchange Commission along with the reporting of other changes in shareholders' equity. Internal Revenue regulations definitely consider treasury stock transactions to be owners' equity transactions.

If treasury stock had not been originally classified as an asset, asset recording principles probably would not have been used in reporting treasury shares and treasury shares would not have been reported at cost. Then the par value method as advocated by Paton in the early part of this century might have been followed, and the relevant Internal Revenue and Federal Securities regulations would have been unnecessary.

FOOTNOTES

[1]Paton, "Some Phases", pp. 328-335 and Paton, "Postscript", pp. 276-283.
[2]Walsh, p. 7.
[3]Van Horne, p. 279-281.
[4]Mead, p. 116.
[5]DuBois, pp. 7-8.
[6]Moore, pp. 372-379 and Levy, "Purchase", p. 11-12.
[7]Finney, Chapter 8, pp. 15-17.
[8]Field, p. 101.
[9]Holt & Morris, pp. 505-510.
[10]Wormser, pp. 178-181; Berle and Means, pp. 174-176.
[11]Levy, "Purchase", pp. 13-17.
[12]Morawetz, pp. 188-197; Levy, "Rights", pp. 430-432.
[13]Ballantine and Hills, p. 230.
[14]Carlisle, pp. 560-561.
[15]Nussbaum, pp. 1004-1006.
[16]Paton, "Postscript", p. 280.
[17]Rankin, pp. 71-77.
[18]Barr, pp. 78-85; Marple, p. 61.
[19]AICPA, 1966, p. 156.
[20]AICPA, 1976, p. 189.

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INFLUENCE OF NINETEENTH AND EARLY TWENTIETH CENTURY RAILROAD ACCOUNTING ON THE DEVELOPMENT OF MODERN ACCOUNTING THEORY*

Abstract: This article is concerned with the problems of nineteenth century railroad asset valuation. The article presents some legal reasons for the early use of depreciation and continues with specific illustrations of railroad financial statements in the 1840s. The article concludes by stating that many of the basic concepts of accounting theory such as disclosure, matching measurement of cash flow had origins in railroad accounting.

The first steam driven locomotive started operating in England during the year 1830, and in the same year was introduced to the United States. Thus a study of railroad accounting practices should begin with information from the decade of the 1830's. The evolution of railroad accounting is traced to 1926, the year in which the Interstate Commerce Commission began to stipulate railroad depreciation policies.

The primary concentration of this study is on the nineteenth century, since it was during the industrial revolution that the requirements for reporting on the custodianship of corporate management to absentee owners first became recognized. During the twentieth century, railroad accounting practices were primarily dictated by regulatory agencies and as a result have diverged from the accounting principles which are generally accepted for other corporate enterprises.

The central thesis of this paper is that the major influence of railroad accounting related to the need for adequate disclosure of the economic health of the business enterprise. We can learn from the experiences of the railroads as to the contemporary discussions and debates regarding the proper means to achieve disclosure. Because the railroads were some of the first companies to require major quantities of long-lived fixed assets, one of the first problems faced by early railway accountants concerned that of asset valuation. Due to the major investments required, the railroads were also the first companies to require massive amounts of outside capital; thus their

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accountants were the first to deal with the problem of public reporting to stockholders and potential stockholders. Finally, because of the quasi-public nature of the industry, these accountants were the first to deal with the problem of providing accurate disclosure of economic health to users. The disclosures originated from the requirements of government regulatory agencies. Each of these problems will be discussed in the following analysis.

THE PROBLEM OF ASSET VALUATION

Chatfield has stated that the railroads were the first industrial enterprises to be confronted with the whole range of asset valuation problems. Requiring much larger capital investments and more long-lived equipment than most businesses of the early nineteenth century, they were compelled to isolate asset expenditures and account for them methodically.[1] The need was recognized early that the lives of assets were limited and that they would eventually require replacement. This led to an acknowledgement by some parties that there was a need for a portion of earnings to be set aside for the replacement of assets. In 1841 an English publication, *The Railway Times*, wrote, "The declaration of a dividend without making allowance for depreciation of stock, cannot in our opinion be regarded as other than fallacious . . . The machine as a whole is gradually and certainly, though insensibly, going to decay; and a time comes at last, when the replacement of parts will not maintain its efficiency, and then it must be cast aside altogether."[2] Littleton has suggested that there were three ways that changes in asset values were reflected in early railroad accounts.[3]

The first of these was simply a periodic revaluation of properties, which appeared among the English railroads. The Grand Junction Railway, the Liverpool & Manchester Railway, and the North Union Railway all followed this practice in the 1830's. The Grand Junction, for example, valued its rolling stock according to its current market value; the change in value, whether debit or credit, was entered in the revenue account at six month intervals.[4] In statistics compiled from reports to the Massachusetts legislature in 1851, George A. Foxcroft cites the following data for the Boston and Lowell Railroad:

Incorporated 1830	
Cost January 1, 1849	$2,013,600
Cost January 1, 1850	1,945,650
Decrease (Caused by revaluation of the fixed property of the road)	67,950

Other railroads in Massachusetts followed the same revaluation practice during the 1840's, although an upward revaluation appeared to be more commonplace than a downward one.[5] An American writer, Dionysius Lardner, indicated his opposition to this practice in his book published in 1850, stating that "If time has diffused some portions (of railroad assets), new portions have been infused so that on the whole the value in use remains the same."[6] The periodic revaluation of fixed assets was an early attempt by some railway accountants to solve the asset valuation problems, a solution which ultimately fell into disfavor. As Lardner pointed out, market values are determined by causes over which a company has no control and are independent of the "use or abuse of their property;" furthermore, revaluation on the basis of increased market values did not provide funds for the replacement of assets at the end of their lives.

A second method of reflecting changes in asset values entailed the setting aside of an annuity each year which would accumulate to the amount required for replacement at the estimated time it would be necessary. In its seventh annual report of 1833, the Baltimore and Ohio Railroad (B&O) devoted one section to the presentation of estimates of the cost of construction and of repairs and renewals of railway using this method. The annual provision for "oak sills and sleepers and yellow pine string pieces" was expressed as "an annuity of equivalent value (to $3,342 due 12 years hence) to commence at the end of one year, to continue 12 years, reckoning compound interest at 5 percent is $209.97."[7] This method appears never to have been widely adopted however, probably because of its relative sophistication and of the need to estimate useful lives and discount rates. Indeed the B&O itself might possibly have discontinued this practice; excerpts from its annual report of 1849 shows expenditures for "repair of road bed" and "repair of motive power" but there is no mention of a provision for replacing these items.[8]

Littleton referred to a third type of early asset valuation which he called the "renewal method." Actually there existed two distinct practices: Repairs and renewals were charged to expense either directly (others referred to this as the "replacement" or "retirement" method) or through an intermediate "renewal" account. Charges to such a renewal account represented estimated amounts by which an asset's value was said to have declined in excess of actual expenditures for repair. The Eastern Railroad, which ran from Boston to Portland, Maine, showed a charge of this type in its annual report for 1846.[9] A good description of the use of renewal accounts for valuation is contained in the Report of the Boston and Providence Railroad (B&P) for 1859:

> In making up the account of expenditures, it will be seen that we have adopted a course which, if adhered to, will secure a good degree of uniformity in the charged expenses of operating the road.
>
> In the first place, we assume that there is an annual decay of sleepers, bridges, station house, etc., and that the extent of that decay for each year, is properly chargeable to the expenses of that year. . . .
>
> We have endeavored to ascertain, so far as is practicable, from the experience of years, what may be expected with a given amount of business, to be the amount of expenses chargeable to each account, annually; and if any year the amount expended actually falls short of that estimate, we do not rely upon a permanent reduction of those expenses, but charge the expenses of that year with the estimated amount, and carry the difference to a fund to meet what may be expenditures of another year on that account beyond the estimate.

The report additionally contained a summary of receipts and expenditures which showed expenditures for eleven items such as new sleepers, new iron, repairs on locomotives, and repairs on stations, buildings, and fixtures. For each of these accounts there was a contra renewal account, for example, "renewal for new iron."[10] The presentation was remarkedly similar to the modern day presentation of accumulated depreciation; indeed the passage quoted indicates that the B&P accountants had a notion of the "annual decay" of an asset's value similar to the modern concept of depreciation. However, charges were not made in a systematic manner but were based on the excess of estimated expenses over actual expenditures and varied from year to year.

As early as 1844 the same railroad in its annual report described a tardy recognition of accumulated depreciation from January 1, 1834:

> On the 31st ultimo we made a careful estimate of the present value of cars, engines, and other personal property of the corporation, which had been charged to the account of construction, and have charged against such depreciation from the cost to income account, the sum of forty

> thousand dollars, and deducted the same from the cost of construction.[11]

Again in 1845 an additional $36,004.84 of depreciation on cars and engines was recognized. By 1870 however the Railroad's annual reports had ceased to show expense charges to the renewal accounts; in fact the 1871 report showed subtractions from three of the expenditure accounts which were explained as "Amount charged to renewal fund." From 1872 until 1888, when the B&P was absorbed by the Old Colony Railroad, the renewal accounts were not shown nor was any other attempt made to account for decreases in fixed asset values.

Apparently the B&P had adopted the retirement method of accounting for fixed assets, which was the most widespread theory from the mid-nineteenth century until the early twentieth.[12] Under this method, the expense due to the exhaustion of property was recognized at the time of the retirement of a unit of the property. This was most often justified by the argument that as long as the property was maintained in good repair then no decrease in the value of the asset had occurred. This argument was advocated by Lardner in his *Railway Economics* and was also enunciated by the president of the Galena and Chicago Union Railroad Company in 1857:

> It will be interesting to examine more particularly the question of depreciation of the road and works. This takes place from year to year in the superstructure of the road, in the rolling stock and in the bridges and buildings. The road bed embankments become appreciated year by year, by the labor which is necessarily embraced in the current expenditures for cleaning out cuts and ditches and raising embankments and ballasting.
>
> The preceding statements show, that the present value of the rolling stock is more than fifty thousand dollars greater than the amount which has been charged to construction for that purpose. In this item, there has also been an appreciation.
>
> The large expenditures which have been made during the year, in replacing the original, temporary and imperfect bridges and culverts, by permanent and improved structures have been sufficient to cover any possible depreciation under this head; . . . The buildings have been put in

> thorough repair during the season, and are now worth almost, if not quite, as much as they cost.[13]

By 1880 the revaluation, annuity and renewal account methods of accounting for changes in asset values had virtually disappeared in the United States and had been replaced by the retirement method. This replacement, according to Pollins, occurred in England in the fifties and sixties as companies found that their past allocations of depreciation reserves had been inadequate.[14] Although these three methods were not strictly depreciation in its modern definition, they did represent an early response to the asset valuation problem and were forerunners of our modern concept. As Holmes has said:

> Depreciation was a knotty problem for these early railroad accountants. They argued over it, scorned it, denied it, anatomized it, and misused their own concepts. But in the end it was from the very ashes of their disagreements that our modern concepts of depreciation arose Phoenix-like fifty years later.[15]

However, one cannot objectively attribute the existence of early attempts to reflect the declines in asset values entirely to the good intentions of the railroads or of their accountants. In the United States a great deal of the impetus to provide funds for the replacement of fixed assets came from governmental agencies. In 1846 the State of Massachusetts provided a new format for the annual reports submitted to it by its railroads which included disclosure of depreciation estimates. A section of the format was entitled "Motive Power of Cars" and is reproduced in Exhibit 1.

EXHIBIT 1

State of Massachusetts
Disclosure Requirements—Motive Power of Cars

For repairs of locomotives	xxxx
For new locomotives, to cover depreciation	xxxx
For repairs of passenger cars	xxxx
For new passenger cars, to cover depreciation	xxxx
For repairs of merchandise cars	xxxx
For new merchandise cars to cover depreciation	xxxx
For repairs of gravel and other cars	xxxx
Total for maintenance of motive power and cars	xxxx

Following the computations of dividends and surplus, the railroads were also required to disclose "estimated depreciation beyond the renewals" for roads and bridges, buildings, and engines and cars.[16] Similar requirements for disclosure of depreciation existed in other states. New York, which with Massachusetts contained the bulk of railroad track laid by 1850, included such a provision in a law passed by its legislature in 1849. The law required the filing of an annual report with the State Engineer and Surveyor which included, among other things, a statement of "the amount charged for depreciation of road, engines, cars, etc." The law did not, however require that such depreciation charges be made.[17] Another law enacted in New Hampshire in 1850 stipulated the disclosure of "estimated depreciation beyond renewals, namely: Road and bridges, buildings, engines, and cars."[18]

Nevertheless the mere existence of laws which allowed charges for depreciation against earnings would not serve to encourage such charges. Such encouragement could be provided, however, by the existence of limitations on the net earnings of the railroads. In 1846 the State of Massachusetts permitted a maximum earnings of 10% with any excess recovered by the State as a tax. A simple management expedient to avoid such a tax would involve expensing sums in addition to actual expenditures to a renewal account for a capital asset. Following such a policy as that previously quoted for the Boston & Providence Railroad, depreciation provisions would provide a means of moderating income fluctuations, and this was, in fact, cited as one of the advantages of the method. It may be significant to note that, of all the railroads referred to by Littleton and Mason in their discussions of early depreciation methods, the only ones which are known to have repeatedly reflected such charges in their accounts operated in the State of Massachusetts. According to Littleton, in 1876 the Massachusetts Railway Commission issued a revised set of instructions regarding railway accounts which made no mention of depreciation as such, but rather called for the reporting of "new locomotives charged to operating expense to make good original numbers."[19] This revision reflected an official acknowledgement of the prevalence among railroads of the retirement method in accounting for fixed assets. The earlier law which had provided for a tax on excess railroad earnings was supplanted by an 1869 law establishing the commission, which itself had no rate regulating authority.[20] Thus, there is evidence to indicate that early depreciation methods, which first became evident in the railroads, were employed not out of considerations for proper asset valuations based in any accounting theory, but were rather instruments of management policy in pursuing the best interests of the railroads themselves.

THE PROBLEM OF PUBLIC REPORTING

As one of the first major industries to require large investments in fixed assets, the railroads were among the first to develop the need for outside capital. Prior to the construction of the first railroads in 1830, the predominant business form in the United States had been the small, family owned proprietorship or partnership. The railroads capital needs were so massive, however, that they were compelled to depend heavily on external financing; thus railroad accountants were the first major group to face the problem of public reporting in order to attract capital. The magnitude of the capital requirements can be seen from statistics compiled by Dogett's Railroad Guide of September, 1847. Railroad mileage in the United States grew from 155 miles at the end of 1830, to 5,740 miles at the end of 1847, requiring a total investment of $122,525,937 in this 17 year period alone.[21] Similar expansions were taking place in England and, to a lesser extent, in other European countries. In order to attract this capital and maintain a market for railroad securities, accountants were forced to develop means both for disclosure of railroad operating results and for ways to report on the custodianship of assets. Since few private companies had previously been required to deal with this problem, there were few precedents to establish the kind of disclosure to be made or the accounting and statistical methods to be followed. A survey of early nineteenth century railroad financial statistics, therefore, provides some interesting insights into the development of current-day financial reporting procedures and measurement concepts.

Early Practices

Initially most railroad accounting records were kept on a cash basis, and as a result their reports primarily dealt with the sources and disposition of cash and with statistical measures of the flow of traffic. The first report issued by the Utica and Schenectedy Railroad covered the period from its opening in 1836 until January 1, 1841, and was partially reprinted in *Hunt's Merchants Magazine*.[22] As an illustration of the early form of disclosure, this data is included in Exhibit 2.

EXHIBIT 2

Utica and Schenectedy Railroad
Report of the. Treasurer (1841)

The capital of the company is 20,000 shares		$2,000,000
The total cost of the road, from its commencement to the 1st Jan. 1841, including the right of way, $322,470, and the purchase of the Mohawk Turnpike, $62,500, was		1,901,785
The calls on stockholders have been	$1,500,000	
Ditto, derived from dividends	300,000	1,800,000
The amount received from passengers, the mail and all sources in 4 years and 5 months, from commencement of road to 1st Jan., 1841		1,618,517
The total expenses during the same period		552,598
Nett earnings, 71 percent on 4½ years		1,065,918
The dividends declared to 1st Jan., 1841 being equal to 13½ percent per annum on the capital of $1,500,000, during 4½ years		917,000
The total cost per mile of the 78 miles, including motive power, right of way and turnpike, is	$ 23,580	
Off right of way and turnpike	4,934	18,646

A more typical report format provided a tabulation of receipts and expenditures. The next Treasurer's Report (See Exhibit 3) of the Utica and Schenectedy was issued in 1842, similarly covered the period from the inception of the railroad until December 31, 1841, and followed a format which was fairly standard in railroad reports for thirty years.[23]

It is noteworthy that, although these reports were being issued at yearly intervals in accordance with legislative requirements, they did not attempt to measure changes in the accounts but rather reflected the status of the accounts at a point in time. Included in the 1842 report were statistics concerning the number of passengers carried and the receipts from various sources (passengers, mail, turnpike tolls, interest and miscellaneous) for each year from 1836-1841. No attempt was made, however, to match expenditures with receipts for these years. In a similar report published in 1844, the New York and Erie Railroad tabulated its receipts and expenditures from its opening until February of that year.[24] The Boston and Maine was still following this practice in 1848.[25]

EXHIBIT 3

Utica and Schenectedy Railroad
Report of the Treasurer (1842)

Amount received for installments on stock		$1,800,000.00
" transportation of passengers		1,864,691.53
" " U.S. mail		83,047.10
" tolls of Mohawk Turnpike		22,834.78
" interest on money deposited		10,226.87
" from miscellaneous sources		49,134.71
Total receipts from all sources to Dec. 31, 1841		$3,829,934.99
Deduct expenditures for all accounts up to Dec. 31, 1841, viz.:		
On construction account	$1,968,022.17	
On transportation account	709,230.12	
On dividend account	1,017,000.00	
Total expenditures	$3,694,252.29	
Balance, being excess of receipts over expenditures up to Dec. 31, 1841		$ 135,682.70

Periodic Reporting

It appears that by the end of the 1840's, however, the practice of reporting receipts and expenditures for periodic intervals had become more common. Some railroads followed the practice of providing this information in financial reports covering both annual and semiannual periods. For example both the South Carolina and the Eastern Railroads disclosed receipts, expenditures, and profits or surplus (on a cash basis) for the year in 1846 and also for each six-month period in the year.[26] The report of the South Carolina is also interesting because it contained, along with the usual traffic and mileage statistics, two statements which were remarkedly similar to an income statement and balance sheet. These statements are replicated in Exhibit 4.

