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Research on the Evolution of Accounting Thought and Accounting Practice

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CONTENTS

Main Articles

British Cost Accounting Development: Continuity and Change — John Richard Edwards, Trevor Boyns, Malcolm Anderson ............... 1

Irving Fisher and the Mechanistic Character of Twentieth Century Accounting Thought — Tom Mouck ........................................ 43

The Cely Shipping Accounts: Accountability and the Transition from Oral to Written Records — Keith Hooper ....................... 85

The Role of Accounting in Public Expenditure and Monetary Policy in the First Century AD Roman Empire — David Oldroyd ............. 117

Edward Wild: Advocate of Simplification and an Organised Profession in Colonial Australia — Gary D. Carnegie, Scott A. Varker ............... 131

Review of Books and Other Publications

Hopwood and Miller, Editors, Accounting as Social and Institutional Practice — Ross E. Stewart .............................. 151

Motyka, Annotated Bibliography of Russian Language Publications on Accounting 1736-1917 — Marc I. LeBow ....................... 154

Omerod, The Death of Economics — Scot A. Stradley ....................... 156
Snooks, Economics without Time: A Science Blind to the Forces of Historical Change
— Christopher J. Napier ................................. 159

Tinker and Puxty, Editors, Policing Accounting Knowledge: The Market for Excuses Affair
— Alan J. Richardson ................................. 160

Van Riper, Setting Standards for Financial Reporting: FASB and the Struggle for Control of a Critical Process — Dean Neu and Eric Powrie ................................. 163

Contents of Research Journals ................................. 167
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Abstract: This paper uses the archival records of three entities successively carrying on coal and ironmaking activities at Staveley between 1838-1900, together with the findings from earlier research, to explore the costing information generated over the period 1690-1900. We find a system of cost accounting, broadly defined, in operation throughout the period, a large measure of continuity concerning its basic features, and innovations made from time to time presumably designed to improve its usefulness. The paper uses the results of this and earlier research to explore the nature of accounting change and draws attention to possible differences in the path of development between countries. Further, we assess the significance of our findings for present ideas concerning the development of cost accounting systems in Britain and the U.S., and argue for a broader view to be taken by researchers into the nature of management accounting's development.

A previous article [Edwards and Boyns, 1992] examined the accounting records of two vertically-integrated charcoal ironmaking enterprizes operating as partnerships in the Sheffield area between 1690-1783. The main findings were that their accounting systems, each based on double entry bookkeeping, involved complete integration of the cost and financial records, the identification of unit costs for raw material inputs, the use of accounting prices to record the movement of goods between locations in order to measure departmental results, and the calculation of input-output yield statistics for raw materials and intermediary products.

These were The Duke of Norfolk's Works in south Yorkshire and the Derbyshire and Nottingham Company located around Staveley, north Derbyshire.
The present paper uses the findings from this earlier research together with the archival records of three entities (two sole traders and a quoted public company) subsequently carrying on coal and ironmaking activities at Staveley, in succession, during the period 1838-1900 for the following purposes:

* to contrast the nature of cost accounting developments in Britain and the U.S.;
* to argue for a broader view to be taken of the development of managerial accounting than is implicit in the debate concerning the significance of events at the Springfield Armory;
* to outline and analyze the costing system in use at Staveley between 1838-1900; and
* to assess the likely relevance of the data generated for the purposes of planning, measurement and control.

INDUSTRIAL ACCOUNTING DEVELOPMENTS IN THE U.S. AND BRITAIN

There is a growing literature on the development of cost accounting and a keen interest in the extent to which failure to respond to changing circumstances during the twentieth century has caused it to lose its relevance [Johnson and Kaplan, 1987]. A feature of this literature is the debate concerning the way in which our knowledge of earlier developments can help to explain the nature and purpose of cost accounting and the process of evolution into its present day form.

Much of the literature used as the basis for generalizing earlier developments in English-speaking countries, post-1800, deals with the activities of nineteenth century U.S. companies [Johnson, 1972; Chandler, 1977, 1990; Johnson and Kaplan, 1987; Hoskin and Macve, 1988, 1994; Tyson, 1990, 1992, 1993]. Particular importance is ascribed to events at the Springfield Armory. According to Chandler [1977, p. 72], “before the mid-1830s the only industrial enterprises in the United States to have an internal sub-division as extensive as that of Adam Smith’s famous pin factory were a small number of gun making establishments.” Features of the most successful of these, the Springfield Armory, were that it had a workforce of 250 men and was, for decades, the largest metal working establishment in the country. Chandler therefore sees it as perfectly natural for “tech-

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²The records for these companies are housed at the Derbyshire Record Office, Matlock, Derbyshire and the Sheffield City Library, archives department.
niques of modern factory management” to appear first in this “important prototype of the modern factory” [Ibid., pp. 72-3].

If we accept Chandler’s view that the scope and scale of business activity is likely to have implications for the design and development of the management information system, we might expect to find differences between the U.S. and British experiences. Of particular relevance is the fact that factory development had begun somewhat earlier in Britain. Proto-industrialization during the seventeenth and early eighteenth centuries had seen the emergence of the proto-factory, involving a significant investment in tools and implements and a labor force assembled to perform specialist functions under supervision [Flinn, 1962; Marshall, 1980, chapter 6; Mepham, 1988, pp. 57-8].

The pace of industrialization picked up in Britain during the second half of the eighteenth century with the textile, especially cotton but also woolen, and iron industries coming to the fore. By 1812, in the neighborhood of Birmingham alone, there were 10 iron works, each of which cost over £50,000 to establish and typically engaged between 300-500 workmen apart from the colliers [Ashton, quoted in Edwards, 1937, p. 193]. An example of an organization growing rapidly during the first half of the nineteenth century, under the leadership of Sir John Guest, was the Dowlais Iron Company which employed 5,192 people in 1842. In the same year, it was described as “the first [iron works] in the world,” but it is not necessary to go beyond the locality of south Wales for other examples of substantial British Companies at this early date.  

The first factory proper is generally considered to be John Lombe’s silk-throwing mill near Derby in 1717. It was 500 feet long and, with five or six stories resembled “a huge barracks … with its automatic tools, its continuous and unlimited production and the narrowly specialised functions of its [300] operatives” [Mantoux, 1928, p. 199].

Letter from S. W. Roberts of Philadelphia to Thomas Evans, the overseas agent of Dowlais. Glamorgan Record Office, Dowlais main series letter book 1842 (2) f. 368.

The Plymouth Iron Company employed 3,900, Tredegar 2,757, Rhymney 2,494, Penydarren 2,071 and Blaenavon 1,971, while Cyfarthfa employed 2,000 at the forges alone [Royal Commission on Children’s Employment in Mines and Manufactories, 1842, Report of Rhys William Jones, Appendix, Part 2, p. 594]. The Report of the Commissioners for the State of the Population in the Mining Districts, 1846, puts employment at Dowlais at c. 6,000 and at Rhymney c. 4,000, of which 1,600 were employed in the mines. It is also stated that 1,700 were employed at Dowlais in the mines, but it is not clear whether this is part of the 6,000.
Given Chandler's [1977, 1990] assessment of the impact of the large-scale business enterprise on cost accounting developments, it would be surprising if progress in this direction had not been made early on by companies at the forefront of Britain's Industrial Revolution. Indeed, research has been undertaken which suggests that important costing developments did in fact occur in Britain both prior to and during the Industrial Revolution [McKendrick, 1970; Stone, 1973; Jones, 1985; Fleischman and Parker, 1990, 1991, 1992; Fleischman, Parker and Vamplew, 1991; Edwards and Newell, 1991; Edwards and Boyns, 1992]. Moreover, refinements of accounting technique, of fundamental importance in terms of departmental profit and performance measurement occurred in relatively small iron making establishments [Edwards and Boyns, 1992].

This paper will present further evidence both explicit and suggestive of the fact that this material was used for management purposes [see also Boyns and Edwards, 1995].

DEVELOPMENT OF MANAGEMENT ACCOUNTING — SOME SUGGESTIONS

It has been persuasively argued that Johnson and Kaplan's analysis of the development of management accounting in Relevance Lost [1987] has "placed accounting history centre-stage not only in the research agenda, but also for practical business management" [p. 36]. The result has been an upsurge of publications in this area and an intense and sometimes heated debate [Tyson, 1992; Fleischman, Kalbers and Parker, 1992; Miller and Napier, 1993; Hoskin and Macve, 1994; Tyson, 1995] between Foucauldians, Marxists and economic rationalists concerning the respective merits of different approaches to accounting history [Napier, 1989; Miller, Hopper and Laughlin 1991]. Calls have been made for recognition of possible merit in more than one approach towards analysing accounting's past [Fleischman, Kalbers and Parker, 1992], and the late eighteenth century accounting practices of Boulton & Watt have been the subject of re-interpretation as the result of collaborative research between Foucauldians and an economic rationalist [Fleischman, Hoskin and Macve, 1995].

Recent years have also seen an interesting debate in the accounting history literature concerning the "genesis of managerialism" [Hoskin and Macve, 1994]. According to Chandler, the necessary administrative co-ordination of emerging large-scale companies during the nineteenth century was facilitated
by the adoption of bookkeeping procedures based on "standard double-entry accounts" [Chandler, 1977, pp. 73-4]. The Springfield Armory case is cited as an exemplar, with events during the stewardship of Colonel Roswell Lee (1815-33) seen to have been of crucial importance.

Historians of a Foucauldian persuasion [Hoskin and Macve, 1988] have challenged Chandler's "demand - response" explanation for the development of managerialism during the 1830s and 1840s. They agree that events at the U.S. Springfield Armory in the first half of the nineteenth century saw accounting play a full part in the development of "managerialism," but see a disciplinary power-knowledge framework as responsible for observed changes. In the opinion of Hoskin and Macve, identified events, which include the "West Point connection," conspired to produce "crucial discontinuities from previous accounting and management practices" [Hoskin and Macve, 1988, p. 38]. The major step forward comprised a new accountability based on "a full accounting for labour productivity" [Hoskin and Macve, 1988, p. 38; see also Chandler, 1977, pp. 72-5]. In a later paper, Hoskin and Macve [1994] have demonstrated conclusively the fact that Springfield's accounting system under Lee was based on the stewardship-oriented charge/discharge accounting rather than, as Chandler believed, the potentially more commercially-oriented double entry bookkeeping [1994, pp. 18-22], and have further argued that it was "a revolutionary time-and-motion study undertaken in 1831 which exposed the previously-hidden problem of slack, and thus made it possible to engineer the subsequent cost and productivity transformations" [1994, p. 6]. The time and motion study is thought to have been the "brain-child" of Lieutenant Daniel Tyler, a West point graduate who joined Springfield in 1831.

The Hoskin and Macve thesis has been challenged by Tyson [1990, 1992, 1993]. Tyson re-examined the Springfield archive and concluded that there was, potentially, a managerial accounting system in place prior to Tyler joining the Armory, and that subsequent changes in the use of this accounting system can better be explained in terms of a range of identified economic and social factors. Tyson's findings have been stoutly resisted by Hoskin and Macve [1994] who re-assert their earlier conclusions.

This debate is of relevance to our study for reasons which include assertions made by Foucauldians concerning the nature and purpose of costing systems uncovered by other academic
researchers. Earlier costing developments in U.S. textile mills are down-played due to their perceived inability to establish effective accountability in respect of workers and production [Hoskin and Macve, 1988, pp. 70-1]. More importantly, for our purposes, while Foucauldians have noted the introduction of cost accounting techniques in British companies before and during the Industrial Revolution [McKendrick, 1970; Jones, 1985; Edwards, 1989; Edwards and Newell, 1991; Fleischman and Parker, 1990, 1991], the significance of these findings has been questioned [Hoskin and Macve, 1988, 1992] on the grounds that they provide evidence of cost finding but not cost control.

We use the findings from recent research into the Staveley archives together with our investigation of its predecessor companies [Edwards and Boyns, 1992] to question this conclusion. We think that progress in management accounting history research needs to pay more attention to two factors, of which the second is given particular emphasis in this paper. First, there is a need to consider the possible significance of differences in environmental circumstances between countries. For example, it is plausible to argue that a country with a long industrial history and steady rate of economic development in circumstances where labor was relatively plentiful (e.g., Britain between the seventeenth and nineteenth centuries) is likely to exhibit significant differences in the development of its technologies, including accounting, compared with a country which started much later but then industrialized more rapidly against a background of labor shortages (e.g., the U.S.).

Second, while we share with Hoskin, Macve and Tyson a concern with the development of accounting as a tool for management, we argue that it is a mistake to focus overmuch on "using accounting information to exert human accountability, e.g., by eradicating slack and increasing work efficiency" [Hoskin and Macve, 1994, p. 7, emphasis added]. The material presented and commented on in the remainder of this paper contains little or no evidence of an accounting system being used principally as a means of surveillance of the workforce. However, we argue that a broader view needs to be taken of the possible nature and role of accounting systems both within and between countries. That is, we suggest that management was concerned to make the best use of available resources within certain constraints, of which one may have been a recognition

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6 Also, in the U.S. context, Porter, 1980.
of the need to maintain harmonious management/worker relations in a period when the "governable person" [Miller and O'Leary, 1987] had not yet been created, at least in the private sector. We therefore take the view that it is unduly restrictive to equate the development of managerial accounting with the growth of scientific management, which is seen to have its origins at West Point and to have been popularized by Frederick Taylor in the late nineteenth century. Rather, we take as a reference point the definition of management accounting which appeared in the report prepared by the team which visited the U.S.A. in 1950 under the auspices of the then recently established Anglo-American Council on Productivity. It is the first such definition of which we are aware that has appeared in the British accounting literature.

Management accountancy is the presentation of accounting information in such a way as to assist management in the creation of policy and in the day-to-day operation of an undertaking (1950, p. viii).

We recognize that we focus on a term "management accounting" which was not even used in the nineteenth century, but we do not see this as a problem. Our sole purpose is to discover whether the system we have researched meets the basic criterion subsequently articulated as justifying that designation.

In the next two sections, we present our analysis of the system of accounting used at Staveley between 1838-1900. In the final section, we emphasize the gradual evolution, over two centuries, of an accounting system which (our investigations of archives elsewhere suggest) had many features in common with that in widespread use among iron, steel and coal companies in the late nineteenth century. Also, we make a tentative assessment, based on the limited explicit evidence available, of the extent to which this system can be regarded as serving manage-

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7 See Miller and Napier [1993] for a different view
8 In this context, we note a broad similarity between the 1950 definition and those used by today's management accounting textbooks.
9 Bolckow, Vaughan and Company Ltd, Cleveland (British Steel, North Eastern Regional Records Centre); Consett Iron Company Ltd, Durham (British Steel, North Eastern Regional Records Centre); Dowlais Iron Company, Glamorgan (Glamorgan Record Office); Pearson and Knowles Coal and Iron Company Ltd, Lancashire (British Steel, North Western Regional Records Centre); Shelton Iron, Steel and Coal Company Ltd, Staffordshire (British Steel, North Western Regional Records Centre); and South Durham Steel and Iron Company Ltd, Durham (British Steel, North Eastern Regional Records Centre).
ment's informational requirements. We acknowledge the lack of surviving evidence to demonstrate the precise use made of this accounting information and refer to the contemporary literature for illumination on this matter. In the final section we also comment further on the process of accounting change in different countries and argue for a broad view of management accounting to be taken by researchers into its history.

THE INTEGRATED ACCOUNTING SYSTEM

1838-41: Staveley Works — George Barrow, Sole Proprietor

In 1783, at the end of a 21-year lease, the tenancy of Joseph Clay (managing clerk of The Duke of Norfolk's Works and the Derbyshire and Nottingham Company) was not renewed and the two partnerships were dissolved. Staveley was then leased to Walter Mather who belonged to a group of capitalists that also controlled foundries and mills in south Derbyshire. In the endeavor to improve profitability, the furnace was re-built to enable the use of coke instead of charcoal as its main fuel [Hopkinson, 1957, p. 117]. Following Mather's death in 1796, Staveley was bequeathed to his sons-in-law, William Ward and Edward Richard Lowe, though the latter died in 1800 and his widow continued in partnership with Ward.

In 1805, Lowe's widow married George H. Barrow, a Southwell solicitor, who initially took little interest in Staveley. Bad management and a run of losses from circa 1810 encouraged Barrow to become more involved and, in 1815, he took over the ground leases and assumed sole responsibility for the works. George continued to run the business until 1841, by which time backward integration had secured supplies of ironstone and coal from local pits and collieries.

The single accounting record which appears to have survived from George's proprietorship is the double entry-based private ledger for 1838-41 [D3808]. Nevertheless, the wealth of physical and financial information it contains enables us to construct a fairly clear picture of the nature of business operations at this time, the flow of goods between operating departments and stock, and the way in which costs and profits were measured [Figure 1].
Small amounts of castings were supplied and recharged to other departments in the form of items such as rails, wagon wheels, punches, plates, pram wheels, point plates, pipes, pulley wheels, washers, drum wheels and doors.

Transfers at cost

Transfers at an accounting price

(1) Separate columns in these ledger accounts list physical quantities transferred to the next stage of operations.
(2) Separate columns in these ledger accounts list physical quantities for both inflows and outflows.

Source: Private ledger of Staveley Works, 1838-41.
The main operating departments (each of which was allocated a separate ledger account) consisted of three collieries, an unspecified number of ironstone pits and coke ovens, two furnaces and a foundry. There were also separate ledger accounts for stocks of limestone (purchased externally and subsequently transferred to the furnaces), ironstone (obtained from the pits and used in the furnaces), pig iron (produced by the furnaces and transferred to the foundry or sold) and castings (produced in the foundry for subsequent sale). Coal was transferred from the collieries to the coke ovens, furnaces, foundry and customers.

The unbroken arrows in Figure 1 indicate transfers to customers at selling price and to other operating departments at accounting prices, subject to periodic adjustment, which were usually below market price. The outcome was an accounting system which produced profit or loss measures for each of the operating departments which interfaced either partly (collieries producing coal and furnaces producing pig iron) or wholly (foundry producing castings) with the market. The costs incurred by the ironstone pits were re-charged monthly to the ironstone stock account, while the cost of coal transferred to the coke ovens was, in turn, re-charged monthly to the furnaces accounts and the foundry account based on their respective usage. The ironstone stock and limestone stock were each re-charged to the furnaces at accounting prices, again subject to periodic adjustment. In these cases, however, it seems that the transfer prices were designed to recover the cost with any under or over-recovery, so far as we can judge, affecting the valuation of closing stock which was inserted as the balancing figure.

Each of the ledger accounts contains figures for physical inputs [Figure 1, notes 1 and 2], while each of the stock accounts also contains figures for physical outputs [Figure 1, note 2]. The reconciliation of physical quantities helped to prove the completeness of the record, identified deficiencies which could be judged acceptable or otherwise, and provided the data which

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10The exception is in the case of the coke ovens where the actual coke produced weighed substantially less than the coal consumed. For example, the charge to the furnaces for November 1848 shows that 549 tons 19 cwts of coal produced 329 tons 19 cwts 1 quarter of coke. These figures are closely in line with the expected input-output ratio of 60% [Gibson, 1922, p. 77], and we speculate that the numbers generated by the accounting system were compared with this kind of yardstick.
we imagine were used to calculate yields. The continuity in the accounting system over time is worth noting. Between 1690-1783, the outputs of operating departments which interfaced partly with the market were also valued at accounting prices (at that time closer to market price than seems to have been the case between 1838-41), while other transfers, such as ironstone (purchased) and charcoal (produced), were made at cost [Edwards and Boyns, 1992, pp. 160-3]. Table 1 lists departmental results achieved at the main profit centers, together with those of the farm, brickyard, lime kiln, and on the meat account.

**TABLE 1**

Balances of profit and (loss) extracted from private ledger 1838-41.

<table>
<thead>
<tr>
<th></th>
<th>April 1838/ March 1839</th>
<th>April 1839/ March 1840</th>
<th>April 1840/ March 1841</th>
<th>April 1841/ December 1841</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pig iron</strong></td>
<td>£4,893. 9. 8</td>
<td>£3,669.15. 5</td>
<td>£3,888. 5. 9</td>
<td>£643.11. 2</td>
</tr>
<tr>
<td><strong>Castings</strong></td>
<td>£3,368. 7.10</td>
<td>£2,676. 9. 1</td>
<td>£454.16. 8</td>
<td>(£50. 5. 8)</td>
</tr>
<tr>
<td><strong>Collieries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hollingwood</td>
<td>£1,676. 1. 8</td>
<td>£1,577.19. 1</td>
<td>£836. 5. 1</td>
<td>£6217. 3</td>
</tr>
<tr>
<td>Nor Briggs</td>
<td>(£206. 2. 4)</td>
<td>(£206. 2. 4)</td>
<td>(£206. 2. 4)</td>
<td>(£206. 2. 4)</td>
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<tr>
<td>Staveley</td>
<td>£751.13. 4</td>
<td>£550.12. 5</td>
<td>(£121. 8. 11)</td>
<td>(£139. 3. 1)</td>
</tr>
<tr>
<td>Nor Briggs New</td>
<td>(£146. 1. 5)</td>
<td>(£173.19.11)</td>
<td>(£196. 18. 6)</td>
<td>(£196. 18. 6)</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm</td>
<td>(£138.19. 4)</td>
<td>(£131. 4. 6)</td>
<td>(£181. 5. 4)</td>
<td>*</td>
</tr>
<tr>
<td>Meat account</td>
<td>(£122. 4. 3)</td>
<td>(£10. 8. 3)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Brickyard</td>
<td>**</td>
<td>(20.19. 0)</td>
<td>**</td>
<td>*</td>
</tr>
<tr>
<td>Lime kiln</td>
<td>**</td>
<td>£43.12. 0</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

* Ledger accounts not written up for these years.
** Ledger accounts not balanced this year

Source: Private ledger, 1838-41 [D3808].

11 We have evidence to show that they were made in earlier times at Staveley [Edwards and Boyns, 1992, pp. 166-7] and also later (see below).
12 The contents of Table 1 reflect the fact that not all the ledger accounts were written up and/or balanced between 1838-41, with the situation worsening towards the end of George's proprietorship. Elsewhere in the ledger we find material amounts of expenditure on fixed assets recorded in accounts which were not balanced until the ledger was closed. For example, there is a Staveley New Colliery Account and a New Furnace Account which, respectively, show accumulated debit balances of £1,729. 17. 7 and £1,068. 16. 8. [D3808, Private Ledger, 1838-41]. These omissions are suggestive of the fact that neither a trial balance was extracted nor final accounts prepared for the years 1838-41.
We can therefore conclude that the ledger provided a fully integrated\textsuperscript{13} record of financial and costing information. At Staveley, the recognition of differential roles for cost and financial records was yet to arrive. The system of double entry bookkeeping had been modified and extended to meet changing business requirements, and we can conclude that the ledger remained the center-piece of the accounting system that could be directly consulted for both the financial and physical data required to inform assessments of the firm’s profits, performance and financial position.

\textit{1841-63: Staveley Works — Richard Barrow, Sole Proprietor}

Following a successful re-negotiation of the lease\textsuperscript{14} in 1841, George transferred control of the Staveley Works to his younger brother, Richard, who had been a “successful merchant in the China trade [and] who made a second career in coal and iron, using his mercantile fortune to exploit the potential of railway development” [Chapman, 1985, p. 123].

For this period the series of private ledgers are supported by journals and cash books. There is also a Capital Account Book, 1841-65 and a Balance Sheet Book, 1841-63 [D3808] which contain final accounts and related working papers. The system of double entry bookkeeping appears to have been the same as before; certainly the private ledgers were maintained on broadly the same basis. However, modifications and improvements were made from time to time in the system of record keeping. Also, for this period, there has survived data generated outside the ledger suitable for the purpose of assessing performance.

\textit{1841 innovations:} Following the change in ownership, certain alterations were immediately made to the system of record keeping, principal among which was that limestone stock\textsuperscript{15} and the ironstone pits each became profit centers [D3808, Private Led-

\textsuperscript{13} Much of the discussion of the integration of cost and financial accounting systems, beginning in the 1890s [e.g., Mann, 1891, pp. 631-2], focuses on the need to reconcile, periodically, separate systems, or to ensure their correspondence through the use of control accounts. The Staveley archive draws our attention to the possibility that, in certain industries at least, a single set of books was initially used to meet differential information requirements.

\textsuperscript{14} The property belonged to the Duke of Devonshire.

\textsuperscript{15} It is possible that the balancing amounts (credit and debit) were under or over-recoveries of cost rather than profits or losses, but this seems unlikely in view of the magnitudes of the amounts involved.
ger, 1841-47]. A further refinement to departmental profit measurement resulted from the decision to re-charge the furnace and credit the foundry “for blast,” with the amount put at £100 for 1844.

The survival of journals for the period post-1841 enables us to examine more carefully the transfer prices used at Staveley. For example:

* Coal: Journal entries for November 1848 [D3808, Journal, 1847-49, fo. 121] show that credit sales and “ready money” sales of hard coal were each made at 6s. for larger quantities and 7s. for smaller quantities. This type of coal was recharged to the “railway sales account” (a new profit center) and the furnaces at 5s. Soft coal was charged to the railway sales account and the foundry at 4s., and this amount also obtained for cash and credit sales, although 5s. was received for one small quantity of credit sales. Cobbles were charged at 4s. to the new furnace and the railway sales account, but produced 5s. from cash and credit sales. Slack was charged at 1s. to the new and old furnaces, but realized 2s. in cash and credit sales.

* Pig iron stock: Journal entries for January 1848 [D3808, Journal, 1847-49, fo. 36] show pig iron stock charged to the foundry at £4 per ton while fetching £5. 15. 0 per ton in the market. In April 1849 [fos. 166 & 171], the transfer price was £3. 10. 0 at a time when the Barrow could get £5. 10. 0 for sales to customers.

We can therefore see that the transfer prices for coal and iron were, at this stage, significantly below market price. It therefore remains a matter of conjecture whether this discount was designed to reflect the fact that a company (buying in bulk) could purchase coal and iron at much less than it could sell them, or whether management made a conscious decision to...
subsidize furnace production (where coal was the major input), foundry production (coal and pig iron) and railway sales (coal).

**1847 innovations:** The first set of final accounts for the new firm was made up to June 30, 1847 [D3808, Balance Sheet Book, 1841-63] six years after the commencement of Richard Barrow's stewardship. The accounts comprise a balance sheet setting out the financial position at that date and a “Statement of Profit and Loss” covering each of the six years since formation. The first balance sheet shows Richard Barrow's capital investment at £116,297. The profit and loss account was produced in what was at this time a familiar format in the iron industry. It lists profits or losses arising at each profit center which included, for 1847, five collieries, several ironstone pits, several coke ovens, two foundries; two furnaces, the farm, a brickyard and railway coal sales. The final accounts did not reveal the calculation (costs and revenues) of departmental profits and losses and it was therefore necessary to refer to the ledger for this information.

An interesting feature of these accounts is the computation of charges for depreciation and imputed interest on the capital invested in fixed assets used by each profit center. These were then deducted from the balances for each profit center (profit or loss) extracted from the ledger, and the outcome was a series of departmental results which take account of both the decline in value of fixed assets and the opportunity cost to Barrow of investing in the Staveley enterprise. The depreciation rates range from 5%-10% on individual assets, which is probably explicable in terms of differential estimates of useful life. The imputed rates of interest varied from 3.5%-5%. These were roughly in line with central government interest rates though we are unable to explain why different rates were used for different assets.

---

18 The detailed calculations were set out in the working papers under the heading “Statement of Capital, Interest and Depreciation Accounts” [D3808, Balance Sheet Book, 1841-63].

19 The inclusion of an interest charge when appraising capital investment proposals was quite common at this time but the imputation of interest in post-fact accounts was rare [Edwards, 1989, p. 312].

20 The yield on government consolidated stock was 3.4% in 1847 and the bank rate 5% at the end of the year.

21 The credit entries for accumulated profit, accumulated depreciation and interest charged to date were, in the balance sheet, added to the figure for Barrow's original capital investment. Also noteworthy is the use of the term “realised” profit for the purpose of describing the figure for profit transferred.
1856 innovations: The business was expanded to a significant extent during the 1850s as a result of opening up the Speedwell and Springwell Collieries. The surviving records show that a number of important changes were made at this stage to the accounting system.

Using the accounts for 1860 for illustration purposes [D3808, Balance Sheet Book, 1841-63], we find that the main profit centers consisted of two ironstone pits, three collieries, the pig iron department, the castings department, and the railway coal sales [Table 2]. The entire output of the two ironstone pits, 26,745 tons, was consumed in the production of pig iron. The total output of the three collieries amounted to 298,816 tons, of which 29,763 tons was consumed in pig iron production and 4,089 tons by the castings department. The balance was available for sale. The entire output of the pig iron department, 12,118 tons, was transferred to the castings department.

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Departments</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Coal</strong></td>
</tr>
<tr>
<td>Victoria</td>
</tr>
<tr>
<td>Speedwell</td>
</tr>
<tr>
<td>Springwell</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Ironstone</strong></td>
</tr>
<tr>
<td>Staveley</td>
</tr>
<tr>
<td>Hady</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Pig Iron</strong></td>
</tr>
<tr>
<td>12,118</td>
</tr>
<tr>
<td><strong>Castings</strong></td>
</tr>
<tr>
<td>16,118</td>
</tr>
<tr>
<td><strong>Railway Coal Sales</strong></td>
</tr>
</tbody>
</table>

Notes: ‘Profit’ figure is equivalent to contribution. For ‘railway coal sales’, only figures for total output and net profit per ton are given.

Source: Balance Sheet Book, 1841-63 [D3808].

Annually to the balance sheet, while a memorandum entry at the foot of the general profit and loss account adds back the charges for interest and depreciation to “realised” profit to give a figure captioned “total” profit.
In 1860, the accounting prices used to track transfers of goods between departments were as follows: the pig iron department was charged at the rate of 6s per ton for hard coal and 5s per ton for cobbles, while the castings department was charged at 5s per ton for coal, presumably of a different type from that used in the iron department. The entire output of the pig iron department was priced at 62s per ton, which we know was the prevailing market price as the castings account shows that an additional 5,120 tons of iron were purchased from outside at this figure. The figure for revenue in the colliery accounts is described as “sales and consumption,” indicating the dual destination of the coal for use within the company and transfer to the “railway coal sales” account. Coke was charged to the castings department at 21s per ton, which may have been the average cost of production in view of the very small balances transferred from the coke account to the general profit and loss account at the end of the accounting period.

**TABLE 3:**

<table>
<thead>
<tr>
<th>Establishment charge</th>
<th>Proportion for collieries £ s d</th>
<th>Proportion for castings £ s d</th>
<th>Proportion for rail coal a/c £ s d</th>
<th>Total £ s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railway wagon repairs</td>
<td>671 2 2</td>
<td>3,020 4 3</td>
<td>3,691 6 5</td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td>3,090 9 0</td>
<td>687 19 6</td>
<td>3,778 8 6</td>
<td></td>
</tr>
<tr>
<td>Railway repairs</td>
<td>1,545 4 6</td>
<td>340 4 1</td>
<td>1,885 8 7</td>
<td></td>
</tr>
<tr>
<td>Loco. repairs</td>
<td>2,683 1 5</td>
<td>591 15 8</td>
<td>3,274 17 1</td>
<td></td>
</tr>
<tr>
<td>Rates and taxes</td>
<td>1,348 11 2</td>
<td>301 19 8</td>
<td>1,650 10 10</td>
<td></td>
</tr>
<tr>
<td>Books, stationery stamps etc</td>
<td>224 15 3</td>
<td>41 16 7</td>
<td>266 11 10</td>
<td></td>
</tr>
<tr>
<td>Manufactory</td>
<td>814 15 1</td>
<td>176 14 9</td>
<td>991 9 10</td>
<td></td>
</tr>
<tr>
<td>Gas Works</td>
<td>365 4 8</td>
<td>87 3 8</td>
<td>452 8 4</td>
<td></td>
</tr>
<tr>
<td>Law expenses</td>
<td>618 15 1</td>
<td>179 1 8</td>
<td>797 16 9</td>
<td></td>
</tr>
<tr>
<td>Schools</td>
<td>126 8 4</td>
<td>31 4 1</td>
<td>157 12 5</td>
<td></td>
</tr>
<tr>
<td>Donations</td>
<td>168 11 4</td>
<td>30 16 8</td>
<td>199 8 0</td>
<td></td>
</tr>
<tr>
<td>Cart Roads</td>
<td>14 0 11</td>
<td>4 4 10</td>
<td>18 5 9</td>
<td></td>
</tr>
<tr>
<td>Water Works</td>
<td>421 8 4</td>
<td>92 18 0</td>
<td>514 6 4</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£11,421 5 1</strong></td>
<td><strong>3,237 1 4</strong></td>
<td><strong>17,678 10 8</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Balance Sheet Book, 1841-63 [D3808].
The post-1856 accounting system so far described was much the same as its predecessor except that the transfer prices were closer to market than had been the case between 1838-47. It also contains four important innovations. The first concerns the treatment of joint costs. A number of entries for overheads, which had previously been debited to the general profit and loss account for the entire business and not traced to individual profit centers, were now entered on a separate schedule headed "Establishment Charges." Table 3 shows that the establishment charges (which cover some overheads of a general character as well as those clearly associated with production) were then allocated between the "proportion for collieries" and "proportion for castings" (foundries); i.e., nothing was charged to the ironstone pits whose entire output, at this time, was transferred to the pig iron department (furnaces) or to the pig iron department whose entire output was transferred to the castings department (foundries) [see Table 2]. The method of apportionment between collieries and castings is not clear and varies from 3.5:1 to 5.6:1 for individual items.

---

22 Interestingly, some of these entries previously appeared in the profit and loss account as credit as well as debit entries, indicating that at least some of the activities measured were treated as profit centers themselves, with production profit centers re-charged for the services they received.
### TABLE 4

#### Cost of getting coal

**Half year ending June 1856**

<table>
<thead>
<tr>
<th></th>
<th>Staveley</th>
<th>Hollingwood</th>
<th>Victoria</th>
<th>Springwell</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wages, viz</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bank</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpenters, smiths  etc</td>
<td>1½</td>
<td>1¼</td>
<td>2¼</td>
<td>2¼</td>
</tr>
<tr>
<td>Carters, labourers</td>
<td>½</td>
<td>1¼</td>
<td>¾</td>
<td>2¼</td>
</tr>
<tr>
<td>Enginemen, firemen</td>
<td>½</td>
<td>¾</td>
<td>2¼</td>
<td>¾</td>
</tr>
<tr>
<td>Hanging on, bank &amp; weighing</td>
<td>3¼</td>
<td>3½</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Leading &amp; stacking</td>
<td>2½</td>
<td>8¼</td>
<td>5½</td>
<td>10/4</td>
</tr>
<tr>
<td><strong>Underground</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting, including head in stalls</td>
<td>2/1</td>
<td>2/5½</td>
<td>3½-</td>
<td>2/0½</td>
</tr>
<tr>
<td>Putting</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5¼</td>
</tr>
<tr>
<td>Heading</td>
<td>1</td>
<td>4½</td>
<td>-</td>
<td>7½</td>
</tr>
<tr>
<td>Horsekeepers &amp; horse drivers</td>
<td>1¼</td>
<td>1¼</td>
<td>2½</td>
<td>3¼</td>
</tr>
<tr>
<td>Engine plane</td>
<td>2</td>
<td>3½</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Switchkeepers &amp; incline</td>
<td>1¼</td>
<td>2½</td>
<td>5</td>
<td>1¼</td>
</tr>
<tr>
<td>Ventilators, airways</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>furnace etc</td>
<td>1</td>
<td>2½</td>
<td>4½</td>
<td>2¼</td>
</tr>
<tr>
<td>New roads, airways</td>
<td>1</td>
<td>8½</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Road repairs, road &amp; nightmen</td>
<td>1½</td>
<td>3½</td>
<td>8½</td>
<td>6½</td>
</tr>
<tr>
<td>Overmen, foremen &amp; deputies</td>
<td>½</td>
<td>2/10½</td>
<td>1</td>
<td>4/9½</td>
</tr>
<tr>
<td><strong>Total wages</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>½</td>
<td>2/10½</td>
<td>1</td>
<td>4/9½</td>
</tr>
</tbody>
</table>

| **Materials & Wages, viz** |          |          |          |            |
| Pit waggons & repairs    | 2½       | 2½       | 2½       | 2½         |
| Pit timber              | 1½       | 2½       | 8½       | 5          |
| Metal punchions         | ¼        | 2½       | -        | 1¼         |
| Stat. eng: & pump repairs: & pumps | 2 | 2 | 2 | 2 |
| Stores, oil, ropes nails, candles etc | 2½ | 7 | 4½ | 5½ |
| Pit horses & horsekeeping | 2½ | 5½ | 8½ | 6½ |
| Pit rails               | ¼        | 3½       | ¼        | 2½         |
| Wrought up iron         | ¼        | 1½       | 1        | 1½         |
| Castings               | ¼        | ½        | ½        | ¾          |
| Carting                | -        | -        | -        | -          |
| Rent of land & surface damages | ¼ | ¼ | ¼ | ¼ |
| N.Marriott's men, stone, bricks etc | ½ | 1½ | 4½ | 2½ |

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TABLE 4
Cost of getting coal
(Continued)

<table>
<thead>
<tr>
<th>Proportion of Establishment Charges</th>
<th>2¼</th>
<th>2¼</th>
<th>2¼</th>
<th>2¼</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railway Wagon Repairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supers' &amp; clerk's salaries</td>
<td>2½</td>
<td>2½</td>
<td>2½</td>
<td>2½</td>
</tr>
<tr>
<td>Railway repairs</td>
<td>1¾</td>
<td>1¾</td>
<td>1¾</td>
<td>1¾</td>
</tr>
<tr>
<td>Locomotive department</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Rates &amp; taxes</td>
<td>¼</td>
<td>¼</td>
<td>¼</td>
<td>¼</td>
</tr>
<tr>
<td>Team Labour &amp; horse-keeping</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>Books stationery, stamps etc</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>Manufactory repairs of machinery etc</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>Gas Works, coal &amp; wages</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>Law expenses</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
</tr>
<tr>
<td>Stores, undivided balance of account</td>
<td>¼</td>
<td>¼</td>
<td>¼</td>
<td>¼</td>
</tr>
<tr>
<td>Hollingwood boat level</td>
<td>¼</td>
<td>¼</td>
<td>¼</td>
<td>¼</td>
</tr>
<tr>
<td>Donations</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Schools</td>
<td>1/-</td>
<td>1/-</td>
<td>1/-</td>
<td>1/-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Royalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
</tr>
<tr>
<td>2¼</td>
</tr>
<tr>
<td>3¼</td>
</tr>
<tr>
<td>2¼</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Cost</th>
<th>6/-</th>
<th>9/7</th>
<th>9/10¼</th>
<th>10/2¼</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on capital</td>
<td></td>
<td>9½</td>
<td>1/8½</td>
<td>7</td>
</tr>
<tr>
<td>Depreciation of capital</td>
<td>2</td>
<td>1/7</td>
<td>3/5¼</td>
<td>½</td>
</tr>
</tbody>
</table>

| Total Cost including interest and depreciation | 6/2 | 11/11½ | 15/0½ | 11/11¾ |

Source: Foundry Statements and Returns Book, 1856-79 [D3808]

Second, the journal and the ledger henceforth contain much less detail than was previously the case [D3808, Private Ledger, 1856-63; Journal, 1856-59]. The ledger accounts contain no physical quantities and, in the main, transfers between departments were made just once a year. Therefore, whereas prior to 1856 it was possible to find out a great deal about business operations from a perusal of the ledger, the informational content is much reduced thereafter.

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23 For example, in 1860 there was a single transfer from foundries to castings on June 30 of £25,317. 12. 11 [D3808, Private Ledger, 1856-63].
The third important change was the introduction of the Foundry Statements and Returns Book [D3808] which ran through from 1856 to 1879. This document contains the physical data previously available in the ledger, and also a significant amount of new material including comparative statements, for similar activities and/or consecutive time periods, usually prepared on a half-yearly basis. The tabular presentation used is illustrated in Table 4 which sets out the cost of getting coal at four of the company's mines in the first half of 1856. It provides cost per ton statistics for each item of input together with subtotals for “Bank Wages,” “Underground Wages,” “Materials & Wages,” and the “Proportion of Establishment Charges”. This tabular format was also used for the purpose of summarizing the overall results of individual departments [see Table 2]. From 1856, the annual accounts also contain, for each department, full details of costs and revenues. It seems likely that average unit cost figures for production inputs contained in the Foundry Statements and Returns Book were prepared by dividing the total cost of each item appearing in the ledger and dividing them by separately recorded totals for physical output. The emphasis on physical as well as financial measures is implicit in the range of additional statements generated at Staveley on a routine six-monthly basis.

The Foundry Statements and Returns Book, together with the analyzed final accounts, therefore provide a clear picture of both the nature of business operations and the financial interpretation of these activities suitable for the purpose of identifying waste and inefficiency (by comparing performance over time), assessing the comparative performance of different departments producing similar products, and measuring the contribution of each department to overall profit.

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24 These were: the get, sales and consumption of coal; cost of getting ironstone; cost of calcining ironstone; loss of weight on calcining ironstone; sales and consumption of coke; cost of making coke; cost of making pig iron; average cost of all descriptions of castings.

The fourth and final change involved the removal of depreciation and interest charges from the final accounts. However, these items continued to be included in the calculations of cost contained in the Foundry Statements and Returns Book [Table 4]. Table 4 shows that the term "Current cost" was used to describe the aggregate of the following costs, using coal for illustration purposes — wages, materials, establishment charges and royalty. The term "Total Cost" was used to describe current cost plus depreciation and imputed interest on capital employed. We can therefore see that information was made available which would have enabled Barrow to assess whether the total cost of individual operations was covered by selling price.

1863-1900: The Staveley Coal & Iron Company, Ltd

Richard Barrow, having significantly extended the coal and iron making operations, in old age with no heirs, sold the business to a group of Manchester businessmen headed by Henry Davis Pochin. The Staveley Coal & Iron Company Ltd was incorporated to acquire the assets of Barrow's firm with effect from July 1, 1863.26 The well-known Victorian accountants David Chadwick [Cottrell, 1984] and James Edward Coleman [Jones, 1988, p. 214] were involved in the promotion of the company and in entering the originating transactions in the books of account. The firm, Chadwick, Collier & Co., was appointed auditor and Richard Barrow stayed on as chairman of the new company until his death in 1865.

The company was reasonably profitable during the first nine years of operations, very profitable between 1872-75, but profits then declined and were poor for a long period extending from 1878 to 1889. The early 1890s were again highly profitable, the mid-1890s a period of depression, followed by recovery which led to high profits by the turn of the century.

There was a considerable expansion of activities in the years

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26The purchase price was fixed at £491,824, satisfied by the issue of share capital amounting to £100,000 and the balance by installments, including interest, over the next six years. In line with the usual practice in Britain, during the late nineteenth century, industrial capital (in this case £285,000) was raised locally, mainly from the cities of Sheffield and Manchester. The new company was quoted on the Sheffield Stock Exchange from 1873, later also on the Manchester and Liverpool exchanges, and from 1899 on the London Stock Exchange.
up to the end of the century, but the broad organization of business operations and the way these were reflected in the accounting system remained unchanged. Indeed, certain books, including the Foundry Statements and Returns Book 1856-1879, were in use for the period spanning incorporation. The company's cost accounting practices continued to exhibit strong evidence of continuity, with changes periodically made presumably in an endeavor to ensure that the system matched perceived business needs.

One important modification was the re-introduction of a depreciation charge to the annual accounts which were now also prepared for external use, with the maintenance of capital being a major preoccupation of the directors throughout the remaining period covered by this paper [Edwards and Boyns, 1994, pp. 1163-67]. However, the practice of making notional charges for interest and depreciation at cost and profit center level was discontinued. The analysis of the establishment charges between departments interfacing wholly or partly with the market continued to be carefully carried out, with the basis of cost apportionment now clearer.

In 1870, for example [D3808, Balance Sheet Book, 1863-93], most establishment charges (salaries, books, stationery and stamps, law expenses, incidental expenses — save for a small amount charged directly to North Staveley Colliery — and travelling expenses) were apportioned between Staveley Collieries, North Staveley Colliery, and the Castings department on a per ton basis. The tonnages were calculated as follows: for the

27 Between 1860 (figures in parenthesis) and 1900, production (tons, round thousand) increased as follows: limestone 43,000 (7,000); coal 1,800,000 (299,000), pig iron 132,000 (12,000); and castings 69,000 (16,000) [Staveley Works balance sheet books 1841/2-1862/3; Staveley Coal & Iron Company Ltd.: detailed balance sheets 1893/4-1922/23].

28 A minor change was to allocate the "establishment charges" to profit centers within the ledger so that the balance in the ledger for, say, Hollingwood and New Hollingwood collieries was after deducting establishment charges which were, for example, £12,144. 16. 5 in 1870.

29 This basis was also used for railway repairs, schools, donations, water works, and workmen's hall, although in these cases the apportionment was only among the Staveley Collieries and the Castings department, implying that the North Staveley Colliery did not benefit from any of these expenditures. Rates and taxes for the North Staveley Collieries, which were presumably in a geographically separate location, were separately identified, whereas the amount for the Staveley Collieries and castings was again apportioned between each pit on a per ton basis. The costs of the manufactory and gasworks were apportioned...
collieries — their output; for castings, — the amount of ironstone, limestone and sand used to produce pig iron and castings, plus the output of the pig iron and castings departments. The logic underlying these apportionments is that establishment costs were a function of throughput and that inputs and outputs should be counted in only one department, so that all coal output was counted only in the collieries.

The approach remained broadly the same at the next decenniel date (1880) but there were some significant modifications. The total amount allocated to the castings and pig iron departments, on the basis of their combined throughput, was then split between those two departments in the ratio 2:1. This change was consistent with a desire to measure the profitability of departments which interfaced at least partly with the market. The decision was made in the early 1870s to expand pig iron production by the construction of additional furnaces (see below) and, whereas pig iron production was insufficient to meet the foundries' requirements in 1870, ten years later nearly half of the pig iron output of 61,526 tons was available for sale. The allocation of the total castings charge between the two foundries and the allocation of the total collieries charge between the ten collieries and two coke ovens was then made on a per ton basis.

between the Staveley Collieries and the Castings department, respectively, in the ratios 1:2 and 1:1. Because the term “Staveley Collieries” covered six separate pits, the total allocation was then shared among them on a per ton basis.

Working papers show that the tonnage figure for castings, for the purpose of the above allocation, was built up as follows: pig iron department — quantity of ironstone and limestone used plus pig iron sold; castings department — pig iron and sand used and castings made. This continues the logic of charging flows to only one department, with pig iron used to produce castings counted only in the latter department. Why these figures were then combined and the allocation instead made between castings and pig iron on a 2:1 basis is not clear, but it certainly affected the allocation as ironstone used was comfortably the largest of the relevant throughputs.

Other changes in the apportionment of establishment charges were as follows: rates and taxes were identified with each major center of activity; the cost of the manufacture was charged entirely to castings, save what appear to be notional charges of £200 and £50 respectively to collieries and pig iron; one half of the gas works expense was charged to castings — the basis for allocating the other half between collieries and pig iron is impossible to discern as is the method of splitting law expenses among all three departments.

It is interesting to note that, despite the emphasis on producing costing data, there does not seem to have been quite so much concern with its reliability. An apparent weakness was the inclusion in the department accounts of large
It is difficult to find any rational explanation for the allocation of establishment costs only to departments interfacing with the market. In circumstances where transfers were made at a figure designed to reflect market price, one would expect cost to be allocated between all operating activities in order to discover whether total departmental cost was covered by departmental revenue. It might be argued that establishment costs were not charged to departments transferring all their output internally on the grounds that such costs were unavoidable, and the essential question was whether production made a contribution to overall company profits. A problem with this line of argument, however, is that not all fixed costs were included under the heading of establishment charges. It might also be pointed out that the method adopted would have had greater logic if all transfers were made at cost; in such circumstances there would be little point in allocating to departments expenditure which would then be transferred, in total, to the next department down the line.

The method used to value interdepartmental transfers became the subject of the board's attention at a meeting held on November 22, 1875 [D3808, Minute Book, 1871-75]. A question arose as to the price charged for ironstone to the furnaces, and the secretary confirmed that it was charged at cost price. Following a discussion of which the details were not minuted, "it was resolved that, in future, the furnace should be debited at the market price so as to show if there was a gain or loss by the undertaking." At the next monthly board meeting, held on December 20, 1875, it was further resolved "that the system of book-keeping laid down by the board at its last meeting in respect of the Frodingham Glebe ironstone be applied to lime, sand, bricks, and all other materials supplied from one department of the company to another department as far as practicable."33

We might assume that the outcome was the production of more relevant data for assessment and decision making pur-

write-off's of capital expenditure from 1885 to 1900 amounting in total to £246,380. However, a record was maintained of such amounts written off, and it would presumably have been possible to interpret the calculations of departmental profit and unit cost in the light of this knowledge.