The South Carolina was thus one of the earliest railroads to recognize the distinction between capital and expense expenditures and the need for accruals. Note also the property statement item "By shares in the railroad," which is presumably treasury stock being carried in the accounts as an asset.

EXHIBIT 4

South Carolina Railroad
General Statement of Receipts and Expenditures
For the Year 1846

Gross receipts from all sources in first half year	$251,741.36
Ordinary current expenses for same time	193,592.21
Nett profits for the first half year	$ 58,149.15
Gross receipts from all sources second half year	$337,340.16
Ordinary current expenses for same time	224,578.96
Nett profits for second half year	$112,761.20
Nett profits for the year 1846	$170,910.35

Property Statement, December 31, 1846

DR.		
To stock — for $35 per share on 34,800 shares		$2,610,000.00
" — instalments forfeited		312,417.65
To surplus income		40,708.52
To balance of indebtedness		2,765,090.74
Total		$5,728,216.91
CR.		
By purchase of Charleston and Hamburgh railroad, embracing road, machinery, &c.	$2,714,377.50	
By purchase of land attached thereto	59,741.30	
" of negroes	11,963.19	
		$2,736,081.99
By construction of Columbia branch		2,863,654.49
By lands purchased since January, 1844	$ 5,083.83	
By loss to credit Aiken lands	35.35	
		5,048.48
By negroes purchased since January, 1844		800.00
By suspense account		8,490.00
By rail iron purchased		15,773.97
By improvement of depots		8,680.29
" of property		30,437.49
By shares in the railroad		40.00

By amount due on pay-rolls and bills not charged, but forming part of balance of indebtedness	9,210.60
Total	$5,728,216.91

Such semiannual reporting was exceptional even though the Grand Trunk Railway in Canada was issuing semiannual financial reports in 1875 and continued the practice until as late as 1907. However by the mid 1850's the annual reporting of receipts and expenditures along with numerous statistical tables was the prevalent practice in this country, a development which was no doubt influenced by the legal reporting requirements which existed in many states.

Matching

Another twenty years passed before railroad accountants became concerned with the need for matching expenses with revenues to arrive at a measure of income. Some of the early experiments with depreciation were, of course, attempts to do this, but such practices did not persist as has already been discussed. It was not until the 1870's that the railroads began to show evidence of the use of accruals in their financial statements. By this time many reports had grown to be 60-70 pages in length and some would contain information, often statistical, from all the major divisions of the company— engineering, operations, and legal as well as financial. The earlier statements of receipts and expenditures had evolved into multiple statements representing both cash flow and earnings. For example, the Allegheny Valley Railroad Company in its 1866 annual report provided both a "Statement of Earnings and Expenses" which was an analysis of the surplus account in "T" form, and a statement of "Receipts and Expenses" in tabular form. The former was apparently a predecessor of the modern income statement, and the latter of a modern funds flow statement. In 1870 the Boston and Providence similarly provided a statement of Receipts and Expenses, a "T" format analysis of profit and loss, and a trial balance as of the year-end date. Numerous other railroads during the 1870's provided both funds and income disclosures including the Atchison, Topeka & Santa Fe (AT&SF), the Flint and Pere Marquette, and the Chicago and Alton. In 1879 the Chicago and Alton's Statement of General Balances contained an accrued liability, described as "sundry items of rent accrued on leased lines, not yet due." The AT&SF was probably one of the first to attempt overhead allocations. In its 1874 report it provided a table which showed a distribution of all overhead expense between receipts from "freight service" and from "passenger service." This table was entitled "Division of Operating Accounts for the Year 1874" and was included for the last time in 1876.

Working Capital

It has been pointed out that statements providing cash flow information existed in railroad financial reports from their earliest operations, and cash flow on an annual basis from the late 1840's. It was not until the latter part of the nineteenth century that the concept of funds flow as a change in working capital items began to emerge. One of the first evidences was the Report of the Board of Directors of the New York, Lake Erie & Western Railway Company which covered the period from June 1, 1878 to September 30, 1878. This report, which covered an abbreviated period due to a change in the fiscal year, included a summary of financial transactions from October 1, 1877, to October 1, 1878. The summary began with the surplus for the year, and added "means realized from sources" which included decreases in various asset accounts and an increase in "amounts due to other companies and individuals on Current Accounts." The summary then arrived at a total of surplus and "other means," and stated "This amount is accounted for as follows." The explanatory items included purchases of equipment, land and stock and bonds, payment of interest, and increases and decreases in various liability accounts.[27] The 1880 Report of the Flint and Pere Marquette included a side by side presentation of "Resources" and "Disposition." Resources consisted of Gross Earnings, proceeds of a bond issue, and a category described as "floating liabilities" which was apparently their description of current liabilities. Disposition included expenditures for construction, interest, and "floating assets." Total resources were then shown to be equal to total disposition.[28] It is significant perhaps that each of these reports were issued while the railroads were in receivership; the receiver in each case felt a fiduciary responsibility to the courts and creditors to disclose the sources and applications of the railroads' funds.

A more clearly-defined understanding of the working capital concept was presented among the statistical tables of the Southern Pacific lines in 1896 in its "Statement of Receipts and Disbursements from all Sources." Receipts included net profits, receipts from capital created and proceeds from sale of property, and collection of deferred and contingent assets. Disbursements for capital asset purchases were also detailed. Then the increase in current assets was subtracted from Receipts and a net decrease in current liabilities was added to Disbursements to arrive at totals which were equal. Thus by the twentieth century, a concept of funds flow very similar to that currently employed had developed in the accounting practices of the railroads.

Early railroad accountants were among the first practitioners to be faced with the need for reporting to the public on the results of business operations and the custodianship of assets. In response to this need these accountants developed methods of disclosure from which arose many of the basic accounting concepts and principles of current day accounting theory. Thus accounting and disclosure practices in the railroad industry developed as a response to the economic environment created by the industrial revolution; another factor, however, which had a substantial effect on railroad accounting was the increasing power and regulation of governmental authorities.

THE PROBLEM OF GOVERNMENT REGULATION

Government attitudes toward regulation of the railroad companies evolved during the nineteenth century just as did the railroads' accounting policies. The railroads constituted not only the first major industry to develop a need for public reporting, they were also the first which was required to operate under extensive governmental supervision and control. This control affected not only the routes they could build and the rates they could charge, but also their accounting policies as well.

A History of Railroad Regulation

In an address before a convention of railroad commissioners in 1893, Henry C. Adams indicated that four distinct views have been held regarding the relation of public highways to the government.[29] Prior to 1830, it was considered a proper function of the federal government to supply the public with turnpikes and canals. During the period 1830-1850 however, the view became prominent that this function rested with the states. A number of states including Pennsylvania, Georgia, Michigan, Indiana, and Illinois provided for public ownership of railroads, and other states either considered this alternative or provided means for public control.[30] After the Panic of 1837-39, many of these public systems failed and opinion turned against public ownership and control. During the period 1850-1870, private corporations were viewed as the proper organizations for building and controlling railroads; the railroad promoter was viewed as a public benefactor and it was deemed essential to encourage the construction of the maximum amount of mileage in the shortest interval of time.[31] After 1870 the public, particularly in some of the midwestern states, began to feel that free competition was not working satisfactorily in the railroad industry. A number of states passed laws, including the Granger Laws, which asserted the right of public control over internal commerce. In 1877 the Supreme Court upheld this right, and, in 1887 Congress enacted the Interstate Commerce Act extending this type of authority to the federal government.

Regulation and Accounting Policies

Although most regulatory commissions were established in order to control rates rather than accounting policies, evidence indicates that such control did affect railroad accounting. One of the first general regulatory laws was enacted in Virginia in 1837. This law required railroads within the state to submit an annual report to the Board of Public Works disclosing the amount of capital stock, the gross receipts, and the net loss or profit for the year. The law stipulated that any return on capital stock in excess of 7% would be remitted to the State as a tax. Ferguson notes that in the 30 years which this law was in effect in Virginia, the Board never collected an excess profits tax from a single railroad.[32] A commission was established in Massachusetts in 1841; it has already been suggested that the 10% profit limitation served to encourage the use of depreciation reserves in that State.

By the 1880's, most states had established some sort of statutory means for railroad regulation, either through commissions which were advisory in nature or those which had rate setting authority. The Granger Laws, passed in Illinois, Iowa, Minnesota, and Wisconsin during the 1870's were the first of the latter type. By 1893, 17 states as well as the Interstate Commerce Commission had legal authority to set maximum rates.[33] The prevalent method of rate setting during this latter period provided for a set return for the railroad on its investment in capital assets; it is significant that the increase in use of this criterion approximately coincided with the increased use of the retirement method for asset valuation, the demise of the use of depreciation reserves among the railroads, and a trend toward capitalizing rather than expensing new assets. One can conclude that the railroads often found it expedient to use accounting practices for asset valuation which maximized their base for rate setting calculations regardless of the validity of the underlying accounting theory. A similar conclusion was reached by Boer, who described the late nineteenth century debates regarding the choice of whether to use replacement or historical costs in determining the rate base.[34]

The influence of the regulatory agencies on railroad accounting policies was not always this indirect, however. The financial difficulty of many railroads during the Panic of 1893, and the subsequent failure of some major lines, emphasized the need for better public disclosure of their financial health.

Regulation and Disclosure

Although railroad financial reports during the latter part of the nineteenth century typically contained voluminous detailed tables of statistics concerning shipments, expenditures, receipts, and services provided, the quality of disclosure was generally considered to be inadequate. Concerning this problem, the *Railroad Gazette* in 1893 made the following comments:

> The annual report of a railroad is often a very blind document, and the average stockholder, taking one of these reports, generally gives up before he begins. He hears that reports are often made for the express purpose of concealing the truth, and he naturally concludes that his own managers are the kind of men that follow that method. There are two common ways of discouraging the inquiring stockholder. One is to make a very brief report, telling him, in effect, that the company's affairs are none of his business. The other is to tell him a great many facts, but to leave out those he wants, and to set upside down the most important of those which are shown. The latter is the more common way. . . .[35]

Edwards states that the first of several railroad audits by Price, Waterhouse & Company was undertaken after the Norfolk & Western Railway was placed in receivership during this period.[36] In another *Railroad Gazette* article in 1893, an unnamed auditor described some of the misleading accounting practices followed by many railroads, and then lamented that such notable railroad failures as those of the Reading and the Baltimore & Ohio could occur without being anticipated by stockholders and the public. He went on to ask:

> Would it not be well for the railroad companies to take the people into their confidence and say, our liabilities are

> so much, the real value of our assets is so much, and the deficiency so much, which we will square up out of earnings as soon as possible, and start on an even keel?. . . . It is not what a road has cost that the stock and bondholders and people want to know; it is its value in gold, and this will not be given except by legal compulsion.[37]

The auditor was not alone in his concern; sentiment in favor of financial regulation of common carriers grew steadily following the Panic of 1893. Congress extended the power of the Interstate Commerce Commission (ICC) in this area by the Elkins Amendment of 1903 and the Hepburn Act of 1906 which empowered the agency to prescribe a uniform chart of accounts for railroads.[38,39] In its annual report for 1908 the ICC said:

> No court or commission or accountant or financial writer would for a moment consider that the present balance sheet statement purporting to give the "cost of property" suggests even in a remote degree, a reliable measure either of money invested or of present value. Thus . . . the balance sheets published by American railways are found to be inadequate. They are incapable of rendering the service which may rightly be demanded of them.[40]

The movement for additional regulation of railroads received added impetus in the period 1913-1917 as the ICC investigated a number of financial scandals in the industry.[41] The Valuation Act of 1914 directed the Commission to conduct a detailed valuation of the assets of all common carriers affected by the Interstate Commerce Act. Finally in 1920 Congress enacted the Transportation Act, giving the ICC control over the issue of railroad securities and requiring it to prescribe changes in railroad asset valuation methods. In implementing this act the Commission issued rules to prevent overcapitalization and stock watering and in 1926 required carriers to adopt depreciation methods of accounting for fixed assets. In justifying this requirement, the ICC pointed out that the retirement method, which had been in widespread use since the 1870's, could be used to avoid recapture of excess earnings. Furthermore, "investors must be protected against falsifying accounts and keeping up the appearance of earnings by postponing necessary replacements."[42] Thus the Congress succeeded in forcing the kind of disclosure in railroad financial reporting which accountants and industry observers had recognized as a need some thirty-five years earlier.

CONCLUSION

From the foregoing analysis a number of conclusions and implications can be drawn regarding the influence of railroad accounting. Because the railroad industry was the first major capital intensive industry, it was the first to be faced with the accounting problems of asset valuation and public disclosure. Many of the concepts which are basic to the practice of modern accounting began to appear among the railroads in the middle part of the nineteenth century because of their need to inform stockholders and creditors about their operations. Railroad accounting developed, however, not only in response to this economic environment but also to a political one as well. There is evidence that many railroad accounting policies were adopted, from their early periods of existence, because of the effects of governmental controls and reporting requirements and not from considerations of accounting theory. When it became apparent that the railroads would not voluntarily begin public reporting in a fashion that accurately represented their financial health, governmental agencies took action in order to achieve this goal. From ten years after the railroads were introduced in this country until well into the twentieth century, the governmental influence has been a primary force in the development of adequate railroad disclosure.

The lesson of the railroad experience to modern day accountants is clear. Modern corporations, like the nineteenth century railroads, may be expected to exploit their accounting records to achieve their own interests, and often these interests will conflict with those of the public in general. If the profession of independent accountants cannot implement changes in current accounting policies to achieve a more realistic disclosure of economic health, then government agencies will attempt to make these changes instead. Perhaps a repeat in other areas of the experience of the railroads has already begun.

FOOTNOTES

[1]Chatfield, p. 94.
[2]Pollins, p. 344.
[3]Littleton, p. 228.
[4]Pollins, p. 345.
[5]Hunt's, April 1851, p. 499.
[6]Littleton, p. 228.
[7]Mason, p. 211.
[8]Hunt's, May 1850, p. 564.
[9]Hunt's, October 1847, p. 628.
[10]Boston and Providence Railroad, 1859.
[11]Mason, p. 217.

[12]May, p. 336.
[13]Galena & Chicago Union Railroad Company, 1857.
[14]Pollins, p. 349.
[15]Holmes, p. 18.
[16]Mason, p. 218.
[17]Hunt's, June 1849, p. 655.
[18]Hunt's, September 1850, p. 356.
[19]Littleton, p. 234.
[20]Miller. See also the comments of Adams, p. 315.
[21]Hunt's, June 1848, p. 99.
[22]Hunt's, May 1841, p. 482.
[23]Hunt's, November 1843, p. 480.
[24]Hunt's, October 1845, p. 384.
[25]Hunt's, November 1848, p. 566.
[26]Hunt's, January 1848, p. 100, and October 1847, p. 628.
[27]New York, Lake Erie and Western Railroad Company, p. 92.
[28]Flint & Pere Marquette Railroad Company, p. 10.
[29]Adams, p. 315.
[30]Miller, p. 43.
[31]Bernhardt, p. 2.
[32]Ferguson, p. 18.
[33]Adams, p. 315.
[34]Boer, p. 93.
[35]Railroad Gazette, January 6, 1893, p. 12.
[36]Edwards, p. 48.
[37]Railroad Gazette, May 19, 1893, p. 373.
[38]Bogen, p. 29.
[39]Holmes, p. 18.
[40]Bernhardt, p. 29.
[41]Locklin, p. 7.
[42]Locklin, p. 171.

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A NEW PERSPECTIVE ON THE EVOLUTION OF DOUBLE-ENTRY BOOKKEEPING

Abstract: Inquiry into the origin of double entry accounting has typically focused on form as the causal factor. In the present article the arguments supporting this view are reviewed and challenged by developing the substantive framework of double entry accounting in equation form and linking it to the evolution of mathematics in the Arab-Hindu cultures. The article concludes with specific suggestions for obtaining empirical evidence which might support the "substantive hypothesis" as the causal factor of double entry accounting.

One of the great evolutionary advances in the history of accounting was the conceptualization of "double-entry" and its subsequent manifestation in form and substance. Accounting historians agree that Paciolo's famous treatise of 1494 represents the first complete synthesis of double-entry bookkeeping in *published* form.[1] Substantially less agreement exists in the literature on the underlying stimuli responsible for the "state of the art" prevailing at the end of the fifteenth century.

The methodology employed by accounting researchers in addressing the latter issue is largely inductive and is akin to that of historians in general. By the same token, general observations on the "form" of double-entry bookkeeping as *evidence of origin* requires a deductive approach which is extremely fragile within an historical context. This paper examines, in a brief manner, the major hypotheses debated in the literature as to the causal factors giving rise to double-entry bookkeeping and offers an alternative explanation in view of the amassed empirical evidence.