33 We saw, above, that the lime kiln and the brickyard had previously been treated as separate profit centers in the period 1838-41.
poses. And we might surmise that the downturn in profitability, in 1875, following four very good years focused the minds of management more sharply on the need for meaningful accounting information. The report made by the directors to the shareholders at the end of the year contains the following passage of relevance in this context:

the extraordinary inflation of the Coal and Iron trades must inevitably lead to very great competition in the future, and there is not the slightest doubt that the development of the iron and coal trades is now far in excess of the requirements of the trade of the country.\(^{34}\)

The analysis considered so far cover periods of six months or a year. Evidence survives for the late-nineteenth century of attempts also made to monitor performance on a weekly or monthly basis.\(^{35}\) Weekly Cost Books detailing operations of individual furnaces cover discontinuous time periods between 1885-1933; the first was for the period November 21, 1885 to January 3, 1891 [D1185]. There is a weekly sheet for each of the three furnaces then in blast which contains unit cost data broadly similar to that appearing in the Foundry Statements and Returns Book.\(^{36}\) In addition, the weekly sheet shows yield data for individual inputs and a column for "remarks" which provided a record of events to help explain increases/decreases in cost/profit. For example, the entry for March 27, 1886 reads: "No 2 furnace stood 124 hours for repairs and alterations to throat. Blast off 5 am Monday March 22nd. Blast on 9 am Saturday March 27th."

Also relevant for the purpose of monitoring performance was the analysis book [Sheffield City Library, SIR31] kept by the company's accountant, Robinson. It contains a miscellaneous range of calculations, records and analyzes for 1879 onwards, including the following items:

- Calculations of the comparative make of pig iron taking four months of 1879 and five months for each of the following two

\(^{34}\) Shareholders were also warned that "profits obtained during the past year are due, in a great measure, to the very favourable contracts which remained unexecuted at the commencement of the financial year."

\(^{35}\) It is of course a possibility that financial statements covering shorter periods than six months were prepared before 1879, but that they have not survived.

\(^{36}\) One difference was the inclusion of a single round sum for establishment charges which began at £90 per week and was increased to £140 in June 1886 when the number of furnaces in blast was reduced from three to two.
years. In the first year there were five furnaces in operation, in 1880 six furnaces, and in the following two years seven furnaces. Calculations were made of the average make per furnace per month and per day, presumably to enable valid comparisons to be made and conclusions drawn.

* A comparison, based on a month in 1883, of the cost of coke used to smelt a ton of pig iron. The results were Ireland coke, 2s 6.91d; Wells and Company's coke, 2s 1.53d and Springwell coke, 1s 11.61d. The conclusion reached was that Wells was 19¾% better than Ireland, Springwell 25¾% better than Ireland and 7½% better than Wells.

* An analysis of activity at the new foundry where pipes and castings were manufactured. Statements were prepared for four or five-week periods, commencing the four weeks ending April 25, 1896 and continuing until 1900. They show the tonnage of pipes and castings manufactured, and cost per ton in respect of the following expenses: coal and iron, establishment charges, haulage, wages, fuel, land and manure, carbon, timber, repair, sundries, stores, wrought iron, steel and brass. There then follows a statement which shows for various employees, the tonnage manufactured, total cost and cost per ton. At the bottom of the sheet total and unit cost was compared with sales figures to give a profit figure. There is a similar analysis for the old foundry.

ACCOUNTING DATA AND STRATEGIC DECISION MAKING — 1863-1900

During the period 1863-1900, there is much evidence of the use of ad hoc accounting reports to help tackle pressing business problems. It is instructional to refer to some of these reports, as they provide an indication of the topics considered deserving of top management attention, of the use made of accounting data, and of strategic decisions reached which influenced the long-term developments at Staveley.

Soon after the Staveley Coal & Iron Company Ltd was incorporated, its board of directors realized that expenditure was needed both to improve the infrastructure of the company and to ensure its longer-term viability and position in the industry. Planning was difficult in the nineteenth century iron and coal industries, with demand fluctuating considerably in response to changing business conditions. It was therefore important to structure the business so as to achieve maximum production flexibility while, at the same time, balancing the needs and capa-
bilities of the various departments. In this context, there was a need to operate a sufficient number of furnaces to be able to match those in blast with current requirements, and to have available a guaranteed supply of essential materials — coal, ironstone and coke.

The second directors' report, for the year to June 30, 1865, indicates that the developmental process was already underway with the purchase of the North Staveley Collieries at Aston for £25,353, an acquisition which proved of inestimable value to the company. A report from Markham to the board, dated December 16, 1867, contained an estimate of the additional cost that would be required to increase the production of coal by 25% from the present level of 800,000 tons per annum. As the existing collieries were working at or near full capacity, Markham advocated three initiatives designed to achieve the desired objective: the sinking of an additional pit at Hollingwood; increased production at North Staveley; and a new sinking at Waterloo to be worked in connection with the Springwell Colliery. Markham then turned to an examination of the resource implications of any decision to expand production. The analysis identifies, in detail, the cost of sinking the new pit and further essential, related expenditure on colliers' cottages (it being increasingly difficult to get colliers to travel from urban centers where jobs were becoming more readily available) and railway wagons. The estimated financial requirements were £100,000, made up of 200 cottages at £90, 600 railway wagons at £70, and the new sinking at £40,000 [Report, December 16, 1867, p. 7].

A further important strategic decision, reported by the directors in 1870, was to build two additional furnaces, making six in all (further increased to eight by 1874) in order to reduce the amount of pig iron which, as noted above, needed to be purchased from outside at this time. We can infer the use of routinely generated internal costings to help reach this decision from the directors' observation that the company "can manufacture pig iron as cheap as other firms ... [and] ... are of opinion that an increased production of pig iron will be attended with profitable results" [Directors' Report, 1870]. Markham's knowledge of relative costs is also demonstrated by his claim that, in 1874, the company could make pig iron as cheaply as its north of England competitors [Chapman, 1981, p. 78]. Later, in 1885, Markham maintained that "nearly all Derbyshire furnaces were smelting at a loss and that Staveley was one of the few that could show any kind of profit margin" [Ibid., p. 79].
It is interesting to speculate on the extent to which cost and profit data for individual companies were readily available. It is difficult to believe that firms were comfortable with the idea of such information being made available to competitors. But iron and coal were close-knit industries at this time, with the same people on the boards of competing concerns (and probably holding significant shareholdings in each of them) and companies using the same business advisors (the services of William Armstrong and Chadwick, for example, were widely sought after). It is therefore likely to have proved difficult to prevent information drift, even when determined efforts were made to prevent this happening. For example, on February 2, 1895 [D3808, Minute Book, 1888-95], the board "resolved that none of the costs of the company to be communicated by any of the officials to anyone without the previous consent of the board."

Capital expenditures, once made, were then carefully monitored. A report from Markham to the board, dated January 20, 1868, re-examines an estimate of £73,000 made on August 27, 1866 to cover a range of expenditure including new pumping engines for the Speedwell and Seymour pits, the development of the North Staveley Collieries, and the Waterloo sinking. The remaining work outstanding, together with revised estimates, indicated further necessary expenditure totaling £60,800 [p. 16]. Markham believed that, although the company had sufficient money to finance operating activities, it would be necessary to provide separately for the above expenditure "which cannot be postponed with advantage" [p. 16]. The directors' minutes for October 19, 1868 [D3808, Minute Book 1866-71] show that expenditure was carefully monitored, with Markham explaining that his January estimate would not be significantly exceeded. There are a number of other references to monitoring the cost of new projects, and the process was formalized by a board minute of November 24, 1891 [D3808, Minute Book 1888-95] by which

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37 Armstrong, an engineering consultant based in Ferry Hill, Durham, was engaged by companies in the north east of England for a variety of business purposes. At Staveley, he was engaged to value the collieries and ironworks at the date of incorporation and to advise, subsequently, on the company's depreciation policy. At Bolckow Vaughan, Armstrong was consulted on a wider range of matters, including cost levels. The arrangement with Armstrong entered into in 1869 is detailed at the directors' meeting held on 21 April [directors' minute book number 2].

38 The then current position was that £17,170 had been spent and he estimated that £46,250 was required to complete the work.
"The secretary was instructed to keep a book for presentation to the board of all authorised expenditures, the estimated cost and the actual expenditure."

In addition to estimates of the cost of new investments, there is evidence of formal attempts made to evaluate the impact of a new scheme on the company’s financial position. In his report dated December 16, 1867, for example, Markham informed the board that a new blowing engine was being constructed. His preoccupation with financial stability may be inferred from the use of the payback method of capital investment appraisal to evaluate the financial implications of this project: "Even in the present depressed state of trade I believe the additional furnace that has been put up will save the Company [in] the first year of its working one half of the present outlay of capital that has been incurred" [p. 9]. It appears that the rapid recovery of the investment was possible because the company was able to manufacture iron at a price 10s less than they could buy it outside [Ibid.].

A board minute dated September 21, 1868 [D3808, Minute Book 1866-71] focuses on the financial implications of a proposal to change operating procedures. Under the heading "Blast furnaces gas, reduction in production of iron," Markham reported that workers "have taken gas from two of the furnaces and are burning it under the stoves and three boilers." Further, that results so far appear to establish the fact that the production of iron from the furnaces is materially reduced, and that the quantity of coal used in the furnaces has increased. A statement has been prepared showing that the make of the furnaces monthly since number three furnace was blown in, and a note made when the gas was taken off from each of the furnaces and the results appear to be unsatisfactory. The make-up of iron for the past month has been at the rate of £2. 12. 11¼ per ton. The coal and ironstone have both been charged at reduced rates as compared with the corresponding period of last year, consequently the cost compared with the other period has materially increased.

The value of the small coals to the boilers is comparatively small, and the fact that we have made our iron at about 48s per ton with a considerable portion of our own stone, renders it essential that the whole of the question, should be examined with great care.
A further illustration of the use of accounting data for strategic decision making is implicit in the following entry in the directors' minutes under the heading "Blast furnaces." Markham reported on and "referred to the stock of pig iron on hand: owing to the unremunerative prices to be obtained and the decreased demand in the present state of the trade, he considered it advisable to blow some of the furnaces out in preference to increasing the stock, which was chiefly 'forge', as he did not think it would be sold for some time to come owing to the change going on in the trade" [D3808, Minute Book 1866-71, June 23, 1879].

REVIEW OF THE EVIDENCE

The Role of Accounting

Questions which we attempt to explore further here are, who used cost accounting data for decision making, for what purpose, and was it relevant? The dominant personality at Staveley between 1863 and his death in 1888 was Charles Markham. He was recruited by Pochin from the Midland Railway Company where he was one of its senior engineers. As was common in the iron and coal industry, the Managing Director (more often carrying the title General Manager at this time) produced a monthly report for the board. No copies of those prepared at Staveley have survived, and we can only speculate as to their accounting content based on the few references made to Markham's reports in the board minutes.

Of most interest in the present context is that, in response to a request made on February 17, 1868 [D3808, Minute Book 1866-71], Markham presented the board [March 16, 1868] with a statement showing the comparative cost of getting coal, and of the sales and profit for each of the four years ending June 1867. We do not know whether this was a regular occurrence, but lack of board comment on such matters suggests that it was not. We therefore conclude that at Staveley the day-to-day management of the works was the responsibility of Markham and his deputies who headed individual departments.

Turning to decisions of a strategic character, which usually involved financial outlay, we find the board members more heavily involved, although it is doubtful whether they did much more than agree with Markham's conclusions. The archives suggest that cash flow was the principal concern when making strategic decisions, with management possibly convinced that a new
investment would prove profitable provided the current level of efficiency could be maintained for an expanded output. Having negotiated long-term leases at the time of incorporation, there was a determination to make the investment work and, provided financial stability could be maintained, management remained confident that the company could outperform its rivals. The fact that the company was incorporated at what proved to be a low capitalization [Edwards and Boyns, 1994, p.1156] no doubt helped in this direction.

Concerning the nature and purpose of the routinely prepared reports, we find at Staveley between 1838-1900, in common with the position between 1690-1783, the complete integration of the cost and financial records; the use of transfer prices to measure departmental profits; and the use of unit costs, analyzed in detail, for comparative purposes both between activities and over time. This type of information may be compared and contrasted with that found by Johnson [1972] at the Lyman Mills textile company for the 1850s where an integrated cost and financial accounting system was in use, but where it was principally concerned with building up figures for the cost of production. Johnson [1972, p. 474] concluded that such calculations were clearly being prepared for management looking “inwards on the shop, and not outwards on the industry.” The basic aim was to control internal plant operations; for example, to gauge the physical productivity of the mill operatives, to assess the impact on operations of changes in plant layout and to control the receipt and use of raw cotton. That is, the emphasis was on cost identification and control.

The cost accounting data at Staveley were adequate to provide an input for these kinds of decisions, but also others. In particular, departmental profit data provided management with the information required to assess the relative profitability of different collieries, furnaces, foundries and ironstone pits; to enable management to discover whether, and the extent to which, total business costs were covered by revenues; to reach closure decisions; and to identify the financial advantage to be gained by squeezing out the middle man. It should also be noted that the detail appearing in the Foundry Statements and

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39 Although there were these broad similarities, the amount of costing data generated increased significantly over time.

40 The inclusion of depreciation and imputed interest, from time to time, is further evidence of an awareness of the need to cover total costs in the long run.
Returns Book 1856-1879 would have allowed management to examine movements in individual costs. In other words, *total cost per unit* was calculated, but there is no evidence to suggest that management was preoccupied with this single measure as the basis for performance assessment or decision making. Elements of direct cost per ton could be used to monitor efficiency, while the careful observation of movements in fixed establishment costs per ton would presumably underline the advantages of working at full capacity.

The lack of surviving evidence of the use made of routinely prepared costing data is disappointing but, perhaps, unsurprising. The questions which such evidence would have been expected to illuminate; e.g., the degree of waste and inefficiency, were matters principally for the consideration of managers lower down the managerial hierarchy. We might expect that, in circumstances free from any constitutional obligation to retain a formal record of what was said (such as the obligation to record the meetings of boards of directors in robust minute books), communication of information was often by word of mouth or in a written form less likely to have stood the test of time. Nevertheless, we can see from evidence occasionally recorded in the minute books that Markham was fully familiar with the cost of operations both at Staveley and elsewhere.

We are perhaps able to gain further insight into the purpose of Staveley’s accounting system from contemporary assessments made by two distinguished scholars. According to Robert Hamilton (1788), Professor of Philosophy in the Marischal College, Aberdeen, “When a person is engaged in several branches of manufacturer, whether on different materials, or on the same materials through several successive stages, he should keep his books in such a manner as to exhibit the gain or loss on each” [quoted in Solomons, 1952, p.6]. While, according to Charles Babbage [1832, p. 203], Lucasian Professor of Mathematics at the University of Cambridge from 1828 to 1839:

The great competition introduced by machinery, and the application of the principle of the sub-division of labour, render it necessary for each producer to be continually on the watch, to discover improved methods by which the cost of the article he manufacturers may be reduced; and, with this view, it is of great importance to know the precise expense of every process, as well as of the wear and tear of machinery which is due to it . . .

One of the first advantages which suggests itself as
likely to arise from a correct analysis of the expense of the several processes of any manufacture, is the indication which it would furnish of the course in which improvement should be directed.

It is clear that the system at Staveley was capable of satisfying these kinds of priorities fairly well.

The Process of Accounting Innovation

In *The Visible Hand* [1977], Chandler's survey of the extant literature led him to conclude that, Springfield Armory and the railways aside, U.S. accounting systems were little concerned with costing matters until the 1850s when, as noted above, managers at the Lyman Mills pioneered important new developments. We have seen that Hoskin and Macve have since re-examined the significance of developments at the Springfield Armory in the light of "the West Point connection" and concluded that they paved the way for革命izing accountability based on the measurement of the productivity of the workforce.

By the 1880s, considerable cost accounting progress had undoubtedly been made in the U.S., and cost sheets prepared for the Carnegie steel company were found to be far more detailed and accurate than the system of cost controls in the leading textile companies and elsewhere [Chandler, 1977, p. 268]. Of relevance for the Hoskin and Macve thesis is the observation made by a contemporary worker at Carnegie that "The men felt and often remarked that the eyes of the company were always on them through the books" [quoted Ibid., p. 268]. But there were other, and wider, applications for the accounting system which, Chandler [Ibid.] judged, included "the evaluation of the performance of departmental managers, foremen, and men"; "to check the quality and mix of raw materials"; "to evaluate improvements in process and in product"; "to make decisions on developing by-products"; to price "nonstandardized items"; and to help decide whether or not to "accept a contract". Our study of the accounting system operated at Staveley shows that, in Britain, costing developments started far earlier and in certain important respects went beyond those revealed by Johnson's [1972] examination of the Lyman Mills records even if, by 1880, they had not achieved the sophistication of data generated at Carnegie. Nevertheless, while the system operated at Staveley from 1690 to 1900 exhibits substantial continuity, it also exhib-
its changes made in response to new business and organizational circumstances.

These findings also require us to modify the interpretation placed on what Solomons [1952, p. 17] has termed "The Costing Renaissance." The starting date of the Staveley records, 1690, predates the first known text on double entry bookkeeping which gives consideration to tracking internal flows of goods [Collins, 1697]. This pioneering text was followed by just a handful of publications [cited in Solomons, 1952, pp. 4-17; Edwards, 1989, pp. 313-14] over a period of almost 200 years which considered the implications of adapting techniques developed for a mercantile economy to industrial needs. Nevertheless, industrial concerns such as Staveley were using costing techniques and developing them as the need arose. Thus Solomons' suggestion that "to a great extent they [the authors cited] were only rediscovering ideas that were becoming of practical importance for the first time, but which could certainly have been found, though perhaps in an undeveloped state, in earlier works" [1952, p. 17, emphasis added] needs to be elaborated, since it is becoming increasingly clear that the rediscovery suggested by Solomons was, in fact, confined to the literature.

The evolution of Staveley's cost accounting system, commencing seven years before the publication of Collins' text, can be seen as a perfectly natural process which may have been replicated elsewhere in Britain as well as in other countries of the world. In such cases there was a need for neither a "rediscovery" nor a "renaissance" in cost accounting; the managers were convinced of the value of costing information throughout. This demand/response explanation for accounting development is recognized as a driving force also in the U.S., where railway managers were aware of the need for a constant flow of information as a prerequisite for efficient railroad operation. This brought a revolution in accounting; more precisely, it contributed substantially to the emergence of accounting out of bookkeeping. The techniques of Italian double-entry bookkeeping generated the data needed, but these data, required in far larger quantities and in more systematic form, were then subjected to types of analysis that were new. In sum, to meet the needs of managing the first modern business enterprise, managers of large American railroads during the 1850's and 1860's invented nearly all the basic techniques of modern accounting [Chandler, 1977, p. 109].
We do not claim that Staveley's system met all the managers’ financial information requirements, nor even that it was as good as it should have been. For example, we find no explicit evidence of the employment of standards or “norms”. Neither have we been able to tie down the method of overhead apportionment in all cases. However, we do find evidence of an endeavor to establish causal relationships (what are referred to today as “cost drivers”), while the use of “norms” based on trial runs has been discovered elsewhere in far earlier times [Edwards, Hammersley and Newell, 1990], and we might speculate that similar experiments provided yardsticks at Staveley. In other words, the detailed cost and yield calculations may have benefitted from comparisons with norms as well as between time and activity.

The findings from this research go beyond the question of the type of the calculations made and their usefulness for the purpose of decision making. They also suggest the need to re-examine the nature of the development of cost accounting and to incorporate in that re-examination a recognition of the fact that similar explanations may well not apply to developments in both Britain and the United States due, for example, to the differential circumstances of industrial development, particularly the fact that industrialization occurred earlier and at a steadier rate in Britain, and that the labor market possibly exhibited different characteristics in the two countries.

Attention must also be paid to changes in business conditions, and their impact assessed. The circumstances at Staveley over a period in excess of 300 years demonstrate important similarities and dissimilarities. The works comprised an integrated business operation throughout, with ironstone pits, furnaces

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41The problems that growing industrialization produced for industry were listed by Edwards (1937), including the following which, one imagines, would have worried management at Staveley — the need to control, supervise and pay large numbers of employees; the need for cost and output details relating to various processes as a check on waste and inefficiency; the need to know prime costs so that decisions about price-cutting could be made when demand was slack. Edwards also commented on the importance of interest as an element of total fixed cost with it being estimated that, by about 1833, interest accounted for about one quarter of a cost of bar iron. We might add that management would also have been interested in total costs to assess the extent to which these were covered by prices and to judge the company’s ability to survive and prosper in the long run. (This matter did not receive emphasis from Edwards who was a determined advocate of marginal cost and a severe critic of the arbitrary apportionment of overheads.)
and foundries' common features. Important changes occurred over time, however, which included the following: charcoal purchased from outside producers was replaced as a source of fuel by coal supplied from collieries owned by the company; the production of pots and pans for domestic use was replaced by cast iron pipes for a business and municipal market; and the slitting mill used in earlier times to convert bar-iron into nails was closed down. The scale of operations, of course, increased enormously with pig-iron production rising from approximately 500 tons in the 1750s to 132,000 tons in 1900, while coal production increased from zero to 1.8m tons per annum, the bulk of which was sold to contribute the major proportion of the company's reported profit at the later date. Judged against this latter criterion, we can conclude that the accounting system at Staveley displayed a high degree of continuity and, with little evident difficulty, was adapted to meet perceived management requirements in an evolving organizational structure which produced massive growth in the scale and scope of operations and numbers employed.

The Need for Further Research

What is the significance of this study for the present debate concerning the nature of management accounting development? On the whole, we see it as providing greater support for economic rationalist rather than Foucauldian-based explanations. This does not mean that we disagree with conclusions reached concerning the importance of events at West Point and the Springfield Armory for the development of managerialism, nor that "the development of cost and management accounting [in the U.S.A.] might be traced to the influence of the engineering graduates of the military academy at West Point" [Hoskin and Macve, 1988, pp. 37-8]. However, we do question whether the case made by Hoskin and Macve is in certain respects overstated, and whether they have underestimated the significance of events elsewhere for the development of management accounting. For example, is there sufficiently strong evidence to justify their claim that the "birth of accounting out of bookkeeping" in terms of the disciplinary effect on workers [1988, p.68] is sustainable? The uses to which accounting information

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42 We have noted in this paper that Britain looked to the U.S.A in 1950 for leadership in the development of management accounting systems.
is put are many and various, including pricing, preparing estimates, measuring the profitability of departments and products, calculating the yield from material inputs, identifying waste and pilferage, assessing labor efficiency and helping management make investment decisions. These seem to go far beyond concerns with “human accountability” [1988, p.37] which is the essence of the Hoskin and Macve thesis.

We have shown that costing information capable of illuminating many of the above management problems was produced at Staveley and, in a few cases, we have been able to cite clear evidence of the way in which it was used in relation thereto. We therefore conclude that Staveley’s accounting function, despite the lack of explicit attention to human accountability, comprised a system of management accounting within the definition of that term laid down in the 1950 Productivity Report. Nevertheless, we would agree that the reasons for the apparent failure to impose labor norms and measure deviations therefrom is a matter which requires further investigation since it may possibly be a factor which helps explain Britain’s relative economic decline after 1870. Whereas systems of scientific management were adopted rapidly in the United States under the influence of Frederick Taylor and others, it is not until the 1920s that we find evidence of them being introduced in Britain [Littler, 1982] or of any attention being devoted to standard costing in the British literature [Stelling, 1924; Renold, 1927]. The existing evidence suggests that, during the period covered by this paper, British management preferred to rely on some combination of subcontracting, piece rates and direct supervision to achieve adequate labor efficiency, and the question of whether British management either considered it desirable or practical to impose disciplinary control through norms is a topic worthy of investigation. At Staveley, concern with waste and efficiency, to the extent that this extended to the performance of labor, appears to have relied on observations of changes in the wages of different categories of labor per unit of output. The extent to which this served as a

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43 Comparable wordings can be found in modern management accounting texts.
44 Current knowledge on this issue in the British context remains limited. Certainly, it does not seem sufficient to justify Locke’s [1979a; 1979b] conclusion that inferior accounting technology was a significant factor explaining Britain’s poor relative performance.
45 Progress was even slower in France with standard costing not receiving widespread adoption until the 1960s.
spur to action is largely hidden from researchers into this archive and must await the discovery of more revealing primary data.