Writing in 1494, Paciolo explicitly denied any responsibility for the origin of double-entry accounting and asserted that he was merely "writing down the system" which had been in existence for roughly two hundred years in Venice.[2] However, Paciolo apparently did express his acknowledgment to one renown mathematician of this era namely Leonardo da Pisa.[3] The possible contribution of this medieval scholar and the genesis of his knowledge appear to have been extremely understated and perhaps omitted entirely as a source of *first order* importance to the development of double-entry bookkeeping. This will become more evident after we define the fundamental elements underlying the framework of "double-entry" accounting and review some of the major arguments.

If Paciolo simply unified the existing practice of his time, what were the developments contributing to the accounting systems which he borrowed from in writing his *Summa de Arithmetica, Geometria, Proportioni et Proportionalita*. The empirical evidence usually relied upon in attempting to answer this question are the historical accounts of various bankers, family enterprises, and merchant ventures which dominated the expansionary growth experienced throughout Italy during the Renaissance era. One eminent accounting historian exhaustively studied several such sources. In presenting his evidence, de Roover claims that "Double entry does not depend in the least upon the form in which accounts are presented."[4] From his viewpoint, the fundamental criterion is revealed by the following test: "At the end do we have a real balance showing the assets on one side and the liabilities and the owners' equity on the other? Only if this question can be answered affirmatively, is one justified in speaking without hesitation of books kept in double entry."[5]

This question is so critical to the present purpose that it deserves elaboration before we confront any arguments from the literature. Littleton divided the problem into one of form versus substance.[6] The former explicitly encompasses the condition of duality and equilibrium in the various phases of recordkeeping. According to Littleton, we could have three forms of duality: (1) duality of books; (2) duality of account form; and (3) duality of entry.[7] Littleton probed further and suggested that equilibrium of results may be the cornerstone of double entry.[8] However, he argued convincingly that these two conditions (i.e. form and equilibrium) were not sufficient for a complete, coordinated system of double entry bookkeeping. The substantive element of "proprietorship", with its primary emphasis on the calculation of gains and losses, was absent.[9]

Unfortunately, Littleton did not elaborate on precisely *how* his definition of "substance" was manifested in a complete system. Schrader, on the other hand, offers a provocative insight into this matter.[10] Employing an inductive approach, he demonstrates that debits are in fact "consideration received" while credits are "consideration given" in an exchange transaction (i.e. for goods and/or services) which is the "essence of business activity."[11] Moreover, Schrader indicates that at the whole life level of analysis, net income results *naturally* from the recording process with no further manipulations of data.

Schrader's analysis illustrates unequivocally that the accounting equation is an *equivalence* of values between *two* fundamentally different attributes (i.e. variables) expressed as debits and credits. Classification in the usual accounting sense of the word does not change the nature of these attributes.

Introducing periodicity into the exchange activities of an entity does not disturb the standard (i.e. transaction) for admission of the data into the system. However, to generate the real balances cited by de Roover, or Littleton's complete system, a concept of net income is mandatory. Again, under the historical cost model, accountants have agreed in principle that criteria be established for "revenue recognition" (the independent variable) and matching of related expenses (the dependent variable). Net income is merely the balancing residual in the system.[12]

Clearly, all three writers have in mind a bi-variate equation system (i.e. the historical cost model) based on an entity, exchange transactions, and a common monetary unit. To avoid any misunderstanding later, it should be observed that the historical cost model *does not compete* with a "current value" model since the phenomena under observation are entirely different. The latter model focuses on "things" or "elements of wealth" as the fundamental attribute. Price coefficients are attached to these things and summed: equilibrium is attained by setting the aggregate total (i.e. assets) equal to liabilities and equities. Obviously, the equation is an identity and represents a uni-variate model since only one kind of attribute (i.e. "asset" or "thing") is involved. Net income emerges as the difference between the net assets at two points in time assuming no capital adjustments. It should be apparent that an understanding or conceptualization of the bi-variate model (i.e. historical cost) requires a more profound knowledge of the relationship between variables than the identity equation of the current value model which is nothing but an equilibrium feature of any uni-variate model.

Returning to the arguments on the origin of double-entry accounting, de Roover notes that in Tuscany, approximately midway through the fourteenth century, double-entry was achieved before the general adoption of the bilateral or tabular form.[13] Prior to 1350, the northern part of Italy had been exposed to the bilateral form—as early as 1327 in Genoa for example. Despite this movement away from the narrative form of accounts and balances, Roman numerals remained the accepted mode of presentation. De Roover further asserts that:

> . . . improvement was achieved by placing the amounts in extension columns instead of inserting them in the narrative. Summations were thereby greatly facilitated, but the use of Roman numerals continued to impose the aid of the abacus.[14]

It is difficult to comprehend how the vertical arrayment of Roman numerals and their characteristic absence of place value would be comfortable to summation. If one wants to add, say, 1,012 and 1,308, writing down MXII and MCCCVIII in columnar format contributes nothing to the process of summation. Another authority, de Ste. Croix, specifically suggests that this limitation in the Roman numeral system prevented the concepts of debit and credit from emerging and therefore inhibited any notion of double-entry bookkeeping.[15]

A somewhat different viewpoint on the emanation of double-entry form centers on our conventional Arabic numeral system. De Ste. Croix is of the opinion that the arrangement of figures in columns in our notation is not an intrinsic virtue but an incidental defect due to a combination of its two greatest virtues: place-value and the small number of symbols it uses. Furthermore, this defect, paradoxically, provided the stimulus toward the advanced concepts of debits and credits.[16]

Both of the above positions imply that form, augmented by some type of number system, was instrumental in yielding the substantive element in double-entry accounting. Why should form alone necessarily lead to the complete concept of double-entry; is it not equally plausible that the idea was first conceptualized and that the element of form merely reflected a lag effect in the application or modification of existing accounts? De Roover's own testimony on the state of accounting in Tuscany tends to lend credence to the latter possibility. But even if form is accepted as a causal factor, what underlying event or set of phenomena can explain the motive behind the emergence of the bilateral form, in a total framework of duality (i.e., journal entries, trial balance, and final ledger balances) regardless of the number system (i.e., Roman vs. Arabic).

Unfortunately, an inductive approach can not provide solutions to this question and some resort to deductive reasoning is essential. At issue here is *not* the appearance of double-entry *form*, which at one time, was generally understood to be in Genoa around 1340. In fact, de Roover claims that this hypothesis has virtually been shattered and the focal point is now the simultaneous emergence in several Italian trading centers around the beginning of the thirteenth century.[17] Instead, the question of interest lies in discovering the compelling force that provided the substantive element of double-entry bookkeeping. Several alternatives are couched in the literature but they appear to be incomplete upon further emphasis.

De Roover, for example suggests that three factors, namely partnership, credit, and agency were of paramount importance. The notion of partnership, with extant documents dating from 1157, is singled out as the most important because it generated the concept of entity. Borrowing from Kats,[18] both Littleton[19] and Gilman[20] have argued though, that the charge-discharge record of the Roman master-slave relationship is sufficient for conceptualizing a separate entity from proprietorship. Credit, enhanced substantially by the Crusade movement, is offered as a second factor. But trade and credit have co-existed since antiquity and the rise of money economies merely added varying degrees of intensity to the complementarity of these two factors. Keister, for instance, rigorously documents the existence of columnar form, summations and a relatively sophisticated level of trade as far back as ancient Mesopotamia.[21] The third factor, agency, is plainly evident generations prior to the advent of Italian merchants. In short, these three factors have paralleled one another for centuries.

As a prelude to discussing these three factors, de Roover emphasizes the duality of exchange transactions embedded in the nature of business and then asks the interesting question "Is it then surprising that the merchants would *eventually* hit upon a system founded on an *equation* between debits and credits?"[22] (emphasis added). In the absence of any additional stimulus, the answer seems to be affirmative. Partnership, credit, and agency, in any proportion would not necessarily yield a complete bi-variate system of equations (i.e. in the Littleton or Schrader framework). Nor is it at all clear that the thinking of merchants or businessmen of any description would envelop and comprehend the relationship of independent and dependent variables from an evolutionary process of partnership, credit, and agency. The analogy of gunpowder and ancient weaponry is an interesting paradigm. No amount of improvement in the technology of making spears, swords, knives, etc. would match (or transform them into) the explosive power of a chemical mixture.

A competing hypothesis is advanced by de Ste. Croix who revives the idea that the rise of the substantive element of double-entry accounting can be closely linked with the introduction of the Hindu-Arabic system of numeration.[23] However, he is careful to point out that this idea has been totally rejected, by the accounting historians Melis and Besta, on two grounds.[24]

First, there is the argument that even though double-entry bookkeeping appeared not later than the first half of the fourteenth century, literally all of the extant accounts were maintained in Roman numerals until about 1500. But Struik, a mathematics historian, writes that the statutes of the *Arte del Cambio* of 1299 prohibited the bankers of Florence from using Arabic numerals; yet they are found on documents dating back to 976 and 1275.[25] Undoubtedly, our contemporary number system was both known and in use prior to the fourteenth century. It should be carefully noted though, that this evidence does not adequately defend the polemic that double-entry bookkeeping requires the Hindu-Arabic number system. Moreover, the legal interference (i.e., the statutes) may explain why de Roover discovered substantive double-entry in the Tuscany accounts but lacking in form.

The second argument repudiating the connection between the Hindu-Arabic number system and double-entry bookkeeping is that the abacus, which was in general use throughout the Middle Ages, precluded the need for a place-value system complete with a zero characteristic. While the observation on the use of the abacus cannot be refuted, it contributes little or no basis whatsoever for rejecting the substantive appearance of double-entry bookkeeping.

Cognizant of these objections, de Ste. Croix nonetheless suspects that the maturation of double-entry bookkeeping can be traced to the seminal work *Liber Abbaci* written in 1202 by Leonardo da Pisa, himself a merchant as well as a mathematician. In translating directly from the original Latin script, de Ste. Croix observes that da Pisa traveled extensively throughout the Mediterranean as a merchant prior to 1200. Not only did he encourage adoption of the Hindu-Arabic numerals for commercial accounting, but he actually set out an account contrasting completely the Roman figures versus the Arabic numerals.[26]

Unfortunately, de Ste. Croix is biased in the same manner as other historians by suggesting that account *form* was the causal factor leading to a complete double-entry system. He states that:

> Once figures began to be disposed in a *single* column, instead of being scattered all over the page and reduced to order only outside the account-book, on the abacus or in the mind, the advantages of having *two* clearly separated columns, simply to facilitate computation, would very quickly become apparent; and this would of itself result

> in the emergence of the bilateral form of account, with debits and credits visibly distinguished. The final step, the further advance to double entry, could then equally well be made by those (no doubt still the large majority) who continued to employ Roman numerals.[27]

This conclusion leads us full circle from the arguments raised earlier and still leaves undetermined the order of form and substance in the emergence of a unified, complete system of double-entry bookkeeping.

It is evident from the above analysis that various social factors—trade, partnerships, and so forth—in combination with technical factors such as accounts and a numeral system, are necessary for double-entry bookkeeping. It is the view of this writer however, that taken together, they are not sufficient for explaining the appearance of a complete double-entry system. Perhaps some process of serendipity did take place at some point but the transition in "accounting" from the middle of the twelfth century to approximately the end of the thirteenth century seems to have required a *radical change of thinking.*

One possibility lies not merely in the introduction of the Hindu-Arabic number system but in the fundamental system of equations which accompanied its introduction into Spain by the Moors. The former event is obviously well-known in the accounting literature; the crux of the hypothesis of mathematics which did not necessarily emanate *from* the *Liber Abbaci* but rather, *pre-dated* it. The reasons for adopting this avenue of inquiry are several. Prior to the Arabs, Europe was virtually ignorant of mathematics. However, the Arabs, having obtained, preserved, and translated the great works of Greek geometry and, also having acquired the Hindu numerical notation complete with the algebra of linear and quadratic equations, made this body of knowledge accessible to Europeans in the colleges at Granada, Cordova, and Seville around the beginning of the twelfth century.[28] Not only did Leonardo da Pisa become exposed to this knowledge, but he also traveled extensively throughout Egypt, Syria, Greece, and Sicily, eventually returning to Italy where his famous *Liber Abbaci* was published in Latin during the year 1202. There is some likelihood that da Pisa was influenced by the commercial activities of these other cultures but no definitive evidence has thus far been uncovered.

Also, there was a contemporary mathematician at the time of Leonardo da Pisa by the name of Jordanus Nemorarius who introduced the use of letters for magnitudes in his algebra. Apparently this was a significant step forward in the evolution of algebraic symbolism.[29] The dispersion of this knowledge was quite slow since all of the Arab script was translated into Latin first and then retranslated into various vernaculars. Nonetheless, this particular development may have been linked to the conceptualization of debits and credits because symbolic representation of these two concepts would permit a surrogate generalization at the "system" level in addition to the apposed physical numbers at the "transaction" level.

But why should mathematics, especially the notion of equations, serve such a paramount role? In the first place, equations require an equality of variables, both independent and dependent. It then becomes a logical step to delineate the equivalence of two variables in an exchange transaction which is the basis of Littleton's concept of duality. Finally, there emerges a rationale for the substantive element in the Littleton-Schrader framework—the calculation of entity income which requires a precise understanding of an independent variable (usually revenue) and a dependent variable (usually expense). Naturally, a condition of equilibrium is maintained at any balance sheet date if the equivalence of exchange transactions is preserved.

Although higher level mathematics found its way into the Arab culture, why did it traverse the boundaries of north Africa *vis-à-vis* the Moors and culminate in the Spanish universities before spreading to Italy as opposed to a movement across land through Syria and northward, or via Syria by sea-trade. The reason for eliminating the land route through Syria is answered in most medieval history books. Apparently, the empires that lay between Syria and Italy were not in the least culturally interactive.[30] This is certainly a tenable proposition since history is replete with examples of colonization (conquest even) where isolated communities for trading were established while, paradoxically, there was a failure (intentional or othrwise) to abstract even a modicum of the indigenous culture. Preserving the ideology and customs of the homeland was the rule rather than the exception. Intriguing as it may be, this phenomenon did not exist among the cultures dominating trade in the western Mediterranean, including Sicily, Corsica, Pissa, Spain, southern France, and the north African coast.[31] Historically then, cultural transmission from the eastern Mediterranean lagged substantially behind economic trade with the western Mediterranean.

The same rationale would appear to nullify sea-trade with Syria as a possible source of mathematical knowledge from the Arabs. Byrne offers some supporting evidence for this position:

> By 1154 Genoese merchants are found trading freely, through most of the year, with Sardinia, Sicily, southern France, Spain, northern Africa; but trade with the Orient, and especially with Syria, was undertaken only at regular intervals.[32]

Moreover, Byrne indicates that:

> Between 1154 and 1164, it can be said with assurance that only five commercial ventures to Syria were made; between 1177 and 1206, only fifteen years can be cited in which voyages were certainly undertaken.[33]

It would be astonishing indeed if such a small number of trading missions dominated by mostly sailors, one or two merchants, and a scribe for inventory control, could have imbibed an understanding of mathematics and carried it back to Italy.

In summary, the relationship of the evolution of mathematics to accounting development seems remarkably direct. Almost all accounting historians speak of the *concepts* of debit and credit which requires a plurality of variables. But even more important, the idea of the fundamental balance sheet equation, alluded to by de Roover, could possibly have emanated from this source of knowledge. Having grasped the equilibrium nature of the final double-entry product, it would then be a matter of decomposing the whole framework into a series of logical component parts, i.e. the journal entries, a trial balance, and a ledger account complete with calculations of profit. This would imply that substance preceded form and not vice-versa as suggested by the spurious reasons documented in the literature. If this is a tenable hypothesis, it need not matter what particular numerical format is superimposed on the basic equation, for a complete double-entry system will manifest itself in the final analysis. Of course efficiency and understanding would eventually dominate the accepted form and numerical base as witnessed by history.

Providing direct evidence for the "substantive" hypothesis is beyond the immediate purpose of this paper. However, future research by accountants with the requisite skills might focus on several areas which are currently absent in the accounting literature. One approach could center on the historical teachings, artifacts, and other documents located in the various universities and museums throughout Spain with emphasis on the Moorish influence. Alternatively, a rigorous search of the lifetime works of special individuals such as Leonardo da Pisa and others who were in contact with the influx of the Hindu-Arabic number system into Spain may prove rewarding. Finally, a thorough search of the Arabic and Hindu cultures themselves may reveal a knowledge of the substantive element in double entry accounting. Not only did they experience trade, credit, various forms of business, account formats, and a number system, but they also created and commanded the higher power of mathematics—an essential ingredient for a complete system of double-entry bookkeeping.

FOOTNOTES

[1]Some accounting historians maintain that Paciolo plagiarized the work of Giorgio Chiarini which pre-dated Paciolo's synthesis but was published later. Taylor, "Luca Pacioli", in Littleton and Yamey, "Studies in the History of Accounting", p. 180, challenges this accusation: "Pacioli in this and other writings has been wrongly accused of plagiarism."