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Abstract: This paper provides an overview of the influence of Newtonian mechanics on the development of neoclassical economic theory and highlights Fisher's role in the popularization of the resulting mechanical conception of economics. The paper also portrays Fisher's *The Nature of Capital and Income* — a work which has been aptly characterized as the “first economic theory of accounting” — as the first move toward the colonization of accounting by economics. The result of Fisher's influence has been a paradigmatic linkage between the Newtonian world view of science, neoclassical economics, and mainstream academic accounting thought. The picture that emerges from this linkage is then used as a backdrop against which the emerging challenges to economics-based accounting thought are highlighted.

Prior to the twentieth century, accounting writings were primarily “how-to-do-it” treatises detailing the techniques of record-keeping and financial statement preparation [Gaffikin, 1987, pp. 18-9]. There was little, if any, treatment of accounting theory; and academic accounting research as we know it today was virtually non-existent [Bricker and Previts, 1990, p. 4]. This situation began to change shortly after the turn of the century. Political debates were raging regarding labor issues and the social, economic and political implications of huge corporations and trusts. The significance of accounting practices was gaining visibility as a result of their roles in these issues [Merino, 1993, pp. 164-5]. The phenomena of absentee ownership and professional management were being recognized as potentially problematic with respect to accountability issues. And capital markets were beginning to take on an increasingly important and visible role with respect to the financial well-being of individuals, businesses and the overall economy. It was into this environment that accounting began to be incorporated in academic curricula at the college and university level, states began to license
accountants, and professional accounting organizations were being formed [Bricker and Previts, 1990, pp. 4-5]. It was a political and economic environment that proved to be increasingly receptive to efforts to locate accounting within a larger theoretical perspective.

Looking retrospectively from the other end of the twentieth century, it is increasingly clear that neoclassical economics became the dominant theoretical perspective for evaluating accounting practices and for generating new views of accounting and accountability [Hopwood, 1992, pp. 128-30]. Thus, accounting techniques have been widely promoted on the basis that they are politically neutral tools for generating objective factual evidence that is useful in the pursuit of efficiency, both within the firm (for managerial decision-making) and outside the firm (for investor and creditor decision-making). And corporate accountability issues have been framed primarily within the narrow confines of market economic theory [Benston, 1982, pp. 89-94]. The mainstream tendency to view accounting practices through the lenses of engineering and machine efficiency is, of course, not incidental; it is largely attributable to the fact that twentieth century accounting thought has been dominated by an economic theory which was inspired by Newtonian mechanics [Mouck, 1994b, pp. 2-7].

In this paper, my aim is to elaborate upon a relatively neglected chapter 1 in the story of how accounting came to be located within the framework of neoclassical economic theory. I must note at the outset that this chapter is essentially a U.S. story; albeit one that is relevant to the much broader international history of twentieth century accounting thought. Specifically, I am concerned with the unique role played by Irving Fisher's role in accounting thought has not been totally ignored. It has been recognized in a handful of articles, such as Chambers [1971] and Lee [1975; 1979]. But it has been omitted or mentioned only in passing by most works on accounting history. For instance, the American Accounting Association's Statement on Accounting Theory and Theory Acceptance includes a discussion of "classical approaches to theory development" [1977, pp. 5-10] but includes no mention of Fisher. Mattesich [1984] states that "[t]he endeavour to cast the foundations of accounting into postulates forming the logical bases for other statements, goes back to Paton's Accounting Theory [1922/73]" [p. 28]. Gaffikin's [1987, pp. 18-9] study of "The Methodology of Early Accounting Theorists" discusses Sprague's The Philosophy of Accounts [1907] but omits any mention of Fisher. Previts and Merino [1979, pp. 169 & 222-3] include only a brief mention of Fisher's influence. Other authors, such as Flegm [1984, p. 184], relegate Fisher to a footnote.

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Fisher in this story. It is my contention that the mechanistic character of twentieth-century accounting thought is, to a large extent, the legacy of Irving Fisher whose 1906 publication, *The Nature of Capital and Income*, has been dubbed “the first economic theory of accounting” [Schumpeter, 1954, p. 872].

Fisher’s role in this story should prove interesting in and of itself, but it also offers a unique potential to add depth to our understanding of the impact of broader social and intellectual movements on the character of twentieth century accounting thought. Fisher’s academic training at Yale placed him at the crossroads of the dominant currents of turn-of-the-century intellectual thought. At Yale, for instance, he was strongly influenced by Willard Gibbs, one of his professors who was also a major contributor to the emerging theory of thermodynamics [Samuelson, 1967, p. 19]. Fisher’s training in science is clearly reflected in his writings on economics; thus offering a valuable view of the extent to which mechanistic thinking underlies economics and its intellectual offspring, twentieth century accounting thought. He was also influenced by William Graham Sumner, a Yale economist who was famous (at that time) for his unabashed espousal of a social Darwinist approach to economic policy.  

Fisher later rejected the extreme views of Sumner, but it was Sumner who suggested that he write a dissertation on mathematical economics. The result of this suggestion has been described by Fisher as follows: “... I became fascinated with Cournot, with Walras, and with Jevons ... . This is how I happened to choose the subject of my thesis, which was founded ... chiefly on Walras and Edgeworth” [quoted in Fisher, 1956, p. 45].

It is interesting to note that another famous American economist, Thorstein Veblen, also attended Yale University and came under the influence of Sumner. This fact will prove quite significant for the history of twentieth century economics and accounting thought. Veblen rejected Sumner’s *laissez faire* economics, but developed his own theory of social evolution which,
in turn, became a cornerstone for his institutionalist economic theory. As Spiegel [1971] notes, institutional economics “was a characteristically American movement with unique features of its own, lent to it by its connection with the American philosophy of pragmatism. Veblen was a student of Charles Peirce’s and a colleague of John Dewey’s …” [p. 628]. And as Merino [1993, pp. 173-5] makes clear, institutional economics informed a view of accounting and accountability that briefly, during the first three decades of this century, challenged the neoclassical economics view of accounting and accountability. The best known articulation of an institutionalist view of accounting was by DR Scott in The Cultural Significance of Accounts [1931]. Institutional accounting can, in an important sense, be seen as “the path not taken”.

A brief exploration of “the path not taken” is relevant to the present paper is several respects. First, it serves as a reminder that the paradigmatic linkage of physics, neoclassical economics and accounting, as promoted by Fisher, did not go unchallenged. It suggests that the work of DR Scott can be seen as an alternative paradigmatic linkage of evolutionary science, institutional economics and accounting. Second, the nature of this alternative is relevant to the present story because it emphasized the cultural, social and political implications of accounting practices. Because of this, it can serve as a backdrop against which the socio-political implications of the Fisherian paradigm can be seen more clearly. Whereas Scott’s institutionalist paradigm served to highlight the broader implications of accounting practices, the Fisherian paradigm served to hide such implications behind a vocabulary of “value-free” machine efficiency. Third, the story of “the path not taken” suggests a strong parallel between the institutionalist paradigm and the “new accounting research” which serves, according to Morgan and Wilmott (1993), “to make visible some of the conditions and consequences of accounting practices, and the ways in which accounting(s) contribute(s) to the processes of social and organizational (re)production” (p. 5). Finally, for each of the major components of the institutionalist paradigm a historical thread can be drawn linking it to an emerging theoretical perspective which is currently challenging the various components of the Fisherian paradigm. Thus, highlighting the contrast between the Fisherian paradigm and the institutionalist paradigm may facilitate the development of new set of paradigmatic linkages among the contemporary challenges to the Newtonian world-view, neo-
classical economics and mechanistic accounting thought.

Thus, my aim is not merely to fill the historical gap regarding Fisher's contributions to accounting thought, although that hopefully will be a side-effect of this paper. My primary objective is to portray Fisher's intellectual contributions (consisting of a unique blend of accounting, economics, finance and physics) as a backdrop against which emerging challenges to the mainstream economics-based accounting research paradigm can be rendered more visible; a backdrop against which the economics-based accounting research paradigm can be rendered more problematic and more susceptible to change. In pursuit of this objective, the paper is laid out in four sections. The first provides some biographical background on Fisher and describes his mechanistic worldview. The second describes how the main currents of twentieth century accounting thought can be viewed as the "legacy" of Irving Fisher. The third provides a brief overview of "the path not taken". And the fourth section provides an overview of the emerging challenges to mechanistic accounting thought, one of which is a new evolutionary view of economics.

IRVING FISHER AND HIS MECHANISTIC WORLDVIEW

Fisher's fascination with mechanical gadgets was manifested by a lifelong habit of dabbling in inventions. Among other things, he invented a sundial, a folding chair, a bizarre bed to maximize the circulation of air, and a cardex filing system. The cardex system was the most important to his financial life. It became the basis for a small firm which "merged with its chief rival to form the nucleus of what was known as Remington Rand and has since been enlarged into Sperry Rand" [Fisher, 1956, p. 161]. But the most relevant "gadget" for the present paper was the mechanical contraption (a "price level mechanism" — see Illustration I) which he invented to illustrate the mechanical workings of market economic forces by means of pipes, levers, cisterns, and so forth.

Fisher's price level mechanism vividly demonstrates the seriousness with which he viewed mechanistic market forces, but his concern with mechanistic efficiency was also applied to his personal life. In fact, it could be argued that he attempted to emulate the rational, calculating *homo economicus* of his economic theories. For instance, in the biography written by his son (Irving Norton Fisher) it is revealed that "[h]e added his professorial goatee, after calculating precisely how much time he would conserve in an average life-time by not shaving" [1956,
ILLUSTRATION I

Fisher's price level mechanism.
Reproduced from Fisher, 1925, p. 38.
p. 17]. And with respect to Frederick Taylor, the efficiency expert, Fisher is quoted as follows: "I've been reading the life of Frederick Taylor and I felt throughout as though I were reading my own biography. I don't mean the events are alike but the character, ideals and methods of thought and work seem so much like mine . . . " [p. 215].

Even his religious views, which were apparently formulated after his recovery from tuberculosis, reflect an attitude of mechanistic fatalism. His letters reveal a view of the Universe as a deterministic, clockwork type of machine:

When and how was the great machine we call the Universe set going and why was it pre-arranged in the particular way it was, so that out of it must have come all that did come out and will come out down to the minutest details . . .

Whatever its meaning, of one thing I am convinced: That it is for us to approve and not disapprove. It is perfect because it is impossible of variation by a hair's breadth. The wheels of time never jump the track. What we call mistakes are deviations from our provisional programs. The Program of Fate is never altered. [quoted in Fisher, 1956, p. 86].

And he describes "Prayer" as "the same thing as communion" with the Universe as it is. "For me it ['Prayer'] could never be a calculated request, for I feel that God's books for the future are already made up" [quoted in Fisher, 1956, p. 83]. The key to religious experience, accordingly, is "[t]o feel union with the infinite and submission and even joy in whatever fate is made for us . . . " [quoted in Fisher, 1956, p. 83].

On the other hand, Irving Fisher was a tireless crusader in his efforts to change the course of events. His crusading was primarily focused on issues of health, world peace, and stable money. For instance, in a 1925 letter, he notes that, "my dreams now are of (1) getting America into the League of Nations, (2) expanding the Life Extension Institute, (3) developing the Eugenics Society and (4) Stabilizing the Dollar . . . " [quoted in Fisher, 1956, p. 222]. But how would he reconcile his crusading effort with his attitude toward Fate? Fisher addressed this question in a different context as follows: "Napoleon was asked why, if he believed in fatalism, he didn't sit still and let empire come to him. He replied that he was fated to fight for it" [quoted in Fisher, 1956, p. 86].
With respect to his crusading efforts, it will be noted that his economic crusading was focused on the issue of stable money. This issue, it seems, was the only area in which he thought that mechanistic economic forces could not be relied upon for efficient results. Other crusaders who worked for more fundamental economic change were considered to be ignorant of the true laws which governed economic and social affairs. There is evidence that Fisher had developed such characteristically strong views as early as 1887 when he was a Junior at Yale, as evidenced by his contribution to a public-speaking contest. His topic was "Liberal Education and Social Needs" and excerpts have been quoted by Fisher [1956, p. 29] as follows:

... there is a class who have just reached the stage of theorizing. They are a strange excrescence of modern civilization, known under the various names of Socialists, Communists and Anarchists.... These would-be reformers with their dangerous mixture of knowledge and ignorance and those of the labor leaders that without reason and without profit block the wheels of industry must have their eyes opened to the great laws they are violating.

In sum, every aspect of Irving Fisher's life and character indicates an affinity for the mechanistic character of neoclassical economic theory with its emphasis on economic laws, "efficiency" and quantifiable calculation. It is not surprising, therefore, that in response to Professor Sumner's nudge toward the literature of "mathematical economics" for a doctoral thesis, the young Fisher quickly became fascinated with the work of Walras and Jevons [Fisher, 1956, p. 45]. Their mathematically precise economic theories that tended to subsume all human social behavior under universal economic laws — laws in tune with the physical laws of the universe — must have resonated powerfully with his love of mathematics, his admiration for science, and his desire for rational certitude. The linkage that was constructed between physics and economics is reviewed briefly below before turning to Fisher's version of mechanistic economics.

Physical Mechanics and the Emergence of Neoclassical Economics

Eighteenth century intellectuals were captivated by the rigor and beauty of Newton's explanatory model of the physical world. With the concept of the law of gravity, Newton had
brought the movement of the planets, the oceanic tidal movements, and the interaction of physical objects on earth all under the umbrella of a single explanatory model; a model that could be specified with mathematical precision and logical clarity; a model that demonstrated the symmetry and timelessness of universal cycles and essential dynamic processes. The Newtonian model of the physical universe was thus profoundly inspirational with respect to the search for an intellectual scheme that could explain the workings of the newly emerging hodge-podge of social, political, and economic practices. The Newtonian model of the physical world fueled the expectation that a comparable explanatory model of the social world could be found; an expectation that has been summarized succinctly by Berlin [1956, p. 27] as follows:

Men were objects in nature no less than trees and stones; their interaction could be studied as that of atoms or plants. Once the laws governing human behavior were discovered and incorporated in a science of rational sociology, analogous to physics or zoology, men's real wishes could be investigated and brought to light, and satisfied by the most efficient means compatible with the nature of the physical and mental facts.

The building blocks for a Newtonian view of the social world were provided by the philosophy of John Locke in the form of ontological individualism. And Locke's theory of property rights gave rise to the labor theory of value which, in turn, became a cornerstone of Adam Smith's classical theory of economics; a theory that explained how the natural working of market mechanisms in which each person is moved by his or her self-interest will result in a harmonious and stable system that provides the optimal well-being not only for individuals but for society as a whole. It is hardly surprising, therefore, that Lowe [1965] should find "a striking affinity between the central problem of a theory of the market and the Newtonian theory of Mechanics. Both try to derive the state and motion of aggregates from the state and motion of their components" [p. 31]. As Rothschild [1992] points out, "Where Newton explained that gravity was the central force holding the universe together, Smith argued that individual self-interest held human society together" [p. 32].

The publication of The Wealth of Nations in 1776 is generally viewed as the originating intellectual achievement of classical economics. For almost a century, classical economic theory
was subjected to various theoretical refinements by Ricardo, Mill, and others. Then in the 1870s and 1880s, a major transformation began. Mirowski [1988] has argued convincingly that the "identifiable discontinuity in economic thought in the 1870s and 1880s which was the genesis of neoclassical theory . . . can be explained by parallel developments in physics in the mid-nineteenth century" [p. 13]. Mirowski points out that all the major figures in the "marginalist revolution" liberally employed metaphors from physics. The most notable (Jevons, Walras, and Pareto) had been trained in science or engineering — Jevons was a student of chemistry and mathematics and both Walras and Pareto were trained as engineers [Mirowski, 1988, pp. 20-21]. Furthermore, in their writings they all made explicit references to the influence of nineteenth century physics.

But the evidence does not end with the use of physics types of metaphors. Mirowski demonstrates clearly how "the neoclassical theory of the maximization of utility was derived directly from the immediately preceding innovations in physics in the 1840s through 1860s" [1988, p. 31]. Jevons, for instance, in *The Theory of Political Economy* [originally published in 1871] derived the criteria for utility maximization (the ratio of relative prices must be equal to the corresponding ratio of marginal utilities) directly from the model of the mechanical lever — a derivation in which utility is related, by implication, to potential energy. Ten years later, Edgeworth expanded Jevon's ideas on utility and developed the indifference curve form of analysis. "In his *Mathematical Psychics* he [Edgeworth] expanded Jevons's utility function by relating the utility of a good not only to the quantity of the good that an individual possessed or consumed but also to the quantities of all other goods possessed or consumed by the individual . . . " [Spiegel, 1971, pp. 525-526]. Edgeworth explicitly spelled out the relationship between energy and utility that was only implicit in Jevons' work:

> The application of mathematics to the world of the soul is countenanced by the hypothesis . . . that Pleasure is the concomitant of Energy. Energy may be regarded as the central idea of Mathematical Physics: *maximum energy* the object of the principal investigations in that

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*Mengers is excluded by Mirowski as a founder of neoclassical economics on the grounds that he was of the "Austrian school of economics". See Mirowski [1988, pp. 22-25] for a detailed argument to the effect that "the Austrians were not neoclassicals".*
science . . . 'Mecanique Sociale' may one day take her place along with 'Mecanique Celeste,' throned each upon the double-sided height of one maximum principle, the supreme pinnacle of moral as of physical science. As the movements of each particle, constrained or loose, in a material cosmos are continually subordinated to one maximum sub-total of accumulated energy, so the movements of each soul whether selfishly isolated or linked sympathetically, may continually be realizing the maximum of pleasure. [Quoted in Mirowski, 1988, p. 15]

Mirowski and Cook [1990, pp. 191-2] have further argued that the mathematics of energy was also used as the basis for the core theoretical analysis presented by Walras in his Elements of Pure Economics [originally published in two parts in 1874 and 1877]. Walras' "theoretical imagination" had been "fired", they suggest, by an explanation of the new physics which he had received in 1872 from Antoinne Paul Piccard, a French professor of mechanics [Mirowski and Cook, 1990, p. 192]. And indeed, in a subsequent paper entitled "Economics and Mechanics" [published in 1909] Walras set out, in the words of Mirowski and Cook, "to explore . . . the metaphor of utility as potential energy . . . [and] to convince the world of its legitimacy" [Mirowski and Cook, 1990, p. 202]. In the paper Walras presents his system of equations which result in the criteria for economic equilibrium at maximum satisfaction, and for comparison he also presents the system of equations that describe the mechanical equilibrium conditions for a lever type of machine in a steelyard. "The analogy", he says, "is obvious" [Walras, 1990, p. 209]. Furthermore, he points out that "the forces or raretes are vectors on the one hand, and energies and utilities are scalar quantities on the other" [Walras, 1990, pp. 209-210]. He then proceeds to demonstrate that "[t]he same analogy exists between economics and celestial mechanics" [p. 210], and he concludes the paper with the assertion that "economics is a mathematical science on a par with mechanics and astronomy" [Walras, 1990, p. 213].

_Fisher's Mechanistic Economics_

Schumpeter [1954, p. 829] has pointed out that, "In the United States, Walras acquired two first-rank followers, Fisher and Moore, but was practically ignored by the rest of the profession". Of these two, it was Fisher who attempted — indeed, with a good deal of success — to reach a mass audience with his
work, while Moore's work scarcely attracted followers even within the economics profession.\(^5\) Schumpeter [1951, p. 223] even went so far as to predict that Fisher's name "will stand in history principally as the name of this country's greatest scientific economist".

Fisher's work is especially interesting from an accounting perspective because of his attempt to provide an economic perspective for the measurement of income. Indeed, as noted earlier, his work on *The Nature of Capital and Income* [originally published in 1906] has been cited by Schumpeter as "the first economic theory of accounting ..." [1954, p. 872], and it provided the principal theoretical notion for income in Canning's *The Economics of Accountancy: A Critical Analysis of Accounting Theory* [1929]. Canning noted that he "considers Fisher's theory of income to be, by far, the best that has appeared in the literature" [1929, p. 145].

Fisher's dissertation, entitled *Mathematical Investigations in the Theory of Value and Prices* [1925], is also particularly interesting with respect to the relationship between nineteenth-century physics and neoclassical economics because it literally provides visual mechanistic models of the workings of "the ideal economic market" [Fisher, 1925, p. 44]. The physical components of Fisher's mechanistic models include stoppers, pistons, levers, pipes, and cisterns. In fact, the re-publication of his dissertation in 1925 includes a photograph of the actual physical mechanism which was constructed for classroom demonstrations. For a given commodity, each individual has a different sized "utility cistern", "cubic inches of water represents the number of units of the commodity ... consumed by the individual" [Fisher, 1925, p. 26], and so forth. Fisher also includes a short dictionary of terms from mechanics and their corresponding economic terms. "Force", for instance, corresponds to "Marginal utility or disutility", "Work" corresponds to "Disutility", and "Energy" corresponds to "Utility" [1925, p. 85]. In short, a more vivid illustration of a mechanistic view of economics is hardly imaginable. In the next section I examine how this mechanistic view of economics has influenced twentieth-century U.S. accounting thought.

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THE LEGACY OF IRVING FISHER AND THE "FIRST ECONOMIC THEORY OF ACCOUNTING"

Fisher's influence on twentieth century accounting thought can be viewed from three different perspectives, and I examine each of these in this section. First, and most specific, he did provide the first economic theory of accounting, thus grounding the notion that a "scientifically correct" measurement of income is possible, at least theoretically. The notion of income measurement in accordance with "scientific" economic theory had an impact beyond his own specific theory of income measurement. Thus, the second perspective on Fisher's influence on accounting is examined in conjunction with the so-called normative apriorist movement for "scientific" accounting practice which peaked in the 1960s and early 1970s. And third, though the strands of specific influence may be harder to identify, the emergence of capital market research in accounting, which has been promoted as "scientific" accounting research, can be seen as an extension of financial economics that resonates soundly with Fisher's views on economic reality, scientific research and public policy.

The First Economic Theory of Accounting

Gaffikin [1987] notes that Sprague's *The Philosophy of Accounts* [originally published in 1907 and reprinted in 1922] has been widely regarded as a seminal work in accounting theory in that it was "among the earliest attempts to establish a rigorous theoretical framework for the discipline" [p. 19]. Gaffikin goes on to point out, however, that the contribution was more on the order of indicating the need for a theoretical foundation than for actually providing one. "In the end, *The Philosophy of Accounts* tends to be not a developed theory but a manual of practice the author observed or perceived to be the most appropriate" [Gaffikin, 1987, p. 19]. Indeed, Sprague's [1922] work even contains chapters dealing with "The Trial Balance" [chapter XIV], "Posting from Tickets" [chapter XVII], and "The Detection of Errors" [Chapter XX]. The fact that it was widely recognized as a seminal work on accounting "theory" makes it an excellent reference point for gauging the significance of the new theoretical direction pioneered by Fisher in *The Nature of Capital and Income* [originally published in 1906 and reprinted in 1930]. Fisher pioneered a radical new direction for accounting theory in two important respects: first with respect to the nature of the
relationship between accounting theory and economic theory and second with respect to the theoretical significance of the concept of income.

Sprague [1922] scarcely refers to economic theory, and when he does [on pages 38 and 47] it is with reference to Fisher’s [1906] theory of capital. Based on his references to economic theory, it is likely that he viewed economic theory as an important aspect of background knowledge with respect to the environment in which accounting functions. It is quite clear, however, that he did not view economic theory as the framework within which accounting theory must be located. Fisher [1930a], on the other hand, very meticulously locates accounting theory within the broader context of economic theory. Specifically, he points out that *The Nature of Capital and Income* is intended to form “a sort of philosophy of economic accounting, and, it is hoped, may supply a link long missing between the ideas and usages underlying practical business transactions and the theories of abstract economics” [Fisher, 1930a, p. vii]. He accordingly begins the book with a three chapter introduction of “fundamental concepts”. Chapter I elaborates an economic definition of “wealth”, Chapter II traces the theoretical linkage between wealth and property rights, and Chapter III is a brief discourse on the definition and importance of the concept of “utility”. Fisher’s definitions of wealth, property and utility are subsequently used as the foundational concepts for his theory of capital and income.