[2]Taylor, p. 180.
[3]Taylor, p. 180.
[4]de Roover, p. 115.
[5]de Roover, p. 119.
[6]Littleton, pp. 24-27.
[7]Littleton, p. 24.
[8]Littleton. p. 25.
[9]Littleton, pp. 26-27.
[10]Schrader, pp. 645-649.
[11]Schrader, p. 646.
[12]Schrader, pp. 45-54.
[13]de Roover, p. 115.
[14]de Roover, p. 119.
[15]de Ste. Croix, p. 60.
[16]de Ste. Croix, p. 55.
[17]de Roover, p. 115.
[18]Kats, pp. 203-210.
[19]Littleton, p. 32.
[20]Gilman, pp. 40-41.
[21]Keister, pp. 371-376.
[22]de Roover, p. 115.
[23]de Ste. Croix, p. 64.
[24]de Ste. Croix, p. 64.
[25]Struik, "A Concise History of Mathematics," p. 87. He further specified that the 976 manuscript, *Codex Vigilanus,* written in Spain is the oldest dated European document containing Hindu-Arabic numerals. The earliest French document dates from 1275.
[26]de Ste. Croix, p. 65.
[27]de Ste. Croix, p. 66.
[28]Sullivan, pp. 18-19.
[29]Sullivan, p. 24.
[30]Braudel, Vol. I, Part One, Chapter II, pp. 103-162.

[31]Braudel, Vol. II, Part Two, Chapter VI, pp. 757-835.
[32]Byrne, p. 136.
[33]Byrne, p. 132.

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AUDITING IN THE ATHENIAN STATE OF THE GOLDEN AGE (500-300 B.C.)

Abstract: Accountability and control of state revenues and expenditures in the Athenian state of the Golden Age was achieved through the verification process by three board of state accountants, based on the accounting records of execution and related budgetary and other documents. More specifically, the purpose of this process was to (a) strengthen the integrity of the accounting system by providing additional controls in the management or state resources, (b) establish accountability against any public officials in charge of public funds, and (c) provide dependable reports to the people on the management of these funds. The three boards were the Council Accountants, the Administration Accountants and the Examiners. Although the main purpose of the attest function was the discovery of fraud, internal controls were also evaluated by comparing the formalized budgets with the accounting records of execution. This conclusion is somewhat contrary to the assumption that internal controls were not recognized in ancient times.

In addition to the use of individualized budgets by the Athenian state of the Golden Age of Greece,[1] accountability and control of state revenues and expenditures was achieved through the verification process by three boards of state accountants, based on the accounting records of execution and related budgetary and other documents. More specifically, the purpose of this process was to (a) strengthen the integrity of the accounting system by providing additional controls in the management of state resources, (b) establish accountability against any public officials in charge of public funds, and (c) provide dependable reports to the people on the management of these funds.

The requirement for audit

The Athenian State of the Golden Age was organized under a system characterized by division of authority, due to the people's distrust of a centralized government. Thus, the business affairs of the state were administered jointly by various boards which consisted of groups of individuals selected or appointed by lot. These boards bore various titles, such as *logistai* (accountants), *euthynoi* (examiners), and the like. Each board usually consisted of ten members, one from each tribe, so that each was represented. The focal point of all these boards was the Council which was charged with full responsibility for the management of all political and economic affairs of the state.

The Council elected qualified people by lot from its membership to perform various accounting duties. Thus, accountants were the persons who dealt with the work of keeping the accounts and accounting offices were the places where these people worked and kept the records. The magistrates then, who administered the public funds, were accountable or under account, being subject to both the examination and audit upon the expiration of their term of office. Once the execution of plans was properly authorized through budgets or other documents, these public officials were then appointed and charged with the responsibility to collect revenues or to incur expenditures according to the authorization given. Before entering office, they were required to submit to a formal scrutiny by an examining body which was usually a law court.

The next step was to make sure that these public officials administered the public funds according to the will of the people and within the existing laws and regulations. It was necessary to demonstrate that the integrity of the system had been preserved. This was the responsibility of professional people known as *logistai* (accountants), to whom the Athenian Constitution[2] had granted this authority and responsibility. The Constitution provided for the rigorous audit of the records of all public officers at the close of their year of office. It dealt not only with the handling of public funds, but it also required that every official act be passed upon a board of state accountants. The accountants' findings were subject to a review by a court.[3] The Constitution also gave full opportunity to any citizen to bring charges against the magistrates for any improper or illegal action.

In the work of Aeschines we find more detail information as to who these magistrates were and what legal restrictions were imposed upon them during the period for which they were "answerable". This period ran from the time their office ended until they had undergone final examination. Accordingly, he states:

> In this city so ancient and so great, no man who has held any public trust is free from audit.

Then, he continues, specifying whom the law considers as being accountable:

> . . . (a) priests and priestesses be subject to audit, all collectively, and each severally and individually; (b) the *triearchs* be subject to audit, though they have no public funds in their hands; (c) the Council of Aeropagus is required by the law to file its accounts with the Board of Auditors and to submit to their examination; and (d) the Council of the Five Hundred to be subject to the audit.[4]

As to legal restriction, Aeschines also states that:

> . . . the person who is subject to audit shall be crowned after he shall have rendered account and submitted to audit of his office.[5]

Also,

> . . . the officer who has not yet submitted his accounts shall not leave the country. Furthermore, the man who is subject to audit is not allowed to consecrate his property, or to make a votive offering, or to receive adoption, or to dispose of his property by will; and he is under many other prohibitions.
>
> . . . A man who has received no public funds and spent none, but has simply had something to do with administrative matters is also commanded to render accounts to the auditors. The law commands him to file precisely this statement: "I have neither received nor spent any public funds." There is nothing in all the state that is exempt from audit, investigation, and examination.[6]

Such legal requirements made the administration of public funds by the magistrates more effective. Finally, public officials were required to maintain accounts for amounts received, spent, and balances, and keep decrees of authorization and other supporting documents in the Council Chamber. This requirement was necessary so that the verification process by the three boards of state accountants could be executed more effectively. The accounting boards and the nature of the accounting work are adequately explained by Aristotle in his *Constitution.* He distinguishes between three boards of accountants, each of ten men; the *Council Accountants*, the *Administration Accountants*, assisted by ten Assessors, and ten *Examiners*, assisted by twenty Assessors. Together these accountants constituted the highest scrutinizing authority in Athens. The nature of their office, i.e., their qualifications and methods of selection are explained below.

Function of the Board of Council Accountants

The ten Council Accountants were selected from the five hundred members of the Council. This was essential since the Council exercised supreme authority regarding the economic affairs of the state. The selection procedures and the accountants' duties are explained by Aristotle, stating that "the Council also elect by lot ten of their own body Accountants, to keep the accounts of the officials for each presidency."[7] These people performed a function similar to that of internal auditors. Thus, they were charged with the responsibility of scrutinizing regularly the financial dealings of all magistrates, particularly those who administered public funds. Such a system provided for a continuing audit which accomplished two objectives: (a) it helped protect the financial resources of the state, since any possible case of embezzlement or fraud could be detected and remedied earlier; and (b) it prepared the groundwork for the final independent audit and examination of the magistrates performed by the next board of auditors, known as Administration Accountants.

Function of the Board of Administration Accountants

These Administration Accountants performed a second type of economic investigation, i.e., a kind of independent audit, when the public officials were relinquishing their offices. Accordingly, the Council:

> . . . elect by lot ten Auditors and ten Assessors with them to whom all retiring officials have to render account. For these are the only magistrates who audit the returns of officials liable to account and bring the audits before the Jury-courts.[8]

Dealing principally with the financial side of the magistrate's government, they were the sole authorities who investigated both the financial and administrative transactions of an "answerable" magistrate.

The audit work had to be performed by the ten auditors and their ten assistant or advocates within thirty days of the date of expiration of the magistrate's term. To carry out the final scrutiny in such a short period of time required hard work by the auditors and their assistants. However, the groundwork for their task had been done by the Council Accountants, who had investigated the accounts in each *prytany* (a period lasting 36 to 37 days). The audit was based on objective evidence furnished by the records. The auditors had to be impartial and fair in performing their work. In other words, When we take our seats to audit the accounts of expenditures, it doubtless sometimes happens that we come from home with a false impression; nevertheless, when the accounts have been balanced, no man is so stubborn as to refuse, before he leaves the room, to assent to that conclusion, whatever it may be, which the figures themselves establish.[9]

The magistrate first had to submit his account in person as the first step in the auditing procedure. Then, he testified that he now gave up the office entrusted in him, and that he awaited his summons to an audit before the board of accountants. At the same time he submitted the relevant report to the Secretary of the Council,[10] who attended Council meetings, and was responsible for the safeguarding of all decrees and other official documents. The collaboration between the Secretary and the accountants was necessary, because the latter checked the magistrate's report against the official documents kept in the Council Chamber. Immediately after the audit of the accounts, the Administration Accountants summoned the magistrates to the Accounting Offices to render the accounts and to submit to examination once more in public. If the Administrative Accountants' findings were unfavorable to the magistrate, their report was turned over to the jury-court for further action.

The Jury-Court

Aristotle, in his Constitution, as well as the orators Aeschines and Demosthenes in their private speeches, provide an abundant and reliable compilation of information about the jurisdiction of the jury-court. After a public official had terminated his office the auditors submitted the results of their audits to these courts for public hearing. Accordingly,

. . . if an official is proven to have committed peculation the jury convict him of peculation, and the fine is ten times the amount of which he is found guilty; and if they show that a man has taken bribes and the Jury convict, they assess the value of the bribes and in this case the fine is ten times the amount; but if they find him guilty of maladministration, they assess the damage, and the fine paid is the amount only, provided that it is paid before the ninth presidency, otherwise it is doubled. But a fine of ten times the amount is not doubled.[11]

For example, in one case Theocrines was charged to pay a fine of seven hundred drachmas which he was sentenced at the audit to pay to the *eponymus* of his tribe.[12] In addition to their findings, the Board of Administrative Accountants was allowed by law and custom to make the following proclamation in front of the Jury-Court in the process of public hearing: "Who wishes to prefer charges?" This gave the opportunity to any citizen to make an accusation against public officials. This procedure, which had the obvious purpose of establishing closer control over the magistrates, was criticized by Demosthenes as "the harsh enactments made against the common people."[14] His statement may be justified, because under such law even the most virtuous magistrate might be the victim of an adverse verdict given according to a false accusation made by some citizen. Finally, the auditors had the power themselves to bring an "answerable" official before the court for theft, provided their audit had shown him guilty of embezzlement. Similar power was given to them to summon any magistrate to the law courts, even though the results of the audit were negative. However, because the large number of officials who had to render their accounts, they could not be brought before the court a second time. In other words, the law did not allow the same person to be subject to trials, examinations, or counter-proceedings a second time on the same charge.

The previous discussion indicates that the judicial proceedings followed the customary judicial course of the defense of the magistrate under accusation. The verdict of the jury followed. It also indicates that the auditors themselves assumed judicial responsibility in that they presided over the court and their assistants read out the charges.

After the "answerable" magistrate had appeared before the court and had publicly passed his examination, he was regarded as having "submitted to examination in the lawcourts, according to the law." The auditor then reported the findings by engraving them in marble and exhibiting them to the public so that every citizen could become informed with regard to the management of public funds. Exhibit A illustrates the kind of reports prepared and published by the independent auditors.

Function of the Board of Examiners

Even with these rigorous auditing requirements, the state was not satisfied as to the proper management of its funds. The fact that the magistrate had submitted to examination did not signify his full and final discharge from his accountability. An additional assurance was deemed necessary through another scrutinizing process, exercized by a third accounting board, the Examiners.

The procedures for their selection and duties are well described by Aristotle, stating that the Council also

> . . . elect by lot Auditors (Examiners), one for each tribe, and two Assessors for each Auditor and if anyone wished to prefer a charge against any magistrate who has rendered his accounts before the Jury-Court, he writes on a table his own name and that of the defendant, and the offenses of which he accuses him and he gives it to the Auditor: and the Auditor takes it and reads it, and if he considers the charges proven, he hands it over to the Jury-Courts.[15]

These ten examiners and their twenty assessors did not form part of the Council. The assessors took their seats at the market-place, which was the most frequented part of the city. They accepted accusations by any citizen against magistrates who had already submitted to examination. The accusations were written on a "whitewashed tablet" and were given to the Examiner of the tribe to which the magistrate belonged. The Examiner at once held a preliminary inquiry and, along with the assessors, investigated the charge. Private charges were brought before the "the local judges," while public charges were brought before the *Thesmothetae* (legislators), who introduced the case to the *Heliaia*, (the Supreme Criminal Court), whose decisions were final and could not be reversed.

Other Functions of the State Accountants

In addition to the regular accounting duties, accountants often assumed the task of conducting unannounced audits at irregular time intervals in those cases where it was considered necessary. This was very common with regard to the handling of funds for the payment of mercenary troops. The size of these funds along with the weak payroll system used gave many opportunities for dishonesty, especially in the padding of the rolls, and auditors were sent out to check the accounts on the spot. Aeschines, for example, mentions that Demosthenes was charged in a conspiracy of having padded the rolls and an inspector (auditor) of the mercenary troops was sent to Eretria.[16]

Finally, the accountants audited the work of the *Hellenotamiae*, whose duty it was to collect the tribute due to Athens by the allies and deposit 1/60 of the total in the Treasury of Goddess Athena.

So, without exception, any person who had held any public trust was subject to audit, even the highest state officials such as the *Hellenotamiae.*

The number of accountants who performed the accounting function for the state during the fifth century, as mentioned in the accounting records, was thirty. This seems to coincide with the accountants included in the three accounting boards discussed by Aristotle. Whether the thirty accountants originally constituted one board or were divided into three boards is not clear from the sources available.

The existence and execution of the aforementioned verification process as it relates to the accounting system is important. In addition to controls by independent boards there is also a formal basis for the establishment of accountability against those to whom public funds were entrusted. Furthermore, the execution of this verification process implies the existence of accounting records of execution for all revenues and expenditures kept by the responsible public officials. Finally, the comparison of actual amounts received and expended with the authorized amounts in the execution of audit substantiates further the integration of the budget system with the accounting system.[17] Thus, it can be concluded that although the main purpose of the attest function was the discovery of fraud, internal controls were also evaluated by comparing the formalized budgets with the accounting records of execution.[18] This conclusion is somewhat contrary to the assumption that internal controls were not recognized in ancient times.[19]

EXHIBIT A

EXPENDITURES FOR THE CONSTRUCTION OF THE PARTHENON FOR THE YEAR 434 B.C.
(Partial Translation)

A. *Amounts Received*

The following amounts were received by the commissioners on public works during the year when Anticles was their secretary, on the fourteenth Council when Metagenes was first secretary and Kratetos was archon of the Athenians:

1. Balance from the previous year, 1,470 drachmas, 70 Lampsacene and 27-1/6 Cyzicene golden staters. (lines 1-16)
2. From the treasurers of Athena of whom Labreus was secretary, 25,000 drachmas. (lines 17-20)

3. From sale of gold, having weight of 98 drachmas, 1,372 drachmas. (lines 21-23)
4. From sale of ivory, having weight of 20 talents and 60 drachmas, 1,305 drachmas and 4 obols. (lines 24-26)

B. *Amounts Spent*

1. For rentals . . . . drachmas. (line 30)
2. Wages to workers who quarried and loaded marble at Pentelicus, 2,226 drachmas and 2 obols. (lines 31-33)
3. Paid to statuaries on pediment-sculptures, 16,200 drachmas. (line 34)
4. Salaries to staff members, 192 drachmas. (lines 35-36)
5. Other construction costs, 1,800 drachmas. (line 37)

C. *Amounts Left at the End of the Year*

1. 70 Lampsacene and 27-1/6 Cyzicene golden staters. (lines 40-43)

Source: Tod, *op. cit.*, pp. 112-113.

FOOTNOTES

[1]Costouros, pp. 78-100.
[2]Rackham, pp. 135-147.
[3]The Athenian senatorial year was divided into ten presidencies or *prytanies.* Each presidency of the Council and the Assembly was taken over by a committee of fifty representatives of the ten tribes for a period of 35-36 days, so that during the year all five hundred members of the Council could participate in the management of state affairs. Magistrates, upon leaving office, submitted their accounts to a board of ten auditors, one from each tribe, appointed by the Council.
[4]Adams, pp.323-325.
[5]Adams, p. 317.
[6]Adams, pp. 325-327.
[7]Rackham, p. 135.
[8]Rackham, p. 147.
[9]Adams, p. 355.
[10]Adams, p. 320.
[11]Rackham, p. 147.
[12]Murray, p. 301.
[13]Adams, p. 327.
[14]Vice, p. 453.
[15]Rackham, p. 135.
[16]Adams, pp. 93, 420.
[17]Costouros, p. 159.
[18]Costouros, pp. 122-125.
[19]R. Gene Brown, pp. 2-4.

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THE OLDEST GERMAN BOOKKEEPING TEXT*

A Commentary to Recognize the Neglected Contribution of Grammateus to Bookkeeping

Abstract: This article brings to light the neglected contribution of Grammateus, the author or *Ayn New Kunstlich Buech* (A New Skill Book) which, although basically a mathematics text, contained a section on bookkeeping in the style of Paciolo's *Summa.* His work is analyzed to prove the technical competence and the historical nature of the bookkeepinq system which he propounded. In order to substantiate the conclusions, the full translation of the first edition (1521) is included in modern English.

Some eight hundred years ago the seed of modern bookkeeping was sown in Florence, Italy. Fragments dated 1211 of the account book of a Florentine banker present the earliest known evidence of the double entry system.[1] From this time the art of bookkeeping began to bud and continued to grow in the fertile soil of commercial practice in Italy. About three hundred years later the double entry concept came to full fruition in Venice.

In 1494 an Italian monk published a book on mathematics which included 36 chapters explaining double entry bookkeeping. In his book, *Summa*, Luca Paciolo wrote "we describe the method employed in Venice."[2] Paciolo thus made no claim to the invention of the double entry system, but its inclusion in his book has resulted in his being generally recognized as the author of the first published double entry bookkeeping text. Benedetto Cotrugli is believed to have written the first double entry bookkeeping book in 1458. It and other hand written manuscripts seem to have circulated in the Italian city states during the 15th century. Cotrugli's book was not published until 1573 so Paciolo may claim the first published text. Hatfield wrote "it is seldom the case that a first book on a subject has so dominated its literature as was the case with Paciolo's *De Computis et Scripturis*."[3]

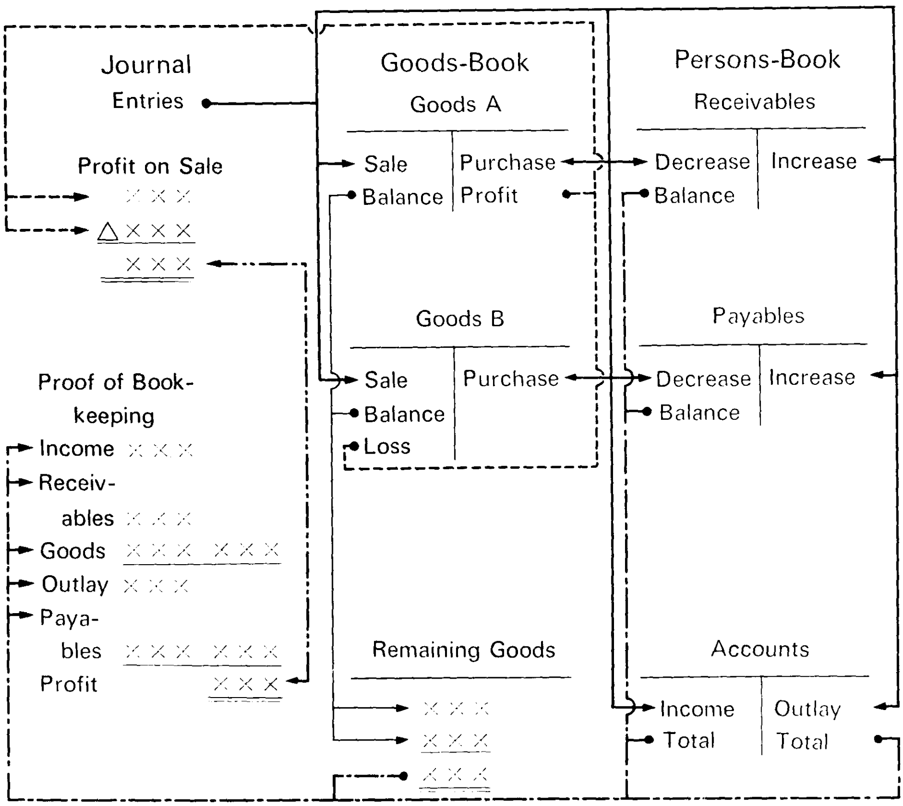
*Based upon Working Paper No. 24, The Academy of Accounting Historians. The author expresses his appreciation for the assistance of Professor A. R. Roberts of Georgia State University and Professor W. E. Stone of The University of Florida.

In 1518, some twenty-four years after Paciolo had published his book a German mathematician named Henricus Grammateus (Heinrich Schreiber in German)[4] completed a book on mathematics at Vienna and published it at Nuremberg in 1521. This book, *Ayn New Kunstilch Buech* (A New Skill Book) devoted a section to the subject of bookkeeping. The first edition was neither paged nor divided into chapters. If it had been paged, it would consist of 248 pages of which pages 187 to 216 are concerned with bookkeeping. This book is recognized as the oldest German text on bookkeeping and, following Paciolo, the second oldest printed text in the world.

Several historians have compared Paciolo's and Grammateus' texts to the detriment of Grammateus. For example, J. R. Fogo wrote about Grammateus' book ". . . the part dealing with bookkeeping is very brief, and so confused and bad that it proves the arithmetic-master's knowledge to have been very perfunctory . . . . it is extremely improbable that he himself knew much about what he was professing to teach."[5] B. Penndorf, a German bookkeeping historian, described ". . . his bookkeeping as neither single or double; he has known Paciolo's work, but not understood. So we will perhaps have to reduce the praise that Grammateus has hitherto received to the proper extent, as J. Row Fogo has already done."[6] These comments by Fogo and Penndorf are followed by other historians. The view that Grammateus did not understand double entry bookkeeping is still widely held.

The "Era of the Fuggers"[7] is symbolic of the economic prosperity of Germany during the Middle Ages. Bookkeeping is a method of accounting for capital and is closely related to economic conditions.[8] Judging from the economic sophistication that Southern Germany had attained during this period, it seems doubtful that bookkeeping methods could have been as "underdeveloped" as the above comments imply. On the contrary, the high level of economic activity should have fostered a higher development of bookkeeping methods there than in other countries.

Using this hypothesis, the author cannot accept completely the criticism that Grammateus did not understand double entry bookkeeping. A review of his system in three respects: the system of records used, the entry rules and the closing procedure, leads to the conclusion that Grammateus' method was based upon a double entry concept. With respect to the "underdeveloped" charge, he was an exponent of "periodic accounting" as opposed to the so called "lot accounting", and there was a numerical connection between the journal and ledger. These are evidences of a well developed system.



(1) Journalizing
Entries
(2) Posting
——— Journal→Ledger (Goods-Book and Persons-Book)
(3) Closing
——— a. Ledger (Goods-Book)→Inventory (Remaining Goods)
- - - - - b. Ledger (Goods-Book)→Income Statement (Profit on Sale)
— — — c. Inventory (Remaining Goods) and Ledger (Persons-Book)→
Balance-Sheet (Proof of Bookkeeping)
(4) Checking
—·-·— P/L (Profit on Sale)↔B/S (Proof of Bookkeeping)

Fig. 1 FLOW-CHART OF BOOKKEEPING BY GRAMMATEUS

The flow chart of the system propounded by Grammateus (Fig. 1) in his 1521 edition discloses that periodic accounting was followed. The process is indicated by the use of a remaining goods record and a proof of bookkeeping. This and relating the journal to the ledgers with a numerical connection are approaches which were not well defined in Paciolo's work.

Simon Stevin has been given credit for introducing the annual settlement (periodic accounting) and the numerical connection in his text of 1605-1608. It is clear that Grammateus preceed Stevin in both of these concepts. In addition, he explained the compound transaction as can be seen in the transaction journalization of the 7th of February on page 192 in the following translation. The introduction of the compound transaction has generally been attributed to James Peele (1569).

Grammateus' contribution in emphasizing the periodic accounting method is particularly notable. It is apparent that the lot accounting method (venture accounting) and the periodic accounting method had co-existed in the general practices of double entry bookkeeping at the beginning of the 16th century. The term "co-existed" is used since, passively, an author may not be able to discern, in a simple manner, the shift from the "lot method" to the "periodic method" as bookkeeping developed. Actively, an author may be able to recognize a homogeneous conception within both methods, and this would lead him to seek for something other than mere difference in method.

"Guided by a conception of the kinds of events that will be relevant, the historian may attempt to trace the origin and development of a particular idea or practice."[9] In this case the underlying conception rests on the objective of bookkeeping. Simply, it was caused by a need to account for invested capital. This capital is employed to seek profits and bookkeeping must follow the activity. By itself, the amount of profit is meaningless and must be measured in relation to a time cycle of capital movement. That is, profit (or loss) must be measured as a factor of the efficiency of the use of capital as well as an absolute increase (or decrease) of capital.

To view the change from the lot method to the periodic method as simply a major event in bookkeeping history emphasizes a change in format (or technique) rather than the more fundamental function of bookkeeping to conform to social or economic change. When we recognize a homogeneous conception within both methods, we may be able to discern the difference between bookkeeping and accounting, not as a difference between form and procedure, but as a difference between the functions of bookkeeping and accounting as a capital calculation at different social stages.

To illustrate that periodic accounting considering the absolute amount and the time cycle for invested capital must have been of interest to merchants, the following algebraic problem was posed by Grammateus:

> Three men form a company. The first man invests 60 florin and stays 12 months. The second man invests some money and stays 4 months. The third also invests some money and stays 5 months. They have gained a total of 1250 florin. The first man is given 180 florin, the second man, 780 florin, and the third man 290 florin. This is the question: how much had the second man and third man invested? (p. 144 of the 1521 edition).

Grammateus maintained that bookkeeping is, by its very nature, always periodic. It was only a short interval between the publication of Paciolo's work and the publication of his own text. However, during that interval he recognized a new importance of the periodic method and by his illustrations and explanations gave us a new light to see the history of bookkeeping and accounting. Grammateus has often been esteemed as the first German author to write on bookkeeping and the author of the text published second only to Paciolo's in the world. However, it has not been until recent times that he has been credited with being the first author to recognize and explain the increased importance of the use of periodic accounting; a concept that still governs much of accounting theory and practice today.

TRANSLATION OF GRAMMATEUS FROM MIDDLE GERMAN TO MODERN ENGLISH

The following translation into English is from the original 1521 edition,* which has fewer misprints than in later editions. It is hoped that this translation will contribute to the body of material available and lead to a better understanding of the evolution of bookkeeping.

(p. 187)

Bookkeeping with Journal, Goods-Book
and Persons-Book for All Merchants

*Source: Original edition at Germanisches Nationalmuseum, Nuremberg.

Buechhaltē durch Zornal Kaps
vnd Schuldtbůch auff alle kauffmanschafft

(p. 188)

For all bookkeeping, three books are useful. The journal, where a man writes the transaction daily, word by word of everything as it occurred. The goods-book, in which a man makes an entry on two sides. On the right hand side of each goods (account) when they were "purchased." On the other side, add to the item when they were "sold." The last is the persons-book, in which outlay and income accounts are contained. Take several pages for you(r personal account). For that which you owe, write on the right side "I must pay," and on the left side "I have paid." Take several additional pages or leaves for you(rself). For the debt which a man (must) pay you, record on the right side "Must pay me," and at left side "Has paid." Toward the end leave some pages for outlay and income accounts. Write "Outlay account" at the right hand and "Income account" at the left hand, as above. Record in numbers in each of these three books as will be shown later. Draw some lines from top to bottom for the amounts on each folio. Also make an entry of the year-number before the beginning of each book. Then follow some rules, whereby (you) must note what may be generally given at the commerce of purchase and sale, (or) exchange and (p. 189) received in exchange.

(p. 189 continued)

The first rule.

When you purchased some (goods) and cash is already paid, enter the item in the journal. Turn therefrom to the goods-book and the side (designated as) "Purchased," indicate where a man would find it in the journal. Again turn to the journal, write in the margin "G" with the number of the page or leaf. Then proceed to the "outlay account," also make an entry of the item and indicate where a man would find it in the journal. Again turn to the journal, write in the margin "A" together with the number where it stands on the account.

To note much with few words.

When you turn from the journal to the goods-book, (income or outlay) account or persons-book, always write the place where it stands in the journal. And then turn to the journal, write in the margin the order where it is found in the goods-book, (income or outlay) account or persons-book.

The second rule.

When you "purchased" but did not pay, (first) turn to the goods-book, and then to the persons-book "I must pay."

The third rule.

When you "purchased" and paid part, turn to the goods-book, "outlay account" and persons-book "I must pay."

The fourth rule.

When you exchanged the equivalent for the equivalent,

(p. 190)

write on the goods-book "Sold."

The fifth rule.

And, if you received some goods on exchange then, proceed to the goods-book "Purchased."

The sixth rule.

If exchanged goods are each not equivalent in value, and a man must pay or deliver to you later, (you) must give attention to the persons-book "Must pay me."

The seventh rule.

On exchange, if you are paid part and the rest is to be paid later, (you) have to turn to the "income account" and then to the persons-book "Must pay me."

The eighth rule.

When you remain indebted on exchange, turn to the persons-book "I must pay."

The ninth rule.

When you were indebted for part on exchange and paid the rest, enter the item (paid for) on the goods-book in "outlay account" and then (enter the balance) in "I must pay" on the persons-book.

The tenth rule.

Write those (items) concerned with goods, expenses, taxes or other things in the goods-book and "outlay account," then it will be clearly seen later.

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It is necessary that you have a register of the goods which you purchased, in which a man may find the leaf in the goods-book. Also (there necessary is) a special register of the names of persons to whom you are indebted, and also who are indebted to you.

Write such items in the journal as *"Adi pri"* (on the . . . day) etc. (of . . . month), that you purchased. Also (indicate), from who, as far as necessary, how costly, and whether you paid for part or all. Also record the place and the person who had been there. Further note whether you gave bond, and many other similar item. Also it is (necessary) to know on a sale whether a man paid you part or all etc., and also on exchange etc.

Some write the items in Latin, some in Italian, but this adds nothing. Write things in the best way one can in one's language. Then I was not educated in the Italian language, and man seldom keeps the books in Latin. But it is noted that some Italian words still remain. (Words) such as *Adi*, that is "on the day," (and) *Contto* that is "account." So these are often set in this small book.

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PICTURE

Note: The same woodblock print as on p. 187 is inserted here, but without printing.

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Journal.

1521

Note: Currency and Weight in Journal
1 florin = 8 shillings or 60 groats
1 shilling = 30 pence (d.)
1 centner = 100 pounds (lb)

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		fl	sh	d.
	On the first of January, I purchased			
G1*	9 barrels of Austrian wine, 20 fl. at			
A3	1 barrel, paid the cash. Total	180	—	—
	On the seventh of February,			
G1	I purchased 8 tons of herring from			
A3	Hans Schmit, at 6 fl. one ton, paid			
P1	a quarter and must pay the rest on the coming Whitsuntide. So he has my bond.	48	—	—

*Journal references are:
G—Goods-book
A—(Income/Outlay) Accounts in Persons-book.
P—(Receivables/Payables in) Persons-book.

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		fl	sh	d.
	On the 20th day of February,			
G1	I exchanged 6 tons of herring, at 7 fl. 1 ton. Total	42	—	—
	On the same day, I received			
G1	1 centner and 68 pounds of wax, at 15 gr. 1 pound. Total	42	—	—
	On the first of March, I exchanged 1 center of wax for			
G1	pepper, at 30 fl. the centner. Total ..	30	—	—

1

(p. 196)

		fl	sh	d.
	On the same day, I received			
G2	24 pounds of pepper in exchange,			
A3	at 5 sh. 1 pound. This made man give me 15 fl. Total	15	—	—
	On the seventh of April, I exchanged 12 pounds of pepper			
G2	with Hans Kesler for linen, at 6 sh. 1 pound of pepper. Total	9	—	—
	On the same day, I received			
G2	2 rolls of linen in exchange from			
P2	Hans Kesler, at 3 fl. 1 roll. This made him owe me, so give me 3 fl. He must pay at the market of the nearest Whitsuntide. Total	6	—	—

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		fl	sh	d.	2
G2	On the sixth day of May, I exchanged 1 roll of linen for knives, at 5 fl. the roll. Total	5	—	—	
G2 P1	On the same day, I received 120 pieces of knife in exchange from George Pfeil, at 3 gr. 1 piece. This made me owe him, so give him 1 fl. I must pay on the coming Christmas. So he has my bond. Total	6	—	—	

(p. 198)

		fl	sh	d.
G2	On the last day of May, I exchanged 60 pieces of knife for 120 pounds of soap, at 4 gr. 1 piece of knife. Total	4	—	—
G2 A3 P1	On the same day, I received 120 pounds of soap in exchange from Hans Schmit, at 10 gr. 1 pound. This made me owe him, so give him 16 fl. I paid 10 fl. and must pay the rest on the coming Christmas. So he has my bond. Total	20	—	—

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		fl	sh	d.	3
G2 A3	On the 6th of June, soap was sent by carriage 1 fl. from Vienna to Pressburg, then the small account book notices this on the first leaf. Total	1	—	—	
G2 P2	On the 7th of July, I sold Peter Weckauf 20 pounds of soap, at 6 gr. one pound. He must pay me that on the coming Michaelmas. The guarantee, Philip of Arn City, was there. Total	2	—	—	

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		fl	sh	d.
	On the 1st of August, I sold			

G2 A3 P2	Sigmund Wiener 1 roll of linen at 6 sh. He paid the half and must pay the rest within eight days after the date. Total	—	6	—
A3 P1	On the 27th of September, I paid Hans Schmit 18 fl. Sirtus of Nuremberg was there. Total	18	—	—
A3 P2	On the 6th of November, Peter Weckauf paid me 2 fl. Total	2	—	—

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	fl	sh	d.	4
On the 18th day of December, I closed my accounts, and found profit and loss as follows.				
At wine profit	—	—	—	
At herring profit	6	—	—	
At wax profit	5	—	—	
At pepper profit	1	4	—	
At linen loss	—	2	—	
At knives profit	1	—	—	
At soap loss	1	4	—	
Total profit	11	6	—	

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To determine the profit or loss at each goods

Inspect at the first whether goods were sold or exchanged, all or part. If they were all sold or exchanged, put the amount that was written for them on sale or exchange. But if some of them still remain, estimate them at their purchased value and add the amount to other (sold or exchanged). And then turn to the purchase (side) and observe the amount. Thus you have two amounts, one for sale and another for purchase. Subtract one from another, loss or profit is left. If you can subtract the amount of purchase from the amount of sale, you have profit. But if you subtract the amount of sale from the amount of purchase, you have loss.

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Goods-Book.

1521

(p. 204)

	fl	sh	d.
Wine sold			
Herring sold			
On the 20th of Feb., exchanged, 6 tons, in journal 1. Total	42	—	—
Wax sold			
On the 1st of March, exchanged, 1 centner, in journal 1. Total	30	—	—

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	fl	sh	d.	1
Wine purchased				
On the 1st of January, 9 barrels, in journal 1. Total	180	—	—	
Herring purchased				
On the 7th of February, 8 tons, in journal 1. Total	48	—	—	
Wax purchased				
On the 20th of February, 1 centner and 68 pounds in exchange, in journal 1. Total	42	—	—	

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	fl	sh	d.
Pepper sold			
On the 7th of April, exchanged, 12 pounds, in journal 2. Total	9	—	—
Linen sold			
On the 6th of May, exchanged, 1 roll, in journal 2. Total	5	—	—
On the 1st of August, one roll, in journal 4. Total	—	6	—
Knives sold			
On the last of May, exchanged, 60 pieces, in journal 3.* Total	4	—	—
Soap sold			
On the 7th of July, 20 pounds, in journal 3. Total	2	—	—

*The original is 2, but corrected in accordance with the journal.