Although Fisher [1930a] devotes three chapters to his theory of capital before turning his detailed attention to income, the latter is the more fundamental concept. This emphasis is in sharp contrast with Sprague’s view of the balance sheet versus the income statement: “The balance sheet may be considered as the groundwork of all accountancy ...” [Sprague, 1922, p. 30]. The balance sheet accounts, according to Sprague [1922], “might also be called the ‘exterior’ accounts, as they alone affect persons outside of the business ...” [p. 68]. The income statement, on the other hand, is presumed to be for internal use only. Sprague refers to the income statement accounts as “economic accounts”, and contrary to the balance sheet accounts, they are considered to be “‘interior’ ones, kept for the instruction of those inside” [1922, p. 68]. Sprague goes on to discuss the pros and cons of various approaches to recording, measuring and presenting income items, but he clearly does not share Fisher’s concern about the importance of a precise concept of income.
Fisher considers the concept of income to be fundamental to a coherent view of economic activity. In fact, in a subsequent work — The Rate of Interest [1930b] — he notes that,

A friendly critic, Professor John B. Canning, suggests that The Nature of Capital and Income should have been called “The Nature of Income and Capital” and that the subject matter should have been presented in reverse order, inasmuch as income is the basis of the concept of capital value and is, in fact, the most fundamental concept in economic science” [p. 3, n. 1].

Income, according to Fisher, ultimately consists of psychic satisfactions derived from the consumption of goods and services; and, as Lee [1979] points out, “Fisher regarded business entities as devices by which human beings could obtain enjoyment from consumption” [p. 326]. “Psychic income”, however, is subjective and unmeasurable. Objective measures of income must therefore be made at a previous stage. Thus, the flow of real physical objects of wealth into the possession of the individual may be viewed as “real income” even though the ultimate realization of income occurs with the enjoyment of the services provided by such objects (food, clothes, houses, etc.). In most cases, however, the events that constitute real income may be preceded by “money income”; that is, the inflow of money enables the individual to purchase the physical objects whose service in consumption will eventually yield psychic income.

But what is the source of income? The answer, according to Fisher, is capital. He defines capital in the most general sense as follows: “A stock of wealth existing at an instant of time is called capital [1930a, p. 52]. Income is the service provided by wealth. Thus, “[a] flow of services through a period of time is called income” [Fisher, 1930a, p. 52].

Fisher’s careful distinction between stock and flow concepts is reminiscent of his hydrostatic price level machine [Illustration I]. In his view, the failure to make this distinction has been a major source of confusion among economists [1930a, p. 59]. He also suggests that economists could have benefited from observing “business bookkeeping” practices.

A little attention to business bookkeeping would have saved economists from such errors; for the keeping of records in business involves a practical if unconscious recognition of the time principle here pronounced. The ‘capital account’ of a railway, for
instance, gives the condition of the railway at a particular instant of time, and the 'income account' gives its operation through a period of time. [Fisher, 1930a, pp. 59-60]

Fisher [1930a] also takes economists to task for their attempts "to mark off capital as that wealth which is 'productive'" [p. 58]. He maintains that his definition of wealth as "material objects owned by human beings" [1930a, p. 2] implies the desirability of potential services inherent in such objects. He further claims that, "[a]ll wealth bears income, for income consists simply of the services of wealth" [1930a, p. 58]. Thus with respect to the balance sheet (which he refers to as a "capital account"), Fisher considers all of the assets to be positive elements of capital. He further views the liabilities as negative elements of capital, so that the owner's "capital balance" is really the "net capital" [1930a, p. 68].

But what about the concept of income? If income is the flow of service that emerges from the use of capital, then in what sense is income the more fundamental concept? In the very broadest economic sense, Fisher considers income to be the most fundamental concept because (as psychic income) it refers to the "desirable events" which give "meaning to all economic phenomena" [1930a, p. 41]. In the more objective sense of business and finance, income is fundamental because it is the expectation of future income that gives capital its value. The linkage which allows the value of capital to be derived from expected future income is the rate of interest. The linkage is a very mechanical one; indeed, it is tautological since Fisher derives the rate of interest from the following ratio [1930a, p. 186]:

\[
\frac{\text{Value of services per unit of time}}{\text{Value of capital}} = \text{value return}
\]

As he notes, "If the income is perpetual and flows at a uniform rate, the value-return is called the rate of interest realized on capital" [1930a, p. 191]. It is clear that the value of capital in this formula is the present value of future income defined as "value of services". "The rate of interest acts as a link between income-value and capital value, and by means of this link it is possible to derive from any given income-value its capital-value, i.e., to 'capitalize' income" [Fisher, 1930a, p. 202].

Fisher goes on to explore various facets of the relationship between capital and income, many having to do with the issue
of capital maintenance. In fact, this issue is the basis for his distinction between realized income and earned income. Assume for instance that during a given time period a proprietor withdraws and spends an amount that is different than her earnings. In Fisher's view, this difference can only happen in conjunction with a change in capital. And since he views consumption (i.e., the psychic income resulting from the enjoyment of services) as the truer measure of income, the amount withdrawn and spent (consumed) is referred to as realized income. Thus, according to Fisher, these relationships can be expressed as follows: "... the general principle connecting realized and earned income is that they differ by the appreciation or depreciation of capital. It is thus possible to describe earned income as realized income less depreciation of capital, or else as realized income plus appreciation of capital" [Fisher, 1930a, p. 238].

Fisher further explored capital maintenance implications relating to sinking funds, depreciation funds, and repair and maintenance funds [1930a, pp. 239-247].

Fisher's theory of income served as the inspiration for Canning's influential work *The Economics of Accountancy* [1929] in which the latter attempted to explain Fisher's economic model and its significance for accounting theory. A less direct influence of Fisher's economic theory of accounting can be seen in the controversy over the use of current values in accounting statements. As Flegm [1984] points out, "the advocates for a change from the historical cost base, both past and present, have concentrated on the data needed to make an investment decision in a given situation based on an economists' view of 'income'" [p. 184]. At this point Flegm points out in a footnote that "The noted American economist Irving Fisher was the first to attempt to rationalize accounting and economics" [1984, p. 184]. Indeed, it is my contention that Fisher's contribution to accounting theory can be seen as the first serious move toward a colonization of accounting by neoclassical economics. It is also my contention that the movement toward a "scientific"
approach to accounting practice, which reached a peak in the
1960s and early 1970s, can be viewed largely as part of the
legacy of Irving Fisher and his economic theory of accounting.

The Normative Apriorists and "Scientific" Accounting Practice

During the first half of the twentieth century when account­
ing theorists were concerned with the articulation of a coherent
set of financial accounting principles, Fisher's economic theory
of accounting, especially as it was formulated by Canning
[1929], was one of the competing theoretical views, but it was
clearly not the dominant perspective [Previts and Merino, 1979,
chs. 5 & 6]. In fact, it could be argued that Fisher's influence on
accounting thought during this time was primarily due to his
role in the development and dissemination of neoclassical eco­
nomic theory which, in turn, was viewed by accounting theorists
as the dominant explanatory scheme with respect to the eco­
nomic environment within which accounting operated.

By the late 1950s, however, the emergence of a heightened
concern with the role of science in U.S. education began to filter
down to business schools and academic accounting programs.
This concern — which has been attributed largely to the Soviet
Union's successful launching of sputnik and the corresponding
fears that the U.S. might lose the "space race" and even the "cold
war" — was reflected in the Ford Foundation study that criti­
cized U.S. business schools for their lack of grounding in scien­
tific theories and techniques. The Ford Foundation study,
among other studies, contributed to the pressure for a wide­
spread reassessment of accounting theory. This atmosphere
paved the way for the emergence of an unprecedented concern
with the development of "scientific" approaches to accounting
theory. And since neoclassical economic theory was widely held
in high esteem for its "scientific" status, the time was ripe for
new articulations of the relationship between economic theory
and accounting theory.

The resulting movement in accounting theory, a movement
whose proponents have been labeled as normative apriorists7,
can be seen as a direct descendant of the spirit of Fisher's eco­

7Their theories have been characterized as normative because they at­
tended to prescribe "scientifically" correct views of accounting practice. They
were labeled apriorists because of their penchant for developing elaborate theo­
retical structures on the basis of postulates assumed apriori to have scientific
legitimacy.
onomic theory of accounting. The normative apriorists did not literally adopt Fisher's theory *per se*, but they resurrected his view that accounting theory must be grounded in economic theory. For the normative apriorists, economic theory was still important in terms of its theoretical explanation of the environment within which accounting operated, but it was also important in a much more direct sense, as a foundation for accounting theory.

Chambers, Mattessich and Sterling were arguably the most influential of the normative apriorists.\(^8\) They each developed book-length systematic treatises on accounting theory that articulated elaborate linkages with economic theory and emphasized their employment of scientific methodology: Mattessich's *Accounting and Analytical Methods: Measurement and Projection of Income and Wealth in the Micro- and Macro-Economy* [1964]; Chambers' *Accounting, Evaluation and Economic Behavior* [1966]; and Sterling's *Theory of the Measurement of Enterprise Income* [1970]. And they all three wrote specifically of the influence of Irving Fisher. Mattessich [1964] has references to Fisher's work scattered throughout. Sterling [1970] likewise contains numerous references to Fisher plus an entire chapter entitled "The Fisher Tradition" [pp. 211-245]. Chambers [1966] contains no direct reference to Fisher, but he does make several references to Canning [1929]. Chambers elsewhere has written directly of "Fisher's Legacy" [Chambers, 1971, pp. 137-149], and he has indicated [in Chambers, 1979] that "Canning's work was one of the earliest analytical studies of accounting that came to my notice when, 15 years after its publication, I became seriously interested in what stood as the theory of the subject" [pp. 764-5].

As noted earlier, the normative apriorists were critical of the specific details of Fisher's economic theory of accounting. It is clear, however, that Fisher's work established an intellectual perspective within which the normative apriorists' various theories can be seen as part of the legacy of Irving Fisher and the "first economic theory of accounting". As Sterling remarks with

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\(^8\)Gaffikin [1988] notes that "four people stand out as having made the most significant contributions to ... [the] increasing methodological sophistication: Chambers, Mattessich, Devine and Sterling" [pp. 16-17]. I leave Devine out of the current list of the most influential theorists of this movement, because he never developed an over-arching theoretical structure for accounting theory. As Gaffikin notes, "Devine's contribution is as a commentator ..." [1988, p. 17].

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respect to Fisher’s theory of income, “If we were to accept Fisher’s thesis, this study would end at this point; therefore it is clear that we must disagree in order to continue” [1970, p. 10]. And Chambers, in a review of “Canning’s The Economics of Accountancy — After 50 Years”, suggests that if Canning had clearly delineated the distinct functions of “past information, present facts, and future prospects in the decision-making process” the linkage between accounting and economics might have been more clearly understood and Canning’s work might have served as a point of departure for a rigorous theoretical restructuring of accounting theory [Chambers, 1979, p. 774]. In any event, if Fisher’s The Nature of Capital and Income [1906] can be seen as the first serious move by an economist to colonize accounting, it is apparent that the normative apriorists breathed new life into that movement. This implication is vividly supported by the following quote from Mattessich [1964]:

Accounting is concerned with the theoretical and practical problems of measuring various aspects of the income or flow of wealth phenomenon and hence may be considered a service discipline which cannot be studied in isolation but which must be viewed in the setting of a threefold relationship: (1) in dependence with its master discipline ‘economics,’ (2) in relation with the other tributaries of economics and business administration, and (3) in connection with the needs of economic practice. [p. 12]

Finally, it must be noted that the normative apriorists also followed in the legacy of Fisher with respect to his penchant for mechanistic assumptions and explanations. Chambers [1966], for instance, asserts that

The laws of human behavior in a society in which a significant part of interpersonal intercourse is mediated by money and in which such behavior is informed by monetary calculation are no less adequate and compelling bases for deriving means of coping with human problems than are the laws of motion” [p. 371].

Mattessich [1964] goes to great lengths to integrate his analytical accounting models with engineering types of operations research models, with computer systems models and with econometric models for simulating economic events. He strongly implies that such models belong to a family of models of which Irving Fisher’s hydrostatic price level model can be seen as a revered ancestor [Mattessich, 1964, p. 321]. And Sterling in a
later work, *Toward a Science of Accounting* [1979], makes even more explicit connections with Fisher's mechanical model.

Wealth is a stock; income is a flow. Stocks are a function of flows, and flows are a function of changes in stocks. We cannot measure one without also at least implicitly measuring the other... This is true of mass flowing in and out of a system or of water flowing in and out of a bathtub, as well as income flowing in and out of a firm... Therefore, if the stocks are correctly measured, the net flows are also correctly measured. If the flows are correctly measured, the stocks are also correctly measured.

I present this general relationship of stocks to flows in an attempt to lay to rest an ancient, pervasive myth in accounting. That myth is that one can have an accurate measure of flows while having an inaccurate measure of stocks. Specifically, that one can have an accurate income statement (flows) which yields an inaccurate balance sheet (stocks). [Sterling, 1979, p. 194]

Sterling follows this passage with an arithmetic example of gallons of water in a bathtub and calculations of net flows, etc. All of this is in support of his view of "the income statement as an explanation of the changes on the balance sheet" [1979, p. 196] and his emphasis on the importance of a common unit of measure in terms of observable market prices.

In spite of their shared concern with the development of a "scientific" theory of accounting and their shared emphasis on the integration of accounting theory with economic theory, the normative apriorists were never able to agree on the details of such a theory, or indeed even the general outline of such a theory. Mattessich, Chambers and Sterling often engaged (via published articles) in very contentious disagreements, often displaying open contempt for each other's work. In fact, Mouck [1993, pp. 39-41] has argued that their inability to formulate a coherent research paradigm contributed to the "revolution" in financial reporting theory that Beaver [1989, p. 18] characterized as the replacement of an "economic income" approach by an "informational perspective". The "informational perspective", however, was not a movement away from an economics-based...
paradigm, nor was it a rejection of the ideal of "scientific" accounting theory. It was an academic movement away from the concerns of "scientific" accounting practice in favor of a paradigm that focused on "scientific" accounting research [Mouck, 1993, p. 44]. And even though the informational approach to financial reporting theory abandoned Fisher's concern with a theory of income, it can still be seen as a major extension of the legacy of Irving Fisher.

Financial Economics and "Scientific" Accounting Research

As Whitley [1986, pp. 175-7] has pointed out, the development of modern portfolio theory (MPT), the efficient markets hypothesis (EMH) and the capital asset pricing model (CAPM) in the 1950s and early 1960s paved the way for the transformation of business finance into financial economics. Essentially this transformation can be seen as an extension of the neoclassical economics paradigm; an extension from a focus on the markets for real goods and services to a broader focus that now includes the workings of financial markets. This broader focus, in conjunction with the recently developed ideas in information economics, allowed Ball and Brown [1968], Beaver [1968], Foster [1973], Gonedes [1972] and other academic accountants to extend the reach of financial economics to include the "market" for accounting information. In short, the informational perspective meant that financial accounting research became capital markets research; it became a sub-paradigm of neoclassical economics.10

Fisher, of course, had contributed much of the early theoretical work upon which financial economics was developed. As Hakansson [1984] points out, "One link among accounting, economics, and finance that is familiar to all of us is the present value formula under certainty. This formula has served as a minor cornerstone of all three fields for decades . . . " [p. 60]. And it was Fisher [1930a] who provided the pioneer work in this area for all three fields. Furthermore, Fisher [1930a, Chapter XVI] extended his analysis beyond conditions of certainty, to include a discussion of chance and "the risk element". In the same book, Fisher applied his present value analysis to the determination of the value of annuities, bonds, and "any income

10See Mouck [1993, pp. 41-5] for a Kuhnian interpretation of this transformation of academic accounting research.
stream whatever" [1930a, pp. 202-226]. He also discussed the possibilities of hedging against risk [1930a, pp. 299-300]. His subsequent book, *The Theory of Interest* [1930b] expands his analysis of these issues; issues that are fundamental to financial economics.

There is, however, a more important sense in which the capital markets research paradigm may be seen as a continuation of the legacy of Irving Fisher; and that has to do with his emphasis on “rational” choices regarding time preferences and lifetime consumption. Fisher considered the rate of interest to be “the link which binds man to the future and by which he makes all his far-reaching decisions” [quoted in Fisher, 1956, p. 131]. He elaborates as follows:

The rates of preference among different individuals are equalized by borrowing and lending or, what amounts to the same thing, by buying and selling. An individual whose rate of preference for present enjoyment is unduly high will contrive to modify his income stream by increasing it in the present at the expense of the future. The effect will be upon society as a whole that those individuals who have an abnormally low estimate of the future and its needs will gradually part with the more durable instruments, and these will tend to gravitate into the hands of those who have the opposite trait. [quoted in Fisher, 1956, pp. 133-4]

In like fashion, the “informational view” of financial reporting theory can be seen as an expansion of Fisher's theory of financial markets to include accounting information. This expansion has been succinctly described by Lev and Ohlson [1982] as follows:

The link provided by capital market theories connects the accounting information system to its function in capital markets. Information has a dual role in these markets. First, it aids in establishing a set of equilibrium security prices that affects the allocation of 'real' resources and the productive decisions implemented by firms. Second, it enables individuals to exchange claims to present and future consumption across different states, thereby attaining both preferred patterns of lifetime consumption and the sharing of societal risks. This explicit conceptualization of the role of information in capital markets appears to provide the elusive operational framework for the systematic analysis of alternative accounting information systems. The out-
come of the economic system, as a function of the information system, can now be analyzed. [p. 252]

In sum, the development of the informational perspective on financial reporting — a perspective which has been characterized as "modern financial reporting theory" [Brown, 1987, p. v] — can be seen as a product of "economic imperialism". From this perspective it is clear that, if Fisher's economic theory of accounting was the first serious move toward colonization of accounting by economics, "modern financial reporting theory" (i.e., the capital markets research paradigm) can be seen as the ultimate move in that direction. In a nutshell, the colonization of accounting by economics is the real legacy of Irving Fisher's "economic theory of accounting".

The result of this colonization has been succinctly captured by Hines (1989a, p. 62) as follows:

Mainstream accounting research views accounting as communicating economic reality and as being an economic good. Markets are implicitly assumed to be naturally occurring, and the demand-supply-price mechanism is seen as impersonal and value-free. The costs and prices which financial accounting communicates are seen to emerge as products of this impersonal mechanism.

As Hines further points out, this has significant political implications.

When prices and costs are taken as natural, and the result of impersonal forces, this protects from scrutiny the socio-political processes by which they are created and sustained. It also blocks from view the existence of the power relationships which create and sustain prices, and hence incomes, wealth and resource allocations. On the contrary, the status quo is legitimated by social practices such as research which takes it as given and value-free. [Hines, 1989a, p. 63]

11"Economic imperialism" refers to the attempt by economists to expand the authoritative domain of economic theory and method to other disciplines in an effort to dominate the field of discourse in those disciplines. Economist Gary Becker was awarded a Nobel prize for his leadership in this movement. The imperialistic tendency of economics is discussed in detail by Radnitzky and Bernholz [1987]. See Mouck [1995, pp. 537-539] for a discussion of economic imperialism and "modern financial reporting theory".
Furthermore, since neoclassical economic theory was inspired by, and following Fisher has attempted to mimick, Newtonian physical mechanics, the proponents of “scientific” economics-based accounting research have tended to claim the prestige and status that is often associated with the Newtonian world-view of physics.

It must be noted, however, that the mechanistic view is not proceeding unchallenged. As we approach the end of the twentieth century, new and formidable challenges to the mechanistic view (in physics, economics and accounting) are emerging. Before turning to those challenges, however, a quick look at “the path not taken” (in terms of the interrelationship between accounting, economics and science) during the first third of this century may provide additional focus for surveying the emerging challenges to the mechanistic view.

THE PATH NOT TAKEN

The Fisherian legacy can be portrayed as a unique linkage between Newtonian mechanical physics, neoclassical economics and “scientific” accounting thought. It is interesting to note, however, that a competing linkage among science, economics and accounting emerged during Fisher’s most academically productive years (the 1890s — 1930s). The competing paradigm during these years linked Darwinian evolutionary science, institutional economics, and a socio-cultural view of accounting. DR Scott’s The Cultural Significance of Accounts [1931] is the prominent accounting treatise to emerge from this linkage, but Veblen’s economic thought is clearly the key link in the chain. Veblen is generally recognized as the founder of institutional economics, and it is Veblen’s view of economics that most explicitly undergirds Scott’s view of accounting.

As noted earlier, both Veblen and Fisher received their Ph.D.s from Yale, and both came under the influence of the social Darwinist William Graham Sumner. The result of Sumner’s influence, however, was radically different for Fisher than it was for Veblen. For Fisher, Sumner’s influence was manifested primarily in Fisher’s lifelong admiration for the methods of science and his attempts to solidify the “scientific” foundation of neoclassical economics. For Fisher, however, the “scientific” foundation for economics was not provided by the evolutionary views usually associated with Sumner; it was as we have seen, the mechanical world-view of Newtonian physics.
For Veblen, on the other hand, Sumner's espousal of evolutionary thought directly influenced his thinking about society in general and economics in particular. As Hodgson [1993] points out, "Veblen became immersed in evolutionary theory, and clear, enduring traces of both Darwin and Spencer can be found in his thought" [p. 124]. Veblen’s evolutionary social theory, however, was radically different from that of Spencer and Sumner.12 Whereas they took the individual to be the fundamental unit of social and cultural evolution, Veblen saw institutions as the fundamental unit, with individual habits of thought and action being influenced primarily by institutional factors. And whereas Sumner's social Darwinism was primarily a defense of laissez-faire capitalism, Veblen's evolutionary view of economics was fundamentally opposed to the existing economic order.

Unfortunately, Veblen's work is notorious for its lack of consistent and straightforward usage of terminology. Thus, there has been considerable disagreement among Veblen scholars with respect to precisely what he meant by the term "institutions". But the view that is most often associated with the "school of institutional economics" has been summarized by Oser [1963] as follows:

An institution is not merely an organization or establishment for the promotion of a particular objective, like a school, a prison, a union, or a federal reserve bank. It is also an organized pattern of group behavior, well established and accepted as a fundamental part of a culture. It includes customs, social habits, laws, modes of thinking, and ways of living... Economic life, said the institutionalists, is regulated by economic institutions, not by economic laws. Group social behavior and thought patterns that influence them are more germane to economic analysis than the individualism of the prevailing marginal type of theory. [p. 247]

Since institutions are always changing and adjusting to new environmental situations, the institutionalists rejected the neoclassical economist's static equilibrium analysis as well as the notion that market forces would automatically promote a harmony of interests. The institutionalists were accordingly able to

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12See Hodgson [1993, pp. 124-128] for a succinct overview of Veblen's knowledge of evolutionary thought and of his differences with the social Darwinism of Spencer and Sumner.
muster a substantial following during the first third of this century as economic reality increasingly diverged from the picture painted by the neoclassical theorists. The increasing concentration of economic wealth and power at the turn of the century, the increasing visibility of waste and conspicuous consumption that Veblen highlighted in *The Theory of the Leisure Class* [first published in 1899], and the massive and persistent unemployment of the Great Depression — all of these were increasingly taken as manifestations of the bankruptcy of the neoclassical economist's world-view. Indeed, as Oser [1963, p. 245] suggests, the rise and influence of institutional economics was curbed only when Keynes [in 1936] "created a more elegant theoretical system" that explained some of the most glaring problematic macro tendencies of capitalism without blatantly undermining the micro analysis of neoclassical theory.

In the meantime, however, "[t]he movement for social control and reform was gathering momentum" [Oser, 1963, p. 246]. And as Merino [1993, pp. 169-78] has pointed out, accounting practices and accounting theory played a significant role in the reform movement. The alternative views of accounting theory that were drawn upon during the economic reform efforts of the early 1900s were primarily associated with institutional economics and, as noted earlier, the related institutionalist view of accounting theory has been explicated at length by DR Scott.

In the second chapter of *The Cultural Significance of Accounts* [1931], Scott gives a preliminary overview of economic institutions and institutional change. In conjunction with this overview, he points out that, "the presentation most nearly embodies what appears to the writer to be the general position of the late Prof. T. B. Veblen" [1931, p. 28, n. 4]. In subsequent chapters he provides a sweeping overview of the historical evolution of economic institutions prior to settling down to his main theme — i.e., the changing role of accounts and accounting with respect to the changing economic institutions. A thorough review of Scott's [1931] work is beyond the scope of the present paper, but a brief summary of the most salient points should be sufficient to mark the extensive contrast of his view of accounting theory with the economics-based accounting theory that has been developed as part of the Fisherian legacy.

Scott [1931] points out that in the early stages of capitalism the competitive unit was the individually controlled enterprise and that in that environment the market and the law were the primary institutional forces relied upon for adjusting conflicts of
interest between individuals. The role of accounting was quite limited.