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	fl	sh	d.	2
Pepper purchased On the 1st of March, 24 pounds in exchange, in journal 2. Total	15	—	—	
Linen purchased On the 7th of April, 2 rolls in exchange, in journal 2. Total	6	—	—	
Knives purchased On the 6th of May, 120 pieces in exchange, in journal 2. Total	6	—	—	
Soap purchased On the last of May, 120 pounds in exchange, in journal 3. Total	20	—	—	
On the 6th of June, expenses, in journal 3. Total	1	—	—	

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	fl	sh	d.
The remaining goods			
Wine 9 barrels. Total	180	—	—
Herring 2 tons. Total	12	—	—
Wax 68 pounds. Total	17	—	—
Pepper 12 pounds. Total	7	4	—
Knives 60 pieces. Total	3	—	—
Soap 100 pounds. Total	17	4	—
Grand Total	237	—	—

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Persons-Book.
1521

(p. 210)

	fl	sh	d.
I have paid On the 27th of September, Hans Schmit, in journal 4. Total	18	—	—
Balance to pay. Total	25	—	—

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	fl	sh	d.	1
I must pay On the 7th of Feb., Hans				

Schmit, in journal 1. Total	36	—	—
On the 6th of May, George Pfeil, in journal 2. Total	1	—	—
On the last of May, Hans Schmit, in journal 3. Total	6	—	—

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	fl	sh	d.
Has paid			
On the 6th of November, Peter Weckauf, in journal 4. Total	2	—	—
Balance to pay. Total	3	3	—

(p. 213)

	fl	sh	d.	
Must pay me				2
On the 7th day of April, Hans Kesler, in journal 2. Total	3	—	—	
On the 7th of July, Peter Weckauf, in journal 3. Total	2	—	—	
On the last of August, Sigmund Wiener, in journal 4. Total	—	3	—	

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	fl	sh	d.
Income account			
On the 1st of March, in journal 2. Total	15	—	—
On the 1st of August, in journal 4. Total	—	3	—
On the 6th of November, in journal 4. Total	2	—	—
Grand Total	17	3	—

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	fl	sh	d.	
Outlay account				3
On the first of January, in journal 1. Total	180	—	—	
On the seventh of Feb., in journal 1. Total	12	—	—	
On the last of May, in journal 3. Total	10	—	—	

On the 6th of June, in journal 3. Total	1	—	—
On the 27th of September, in journal 4. Total	18	—	—
Grand Total	221	—	—

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Proof of Bookkeeping

Add the income, that man is due you and the remaining goods in all. From the total amount, subtract the outlay, (and) that which you still owe. When the figure of profit remains then, it is right.

The End of Bookkeeping

FOOTNOTES

[1]Original reproduced in Inoue, *Accounting History,* p. 8.

[2]Geijsbeek, p. 33; Crivelli, p. 2; Brown and Johnston, p. 26; Kataoka, p. 47.

[3]Hatfield, p. 6.

[4]Heinrich Schreiber was born at Erfurt, Germany at the end of the 15th century. He named himself Henricus Grammateus in Greek and wrote some books in Latin under this name. In English he might have been called Henry Writer.

[5]Fogo, p. 123.

[6]Penndorf, p. 113.

[7]Ehrenberg, p. 132 ff.

[8]Inoue, "History of Bookkeeping", p. 69 ff.

[9]Deinzer, p. 2.

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GRAMMATEUS REAPPEARS IN 1911

Abstract: There seems to have been little change in financial statements from Grammateus to 1911. This article contains a 1911 practice set which was used to teach transaction accounting as well as trial balance and statement preparation along the lines described in the previous article.

Just after editing the Inoue manuscript translating the 1521 accounting text of Grammateus, a practice set from 1911 was given to me for Christmas. It had been purchased in Miller Falls, Massachusetts and was titled Modern Illustrative Bookkeeping (Introductory Course). The student, Mary R. McGlynn, had completed sample transactions for two different business organizations for the years 1911 and 1912. The instructor, F. W. Morrill, stamped his approval and its date on each assignment. The text used is not known but all the vendors and customers which the practice set businesses dealt with were located in small towns in central Massachusetts. Each practice set ended with a balanced trial balance and a "business statement."

The "business statements" differed from those of today and by an amazing coincidence were very similar to the ones translated from Grammateus and illustrated in the flow chart (Fig. 1) of Professor Inoue's article.

Business Statement, May 31, 1912

Mdse. on hand at close of last month	0	
Mdse. purchased during month	9,362.10	9,362.10
Gain carried down		1,921.21
		11,283.31
Expense cost during month	347.75	
Less inventory for unexpired insurance & stationary	98.75	249.00
Discount		114.16
Depreciation as under furniture & fixtures		23.10

Net gain		1,552.24
		1,938.50
Mdse. sales during the month	7,910.76	
Mdse. on hand now	3,372.55	11,283.31
		11,283.31
Gain brought down		1,921.21
Mdse. discount		17.29
		1,938.50

Financial Statement, May 31, 1912

Cash in safe		
Cash in bank		272.54
Property as under real estate, ledger valuation		12,125.00
Furniture & fixtures	231.00	
Less depreciation	23.10	207.90
Mdse. on hand valued by H.F. Adams		3,372.55
Expense inventory		98.75
Sundry trade debtors as under bills receivable		700.00
Open book accts. considered good		3,622.75
		20,399.49
Sundry trade creditors as under bills payable		6,505.00
Open book accts.		3,654.25
		10,159.25
H. F. Adams Invested	8,800.00	
H. F. Adams Withdrew	112.00	
	8,688.00	
Net Gain	1,552.24	
Present worth of business		10,240.24
		20,399.49

The business statement above agrees with Grammateus' "Profit on Sale" calculation and the balance of the business statement and the financial statement are contained in Grammateus' "Proof of Bookkeeping". Only a clearer concept of the balance sheet has emerged in 450 years.

John Heins

THE PRESIDENT'S REPORT (1889)

Abstract: This represents an extract from the handwritten minutes of the Annual General Meeting of the American Association of Public Accountants, Monday, May 27, 1889. The extract is the Report of the President John Heins. This version, in typewritten form came to the attention of researchers at the University of Florida in 1971.

To the Members of the American Association of Public Accountants.

Gentlemen:

On the occasion of our first annual gathering since the organization of the Association, I have to congratulate the members on the success it has so far attained — a success which has enabled us to bring the profession of Accountancy prominently before the public as one of the necessary adjuncts of business lending to the commercial success and prosperity.

The profession of Accountancy having hitherto been but little known in the United States, and the recognized wants of a well organized body of professional and public accountants, whose ability, character, and strictly business conduct could be relied upon, being called for by the leading commercial and financial representatives of the country, led to the formation of our association — the lines being taken mainly from the older countries — notably England — in the formation of the ruling and conduct of our Order.

The object of our Association being fully laid down in our Constitution and the By-laws arranged in accordance with the powers given us in such Constitution, with which you are all conversant, have been adhered to, and acted upon, but it has been an open question whether they are not too rigid and strict in their application regarding the admission of members in the earlier stages of the Association's career, and the Council have had under consideration the advisability of reducing the Initiation Fee, the adoption of local boards, in large cities of the Union in order to regulate its affairs in their respective districts, and with that view certain propositions to effect these objects will be submitted to you.

It is much to be regretted that our Association is not stronger in number. At the present time we have about 25 fellows and 7 associates, which I am sure you will agree is not enough to give the Association the standing and recognition we hold as our end and it is of paramount importance to the profession that some means should be adopted to increase our membership.

The final success and universal recognition of the commercial and investing citizens of the advantages of our services can only be developed slowly, by care, and by prudence in the management of its affairs and unanimity of feeling toward those engaged in the profession.

With that view we must not be too rigid in our rules and regulations for the admission of persons who are now in practice and recognized as accountants. Consideration must be given to what our objectives are, and why we are endeavoring to develop this Association. We are organized to advance the interests of our profession, and to develop the Accountancy and Auditing business, and it is apparent to my mind that by liberal treatment and somewhat elastic views we shall acquire the goodwill of a great majority and attain fewer enemies and objections to our scheme than if we adopted a stern and exacting policy.

It has repeatedly been brought to our attention that persons calling themselves Accountants, are not only unworthy of the name but bring discredit upon us who are qualified by training and experience. There are no doubt many — and it cannot be denied — who are quite incompetent to be employed in such a capacity, and should any of these be applicants for admission to our Association the Council should make such rules, regulations, and inquiries to debar them from becoming members or parading themselves as accountants under the guise of our society.

To effect such objects I have pointed out I am decidedly and strongly of [the] opinion that our door must be open to those who are now in practice as accountants under such regulations as the Council may determine as to character, ability, and competency, during the time they have practiced as accountants, and extending the time for the application of these until either 1892 or 1893.

Some such scheme as this, while increasing our numbers greatly and our profession by its being wider known, and consequently bring about interest, working to develop Accountancy, aided as it will be by a larger membership assisted by their respective friends and adherents working for a common cause.

With regard to the prospects of our profession in the country, there can be but one opinion that they undoubtedly will increase. On all sides and in all directions we hear of the advantages of Accountants, and it is universally admitted that our services are needed and necessary, and requisite, but how much more so will they become if it can be demonstrated that we are in existence, and associated together with unanimity and harmony, working to effect the highest proficiency in our business for the benefit of those employing us, and bound down by our Association in strict rules of conduct, insuring faithful and efficient work to our respective clients and the public in general.

I think the time has now arrived that energetic measures be at once adopted, and the attention of our members be given to the enlargement of our Association, and with that view I have outlined my ideas upon the subject. It is important that we lose no time in doing so, and I am confident that if all of us do our part that the Association cannot fail to be a success. Should we be unsuccessful it is possible that other associations will be formed popularizing the movement and developing the profession in a manner that we now have the opportunity of doing and should take advantage of, and receive credit for.

William Holmes
PEAT, MARWICK, MITCHELL & CO.
BOSTON

BENJAMIN GILLIAM'S BOOK – 1700

Abstract: The ownership of a copy of Chamberlain's *The Accountants Guide or Merchants Bookkeeper,* 1686 is traced through six famous owners from 1700 for almost a century. It is now housed in the Boston Athenalum.

Accounting history research for the most part is slow, methodical work and with its fill of frustrations. Once in a while, however, the researcher stumbles over something almost by accident. These occasions are Fortune's reward. Recently while thumbing through the index boxes at the Boston Athenaeum I found a card with the following notation:

"The Accomptants Guide or Merchants Book-keeper"
Robert Chamberlain, London, 1686

Such a find in an English library would have been interesting. To find it in Boston was more than that, especially if it could be shown the book was in America close to the publication date. Happily, on closer inspection, the book held all the clues to its early "genealogy" and, as will be set out later, it passed through some fairly prestigious hands in its first hundred years.

THE BOOK

Chamberlain's book has an interesting connection with America right in the opening pages. The book is dedicated:

To the Right Honourable
And My Honoured Lord
Thomas Lord Culpeper
Baron of Thoresway, and Governour of his Majesties
Colony and Plantation of Virginia

One wonders whether Chamberlain might have visited Virginia since in his introduction "To the Reader" he says,

> "having myself arrived to a sufficient measure therein (keeping Merchant's Accompts) by Experience, which is the best Schoolmaster, and my long practice *both at home and in foreign parts . . .* "

Like most textbooks of these times, Chamberlain's method of exposition is long on rote and short on reason. The entire methodology is summarized in the opening paragraphs under the chapter heading "Instructions and Directions for a Methodical Keeping of Merchants Accompts."

> "The chiefeft thing in keeping *Merchants Accompts* is, readily to know what Accompt or Accompts are to be charged or made Debtor, and what Accompt or Accompts are to be difcharged or made Creditor.
>
> By the Debtor is to be underftood, the thing that is received, be it money or Goods, according to their different qualities.
>
> By the Creditor is to be underftood the thing that is delivered forth, be it money paid or goods fold according to the refpective qualities.
>
> Firft of all, as a Foundation to your Accompt, take an Inventory of all you ready Money, Plate and Jewels, Wares or Debts belonging or owing to you, and make them Debtors or owing to Stock, their refpective Sums, and Stock Creditor for the whole Sum, as you fee done in Journal, page 1. Secondly, for what Moneys are owing by you, make Stock Debtor or owing for the whole Sum, and the feveral Perfons Creditor for the feveral Sums due to them, as in Journal, page 2.
>
> Note, That all things received or the receiver, is charged and made Debtor, and all things delivered or the deliverer are difcharged or made creditor, fo that the Debtor is the charge or thing charged, and the Creditor is the difcharge or thing difcharged."

Thereafter the book examines more closely all the kinds of transactions likely to be met with under a series of headings, and sets out by example the necessary journal entries. The second half comprises the usual accounts covering a year and exemplifying the application of theory to a full set of accounts.

GENEALOGY

The First Owner is Evidenced on the Front Fly-Leaf Thus "Benjamin Gillam's Book — 1700"

This is undoubtedly the eldest son of Benjamin Gillam who arrived in Boston from England in 1634. His wife Anne arrived with Benjamin junior, then one year old, in 1635 on the Abigail. The father was a shipwright but by the 1650's was most likely trading as a merchant and buying shares in ships as the merchants of the time did. Benjamin junior appears to have carried on the good work. The father died in 1671. Benjamin junior married and had a daughter whom he named Abigail, most likely after the name of the ship he crossed to America in as a baby.

Abigail leads us to the second owner of the book. After the death of her first husband she married William Tailer, probably shortly after 1700, and the book followed her into the Tailer family. Through his mother, Rebecca Stoughton, William Tailer also had connections back to the earliest colonial days. Her father was Israel Stoughton one of the prominent early founders of Massachusetts. Her brother William was Lieutenant Governor of the Colony and the Chief Justice at the Salem witches trial in 1692.

William Tailer also made a name for himself. In 1711/1715 he was Lieutenant Governor and in 1715/1716 Acting Governor. He acted as a member of the council from 1712-1729 and died in 1732.

The book was apparently given by him to his son Stoughton Tailer for we find two entries on the fly-leaves.

"Stoughton Tailer His Book 1725"
and "Stoughton Taylor's Book October 29, 1733"

I believe the next owner was Supply Clap. His name appears without a date affixed, but the Tailer family had connections with Dorchester—William Tailer was buried there in the churchyard—and Supply Clap was the schoolmaster in Dorchester in 1731 and became pastor of the church in 1732. He was the great grandson of Roger Clap, one of the original settlers of Dorchester about 1630 and so the book continued to assert its connections with the earliest families.

The next owner whose name appears in the fly-leaves was Alexander Gray who dated his ownership as 1767. I have been unable so far to learn anything specific about him. There was a Gray family in the Boston area who became fairly prominent merchants and he is most likely a scion of that clan.

From Alexander Gray the book seems to have passed to the Honourable Thomas Cushing who was the son of a wealthy merchant, elected to the Massachusetts Assembly in 1766, chosen speaker in 1774, and elected to both the first and second Continental Congress in 1774 and 1775. In 1783 he was appointed Lieutenant Governor of Massachusetts.

So our book has connections back to three founding families of Massachusetts, the Gillam's, the Stoughton's and the Clap's. Among its owners it boasted an Acting Governor, two Lieutenant Governors, a preacher and schoolmaster and probably two merchants. It was also "represented" on both the first and second Continental Congresses—a history to be proud of.

The book leaves one unsolved riddle. One of its owners did more than just give it shelf space. He studied it! The entire "theory" section is annotated throughout in the margins and selectively underlined. However, it is not at all obvious from a comparison of the script signatures on the fly-leaves and the printed annotations who was the scholar. The neatness of the printing would seem to indicate schoolmaster Supply Clap who owned the book, most likely in the later 1730's.

There is a significance to the presence of the book on New England as early as 1700. Books were scarce and likely to have been ordered from England only after some thought. Bernard Bailyn in his "The New England Merchants in the Seventeenth Century" has told the story of the growth of a resilient merchant class dating from the 1650's and incidentally mentions "Benjamin Gillam" as owning the ship *Mary Ruth* in 1666. It is reasonable to assume some of this class were interested in adopting better bookkeeping systems. At any rate, to my knowledge, it is the earliest bookkeeping textbook known to have been in use in colonial New England and probably in colonial America. It was donated to the Athenaeum by a private library in 1897.

Kenneth O. Elvik, Editor
IOWA STATE UNIVERSITY

BOOK REVIEWS

V. A. Mazdorov, *History of Accounting Evolution in USSR (1917-1972),* (Istoriya razvitiya bukhgalterskogo ycheta v CCCP), Moscow: Finance Publishers, 1972, 320 pp. (published in Russian).

Reviewed by Yoshiro Kimizuka, Denkitsushin University and Akira Mori, Meiji University

Studies in accounting history attract the concerns of researchers in the USSR. We have found nearly a dozen examples in the literature published from 1958 to 1977, but this book is the first one entitled accounting history. It outlines the process of accounting evolution, a bypath of economic history, and can be divided into 5 parts.

(1) Russian accounting (ch. 1, before 1917). Russia was an undeveloped capitalist state before the Revolution. Double entry bookkeeping spread itself gradually in the 18th century for purposes of bank credit, taxation, and prevention of fraudulent bankruptcy, along with the growth of industry, as we have in other countries.

(2) Revolution and restoration (ch. 2-4, 1917-1929). Drastic inflation, caused by World War I and wars against the White Army along with foreign intervention, disordered accounting for several years after the Revolution in 1917. Accounting was further aggravated by some prejudice, despite Lenin's instruction. Decreased production was recovered in 1926 and the First Five-Year Plan for industrialization needed a diffusion of cost accounting. Accountants attended the world congress in 1929 and observed foreign practice and calculators.

(3) Construction of socialist institutions (ch. 5-6, 1930-1940). Socialism became firmly established and socialistic ownership (state enterprises and cooperatives) formed the foundations of industry. Theoretical classification of accounts was publicized after a comment made by Strumilin, the noted economist, and "norm costing", Soviet-typed standard cost accounting, was popularized. The foundation of Soviet accounting was fixed then.

(4) World War II and reconstruction (ch. 7-8, 1941-1950). The War (1941-1945) destroyed enormous assets and innumerable lives.

Rough estimations of inventories, fixed assets, debts and credits were necessitated by demands of defense and dispersion of facilities, the need for simpler calculation, the death of experienced accountants, etc. The authorization for the chiefs of accounting departments to check on their leaders in order to remove unfavorable habits remained even to some extent after the War.

(5) Advancement of socialism (ch. 9-12, 1951-1972). Accounting systems were made more precise but simpler to the extent possible, and accounting standards of materials, wages, fixed assets, forms, etc. were regulated successfully. "The New Economic System", initiated by Liberman,[1] changed the indicator of business activities from the total output into the amount sold and the rate of profit. Profit became a principal factor of bonuses in 1965. 777,000 specialists in such computation were trained at 106 schools from 1966 to 1970 and computers contributed to the modernization of accounting and saved much accounting labor. Accounting came to play a much more significant part in socialist society, as Marx and Lenin predicted.

In short, we know that Soviet accounting is a process of unprecedented structures, created by repeated trial and error and that the mechanism of both bookkeeping and costing does not differ fundamentally in the USSR. However, characteristics of Soviet accounting based on socialist ownership must be understood, before one reads Mazdorov's volume, the only one in this field at present. To our regret, Soviet books often go out of print and do not identify the author's location, making it difficult to find them and thereby hindering us from cooperation in the academic world.

EDITOR'S NOTE

The Book Review editor has been fortunate to receive the following illuminating commentary on historical research in Japanese accounting from Professor Kojiro Nishikawa of Nihon University:

> Accounting historians in Japan have been, heretofore, active mostly in the history of Western accounting, only a few have had

[1]Professor Liberman wrote to Kimizuka in 1966, saying that profit was only a means for the first end of socialist production: (to satisfy all needs and requirements of our population", namely, "(1) to supply necessary funds for social service free from any charge from the people, (2) to get money for economic expansion, (3) to serve as an indicator of the efficiency of enterprises and (4) respectively — to shape a source for an incentive payment system" (With Professor Liberman's consent, we refer to this letter).

an interest in Japanese accounting history. There are two areas of study in Japanese accounting history: indigenous methods of bookkeeping and Western bookkeeping introduced to Japan. The study of the former is especially rare because the traditional usage of accounting evolved in the larger business houses in the Tokugawa era (1600-1867) as a secret of each family to be handed down from fathers to sons. No outside writers of treatises on bookkeeping appeared and nobody attempted to formulate the reasoning or theory of it.

The first instance brought to the knowledge of academic circles before the World War II was "Izumo Bookkeeping," found in 1936 by Y. Hirai and K. Yamashita of Kobe National University. After World War II, however, an interest in the historical development of old business firms increased and the research on the basis of actual data in account-books and business records has become active. In 1962, Eiichiro Ogura of Shiga National University published "Goshu Nakaike Choaihoho" (Bookkeeping Methods of the Nakai Family), based on the actual books and records of business in drugs, dry goods, grain and so forth, for the one hundred and fifty years from 1734. This is the first outstanding book written on the indigenous method of bookkeeping in Japan. Kawahara's work on the "Edo" period is the second book in the same area of study.

Kazuo Kawahara, *The Bookkeeping Methods of the Edo Era in Japan,* Tokyo: Gyosei, Inc., 1977, pp. xxi, 437, y2800 (published in Japanese)

Reviewed by Ryoji Inouye, Chuo University and Kousaku Hamada, Chiba University of Commerce

The objective of this book is to indicate how bookkeeping was done in the Edo Era (1603-1867), which was a feudal age, before the European style of bookkeeping was imported into Japan in the 1860's. The author states that calculations which determine net worth and which serve to check each other were adopted in those days, though the bookkeeping peculiar to Japan did not use the ledger account form.

This book is divided into three parts. The first part (Chapters 1 through 7) deals with the Tomiyama accounting books. The second part (Chapters 8 and 9) concerns the accounting books of the Tanabes, the Kondohs, the Ishimotos, the Honmas, the Hasegawas, the Onos, the Kohnoikes, the Mitsuis, and the Nakais, and the third part forms an appendix.

The contribution of this author is in the area of the investigation of the bookkeeping methods of the Tomiyama family, which are presented in part one since the bookkeeping methods of the families which are included in part two have already been researched by other scholars, namely, Professors Hirai, Ogura, Yamashita, and Yasuoka. (Japanese bookkeeping methods in the Edo Era are being investigated by a special committee on the existing state and the future responsibility of accounting history research of the Japan Accounting Association.)

According to the author, though there are many differences between the Tomiyama accounting procedures of the main office and those of the branch offices and between the first stage of the Edo Era and the middle stage of the Edo Era, the development of the Tomiyama accounting procedures were always that of an attempt at completion of the dual calculations.

Here are the dual calculations: one is the calculation by formula (1); the other is that by formula (2):

$$P_0 + R = E + P_1 \quad \ldots\ldots (1)$$
$$A_1 - L_1 = P_1 \quad \ldots\ldots (2)$$

Below is the key to the symbols in the above formulas:

P_0 = Proprietors' equities at the beginning of the period.
R = Revenues for the period.
E = Expenses for the period.
P_1 = Proprietors' equities at the end of the period.
A_1 = Assets at the end of the period.
L_1 = Liabilities at the end of the period.

The details of the items such as P_0, R, E, P_1, A_1, and L_1 seem to be recorded in subsidiary accounting books. The figures and the titles on a calculation statement (the Sanyo Cho are transferred from the subsidiary books directly, or to the Sanyo Cho from summary statements which sum up each subsidiary book. Thus, the author points out that there was definitely a developed bookkeeping method in the Tamiyama accounting books though it did not use ledger account form.

We have to notice that not only did the Tomiyama bookkeeping system have the dual calculations, but also that bookkeeping methods of other big merchants in the Edo Era used the same calculations. Therefore, the great contribution of this author is to point out that the Tomiyama accounting books which are the oldest in existence used the dual calculations. We must value the author's contribution highly when we consider the age of the author's research material and the difficulty in deciphering it.

It is regrettable however, that in his investigation of the origin and development of bookkeeping methods peculiar to Japan in the Edo Era, the author did not sufficiently trace the dimensions of economic and social history and clarify the degree to which the bookkeeping method satisfied social needs.

Furthermore, we hope that the difference between the meaning of "double entry" and "dual calculation" as in this book will be clarified.

Shigeo Aoki, editor, *History of Development of Accounting in Japan; Development and Perspective of Accounting in Our Country,* Tokyo: Doyukan, 1976, xii, 331 pp., y2,300, (published in Japanese)

Reviewed by Torao Moteki
Rikkyo University

About one hundred years has passed since the Japanese economic system changed from feudalism to capitalism. In the Edo Era (the feudal period), there were native (non-Western) Japanese bookkeeping systems. When the Meiji Era (modern capitalism) came, the form and principle of double-entry bookkeeping was introduced and generalized. The essence of the latter is much the same as that of West-European bookkeeping. Native Japanese bookkeeping is not necessarily double-entry bookkeeping while modern Japanese methods are based on double-entry bookkeeping history.

Twenty-one leading members of the Japan Accounting Association contributed special articles to make up this volume, the first publication of a complete history of modern accounting in Japan. The research includes the entire modern accounting era from the early Meiji period up to the present time and (begins with the introduction of West-European bookkeeping in the early Meiji era.)

The first historical article is "The Birth of Modern Bookkeeping and Accounting" by Kiyoshi Kurosawa. Prof. Kurosawa wrote from the reviews of "Choainoho" and "Ginkobokiseiho", both published in the sixth year of Meiji (1873). These old Japanese bookkeeping books are based on the theory of the West-European bookkeeping system. With the assumption that accounting history is a study based on the system of double-entry bookkeeping, can we systematize the role of fuedal accounting history as a part of Japanese accounting history?

The volume is made up of three main parts. The first is "The Development of Bookkeeping and Accounting from the Meiji Era to World War II". This part contains six articles, including "Birth of Modern Bookkeeping and Accounting" by K. Kurosawa; "Significance of Enactment of The Commercial Code" by I. Katano; "Accounting Standards Prescribed by Commerce and Industrial Development", by K. Kurosawa.

The second part is "The Development of Modern Accounting after World War II". This part has nine articles. Our accounting theories and practices since 1945, were largely influenced by American accounting theories and practices. This part deals mainly with the advancement of "Business Accounting Principles". Starting points of modern accounting are identifiable and studies of managerial accounting are popular.

The third part is entitled "Problems and Perspective of Future Accounting" and consists of eight parts. The writers analyze new accounting problems; for example, international accounting standards, consolidations, accounting for inflation, and other topics of a current nature. This book was published as an historical perspective of current accounting problems and includes not only the history of financial accounting but also managerial accounting.

The research covers many fields of accounting theory, analyzed by specialized scholars.

Recently, the study of West-European accounting history has developed very rapidly, but there has not yet been a development of an all-inclusive historical methodology. Of course, a single person's research cannot cover all the fields of accounting history. Jointwork is becoming more of a necessity. This book has great significance as the fruit of study of Japanese accounting history by cooperative effort. The task of Japanese accounting historians is to analyze the source of characters of accounting (instruments), accounting theories, and accounting thoughts. The standard of Japanese accounting history evolved up to a level comparative to that of West Europe. This cooperative venture by 21 persons is highly recommended.

Written Contributions of Selected Accounting Practitioners, Vol. 1: Ralph S. Johns (Urbana-Champaign: Center for International Education and Research in Accounting, University of Illinois, 1976, pp. 383, paper, $5.00)

Reviewed by Dale L. Flesher
University of Mississippi

This publication is a readings book consisting of articles authored by Ralph S. Johns. Ralph Johns began his accounting career with Haskins & Sells in 1926. He became a partner in 1943, managing partner of the Chicago office in 1951, and retired from the firm in 1969. Mr. Johns cooperated in the publication of this book and included his current comments relative to the background behind each article and the subsequent effects.

Several of the articles (and comments) would be quite interesting to those historians interested in early 20th century accounting. For example, one article on accountants' ethics discusses the evolutionary development of various parts of the Code of Professional Ethics. It should be a required source for anyone doing work in the area of ethics history.

Johns commented that he had intended to write a book on the history of the auditor's certificate (report) when he retired. In fact, he accumulated material for 20 years. However, when retirement came, he decided instead to devote his time to foreign travel. The subject is still a good topic for a dissertation. Unfortunately, Johns disposed of his 20 years accumulation of materials on the subject when he decided not to do the book. An article on the topic provides considerable insight into the subject. Most interesting are examples of early certificates where the words "true" and "correct" were used.

The articles on income tax allocation are interesting not only because of the subject matter, but also because of Johns' view on the topic since he was against allocation. One 1945 article on taxes is interesting in retrospect since it questioned whether Accounting Research Bulletins were mandatory and, if so, what the effective date would be. He particularly deplored the fact that ARBs were dumped upon the profession without any forewarning in the form of an exposure draft.

Other areas that receive lengthy treatment include college accounting and legal liability. The legal liability article is especially enlightening in that it discussed several little known cases.

Many of the articles are of much relevance today. For instance, the first fifty pages of the book are devoted to the advantages of the natural business year. Prior to Johns' first publication on the subject in 1926, about 72% of the firms in this country ended their year on December 31. The latest *Accounting Trends and Techniques* indicates that December 31 still accounts for nearly 2/3 of all closings. Institute legislative policy is discussed in a 1957 article. The article is very timely in this reviewer's home state as the question of regulatory versus permissive legislation is still a hotly debated topic. Perhaps Johns should be applauded for writing articles of such enduring value.

Most accountants would enjoy reading this book. The University of Illinois is making a contribution to the historical literature by publishing the works of such important early accounting practitioners.

DR Scott, *Theory of Accounts,* (New York: Arno Press, Reprint Edition, 1976, pp. 284, $18.00)

Reviewed by Joseph R. Oliver
The University of Texas at San Antonio

Theory of Accounts is a reprint of DR Scott's introductory accounting text copyrighted in 1925 by Henry Holt and Company. Despite the fact that the book was initially intended for use in university accounting courses, it provides an interesting view into past interrelationships of accounting and business. While more than forty years have passed since its first publication, the work continues to instill in the reader an appreciation for Scott's foresight and his grasp of the role of accounting in its environment.

Scott emphasizes in his preface the importance of a broad education in giving an accounting student an appreciation for the "part played by accountants in the economic organization of society." The book was written in that vein, and the option of supplementing it with selected problems (but not mere bookkeeping practice) was suggested. The author's purpose for the book, then, was "to give students an oriented knowledge of accounts." Since the book is divided into four parts, each part will be discussed separately.

References to the historical evolution of accounting and its interrelationships with business and political development occur with surprising frequency throughout the text. Nowhere is this more evident than in Part I which begins with a chapter entitled "Development and Functions of Modern Accounting." Part I subsequently affords the reader an overview of the accounting function, devoting five more chapters to examinations of the balance sheet, income statement, ledger and trial balance. Scott pointedly conveys his opinion that accounting is "best studied from a functional rather than a static viewpoint" since he believes it to be "a vital part of an ever changing system of economic machinery."

Part II is more mechanically oriented than Part I, exploring the processes through which accounting gathers and processes information. The author presents the elements of bookkeeping, making particular reference to their interrelationships with contemporary and prior business enterprises. He expects the instructor to supplement what he terms a "highly condensed" explanation of bookkeeping with further discussions and considers such additional comments to be most appropriate in a university course.

An examination of capital accounts of partnerships and corporations is the thrust of Part III. One chapter is devoted to partnerships with an overview of business form and specific discussion of transactions affecting capital accounts. Three chapters survey the corporate organization and its capital accounts. Considerable space is given to transactions affecting "reverses".

Scott sees the open market as adjusting most conflicting economic interests, the process of adjustment being that of "valuation" in which accounting plays an integral part. Part IV, about one-third of the text, is concerned with valuation. Within this section are three chapters on depreciation, but more than half of Part IV discusses means with which values could be placed on assets. In one particularly forward-looking section, cost and current market value are contrasted as bases for valuing assets. Scott is cognizant of the fact that some government regulation of business is necessary to resolve conflicting interests. He sees government as being an occasional substitute for the open market in setting values, but in no way a replacement for management of enterprises under regulatory authority.

In addition to stressing the increasing importance of accounting in developing economic institutions, Scott's summary notes that one who has studied the text should have more of an understanding of the "larger aspects" of accounting than the mechanics of bookkeeping. He wants the student to appreciate the historical development of accounting, the likely influences upon its future evolution and its increasing role in the world around it.

Theory of Accounts is certainly a productive addition to any library. Used initially in mimeograph form at the University of Missouri where Scott spent all of his working years, the text was polished in the classroom and embellished with the thoughts of a man who could be regarded as an early visionary in the discipline of accounting.

James C. Stewart, *Pioneers of a Profession* (Edinburgh, Scotland: Scottish Committee on Accounting History, The Institute of Chartered Accountants in Scotland, 1977, pp. xii, 181, t 6.50)

Reviewed by M. J. R. Gaffikin
Massey University, Palmerston North, New Zealand

The primary purpose of this book, according to the Author's Preface, was to provide a list of persons concerned with the early history of the Chartered Accountants in Scotland as a necessary first step in an inquiry into its social background. If it were simply a list of names with brief biographical details then it would be a book of very limited appeal; fortunately it is not. Although the major part of the book is devoted to the purpose mentioned above there is a thirty page prefatory essay, several photographs of people and places associated with the early history of professional Scottish accountancy, and a substantial appendix describing the links of some of the pioneers with early and contemporary accounting firms.

Until recently there have been few who could be referred to as accounting *historians*—a notable exception being the late A. C. Littleton. Even some of the more recent standard texts on the subject have tended to be little more than mere chronological descriptions. In this prefatory essay Stewart has approached his subject in a manner more fitting a true historian. He acknowledges that Scotland was not the home of the first associations of accountants. But he also notes that by 1850 all those associations that had been formed had, disappeared almost without a trace. In the period since 1850 (the "modern" period?) the Scottish associations were the first formed and he asks "Why?". The remainder of the essay attempts to provide an answer and in doing so discusses some of the background circumstances:

1. The social and political change subsequent to the middle of the 18th century.
2. The evolutionary nature of industrial development in the same period—especially the developments in transport and communications.
3. The growth in international trade and the consequent demands for insurances.
4. The impact of the joint stock company.

Realizing that an essay of such length cannot adequately deal with such a wide sphere of interest, Mr. Stewart has not attempted to delve too deeply into each area but picked out the main arguments supporting his discussion. This has necessarily involved generalizations—some a lot worse than others; for example his distinguishing attributes of a profession:

> "The attributes which distinguish a profession are more readily recognized than defined and listed",

as opposed to,

> "The Scots predilection for litigation may well also have contributed to the demand for persons of skill to elucidate accounts and assist in establishing claims."