In the field of merchandising in which accounting first developed, the scope and function of accounts were limited, in the beginning, to recording decisions rendered by the market. A system of books constituted a record of transactions affecting one particular competitive interest. The theory of accounts involved nothing beyond setting up an efficient bookkeeping record. Accounting was, thus, entirely subordinate to the market and to law. [Scott, 1931, p. 197]

With the emergence of machine technology and the attendant rise of large scale enterprises characterized by absentee ownership, however, the role of accounting had changed dramatically. Scott points out that accounting in such organizations plays a major role with respect to internal management and control; a role that interweaves extensive statistical data with the traditional double entry accounting system.

A multiplicity of forms, the distribution of records over many departments, the summarization of data in statements which do not take the form of balance sheets and income statements and the keeping of records which do not run in money terms, are all parts of a system calculated to afford a maximum of information useful for the purposes of administrative control [Scott, 1931, p. 212].

The larger integrated role of accounting within the organization, Scott suggests, has done much to enhance the professional status of accountants. In his words, “Accountants came to be regarded as something more than mere grown-up bookkeepers” [1931, p. 210].

A more significant development, however, was the changing role of accounting with respect to outside institutions such as the law, markets and government. The expanded role of accounting, Scott maintains, was largely due to the emergence of a plethora of interests that are affected by the measurement of profit and the reporting of financial condition.

The typical accounting record has come to be a record not of one but of many interests. The relationships to be recorded and differentiated are many and various. Creditors, and customers, profit-sharing managers and employees, present and future stockholders, common and preferred stockholders, majority and minority stockholders, partners, bond holders and under-
writers represent some of the interests involved in modern enterprise. [Scott, 1931, pp. 202-203]

A major result of the new organizational and institutional realities was that accounting practices and accounting theory began to be embedded in legal arrangements, market transactions, and government regulatory practices. In Scott's words, "The principles of accounting, principles of law, accounting technique and the machinery of the market are all mixed up together in the process by which conflicting interests are adjusted" [1931, p. 202].

Covaleski and Dirsmith [1991, pp. 4-7] have contrasted Scott's view of accounting and accounting theory with the neoclassical economics view (i.e., accounting theory as developed within the Fisherian legacy). They couch their comparison in terms of "first and second order concerns of accounting research". The first order concern, they suggest, views "accounting information . . . [as] a technical device for coping with an objective world, rationally fostering efficiency, order and stability" [Covaleski and Dirsmith, 1991, p. 4]. It is my contention that this concern is wholly within the Fisherian legacy which sees accounting as a set of purely technical apolitical tools for the pursuit of economic efficiency. As they point out, however, this perspective ignores, or assumes away, the second order concerns raised by Scott [1931]; it "ignores the critical topic to be investigated — the role of accounting between internal organizational structures, ideologies, and processes and the society within which they exist" [Covaleski and Dirsmith (1991, p. 5]. Such second order concerns, they suggest, are quite relevant to a looming crisis in accounting research. Scott's [1931] work provides "a meaningful basis for addressing the significant issues embedded within the contemporary research crisis" [Covaleski and Dirsmith, 1991, p. 1].

In the next section, I provide an overview of some of the more salient challenges which are confronting the mechanistic Fisherian style of accounting thought. My overview of these challenges will, to some extent, support the contention of Covaleski and Dirsmith by pointing out important parallels between the emerging "new" challenges and the challenges posed by Scott's "institutional" view of accounting.
EMERGING CHALLENGES TO MECHANISTIC ACCOUNTING THOUGHT

Just as the Fisherian Legacy and the “path not taken” were construed in terms of paradigmatic linkages among science, economics and accounting, the most salient contemporary challenges to the mechanistic accounting paradigm can be construed in parallel terms. Chaos theory and complexity theory are challenging the reductionistic perspectives associated with the Newtonian scientific world-view; the “new accounting research” literature is challenging the narrow asocial, ahistorical and apolitical perspectives of mainstream accounting research; and the neoclassical economics paradigm is being challenged by a new evolutionary economics movement. This section contains a very brief overview of each of these emerging challenges.

The “New Accounting Research”

Morgan and Willmott [1993] use the term “new accounting research” (NAR) in a very broad sense “to identify accounting research that is self-consciously attentive to the social character of accounting theory and practice” [p. 3]. NAR rejects the positivistic methodological views of mainstream accounting research and tends to favor social constructivist methodological perspectives associated with Gadamer’s hermeneutics, Habermas’ critical theory, Foucault’s genealogies and archeologies, and Derrida’s deconstructions. In words that are reminiscent of DR Scott, Morgan and Willmott [1993] note that “NAR contrives to render visible, and amplifies, accounting’s wider social and historical constitution and significance as a technology of social and organizational control” [p. 4]. By rendering the socio-political implications of accounting more visible NAR tends to problematize the accounting practices and accountability relationships by which the status quo is reproduced. NAR can thus be seen as an attempt to counteract the previously cited conservative political role that is wittingly or unwittingly being perpetuated by mechanistic accounting research.

The wide-ranging scope of NAR projects can be illustrated with the following very limited list of examples. Tinker and Neimark [1987] have examined “The Role of Annual Reports in Gender and Class Contradictions at General Motors”. Hines [1988; 1989b] has examined the role of financial accounting in the construction and maintenance of the social world. Arrington and Francis [1989] have used Derrida’s techniques of
"deconstruction" to disclose the fundamental contradictions in agency theory. Boland [1989] has used Gadamer's hermeneutics as the basis for treating accounting as a text to be interpreted. Broadbent et. al. [1991] have used Habermasian critical theory to examine financial and administrative changes in Britain's National Health Service. Miller and O'Leary [1987] have used a Foucauldian analysis to examine the role of cost accounting in "the construction of the governable person". Preston and Chua [1993] have examined the role of hospital cost classifications in the rationing of health care to the elderly. And on and on.

NAR obviously poses a wide range of challenges to mainstream economic-based accounting research. The number of international journals which routinely publish such research has expanded to include the following: Accounting, Organizations and Society, Accounting, Auditing and Accountability Journal, Critical Perspectives on Accounting, Advances in Public Interest Accounting, and Accounting, Management and Information Technologies. Furthermore, international conferences which focus primarily on NAR — such as Interdisciplinary Perspectives on Accounting (held every three years in Manchester, England), Critical Perspectives on Accounting (held every three years in New York), and beginning in 1995, Asian Pacific Interdisciplinary Research in Accounting (scheduled to be held every three years) — consistently draw large numbers of participants. In sum, the challenge represented by NAR shows no signs of dissipating or of being co-opted by the mainstream.

With respect to the concerns of the present paper, the emergence of NAR can be seen as the rebirth of the socio-cultural accounting research movement that culminated with DR Scott over sixty years ago. There is, however, a very significant difference between Scott's socio-cultural research and today's new accounting research. Whereas the former was linked with an identifiable scientific perspective (Darwinian evolutionary theory) and an identifiable school of economic thought (institutional economics), the latter (NAR) is more closely aligned with certain areas of philosophy and social theory and has eschewed any significant affiliation with science or economics. In my view, however, the emerging theories of chaos and complexity as well as an emerging new evolutionary economics can be seen not only as challenges to the scientific and economics perspectives associated with the Fisherian legacy, but also as potential linkages that could be developed with NAR. Exploration of the latter notion — that some sort of intellectual linkage could be
developed between complexity theory, the new evolutionary economics and NAR — is obviously beyond the scope of this paper, but I shall attempt in the following sub-sections to provide at least a cursory indication of this possibility.

**Chaos and Complexity Theory**

The Newtonian scientific world-view upon which neoclassical economics is built presumes that: natural phenomena behave in accordance with fixed and immutable laws; effects are proportional to causes; and causality implies the potential for predictability. The Newtonian world-view is reductionist in its presupposition that knowledge of the behavior of the component parts is sufficient for explaining the behavior of the whole. That is, the behavior of the whole can be reduced to the behavior of the component parts.

Chaos theory has demonstrated quite precisely with mathematical models that causality does not necessarily imply predictability and that nonlinear dynamics can generate effects that are spectacularly out of proportion to causes [Prigogine and Stengers, 1984, pp. 167-70; Gleick, 1987, pp. 173-7; Peitgen et. al., 1992, pp. 42-59]. Chaos researchers have also demonstrated convincingly that the processes working in the mathematical models are also evidenced in many natural and social phenomena including turbulent dynamics of fluids and gases, weather patterns, geological developments, and social and political turmoil. The rapidly growing interest in the study of such phenomena has culminated in the emergence of a new interdisciplinary field of scientific endeavor that is variously termed “complexity theory” or “complex non-linear dynamic systems theory” or “complex adaptive systems theory”.

The Santa Fe Institute (SFI) has gained an international reputation as the leading center for the study of complexity theory [Lewin, 1992, pp. 9-10 and Waldrop, 1992, p. 12], and the studies reported by the SFI are further challenging the Newtonian world-view of science. SFI researchers, for instance, have demonstrated that perpetual novelty is associated with the behavior of complex adaptive systems, and that such perpetual novelty is frequently due to “phase transitions” that occur in systems operating far from equilibrium. Phase transitions are associated with the emergence of new phenomena that behave in qualitatively different ways than before the phase transition. The most far-reaching implication of such findings is that the behavior of the whole cannot necessarily be reduced to, and
explained by, the behavior of the parts; i.e., reductionism is invalid with respect to complex, non-linear dynamic systems. Indeed, Cohen and Stewart [1994, pp. 247-85] have cited such studies to suggest that "natural laws" may not be fixed and immutable; that natural laws may evolve. This is an enormously controversial suggestion, but at the very least, the studies of complexity have demonstrated the importance of history, not just with respect to social systems, but also with respect to the study of natural systems. In the jargon of complexity theory, outcomes are "path-dependent".

The developments associated with chaos and complexity theory have interesting implications for the themes of the present paper. Not only do they challenge the Newtonian scientific world-view which supports neoclassical economic theory and the related developments in accounting thought, they also draw more heavily upon evolutionary metaphors than upon the metaphors associated with physical mechanics. In this sense, chaos and complexity theory provide an interesting parallel with the evolutionary perspectives of institutional economics and the "path not taken" in accounting thought in the first third of this century. This parallel may be made more apparent by the following cursory overview of the new evolutionary economics movement.

A New Evolutionary Economics Movement

In 1987 the SFI held a workshop in Santa Fe on "The Evolutionary Paths of the Global Economy". The proceedings, published in Anderson et. al. [1988] demonstrate many of the implications of complexity theory for the study of economics. One paper in particular, Holland [1988], succinctly captures the evolutionary perspective on economics:

The global economy is an example, par excellence, of an adaptive nonlinear network (ANN hereafter). Other ANNs are the central nervous system, ecologies, immune systems, the developmental stages of multi-celled organisms, and the processes of evolutionary genetics. ANNs allow for intensive nonlinear interactions among large numbers of changing agents. These interactions are characterized by limited rationality, adaptation (learning), and increasing returns. (Typical examples in the global economy are: entrainment of speculators in the stock market, anticipation of shortages and gluts, learning effects in high-technology, and niche creation
wherein a successful innovation creates a web of supportive and augmentative economic activities.) [p. 118]

Economic agents in such an economy are continually engaged in future-oriented decisions on the basis of "rules-of-thumb" that have evolved on the basis of past experience and are continually being revised as new experience is accumulated. Their decisions are also influenced by expectations of what other agents are likely to do; i.e., much of the decision-making is strategically oriented. The arena in which these agents operate "is typified by many niches that can be exploited by particular adaptations ..." [Holland, 1988, p. 118]. This notion of environmental niches is especially relevant with respect to technological developments since, as Holland notes, "[n]iches are continually created by new technologies and the very act of filling a niche provides new niches (cf. parasitism, symbiosis, competitive exclusion, etc., in ecologies)" [1988, p. 118]. Thus, new technologies are inherently linked with the ongoing production of novelty and choice.

Such an evolutionary perspective has radical implications with respect to neoclassical economic thought. For instance, the phenomena of increasing returns has the potential of driving an economy far from equilibrium, and it plays havoc with the equilibrium analysis of supply and demand. Additionally, the agents who operate in such an economy are adaptive learning agents as opposed to rational maximizing agents. The upshot of such implications is that welfare economics criteria frequently cited by capital markets researchers — criteria such as "Pareto optimality" and "Pareto improvement" — are clearly not applicable within an evolutionary perspective.

The economic theory implications of an evolutionary perspective are explored more fully in Hodgson [1993], England [1994] and Mirowski [1994]. Hodgson [1993] in particular does a thorough job of assessing the challenges and prospects facing the new evolutionary economics movement. He also provides an historical overview which emphasizes the linkages of the contemporary evolutionary economics with the evolutionary thought imbedded in the writings of earlier economists, including Marx, Marshall, Schumpeter and Hayek. Most significantly, however, with respect to the present paper, his overview makes it clear that some of the strongest and most significant linkages are with the institutionalist economics associated with Veblen. As Hodgson [1993, chapters 1 & 16] makes clear, the linkages with institutionalist economics facilitates more extensive link-
ages with both post-structuralist social and political theory and with complexity theory. It is my contention that these broader linkages hold the potential for the development of a new alliance between accounting, economics and science; an alliance that would link complexity theory, the new evolutionary economics and the new accounting research. Since the relationship between economics and complexity theory has already been discussed, a brief discussion of the potential linkage between NAR and complexity theory should be sufficient to complete my suggestion regarding the possibility of a new alliance among science, economics and accounting.

Chaos Theory, Post-structuralism and NAR

Structuralism did much to promote the view that the human world is a socially constructed world; a world that is constructed, held together, and perpetuated by socio-linguistic processes. The movement known as post-structuralism did not repudiate this basic notion; it primarily took issue with the structuralist view of language as a system of fixed meanings or as a system of meanings based on fundamental sets of binary oppositions. The difference can be simplistically characterized as a closed (structuralist) versus open (post-structuralist) system of linguistic meanings. The NAR of the last decade has seen an explosion of literature exploring accounting practices from various social constructivist perspectives, including the post-structuralist/post-modernist views of Foucault [Hoskin and Macve, 1986; Loft, 1986; Hopwood, 1987; Miller and O'Leary, 1987; Preston, 1989; and Stewart, 1992], Derrida [Arrington and Francis, 1989], Rorty [Arrington, 1990; Mouck, 1994a], and Laclau and Mouffe [Mouck, 1995].

Chaos theory and complexity theory have much in common with post-structuralism. In fact, chaos theory has even been referred to as post-structuralist science [Hayles, 1990, pp. 288-92]. It is my contention, accordingly, that chaos and complexity theory have the potential to make significant contributions to the post-structuralist accounting research program. For a brief exploration of this suggestion, it will be useful to begin with an analogy between structuralism on the one hand and both the Newtonian world view of science and neoclassical economics on the other hand. Just as structuralists seek to isolate the elementary components of linguistic structures and identify the rules governing their constructive possibilities, scientists working within the Newtonian world view hope to locate the basic sys-
tematic building blocks of the physical world together with the
laws of nature that limit the various possible structural arrange-
ments. Neoclassical economics likewise can be seen as structur-
alist in the sense that (having presupposed atomistic individuals
as the elementary building blocks) it attempts to locate the in-
variant laws governing the socio-economic universe. For the
neoclassical economist, as for the economistic accounting re-
searcher, once the basic structural possibilities are identified,
then predictions can be made regarding various alternative
policy stances.

Post-structuralist social theory shifts the focus away from a
search for invariant structuralist elements and laws, and high-
lights the processes which drive change; processes involving
metaphoric views of language and the role of rhetoric in social
interaction. Post-structuralist social theory, accordingly, can be
seen as a powerful tool for attacking the reductionistic and de-
terministic perspectives associated with neoclassical economics
and economistic accounting theory. In a similar manner, chaos
theory has shifted the focus away from a search for elementary
building blocks and the invariant laws of nature and redirected
the focus of inquiry toward the processes which continually
bring forth new phenomena and new patterns of behavior. From
this perspective, it is increasingly clear that there are many po-
tential interconnecting threads among the concerns of post-
structuralist accounting research, chaos and complexity theory,
and the new evolutionary economics. These potential intercon-
nections hold the promise of a powerful challenge to the
Fisherian-style economistic accounting research that has domi-
nated the mainstream academic accounting journals for most of
this century.

CONCLUSIONS

It is understandable that Fisher has not been prominently
mentioned in historical accounts of the development of account-
ing theory. It is understandable because, at the time of his con-
tributions (roughly the first three decades of this century), ac-
counting theory development was largely driven by issues facing
practitioners, while Fisher’s contributions to accounting theory
were driven by his concern to fit accounting issues into the
abstract theoretical framework of neoclassical economics. Ac-
counting theorists of that time tended to view Fisher’s work as
economic theory, not accounting theory. Thus, accounting histo-
rrians have understandably omitted, or minimized, Fisher’s influ-
ence on the development of accounting thought.

In hindsight, however, it is clear as we approach the end of the century that accounting theory and academic accounting research have been increasingly colonized by neoclassical economics, with the result that works such as Fisher's *Capital and Income* would now be easily recognizable as accounting theory. It is in this sense that I claim that economics-based accounting thought, whether of the normative apriorist sort or the subsequently developed emphasis on capital markets research, can be appropriately characterized as the legacy of Irving Fisher and the "first economic theory of accounting". Not only is this descriptively appropriate, it is also useful, as I have sought to demonstrate, for the purpose of highlighting the intellectual constraints that have accompanied the colonization of accounting by economics. As Fisher's work makes abundantly clear, the primary metaphors and analytical techniques of neoclassical economics were directly inspired by Newtonian mechanics and the nineteenth century physics of energy, the economists of that school have been able to claim that their analyses are technical and apolitical.

The historical analysis of this paper — an analysis which highlights the paradigmatic linkage between the Newtonian world-view of science, neoclassical economics and mainstream academic accounting research — provides a backdrop against which to illuminate both the breadth and the depth of current challenges to mainstream accounting research. Not only is the mechanistic character of mainstream economics-based accounting research being challenged on all fronts by the "new" social constructivist view of accounting techniques and practices; the underlying neoclassical economics paradigm itself is being challenged by a new evolutionary perspective on economics. Furthermore, the emerging evolutionary economics research is significantly affiliated with the new sciences of chaos and complexity which are posing profound challenges to the Newtonian world view of science. In Kuhnian terms, the economics-based accounting research paradigm is increasingly susceptible to challenge and, as this paper has indicated, potential linkages with complexity theory and evolutionary economics could magnify the growing challenge posed by the "new accounting research".
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THE CELY SHIPPING ACCOUNTS:
ACCOUNTABILITY AND THE
TRANSITION FROM ORAL TO
WRITTEN RECORDS

Abstract: The records of a voyage from London to Bordeaux during 1486-87 are reviewed. The voyage was the first of a regular pattern of trading voyages conducted on behalf of the Cely family who traded English wheat and wool for Bordeaux wine. This family were fifteenth century London merchants whose accounts and other papers are held by the London Public Record Office. Secondary sources are used to show that by the late fifteenth century many English merchants were attracted to overseas trade, which despite considerable risks, offered the prospect of a good return.

The paper illustrates some features of medieval accounting, especially the problem of accountability and control, when direct oversight was not possible. The expansion of English shipping and overseas trade was accompanied by the development of written records and the replacement of oral systems of accountability common in feudal England.

The Cely family were London wool and wheat merchants who, in 1486, ventured into ship-owning and the Bordeaux wine-trade. Accounts relating to their first voyage survive, and useful records of the two following voyages exist.1 The accounts are of interest because they were written English at a time when an educated minority wrote in Latin and, more importantly, occurred during the period of transition from oral to written

1The Cely papers came into the possession of the Public Record Office as the result of a dispute in 1489, between Richard Cely and the widow of his brother, George, over payments of debts arising from the brothers' joint trading ventures. Thus the accounts were collected as evidence to pursue a suit in the Court of Chancery. The documents studied are from a set of transcriptions made by Dr A H Hanham from original letters, accounts and memoranda now assembled in the Public Record Office, London. The collection comprises two volumes of letters and seven files of accounts and memoranda (Chancery Miscellania, C.47, Bundle 37, Files 10-16.
records. The detail in the accounts and the careful manner in which the partners kept them also indicates that the accounts may have served both to meet specific accountability purposes and to preserve the long term interests of the partnership.

The objectives of the paper are:
— to learn more about the content and form of fifteenth century shipping partnership accounts;
— to illustrate the agency problems arising when direct oversight is not possible;
— to consider during this period of transition the relationship between oral and written records; and
— to demonstrate the problems of accountability and control in fifteenth century shipping records.

The paper is organised as follows. First, a background of the Cely family and the trend by merchants to diversify into shipping and overseas ventures is detailed. Second, accounting practices of the period are reviewed. The third section comprises data concerning different financial aspects of the voyage and is presented in four parts [I to IV]. Finally, with respect to the data cited, the role and purpose of written accounts by English merchants is considered.

BACKGROUND

In 1486, the family business was run by two brothers, Richard and George Cely. Richard, the elder brother, had inherited most of the family property upon their father's death a few years earlier. George had joined the family firm as a partner from 1473 and remained the principal partner until his death in 1489. He primarily controlled the family business and kept the written accounts.

The firm also had a loose association with two other wool exporters, John Cely, an uncle of the two brothers and William Maryon, Richard Cely's godfather. In 1486 William Maryon joined Richard and George in a shipping partnership which began with the purchase of a Breton fishing vessel. The ship was refitted and renamed the 'Margaret Cely of London'. During the period recorded in the letters and accounts [1486-1489], the ship went on possibly as many as ten voyages — three of which were to Bordeaux in autumn months for wine, the remainder being shorter but regular voyages to the Bay of Bourgneuf for salt, and to Calais and Zealand with wheat. On the longer Bordeaux voy-
ages, only enough salt food was carried for the journey out, the ship being re-victualled by the purser in Bordeaux.

A crew of between 14 to 16 including a master, boatswain, cook, purser and/or merchant's agent was required. The purser was expected to sell and buy on the firm's behalf and to provide for the crew. Piracy was a risk faced by the firm whose ship was armed with cannon, bows and darts, although it never went further than Bordeaux.

The growth of the English merchant marine 1460-1520 referred to by Burwash [1969], Lander [1969], Du Boulay [1970] and Ramsay [1957] may have been stimulated by the need for English merchants at a time of diminishing domestic trade to find more profitable returns. Diversification into overseas markets would have required many new decisions to be made. Medieval merchants like the Celys had to choose between many alternatives — which commodities to trade, which currencies to use, which ports to visit and when to time their transactions to obtain the best prices.

Gray [1956], Lander [1969] and Power [1941] reveal that the wool trade in the fifteenth century, though still the largest branch of English commerce, was steadily declining. This decline had great significance for the future of English shipping, for the wool trade was conducted through a market at Calais, and foreign buyers were left to freight their purchases from the market. Thus a slow decline in wool encouraged diversification into two other areas of English commerce: cloth and wine. To develop these trades, English merchants had to do more than simply ship their goods across the Channel to Calais. They had to assume greater risks, invest in larger vessels for longer voyages, seek out new markets, visit more foreign ports, and above all, as exemplified by the Celys, arrange the freight both to and from their overseas clients.

Carus Wilson [1954] tells how a new class of merchants emerged in the latter half of the fifteenth century. They made

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2The annual autumn voyage from London to Bordeaux and return began in mid-September. The ship stopped for cargo at Plymouth and Falmouth on both legs of the journey. The overall length of the voyage varied according to weather conditions and time spent in ports en route. Sixteen to eighteen weeks was the usual time taken to complete the round trip.

3Burwash (1969) is probably correct in maintaining that English merchant ships were increasing in size during the fifteenth century, from an average of 81 tons in 1400 to an average if 117 tons by mid-century. Later, from 1461 to 1483 the average tonnage was calculated at 159 tons.
their fortunes entirely by foreign trade. From such a group of enterprising merchants, the Bristol shipowners developed. Earlier in the century, Bristol merchants had specialised in one particular trade and had left the shipment of their goods to the shipmasters. However, it was the merchants-turned-shipowners who, by the end of the century, became the most wealthy and influential citizens, and included William Canynges, Thomas Strange and John Godeman. These men had earlier abandoned production and domestic trade to specialise in overseas trade in all commodities. Eventually like the Celys, they became shipowners.

The reason for increasing merchant diversification was the chance of better profits in overseas trade. Power [1941] estimates the Celys and other wool traders made between one and two pounds per sack of wool which, after allowing for rebates and expense, is a gross return of around ten percent.