The essay is well written and because of the author's continual search for justification in statements on the early development of the Institute of Chartered Accountants in Scotland it is of immediate interest to all interested in the development of professional associations of accountants.

The major sections and purpose of the book, however, is the listing, with brief biographical details, of 346 men who were entitled to describe themselves as accountants between 1854 and 1879. With such a large number it follows that biographical data is necessarily brief. Nevertheless some detail is devoted to a few. One such name, likely to be familiar to many people interested in accounting history, is, Richard Brown, editor and part author of *A History of Accounting and Accountants* (Edinburgh, 1905). A straightforward descriptive account is given of his life, his association with the profession, his other contribution to the discipline followed by an indication of his "extra curricula" interests ("A man of musical and literary taste . . . "). For many only their birth and death dates, the date of their joining the profession and the firm with which they were associated are given. As already indicated, an appendix follows the biographical notes section and it is interesting to observe that some firms are still in existence with the same names today as well as the associations with some contemporary substantial firms (four of the "Big Eight"). Whereas illustrations are often merely interesting those in this book are a little more informative. They include maps of early Glasgow and Edinburgh, the first page of the Royal Warrant (Edinburgh Society) of 4 November 1854, bank notes, institution buildings and many portraits.

There is little doubt that this book is a notable addition to the accounting history literature. While its primary purpose of providing biographical notes of Scottish Accountants in the first 25 years of their association may seem unduly narrow it does contain significant resource material. In addition, there is the prefatory essay which, although limited by size, suggests new insights into the reason for the development of the first professional accountancy associations in the modern era. A book well worth recommending to all those who profess an interest in accounting history.

Thomas J. Burns & Edward N. Coffman, *The Accounting Hall of Fame: Profiles of Thirty-Six Members* (Columbus, Ohio: College of Administrative Science, The Ohio State University, 1976, pp. vi, 88, single copies available upon request)

Reviewed by Chris Luneski
University of Oregon

This volume presents a profile of each of the thirty-six men who had been inducted into the Accounting Hall of Fame (located at The Ohio State University) through 1976. The nomination and induction process is described and it somewhat resembles the Nobel selection process. The list of inductees also shares some of the characteristics of the list of Nobel Laureates in Literature.

The profiles are short and are restricted to factual biographical information. Within the space limitations, the authors have managed to provide an interesting and useful set of sketches. For the person seeking information about the lives and activities of some of the people who have influenced accounting, this collection serves as a worthwhile reference. The entries are carefully researched and documented. The accuracy of the entries is further aided by the fact that the senior author, in his youth, was acquainted with all the inductees.

Though not its purpose, the collection is perhaps even more interesting for the reader with a speculative bent. Much of historical research involves drawing inferences by reading between the lines of factual information. With a liberal application of imagination, the profiles can provide the basis for all sorts of inferences about the nature of accounting and its development. For instance, there is material that might lead one to speculate about the impact of railroads on accounting or on the relationship between accounting and music. The collection could be used in this regard as a fun exercise in a history seminar.

The authors have accomplished a valuable serious purpose and have incidentally provided a stimulus for speculation. This reviewer found the collection to be enjoyable reading for both these reasons.

Joyce Bankes and Eric Kerridge, editors, *The Early Records of the Bankes Family at Winstanley,* (Manchester, England: printed for the Chetham Society by Manchester University Press, 1973, pp. viii, 113, £6.00)

Reviewed by John Freear
University of Kent at Canterbury

Bankes and Kerridge have performed a useful service in making available to a wider readership the early records of the Bankes family. The volume comprises transcriptions of the memoranda book (1586-1610) of James Bankes, his probate inventory (1617), and finally, accounts (1667-1678) and rentals (1668-1677) relating to the Winstanley estate. The editors have also provided indexes of persons, places and topics, together with four photographs, a map of the estate, a short preface (by Bankes) and a longer introduction. The introduction, by Kerridge, is an interesting commentary on the late sixteenth and seventeenth century Lancastrian agrarian economy, with reference to the Winstanley estate. He also draws parallels with James Bankes' contemporary, Robert Loder of Harwell, emphasizing their piety and their concern over wage costs. But, compared with Loder, Bankes displayed little understanding or use of economic ideas in his management of the estate.

We are denied a clearer picture of Bankes' estate and his management of it, because the account book, to which he refers in his memoranda book, has not survived. A later account ledger (1667-1678), kept by a steward, has, however, survived and is transcribed in full. The rental, which is also transcribed, was written "in the same ledger turned upside-down and used in reverse" (page 10) and is interesting mainly for the details of the ways in which tenants discharged their dues and for the occasional remittance of rents, the tenant "being poor". The main purpose of the steward's accounts, as might be expected, was "to quit himself of what was charged to him in the course of his managerial duties" (page 10), by recording the yields and the disposal of the grain crops; thus the figures are mainly quantities, although where grain was bought or sold the price was given, as were the outlays on such tasks as harvesting.

From the accounting historian's point of view, it is a pity that Dr. Kerridge dealt so briefly with these accounts in his introduction. He draws the reader's attention to the more detailed daily records of the later years compared to the summary accounts of the earlier years, and comments that the accounts "are made up in an orderly fashion . . . and they maintain the same high standard almost to the end" (page 10). He reminds us that the steward was not concerned with profit or loss, and concludes that "otherwise these documents call for little remark. They are wholly conventional and valuable to us mainly for the light they shed on estate management after James' death" (page 10). While this may be true, it is a pity that he does not explain or conjecture, for example, as to how grain "brought home" was valued, as there seems to be no consistent valuation basis in the accounts. It may be that when such accounts as these are published—and publication is to be encouraged—it would be a considerable service to many readers if a marginal commentary could be provided alongside with the transcription, in addition to a general description and introduction to the records. Otherwise, as is the case here, the reader must rely substantially on his own knowledge and resources, being at least partially deprived of the wisdom of the editor.

Patricia Hudson, *The West Riding Textile Industry,* A Catalogue of Business Records from the Sixteenth to the Twentieth Century (Edington, Wiltshire: Pasold Research Fund Ltd., 1975, pp. xvi, 560, £10.50)

Reviewed by J. R. Edwards
University College of North Wales

The purpose of Hudson's book is to provide the historical researcher with a comprehensive guide to surviving wool textile industry records deposited at various repositories in the West Riding area. The catalogue is of direct interest to social, economic, business, accounting, and even political historians. Indeed the wealth of data covered will, no doubt, attract the attention of those working in many other fields. However, it is the particular significance of the book for accounting historians which will be considered here.

Many accountants believe that much of the research designed to achieve a more complete understanding of business development pays insufficent attention of financial developments at the company level. Accountants must accept much of the blame for this imbalance which is due to their failure to become immersed, in sufficient numbers, in the historical aspect of their discipline. A partial explanation for this is the absence of catalogues and registers which reveal the location of material on which to base research. For this reason alone Hudson's guide to primary sources must be welcomed.

It is important to examine carefully the methodology adopted for the purpose of presenting the material which has been discovered. Here the author achieves a high degree of success. The bulk of the book (473 pages) is devoted to publicizing the surviving information relating to 122 textile companies. Miss Hudson has wisely adopted a flexible approach for presentation purposes; the length of the alphabetically arranged entries reflect the quantity of available material (the records of T&M Bairstow Ltd. require 40 pages) and the contents summary, for entries which justify this refinement, varies depending upon the particular range of information which has been preserved. The detailed summaries of surviving records, which in some cases amount almost to a financial history, should reduce the possibility of misconceptions to a minimum. Where a company has already been the subject of published research, references to work done are given.

Both the book and the records it covers possess considerable potential for research in areas which include:

1. methods of asset valuation;
2. the development of profit measurement procedures—capital changes versus the matching process;
3. methods of financing business development and capital formation;
4. developments in the accounting vernacular encompassing not only revised descriptions of particular accounting matters but also changed meanings attached to well established business terminology.

There is some evidence that the author did not fully appreciate the nature and significance of certain items which she encountered and recorded during the course of compiling this volume. The result is that in some cases obsolete descriptions are used without warning the reader that the document contains data quite different from what might be expected. Elsewhere information is repeated which although, no doubt, a fair summary of the original, is not entirely explicable without further amplification. These observations in no way detract from the value of the book as a guide to primary sources; they merely emphasize the need for accountants to make a weightier contribution to business history research.

Maureen H. Berry, Editor
UNIVERSITY OF ILLINOIS

DOCTORAL DISSERTATION ABSTRACTS

This edition focuses on the international development of accounting principles and practices as well as the intrastate development of the public accounting profession in the United States.

At the national level, two studies outline the growth of indigenous theory and practice in unique societies: Imperial China and Japan. Closer to home, two researchers, using different approaches, investigate the evolution of financial accounting and reporting in Canada.

Accounting practitioners make their own particular contributions in the search for improvements in and extensions of accounting thought. Three studies trace the rise of the public accounting profession at the state level: in Colorado, Kansas and Mississippi. Their common theme is that from origins in general bookkeeping practice, and assisted by State regulatory legislation, public accounting has benefitted from the considerable increase in the level of skills and range of services offered by the professional practitioner.

A Study of Governmental Accounting in China: With Special Reference to the Sung Dynasty (960-1279) (U. of Illinois, 1968, 442 pp.; 30/1, p. 2-A)* by Philip Yuen-Ko Fu. Part I of this dissertation commences with an overview of governmental accounting in imperial China and a critical evaluation of Sung accounting is provided in Part II. This particular dynasty was selected "because of its greater attention to accounting as a means of controlling expenditures and waste. Consequently, the dynasty modified accounting structure, formulated methodology, and matured already existing practices."

In the early days of accounting in imperial China, the concept of accountability encompassed both accounting and auditing. During the Chou dynasty, these twin aspects were incorporated in an emerging financial accounting model, providing for funds, fiscal years, and budgeting. The Three Kingdoms witnessed both the final separation of financial from non-financial accountability, com-

*Volume/Number and page in *Dissertation Abstracts International.*

menced under the Han dynasty, as well as the segregation of the accounting and auditing functions. By the time of the Sung dynasty, such practices had developed as: mobile auditors, the special Yuan-hokuo-chi pu report and the compilation of K'uai-chi-lu reports. Significant changes occurred three times in the Sung accounting structure because of government reorganizations. Prior to 1078, accounting activities were mainly carried out by five offices under the jurisdiction of the Commission of Finance. After 1085, following the reign of Yuan Feng, the T'ang system was restored and the Ministry of Finance again assumed accounting responsibilities. Agencies in the 'Six Courts and Four Bailiffs' performed most of the accounting functions during the Southern Sung. The author concludes:

> "The Chinese view of auditing was strikingly different from the Western concept. Although auditors were asked to improve existing accounting systems, the discovery of fraud was considered their major responsibility.
>
> Through most of its history, China developed a civilization largely independent of any outside influence. Its accounting methods were a product of this environment; methods were largely developed in isolation, and were uniquely Chinese."

An Analysis of the Development and Nature of Accounting Principles in Japan (U. of Illinois, 1968, 263 pp.; 29/7, p. 1986-A) by Yukio Fujita has, as its objective, an historical analysis of "the social function of accounting principles in Japan to determine the nature of Japanese accounting principles which have been developed in a unique social climate."

Three stages, or time periods, were identified. First was a formative period from 1890-1947. During this time, four commercial codes were promulgated, working rules for financial statements were issued by the Ministry of Commerce and Industry in 1934, and the Planning Board developed the Tentative Standards for Financial Statements. These two latter recommendations, however, were not legally enforced.

During the second stage, 1947-1962, there was a move towards establishing generally accepted accounting principles (GAAP) in written form. This was motivated by the "Instructions for the Preparation of Financial Statements issued by the General Headquarters of Supreme Commander for the Allied Powers." In 1949, the first such written pronouncement in Japan on GAAP appeared in 'A Statement of Business Accounting Principles'. This Statement "performed a very important role in the improvement of financial reporting in Japan until the Commercial Code was materially revised in 1962."

In the last, and contemporary, stage commencing in 1963, the Regulation for Corporate Balance Sheets and Income Statements was enacted "to encourage the effective application of the accounting provisions of the Commercial Code."

"In summary", the author comments "a history of the development of accounting principles in Japan since 1890 revealed a pattern of development from the "compulsory" type through the "semi-autogenous" type to the "compulsory" type of accounting principles. From a viewpoint of international accounting, the revival of the "compulsory" type of accounting principles indicates a difficulty in establishing international accounting principles because the "compulsory" type of accounting principles is concerned with both domains of accounting and law."

The Evolution of Selected Annual Corporate Financial Reporting Practices in Canada: 1900-1970 (Michigan State U., 1970, 306 pp.; 32/1, p. 4-A) by George Joseph Murphy selected certain Canadian corporate annual financial reporting practices and documented evolutionary changes in them during a 70-year period. The selected practices included: "the mandatory audit and the content of the auditor's standard report;" . . "various aspects of the balance sheet and the profit and loss statement"; and "corporate depreciation practices." The research methodology employed was a literature review, including such sources as: annual reports of industrial companies, empirical studies, incorporating and regulating statutes, parliamentary debates, governmental committee hearings, and other "professional, academic, and financial literature".

The study disclosed that change has taken place slowly. "Early Canadian corporate practices were influenced by the English legal tradition, by the early public accounting firms formed by Scottish and English chartered accountants and by the use of English accounting texts." By the mid 1930s, however, the English influence diminished with the growth of U.S. investments in Canada and "the proximity and articulateness of the American Institute and of American academic contributions." Corporate depreciation policies have been significantly affected by tax legislation and corporate reporting practices by Companies Act legislation. Two other important advocates for change in corporate reporting practices have been the Canadian financial press and the Canadian Institute of Chartered Accountants.

The Evolution of Accounting in Canada (NYU, 1972, 272 pp.; 33/8, p. 3846-A) by Harvey Mann examined the financial statements and auditors' reports of six Canadian companies, with business lives ranging from 60 to 150 years, for evidence of intracompany accounting changes and intercompany accounting differences.

It was found that most changes occurred in the area of "fixed assets and depreciation, the form and format of the financial statements, and the auditors' reports." Analysis revealed a pattern in the evolution of dominant change agents. The initial predominance of the individual accountant gave way to the emergence of the law which, though remaining important, yielded place to the pronouncements of the Institute of Chartered Accountants.

The study concluded that accounting reports are "virtually meaningless to the layman" and should be prepared for a professional user, providing him with additional details and data for use in advising clients.

A History of the CPA Profession in Colorado (U. of Missouri-Columbia, 1974, 342 pp.; 35/9, p. 5585-A) by John Matthew Hunthausen, S. J., examined the "origins, development and growth of the certified public accounting (CPA) profession in Colorado" from 1885-1973, using interviewing techniques and document research. During that period, over 2,900 CPA certificates were issued in Colorado, about 71% of them since 1958.

In 1904, forty-eight charter members organized the Colorado Society of Public Accountants and, largely due to their efforts, the first regulatory accounting law was enacted some three years later in 1907. High standards for admission to the profession are evidenced by subsequent legislation. Since 1908, all candidates for the CPA certificate have "been required to have at least a high-school education, to pass a written examination, and to have a prescribed number of years of accounting experience." An accounting degree from a State Board accredited college or university has been mandatory since 1965 and a continuing education law was passed in 1973.

Causal factors associated with the growth of the profession are: the economic growth of the state; "the increase in governmental regulations, the increased demand for CPA services, and the recruiting activities" of the State Society. Over a period of almost a century, the professional profile has changed from that of a general practitioner, occupied mainly with bookkeeping services, to a specialist making skilled talent available to the public.

A Study of the Development of the Certified Public Accounting Profession in Kansas (U. of Missouri-Columbia, 1967, 335 pp.; 28/10, p. 3819-A) by Eldon Curtis Lewis had as its main objective determining "the significant internal events which contributed to the growth and development of the Certified Public Accounting profession in Kansas", using a document research methodology.

Early accounting practices in Kansas were basically limited to bookkeeping and financial statement preparation. However, the profession grew as the demands for accounting services became more sophisticated and challenging. The most significant influences on the internal development of the profession were regulatory legislation and the organizing of CPAs into a professional group. As early as 1915, the CPA designation was restricted to those meeting legal requirements and, in 1951, a second law "regulated accounting practice and restricted the use of the CPA designation."

The study identified eight ways in which the Kansas Society of Certified Public Accountants, organized in 1932, was influential in developing the CPA profession in Kansas. These included: encouraging CPAs to become members of the State Society; developing cordial relationships with other institutions, such as State Board, legislators, attorneys and bankers, and educators; adopting rules of professional conduct; and encouraging entrants to the profession.

The Development of the CPA Profession in Mississippi (U. of Mississippi, 1972, 312 pp.; 33/1, p. 1-A) by James Wilbur Davis explores the growth of the profession in Mississippi from 1904-1971, using both document research and interviewing techniques. The study surveys the rise of the profession from its early focus on bookkeeping and fraud investigations to the present full range of professional services provided by more than 1,000 annual CPA registrants with the Mississippi State Board of Public Accountancy. The State Board was established in 1920 under a legislative act giving recognition to CPAs. This same year also saw the establishment of a statewide organization of Mississippi CPAs which now counts more than 600 members. In 1930, revisions to the code required that CPAs register annually and it limited public accounting practice to CPAs and lawyers.

Several recommendations for further development of the profession in Mississippi included: "a greater responsiveness on the part of the State Board to proposals of the Society, adoption of the minimum education and continuing education requirements of the Institute, passage of amendments to the State law, establishment of a professional periodical, involvement in the affairs of government, and a greater specialization of services within firms."

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33. The CPA's Professional Heritage, Part IV, "The Birth of the SEC", by John L. Carey.

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