At the time the Celys were drawn to shipping and overseas trade, the English wool exports 1279-1547 as shown in the graph below were declining. Staplers, like the Celys, were slowly being pressured to look for new outlets and diversify [Power and Postan, 1966, p.68].

**TABLE I**
[adapted from Power and Postan [1966]]

<table>
<thead>
<tr>
<th>English Wool Exports, 1350 - 1520 [Sacks per thousand]</th>
</tr>
</thead>
<tbody>
<tr>
<td>From material surviving from the first 12 years of Edward IV's reign and the first 12 years of Henry VIII's reign, Burwash [1969, p. 145] has been able to show the definite increase in English shipping activity in the two chief ports from 1463 to 1520.</td>
</tr>
</tbody>
</table>
TABLE II

<table>
<thead>
<tr>
<th></th>
<th>1465-66</th>
<th>1519-20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>London - Arrivals and departures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English ships</td>
<td>105</td>
<td>183</td>
</tr>
<tr>
<td>Foreign ships</td>
<td>200</td>
<td>279</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1463-64</th>
<th>1519-20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Southampton - Arrivals and departures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English ships</td>
<td>32</td>
<td>100</td>
</tr>
<tr>
<td>Foreign ships</td>
<td>54</td>
<td>92</td>
</tr>
</tbody>
</table>

Taking these two main ports together, the volume of English shipping had not only increased more than 100% but the proportion of English ships to foreign ships entering or leaving harbour had also increased from 56% to 76% of total shipping — a substantial increase in 60 years. Ramsay [1957] also observed that the port of London, in spite of its communities of wealthy foreign merchants, was increasingly used by ships of native ownership and construction in the late fifteenth century [p. 4].

Power and Postan [1966, p. 238] refer to the growth of mutual partnerships and the typical shipping partnership involved the contribution of capital and/or labour. Thus the co-ownership of boats enabled a merchant to invest his capital in several boats taking the form of share holdings, rather than being the sole owner of one boat. This common practice helped to take some of the risk out of shipping investment. Hanham [1975] cites George Cely, Richard Cely and William Maryon as financial co-owners of their boat the Margaret Cely. As joint owners, the Cely partners could not be joint managers, as some management necessarily devolved upon an overseas agent or ship’s purser. Shipping imposed a necessary separation of ownership from management and, as the following accounts reveal, posed a new problem of accountability between agent and principal. With reference to this problem of accountability encountered by fifteenth century shipping partnerships, Power and Postan [1966, p. 236] commented: “Much loss must have been suffered through the dishonesty of some of these agents, who had been trusted to carry on business abroad with little supervision from home.” Perhaps because he was aware of the possibility of dishonesty, George Cely tried to maintain overall control and supervision by summarising the accounts himself, and insisting on written accounts from his agents. As a further precaution which,
perhaps, reflects the uneasiness of the transition from an oral tradition to written records, George Cely sent his family servant, John Sperying, with the ship to act as banker and dole out funds in small increments. Nevertheless, the problem of delegating some management and financial control to the ship’s purser could not be entirely avoided.

**ORAL AND WRITTEN ACCOUNTING PRACTICES OF THE PERIOD**

Typical of the size of English businesses of the period, the Celys’ family business was quite small. Writing of the accounting procedures before 1800, Edwards [1989, p. 43] noted:

An elaborate system of accounting is not justified unless it enables significantly better decisions to be made. The accounting systems employed in feudal times, seem to have been adequate to meet contemporary needs. . . . Charge and discharge accounting is not concerned with profit measurement. The general lack of interest in formal performance assessment resulted from the fact that income was fairly fixed and the bulk of the expenditure unavoidable.

Edward’s comments do not entirely apply to the Cely accounts because income was not fairly fixed and expenditures in shipping were often dependent on the vagaries of the weather.

The use of Roman numerals in the fifteenth century made calculation and understanding more difficult. Records were in narrative form and, as Noke [1981, p. 141] found, there was no attempt to have a money or quantity column extended from the narrative. Roman numerals were typical of English accounts of that period. Accounting historians have [Glautier, 1973, p. 69, de Ste. Croix, 1956, and Chatfield, 1974, p. 16] considered that the Roman legacy to the Middle Ages was tenacious and a preference for Roman numerals continued among bookkeepers until the sixteenth century, hundreds of years after the introduction of Arabic numbers.

Edwards [1989, p. 45] explained that because Roman numerals have neither zero nor place values, they do not lend themselves to addition or subtraction, a feature which inhibited the development of double entry bookkeeping. Moreover, Roman numerals cannot be adapted for division or multiplication. Noke [1981, p. 141] observed: “Roman numerals were used in all the accounts and since such a system has no place values, an
exact tabulation of the figures would not help the addition." The use of Roman numerals may explain why the Cely accounts were restricted to listing payments and revenues. Macve [1985] disagreed with the notion that a particular form of numeric accounting was necessary to make sophisticated computations [p. 241]. Edwards [1989, p. 47], however, observed that the use of Arabic numerals was resisted on the grounds that they could be more easily changed for fraudulent purposes by adding, or removing or altering a single figure. This may account for an established custom of the period but such an explanation was less likely to specifically apply to family businesses like the Celys, who used their accounts for internal purposes only.

For merchants in the fifteenth century, there were few precedents for record-keeping in English. Latin was still the essential written language of intellectual intercourse, and clerks and estate officials wrote in Latin [Lander, 1980, p.156]. However, there must have existed a strong purpose for written records given the effort, energy and care required from what was generally a semi-literate society. According to Clancy [1979]:

There was no straight and simple line of progress from memory to written record. People had to be persuaded — and it was difficult to do - that documentary proof was sufficient improvement on existing methods to merit the expense and mastery of novel techniques which it demanded [p. 231].

Clancy was referring to the period ending 1307, but until the fifteenth century and the break-up of the feudal system, social change was gradual and slow. The growth of written manorial accounts [written in Latin] coincided with the advent of demesne farming which resulted in manorial officials being entrusted with moveable assets [Noke, 1981, p.138]. Nonetheless, where simple, recurring transactions dominated, oral rather than written reckoning was adequate [Noke, 1981, p. 138]. Indeed, Lander [1968, p. 193] maintained that the fifteenth century's main characteristic was its conservatism. Moreover, before the fifteenth century historians [eg. Jones, 1953; Clancy, 1979] are not agreed as to levels of literacy in English society or to the use of English in written documents. Although, Du Boulay [1970, p. 18] is sufficiently bold to estimate that: "Perhaps 30 per cent of the population could read in the fifteenth century ... though rather fewer could also write." Clearly, by the fifteenth century literacy was more common and English was beginning
to replace Latin and French as a means of written communication, especially in commercial rather than manorial and intellectual intercourse. The social standing of merchants was low, however, and, according to Thompson [1991, p. 584] merchants could neither invoke the authority of learning nor the authority of their position so their use of written English did not excite wider interest.

Nevertheless, the spread of writing in the late Middle Ages was partly responsible for the transformation in the way in which thinking was being conducted [Thompson, 1991, p. 587]. Writing, Thompson [1991] argues, creates a space for a silent discourse — an internal contemplative type of thought [Clancy, 1979]. Writing subordinated verbal argument [rhetoric] to the dictates of reason.

It silenced a robust and public form of rhetoric, reducing it to mere communication. From now on the work of the intellect went on within the dialectic only rather than within a system which included rhetoric and dialectic in a complex combination, and where neither was given preference. This "prior" form of thinking the nature of thinking, where there had been no distinction between rhetoric and dialectic, was more suited to an environment in which the spoken word formed the content of discourse — where personal verbal testimony and listening constituted the typical modes in which knowledge was invented and consolidated [Thompson, 1991, p. 587].

Fifteenth century merchants, like the Celys, were wrestling with the problem of writing. Without a working knowledge of Latin they adapted their native tongue into a written form. Writing was, as Thompson argues, more robust and public, and, therefore, better suited to larger firms continuously engaged in shipping ventures. The oral testimony from trusted family servants, though useful to report regular domestic transactions, was less suited to reporting an irregular series of transactions to several partners, especially where direct control could not be exercised. Moreover, while writing also contained rhetorical elements it was more dialectic and available to subsequent analysis by a range of partners.

The Cely accounts were meant to serve only internal purposes, but the nature of those purposes is open to question. Certainly, the accounts served to record receipts and payments and settle differences between partners. Also, accountability was
essential in a shipping partnership where control was often indirect. Merchants in more traditional, domestic trades would have enjoyed more direct control and have acquired from experience a shrewd estimate of the likely receipts and payments involved. In the traditional domestic trades illiterate merchants could flourish without written records. Written accounts allowed the partners to exercise more control over distant agents and permitted greater degree of accountability among the partners. Noke [1981, p. 138] maintains, referring to manorial accounts, that it was likely that estate administrators realised the advantage of written accounts both as a source of data for forward planning and, more importantly, as an aid to control. These aspects of written accounting were also significant to the growing number of new shipping partnerships engaged in overseas trades which could yield unpredictable results.

Clancy [1979] comments, however, on the difficulty of making the transition from oral to written reporting. Fourteenth century people, he argues, were reluctant to attach more weight to documentary, as opposed to oral evidence, and this reluctance was probably still applicable in 1486. With regard to written accounts of land transactions Clancy wrote:

The writing was of secondary importance, and was hedged about with repetitious clauses, because less confidence was placed in it than in oaths and public ceremonies which had traditionally sanctioned conveyances. [p. 232]

The repetition referred by Clancy is a noticeable feature of the Cely accounts. The hedging about with repetitious clauses so conspicuous in the accounts draws attention to certain transactions and in an oral tradition the equivalent transactions would have been the focus of elaborate oaths and ceremonies.

THE CELY ACCOUNTS AND THE FIRST BORDEAUX VOYAGE OF 1486-87

The Margaret Cely’s first voyage to Bordeaux was in the autumn of 1486. The voyage ended when the ship returned to London in March 1487. The financial accounts of this voyage are nearly complete, certainly more so than the accounts referring to the subsequent Cely shipping ventures. The accounts cited are the separate written records of John Speryng, George Cely, and William Aldereche together with a final accounting summary by George Cely. The accounts concern the return leg.
of the Bordeaux voyage and are organised into four sections [I to IV].

I. John Speryng's account of the return voyage

John Speryng joined the 'Margaret Cely' in France for the return voyage. He had been entrusted to handle family funds and buy wine on behalf of the Cely family. In August of 1486, George Cely wrote, "Y sent John Speryng my servani to Bordewys yn the Margett and Y deluyrdr hym to bewtowe there thesse parsellys ffollowying" [File 13 fo. 35]. John Speryng may have acted as merchants' agent but he was not purser on the ship. William Aldereche was the ship's designated purser, as he had been ever since the ship was purchased in 1485.4

John Speryng had two reasons to be on board the ship. First, to make private wine purchases for George Cely to sell in London on his own behalf and, secondly, to safeguard the family funds. In his latter role as ship's banker, John Speryng provided parcels of money to the purser at different stages in the voyage. However, because Speryng primarily acted as George Cely's agent his accounts refer mainly to the wine bought by George Cely and not to the bulk of the freight carried by the Cely's ship.

The following is an account of the several different parcels of foreign coins received by John Speryng from George Cely. The different coins were all converted into francs and it can be deduced that 60 hardits equalled one franc. John Speryng received in total 159 francs and 40 hardytys for the voyage to Bordeaux, at approximately 10 francs to one pound. Purchases made in Bordeaux were expressed in francs in the accounts.

File 13 fo. 63.

Memorandum that John Speryng resseyvyde off my master thys parsels here after folwyng.

Item xxv crowns in valew a pese ij frankys
xxiiij hardytys lx frankys

Item xxvj Owterecht in valew a pese a C hardytys and x xlviij frankys xl hardytys

Item xij Andrew gyldens in valew a pese ij frankys xxiiij frankys

Item in Nymyng grotyes and halff grotyes in valew off Flenys mony iiij li. xs.

4 Usually, but not in this case, the purser was the merchant's agent. Even on much larger ships of the period like the Trinity of Bristol (300 tons), the purser, John Balsall held two roles, ie. purser and merchant's agent (Reddaway, 1969).
in valew at Bordows a Nymygn grote viij hardytys — Som xxviiij frankys. Som vijxx frankys xix and xl hardytys.\(^5\)

The next account shows John Speryng then bought at Bordeaux nearly two tuns of wine,\(^6\) a barrel of sturgeons, a gimlet and a marking iron. He paid customs duty on the wine to the King of roughly 2.5% of the purchase price and a small town tax of 0.2%. The duty levied on the barrel of sturgeons was 1.4%. All of these duties are very mild by present day standards. Other levies on the wine included rummage of 0.2% [this was a fee for arranging or re-arranging wine casks in the hold of the vessel] and the “average” of 0.6% [customs duty paid on wine carried in another vessel]. Speryng sent half the wine purchased back on another vessel, the ‘Carvel of Dewe’, presumably for insurance purposes because the Margaret Cely sailed only two-thirds full.

**File 13 fo. 63**

- Item j ton a wyne pryse  
  \(xlj\) frankys
- Item iij hoxhedys  
  \(xxxij\) frankys
- Item iij tasys pryse  
  \(xiiiij\) frankys
- Item j barell a storgyns  
  \(vj\) frankys
- Item j gymlet and j markyngeyren  
  \(xxx\) hardytys
- Item for costom off a ton awyn  
  to the Kyng  
  \(iiij\)  
  \(xx\) hardytys
  Som  
  \(ij\) frankys  
  \(x\) hardytys
- Item to the town costom off a ton v hardytys  
  \(x\) hardytys
- Item for costem off a barell storgen  
  \(vj\) hardytys

Speryng also bought odd items of cloth which could have been for ship use but more likely were private purchases for himself or the Cely family. The cloth purchases can be seen in the next account.

**File 13 fo. 63.**

- Item for roma gyng off a ton, v hardytys  
  \(x\) hardytys
- Item payde for average off a ton a wyn in the  
  Carvell a Dyve  
  \(xx\) hardytys

---

\(^5\)The layout and detail of the accounts cited are presented as closely to the original form as possible. Spelling and grammar are unchanged.

\(^6\)In order to interpret medieval accounts it is essential to know that one Bordeaux tun had many equivalents, eg. 1 tun equalled: 1 tontight, or two pipes, or four hogsheads, or 252 gallons, or six tierces, or two butts, or forty pieces of figs, or twenty two kintails, or five quarters of wheat, or twenty English hundred weight. Freight rates varied from between 15s to 25s per ton.
Item j grose a pontys  
Item for loss in the crowns  
Som iiiij xx xvij frankys xij hardytys

Item for iiij yardys a lyne clothe pryse the yarde iiij d x d.
Item ij yardys a bokeram pryse the yarde viij d xv d.
Thym in threde j d.
Thys drawyt to after rate the franke i franke xvij hardytys:
Som iiij xx j frankys and lj hardytys.

As can be seen in the following account, the remainder of the monies carried by Speryng were passed over to William Aldereche, the ship’s purser, at Bordeaux and Plymouth as described below. This was unusual as pursers in the fifteenth century usually acted as merchants’ agent [Reddaway, 1969]. In this case, it is evident that the Cely family did not have complete trust in the purser and preferred their family servant Speryng to hold the budgeted funds for the voyage, paying over lump sums at pre-defined stages. Even with John Speryng on board to monitor events, at the conclusion of the voyage there was a dispute over expenditure between William Aldereche and George Cely.

File 13 fo. 63v

Item dellyuered vnyo Wylliam Aldryche
Item at Bordows xliij frankys
Item at Plymothe xij franky
Item for making to the mesen iiij frankys xv hardytys.

Speryng’s account for money received may be summarised as follows.

<table>
<thead>
<tr>
<th>Money Received</th>
<th>Paid Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>francs</td>
<td>hardytys</td>
</tr>
<tr>
<td>159</td>
<td>40</td>
</tr>
<tr>
<td>Goods purchased</td>
<td>98</td>
</tr>
</tbody>
</table>
|[2 tons of wine etc.]
| Cloth purchased| 1        |
| William Aldereche| 60     |
|                 | 159      |
|                 | 63       |

Evidently Speryng managed to pay out slightly more than was received, possibly the result of minor exchange rate miscalculations or variations.
II. George Cely's business and private accounts of the voyage

George Cely conducted the family's trading affairs from London but also employed John Speryng to trade privately on his behalf. Private and business accounts were kept separately by George Cely and the first extract expressed the allocation of family money as follows. The end of the extract below indicates that George Cely remained in London.

File 13 fo. 35

A per Speryng at Bordewys xlirij frankys  
At Plemothe xij frankys xx ardettyes  
Pro me ffor le meson iiiij frankys xv ardettyes  
Le stremer cost me per Speryng j franke xvj ardettyes ijs.  
iijd.  
Sum lxj frankes lj ardettyes  
Per me at London as be the boke of the Margett appere

The purchase of a 'meson' implies the ship may have been caught in a storm in the Bay of Biscay and lost its mizzen mast. The mast was renewed in Plymouth before the ship continued to London. That the ship had been through dangerous weather is also suggested by an entry in the ship's wages account where the word 'dead' appears alongside the name Davy Williamson. Losses and accidents at sea were commonplace in fifteenth-century ships [Burwash, 1969].

The following accounts in this section refer to George Cely's private dealings and are also expressed in francs and in sterling. Not only does George Cely's account give a full record of the cost of importing the wine from Bordeaux, but there is sufficient information available for the margin of profit to be calculated.

File 13 fo. 36

Item bought be John Speryng ffor me  
at Bordewys  
an ton pris xliii francys. Sum  
Item iiij hogges hedes xxxij francys. Sum  
Item the costum of an ton to the Kyng of wynys iiij xx ardettyes  
Item to the town costum of an ton v ardettyes  
Item ffor ronage of an ton v ardettyes, x ardettyes  
Item awerayge in the Carvel of Dewe ffor an ton xx ardettyes  
Sum
George Cely then recorded his further costs incurred with regard to unloading and selling the wine

File 13 fo. 37

\[
\begin{array}{ccc}
\text{Item} & \text{Cost} & \\
\text{for costys when my wyne com} & £ & s & d \\
\text{whom to London} & & & & \text{iii} \\
\text{for costum of an ton iijs. The remenavnt} & & & \\
\text{vas y geven to me} & & & \\
\text{Item iiij byllys} & & & \text{ii} \\
\text{Item lyterayge of an ton iijd} & & & \text{iv} \\
\text{Item cranayge of an ton iiijd} & & & \text{vi} \\
\text{Item brengeng whom of ij ton, xijd. le ton} & & & \\
to the wyn drawers & & & \text{ii} \\
\text{Item ffrrayght in the Margarett and in the} & & & \text{i vi} \\
\text{Carvel of Dwy, xviijs. le ton} & & & \text{ii} \\
\end{array}
\]

From the above accounts provided by George Cely, the total cost of importing wine to London may be calculated as follows.

<table>
<thead>
<tr>
<th>Description</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost of importing 7 hogsheads to London</td>
<td>7</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Total costs payable in London, freight, wharfage and customs</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>15</td>
<td>11</td>
</tr>
</tbody>
</table>

Thus, the average cost of importing seven hogsheads amounted to £1 - 8s - per hogshead.8

The next extract [File 13 fo. 37v] exemplifies the medieval shipping practice of a seaman’s portage, which referred to an allowance of cargo space free to the crew on longer voyages but not customarily on shorter voyages such as to Calais and Zealand.9 George Cely bought a further four hogsheads of wine in London from the crew as follows.

7George Cely charged himself the normal freight charge, indicating that this was his own transaction and not done on behalf of the family firm. However, as Burwash (1969, p. 93) estimated the freight charge per ton to Bordeaux was around 25s, perhaps George Cely was allowing himself a small discount. Duty in London was levied on each complete tun of wine.

8One hogshead comprised 63 gallons of wine.

9Portage is one of the factors which make it difficult to calculate a seaman’s pay because the portage allowable probably varied between ships and voyages. Moreover, it can never be known as to the extent to which seamen were financially able to make use of the free cargo space allocated them.
File 13 fo. 37

Item wyns bought per me at that vyayge at London.

Item of an maryner portayge, ij hoggys hedys redewyne pris 10

Item of Speryng ij hogys hedys and an pris ii

Item pay’d be me to master Tatys porsar ffor Speryng that he toke vpe at Bordewys 11

Item payd be me the ffrayght of Speryngys wyne in the Margaret 12

Sum iv xiii iv

George Cely, therefore, purchased on his own account a further 4 hogsheads at £1 - 3s - 4d each. He managed to import his wine at a lower cost because he purchased at a discount some of the crew’s portage allocations. In London the eight hogsheads were sold for £15 or for £1 - 17s - 6d per hogshead as can be seen from the extract below.

File 13 fo. 38

Item the xiiij day of Marche anno iiij xx vj sowld to master Thomas Tyrell an pype of rede wyne and ij hogys hedys of clarrett pris le ton - vij li.

Item the xxiiij day of August sowld to Harry Brazer an pype of rede wyn and ij hogys hedys clarett pris viij li.

A modern trading account of George Cely’s personal wine transaction would reveal the following.

Sale of 8 hogsheads £15

Less stock at average cost 3 - 18 - 10
Cost of wine 10 - 10 - 4
Gross Profit 4 - 9 - 7

Total £15

The gross profit percentage which included freight and customs duty was 30% and the mark up on goods imported was 43%. These percentages were an improvement on the Cely family’s traditional domestic gross margins of around 10% net.

10This price would seem to be a fairly low as French wine usually cost between £4 to £10 per tun (Burwash, 1969, p. 204).
11This entry indicates that Speryng joined the Margaret Cely at Bordeaux.
12It would appear that Speryng was not allotted portage so his status on the ship was not that of a crew member.
[Power, 1941, p. 7]. To some extent the existence of such margins may explain the growth of English shipping as English merchants diversified into overseas trades. The accounts kept by merchants such as George Cely provided a rational basis for such decision making. However, the opportunity for increased gain from overseas trading must have been tempered by the prospect of total loss from the perils of ocean travel. In an age before commercial insurance brokers, merchants such as the Celys protected themselves by combining into partnerships, mostly family based [Power and Postan, 1966, p. 238], and by loading some of their cargoes on to other ships [e.g. the Carvel of Dewe, File 13 fo. 36].

III. The accounts of William Aldereche

The accounts written by William Aldereche, the purser on the voyage, detail the ship's running expenses, and the revenue from the freight carried for other merchants [File 13 fo. 54-60]. It would appear the original victualling of the ship in London for the outgoing voyage was the responsibility of the ship's owners, not the purser. The custom as John Balsall [Reddaway, 1969, p. 8] recorded was that shipowners fitted out the ship before she left, purchased victuals, replaced worn equipment, [rigging, in particular, needed constant attention due to the poor quality of rope then available] and engaged the crew. Wages were always paid in two instalments, on engagement and half way through the voyage. The latter payment was the purser's responsibility.

An amount of 132 francs was provided to William Aldereche to manage the ship and pay the crew from Bordeaux. The money was paid to Aldereche by the respective agents of the three merchants [the Cely brothers and their cousin] and spent at the French ports of La Rochelle, Bloy, Ile of Rethe and Bordeaux to re-supply the ship on the return voyage. Each merchant contributed 44 francs [approximately £4]. Giles Buckingham appeared to be the agent for Richard Cely and William Maryon, while John Speryng acted for George Cely. In the account below William Aldereche records the amounts he received from the servants of the three partners.

File 13 fo. 55.

Item resseyuyd of Geylys Bekyngham for my mayster xl ffrankys
Rychard Cely at Bordyows
Item resseyuyd of hym at Bloye iiti ffrankys
Item resseyuyd of John Speryng at Bordyows
for my mayster George Cely xl ffrankys
Item resseyuyd of hym at Bloy iiij ffrankys
Item of my mayster Wylliam Maryon xl ffrankys
Item resseyuyd at Bloy of Geylys Bekyngham for my mayster Wylliam Maryon iiij ffrankys

Just over half the 132 francs William Aldereche received was used on the second and final instalment of the crew's wages to cover payment for the return voyage. The time taken on the return voyage was usually four to six weeks [file 14 fo. 49-58]. On this first voyage, though, the ship was delayed at Plymouth eleven weeks to replace the broken mizzen mast.

According to the wage roll, apart from the master and purser, there was a crew of twelve on the Margaret Cely. The wage roll of the ship was as follows.

File 13 fo. 55.

Men herys at Bordyows.
Fjurst Wylliam Parker
Mayster vnder God xij ffrankys
Wylliam Ayelryche purser viij ffrankys
Wylliam Jacson iij ffrankys
Pelegor Larderys v ffrankys
Jamys Walysshe iij ffrankys
Thomas Cardon iij ffrankys
John Chener v ffrankys
Roberd Lynkholl v ffrankys
Thomas Medycrofte iij ffrankys
Rychard Bocher iij ffrankys
Davy Wyllyamson iiij ffrankys
Thomas Bawen iiij ffrankys
Jamys Tayler iij ffrankys
Perys Perker iij ffrankys
Sum lxvij ffrankys

Although the ship's master earned four times that of the lowest paid seamen, on the whole the wage differentials were fairly modest and more egalitarian than later eighteenth and nineteenth century differentials.

Besides the payment of wages, William Aldereche, as purser incurred many expenses victualling the ship for the return voyage. An analysis of his accounts reveals the main items of expenditure as being bread, beer, meat, replacements and repairs, and some personal costs while ashore. These items were purchased at the French ports of Rochelle, Bloy, Ile of Rethe, and Bor-
deaux. Purchases of supplies made at these ports had to last until the next re-victualling stop at Plymouth. At these French ports William Aldereche spent in all, 64 francs [approximately £6]. The money was all allocated as follows: 50% beer, 17% personal costs ashore, 12% repairs, 10% miscellaneous, 8% bread, and 3% meat. His personal costs ashore were not detailed — a noticeable omission.

For the return leg of the voyage from Bordeaux, William Aldereche received 132 francs and paid out just over 131 francs in wages and expenses. The Celys appear to have had a very shrewd idea of how much a purser on the Bordeaux run should spend, for William Aldereche was left with very little money over from the original 132 francs. Or was it perhaps that William Aldereche spent up to the limit of his allowance? For example, he listed an item of 6 francs as, ‘my cotys at Bordyows’ [File 13 fo. 56V]. A sum of 6 francs was equivalent to an ordinary seaman’s wage for the whole trip of six to eight weeks, or just over a skilled man’s average monthly wage. The records reveal George Cely’s dissatisfaction with Aldereche’s lack of detailed accounting, because as elsewhere shown, the merchants and their servants were detailing quite trifling sums.

George Cely was trying to overcome fifteenth century ‘putting out’ practices [Du Boulay, 1970] whereby agents pocketed the difference between the funds made available by principals and the disbursements they made as legitimate profit. The question of William Aldereche’s status is important in this context, was he a servant/steward or sub-contacting agent? The accounts record Aldereche as receiving a wage of two shillings per week, which supports George Cely’s view of Aldereche as a paid servant who was directly accountable for all disbursements. William Aldereche, as a ship’s purser, apparently saw his role differently and did not detail his six francs of costs expended in Bordeaux. In any case he was not re-hired for further voyages.

On the ship’s belated arrival in Plymouth, Aldereche received a total of £6 - 4s - 4d in additional funding to meet costs. The purser received from Speryng 20s 8d, £4 from the three merchants, another 8s 8d from William Maryon and another 15s from Speryng. These last two amounts would appear to be supplementary payments to meet unexpected levels of expenditure in connection with the delay at Plymouth while the mast was replaced. Aldereche details the receipt of these additional funds in the following account and then lists his expenditures at Plymouth where the ship was delayed for repairs.
File 13 fo. 57.

Item resseyuyd of John Speryng at
Plymowthe  xx s.  viij d.

Item resseyuyd of my maysters
  Rychard Cely and George Cely
  and Wylliam Maryon  iiiij li.

Per Wylliam Maryon  viij s.  viij d.
Per Speryng le rest  xv s.
Sum  vij li  iiiij s.  iiiij d.

Wher of payd this parcellis foluyng:
Ffurst payd at Plymowthe for a pipe bere  vij s.  viij d.
     Item payd for a dosyn bred  xij d.
     Item payd for f KYsshe  xij d.
     Item payd for bred  iij s.  vij d.
     Item payd for ffysshe  xv d.
     Item payd for a bosshell bay salt  vi s.  vi d.
     Item payd for j Ciiij peny nayle and a
       Cij peny nayle  vij d.
     Item payd for a quarter of befe  iij s.  iiiij d.
     Item payd for iij dosyn bred  iij s.
     Item payd for a pipe of bere  vij s.  viij d.
     Item payd for ij cowpill salt fysshe  xij d.
     Item payd for ffysshe  iij s.  x d.
Sum  xiiiij s.  vij [32s.6d

From the accounts above and below, it can be seen that Aldereche’s expenditure on provisions for the ship came to £5 - 9s - 3d. However, the amount of cash in hand at the end of the voyage is uncertain because Aldereche’s personal costs at Plym­mouth and London, though mentioned in the following account are not detailed. Moreover, the exact exchange rate of francs to pounds sterling is not known. Aldereche provided further details of his expenses at Plymouth in the following accounts.

File 13 fo. 57.

Item payd for flesshe  viij d.
Item payd for bred  iij s.  vij d.
Item payd for flesshe  xij d.
Item for my costys at Plymowthe xj wokes
Item for my costys at London whyle be shyp
delyuyrd j wok

Sum iij li.  xvj s.  ix d. [3.16.9] by syde my costys.

File 13 fo. 55.

The rekenyng of the Margaret Cely from Bordyows be sec­ond yer of be rayn off Kyng Harry be vij.
Expenditures again fall easily into the classifications of beer, bread, fish, meat, salt, repairs and replacements indicating that once the purser had experienced a few voyages, the pattern of victualling purchases became fairly routine.\footnote{The beer consumption on the ship seems extremely high. Fifteen hogsheads of beer were purchased (945 gallons) and were presumably consumed by the crew before the end of an anticipated seven to twelve week voyage. The rate of consumption works out at around eight pints per crew member per day. Perhaps the tough, arduous existence in the wet and cold prompted continuous anaesthetization by alcohol.}

In summary, William Aldereche received 132 francs at Bordeaux [approximately £13 - 4s]. He received another £6 - 4s - 4d at Plymouth, making an approximate total of £19 - 8 - 4d received. On the other hand, his total voyage expenditure amounted to £18 - 11s - 3d, which should left a cash surplus [depending on the exchange rate of francs to £s] of between 17s and £2. In theory, William Aldereche’s ability to keep written accounts should have made the process of accountability exact and objective. In practice, however, the lack of detail with regard to personal expenditure, the unexpected length of the voyage and exchange rate variations made the process of settlement more a matter of rhetoric and judgement. George Cely’s audit of the purser’s accounts concluded that the cash in hand at the end of the voyage was insufficient and that Aldereche would be required to make good the deficiency.

File 13 fo. 58.

[In George Cely’s hand]

Wylliam aldereche
Memorandum that ther remaynus yn Wylliam Aldereches hoindys at thysse day, the xxviiij day of Jenyvyr, all thyngys rekonyd of thys Bordewys vyayge viij s. iij d. and ffor harnessse iiiij s. xij s. iij d.

Item ys an greyd an magnyst vs that and ytt be ffond that he howght to havwe ij s. ffor heuery wheke appon the vyayge, he most have xj s. viij d. mor, or ellys he most restor le rest.
The above memorandum reveals that the purser had cash in hand of 12s - 3d, and a harness [a protective leather jerkin] worth 4s. After allowing for the purser’s wages, there should have been a further 11s - 8d. George Cely calculated that William Aldereche owed the Celys a cash balance of £1 - 3 - 11d. It is not clear from subsequent records whether Aldereche restored the claimed cash deficiency, but it was William Aldereche’s last voyage on the Margaret Cely.

With regard to Aldereche’s accounts two final observations are made. First, Aldereche as ship’s purser was not a member or a servant to the Cely family. In the fifteenth century most pursers were also merchants’ agents and often intimately connected with their principals and their families [Reddaway, 1969]. Such a system had less need for written accounts and relied on medieval concepts of allegiance and sworn trust. During the fifteenth century, however, ships were increasing in size and capacity and the feudal system was breaking down [Noke, 1981]. Pursers like William Aldereche represented a new breed of literate men who belonged to no one but were independent and for hire. As ships became larger so the number of participating merchant owners increased and the employment of literate, sub-contracting pursers became more common [Reddaway, 1969].

Secondly, although written accounts were, in theory, more exact and objective, George Cely was not satisfied. Written accounts, then as now, may still be found wanting for lack of full disclosure. For the purposes of accountability in the fifteenth century oral accounting practices were still widely used and fulfilled most commercial needs. Many fifteenth century merchants and officials still retained doubts about trusting writing, oral accounts based on sworn oaths and pledges of allegiance still commanded respect especially in traditional commerce [Clancy, 1979, p. 232]. However, with the breakdown of feudal relationships, many merchants [especially in the newer, developing fields of commerce such as shipping] in the late fifteenth century began, like George Cely, to abandon oral traditions and keep written records. George Cely, however, had just shifted his focus from the traditional wool trade to shipping and trading in a diverse range of commodities. Accordingly, he encountered new problems of accountability and agency. Pursers on the new, larger ships were not domestic servants bound by oaths of allegiance and produced written records instead of sworn statements. Such changes required accepting and developing new forms of accountability. Postan [1972, p. 220] described how
more substantial partnerships had evolved, by the end of the century, based on a system of conducting trade through agents permanently resident abroad.

IV. George Cely's accounting summary

The voyage was subject to a final accounting by George Cely in London. By modern standards, his final accounts are without form, repetitive and over-elaborate. However, it appears he achieved his purpose of arriving at a settlement between the partners. Indeed, it is argued that the devotion in the accounts to a constant allocation of receipts and the repetitive mention of certain transactions, reflected the transition from an oral tradition; that is the detailed, repetitive rhetoric of oral reporting was being carried over into a written form.

First, he listed the expense items which he personally paid or which John Speryng had purchased and which he considered deductible to the partnership.

File 13 fo. 58.

Payd per John Speryng at Plemovthe goyng to Bordewys ward ffors le Margett
Per my B vij s. vj d. Fforst ffors the meson and me le rest.
viij s. ij d. Ffor ny broder and as moche ffors me.
Sum xiiij s. iiiij d.
Item the strener cost at Plemovthe ij s. ij d.
Item an lb. saylle twyne v d.
Sum xvij s.
Per me George Cely ffors le Margett
Item ffors kellyng of the ox iiiij d.
Item ffors vryngynge to Blake wall viij d.
Item to Byrde ffors hovyr loffe borde iiiij s j d.
Sum v s. j d.

Next George Cely detailed the freight. The great bulk was carried for a merchant named Tybott Oliver, some 48 tons at a freight cost to Oliver of £47 -10s. A further one ton of freight belonged to 'Peter Joye' who was charged 19s. The rest of the freight [7 tons] belonged to members of the crew, the Celys and their servants, who were, as mentioned earlier, engaged in small personal transactions.

File 13 fo. 58.

Tybbttys ffrayght ys ffors xlviij ton so
ys xxij ffors xx a battyd xlviij li. x s.
Item averayge at Bordewys
On 16 March 1487, George Cely recorded the receipt of £20 from Tybott, the principal buyer of the Margaret Cely's cargo. As it appears that the voyage ended on 28 January, the time lapse before payment would seem only a little longer than present day commercial practice. Instead of collecting all receipts and expenditures before settling the balance between the partners, George Cely adopted the practice of continually trying to allocate receipts and expenditures between the partners as they arose [see below]. Such practice necessitated multiple transactions and generated a series of balancing items in the Cely accounts. The following account provides examples of these balancing settlements.

File 13 fo. 59.

Item George Cely v hogys hedys iiij tery                        sxxvij s.
Item Rychard Cely an hogys hede                               iiii s.    vj d.
Item John Speryng at Plemovthe iij hogys hedy                  xiiij s.    vj d.
Item Petty John at Plemovthe j hogys                            xlix li.  xix s.  vjd.
Sum14

Item her of resseyuyd of Tybott the xvj day
of Marche anno iij xx vj                                        xx li.

Wher of delyuyrd to my broder                                  vj li. xiiij s. iiii d.
To my selfe                                                    vj li. xiiij s. iiii d.
To Wylliam Maryon                                              vj li. xiiij s. iiii d.
Item whe hawe an oblyg of Tybott payabyll
Item whe have resseyuyd of hym
yn rede mony mor                                               xxv li. viij s. x d.
Item whe most hawe mor of Tybott                               lj s. iij d.
Item awerayge                                                  v ffrankys
Item premayge                                                  ij d. le ton.
W Maryon The xxiiij day of Marche ys payd.
That ys to heche of vs                                          xvij li. xiiij s. vj d.
Item the same day payd hym ff for my broder that
he layd howght mor                                              xx d.
Item payd hym ff for that he layd howght
mor than Y dyde                                                 sxxv s. vj d.

Tybott appears to have been a reliable customer, who followed up his initial £20 on account, on 16 March 1487 with a

14Judging by the volume of freight carried, the Margaret Cely was probably, as Burwash (1969, p. 35) estimated, a small ship of around 70 tons. Even so, at an estimated 70 tons the ship was returning only two-thirds full on its first voyage from Bordeaux.
The instalment payment enabled Tybott to market his freight in small parcels and hold over payment of his accounts until cash from his customers flowed in.\textsuperscript{15}

The remainder of George Cely’s final voyage settlement account comprises small payments and settlements between the three ship owners. Some of these items were very petty and hedged with repetitious clauses as can be seen from the extract below. This type of accounting practice which involves multiple, trifling entries tends to obfuscate and obscure meaning but given the recent shift from oral to written reporting it illustrates the urge to be fully accountable and implies a lack of confidence in the written act [Clancy, 1979, p. 232]. Receipts were either split three ways immediately, used to discharge expenses, or applied to settle account differences between the partners.

Such forms of single entry accounting were the product of a semi-literate society which had not long before emerged from feudalism. George Cely’s written accounts maintained some of the oral practices of feudal accountability based on continuous, interim settlements. The need to institute such settlements and constantly restore the balance between partners made the accounting for shipping ventures unduly complex and over-elaborate. During this period of transition, however, many of these unnecessary practices were inherited from the oral tradition. For those merchants who were illiterate or who had a different form of English\textsuperscript{16} such accounts would have had little significance and much had to be taken on trust between such partners in an unregulated age. The need for mutual trust may explain why merchant enterprises were most often family concerns in the late fifteenth century.

\textsuperscript{15}As it appears the Celys expected another 51s 2d from Tybott, the average and primage must have added another 10s to the bill. Tybott’s freight came originally to £47 - 10s and two payments of £20 and £25 - 8s - 10d were received, while the amount still owed was recorded as £2 - 11s - 2d, a total of £48. The average at this time referred to a customs duty payable by the freight owner. It was not until the next century that this term was used to imply a loss of cargo. The primage referred to a customary allowance made by the shipper to the master and crew of a vessel for the loading and care of cargo.

\textsuperscript{16}Written English was not standardised at this time. The language was in transition from fourteenth century Middle English to sixteenth century Modern English. Not everyone kept pace with the change and, according to Jones (1953, p. 142), “the language passed through a stage of confusion worse confounded, with no great writers to furnish a standard.” Moreover, there existed different regional and social forms of English.
On 20 March 1487, George Cely attempted a final reckoning for the voyage. The merchants had together laid out a total of £23 - 2s, or £7 - 14s each, after taking into account another network of set-off transactions [see below].

File 13 fo. 59.

Her afftyr apperythe the cler rekenyng of this Bordewys vyayge. Whe record the xx day of Marche anno iiiij xx vj. Fforst the holle of owr ffrayght amovntyys vn to xliix li. xix s. vj d.

William Maryon hasse layd howght appon thy vyayge

Item my broder hass layd howght allso appon reggyng

Item ny selffe hasse layd howght ffor my partt allso

Item my broder délyuyrd to Wylliam Maryon xx li. v s. j d. Item a délyuyrd hym ffor me that Y laked of layng howght of so moche

Thys beyng battyd of ix li. xvj s. sole lath

howght nowe

Item my broder most hawe of me ffor that Y layd nott howght so myche as he dyde per

Thys beyng battyd of so ytt ys

Item Y pay to Wylliam Maryon

Item to my broder Rychard Cely

Thys beyng hadede to my layng howght makys

The income due from all the freight amounted to £49 - 19s - 6d, each merchant's share being £16 - 13s - 2d. The summary of these transactions is, however, difficult to follow because the partners had originally invested different amounts at different times and claims to their private portions of the cargo had to be settled between them. The mixture of private and business transactions was only possible within small firms where partners were intimately acquainted. According to Edwards [1989, p. 80] the tendency of merchants to mix personal and business expenditure was a feature of accounting in what he called 'the age of stagnation' before 1800. However, from this complex mixture of personal and business expenditure, George Cely calculated that Richard Cely had in effect contributed £8 - 16 - 3, William Maryon £9 - 1 - 4 and George Cely £5 - 4s. The effect of the
settlements between the partners was to bring each merchant’s investment to £7 - 14s per partner [File 13 fo. 59].

George Cely summarised the each partners share in the final reckoning as follows.

File 13 fo. 60

Wylliam Maryon is payd. Heuery mans partt comys vn to xvj li. xij s. ij d. [£16.13s.2d]
And he hasse of vs not wheche he hade layd owght as apperre xxvij s. ij d.
Rychard Cely hasse. My broder hasse retaynyd fforst be hys ffrrayght and Pety John ix s. x d. that a resseyuyd of Tybott he payd Wylliam x li. and xxvij s. ij d. So he hasse le rest - xiiij li. xx d.
My partt of my ffrraygt Y retayne in my hondys: for my selfe xxvij s. Ffor Speryngys ffrrayght xij s. vj d. And of the xx li. ressuyuyd be me of Tybott, vj li. xiijs iij d. to Wylliam Maryon and le rest to me. Sum xv li. viij s. ij d.

George Cely finally calculated that each merchant’s investment amounted to £7 - 14s [File 13 fo. 59V] and each merchant at the close of the venture was entitled to £16 - 13s - 2d being a third share of £49 - 19s - 6d. The final settling of these shares appears to be quite complex. Each merchant obtained a gross return of 115 percent on his capital employed, before allowing for depreciation of the ship. Or, expressed another way, for voyage expenses of £23 - 2s, the total revenue from freight was £49 - 19s - 6d and profit derived was £26 - 17s - 4d, a very handsome gross return.

Although the single entry accounting for this voyage appears to modern eyes as elaborate and repetitious, it was, as mentioned, derived from an oral system of oaths and allegiances which had not entirely disappeared. It may be supposed that the partners, probably unschooled in Latin, knew nothing of Italian double entry systems or other forms of accounting. In 1521 a monk, Henry Bradshaw, translated from Latin to English a history of the life of Saint Werburge. At the end, Bradshaw wrote that he translated the work “For merchants and rude men who possess little learning” (Jones, 1953, p. 12).
THE PURPOSES OF WRITTEN ACCOUNTS IN THE FIFTEENTH CENTURY

Edwards [1989, pp. 34-45] referred to the limitations of English single entry accounting being voluminous and clumsy for the calculation of profits. He believed there was a general lack of interest in formal performance assessment because income was fairly fixed and expenditure unavoidable; activities were repetitive and followed a consistent seasonal pattern. Such arguments concerning performance assessment are worth reviewing in the light of the Cely accounts and three alternative explanations are advanced.

First, the single entry records cited are little more than a list of payments and receipts and contain no direct mention of profit. They merely use the expression, 'Heuery mans partt comys vn to,' a phrase which instead emphasises the notion of sharing — both expenditure and revenue. The manner of the accounting and the discourse used is more akin to a group of people sharing the cash left-overs from a holiday. The prevailing tone of the account entries reflect a more cooperative rather than competitive kind of enterprise. Furthermore, as Noke [1981, p. 146] points out, Walter of Henly, a century earlier, while silent on the mechanics of profit calculation, does, however, seem to broach a primitive theory of income. The concept of profit was still, at this time, barely thinkable in an era when philosophers were ready to identify merchants with the sin of covetousness [Thompson, 1991, p. 584].

Second, the Celys began in 1487 a regular pattern of shipping and overseas trading activities. The regular pattern developed indicates that they were motivated by experience rather than contemporary rumours of speculative ventures. The more literate partners would have been very familiar with the accounts which were written in English solely for their internal use, and which they took care to preserve. It is plausible, therefore, that in an age of semi-literacy these accounts were valued and that they communicated more to the partners than accountability. Noke [1981, p. 138] maintains that there was a growing realisation around this time as to the advantages of written accounts as a source of data for forward planning. The shipping accounts show an emerging pattern of voyaging with the Margaret Cely returning to the same ports with the same commodities at the same times. The accounting records may well have provided the Cely partners with information to repeat the same ventures because they evidenced a positive return. Some English
merchants were opportunistic and drawn by tales of treasure islands then circulating, but the Celys preferred to maintain a regular pattern of overseas trading ventures.\footnote{For example, seafarers told of the fabulous 'Ile of Brasile' reputed in the 1480s to be somewhere west of Ireland (Carus Wilson, 1954).}

Third, written accounts among merchants developed as traditional forms of oral accountability became increasingly inappropriate due to both the breakdown of feudal relationships [Noke, 1981, p. 138] and the changing nature of commerce [agents replacing servants]. In oral examination, rhetoric, expression, intonation and force may have sufficed to create satisfactory subjective impressions of accountability. Written accounts were objective but had to be hedged with repetition to be persuasive or, at least, rely on creating an impression that instilled confidence. Moreover, the written system of constantly settling accounts between partners employed by George Cely probably had its roots in the oral tradition. Oral accounting requires the settlement of outstanding balances immediately when funds become available as it is difficult to carry over debts by relying on memory.

The shift from traditional oral systems of accountability to written systems provided merchants like George Cely with an archive of records detailing dates, transactions, markets and commodities. In other words, written accounts could become a reference resource. For unschooled English merchants becoming involved in international trading, there were many complex decisions to be made. Which ports to visit and in which season? Which commodities to trade? Which currencies to trade? The commercial world was changing for the fifteenth century English merchant and there were many new variables to be considered before ships could be confidently routed to a chain of destinations.

The evidence from the Cely accounts suggests, as Macve [1985, p.261] maintained, that single entry records were adequate for the purpose of income assessment: "Heuery mans part comes vn to xvj li. xij s. ij d. [File 13 fo. 60]. The level of returns both enabled and justified their departure from the traditional wool trade to English merchant shipping. There is no evidence to indicate that the Celys decided on impulse to establish new patterns of trade but rather the documents suggest that the Celys used such information as was at their disposal to evaluate the continuing viability of new markets they had discovered.
CONCLUSION

The object of this research exercise has been to investigate the shipping activities of the Cely family. The focus has been on the first Bordeaux voyage in 1486-87, for which the fullest, though still incomplete and disorderly, records exist. From this successful voyage, details of fifteenth century accounting practices have emerged.

The preference for Roman numerals at this time, with neither zero nor place values, made orderly formatting of numerals, addition and subtraction difficult and therefore inhibited accounting development. The Cely accounts bear out these criticisms as they amount to little more than lists of payments and receipts. Edwards [1989, pp. 56-57] referring to the adoption of double entry bookkeeping in England, described the rate of adoption as extremely slow: “What were the reasons for the delay — ignorance, lack of expertise, the complexity of the new system or something else?” The answer to Edwards’ question may lie in the English class system and the growth in overseas trade in the fifteenth century [Du Boulay, 1970, p. 74]. Most merchants were not sufficiently familiar with Latin and French, the languages of the educated classes. They wrote in English, the language of peasants and artisans. Pacioli’s bookkeeping text Summa written in the Italian vernacular which showed how revenue and capital accounts may be separately classified and profit calculated was not published until 1494. Meanwhile, English merchants were developing in comparative social isolation their own single entry systems which, it is argued, while not clearly measuring profit were designed to distribute revenue and yield some idea of income [Noke, 1981, p.146].

However, the primary objective of the written accounts per se appears to be accountability and control. The inability by the partners to directly oversee the operations of their agents posed unique problems to fifteenth century shipping merchants. The need to exercise control at a distance necessitated a transition from oral to written records. In domestic feudal relationships, the oral testimonies of family servants were sufficient to detail regular transactions. Overseas trading, however, required irregular patterns of expenditure and master/servant relations were replaced with an agent/principal association. The latter de-

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20Jones (1953, p. 13) wrote that: “In spite of extravagant praise of past poets, especially Chaucer, and sometimes of modern writers, there was almost universal agreement in excluding the native tongue from the literary world.”

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pending on written rather than oral reporting methods and giving rise to new problems of accountability and control. The Cely system was to require written accounts from three sources: the purser, the servant/banker accompanying the ship and the managing partner. From these independent sources cash revenues and expenditures were established, and shortages, as the case exemplified, identified. The Cely papers illustrate how fifteenth century shipping merchants required written accounts because of the necessary agency relationship which developed between ship’s pursers and their merchant principals. In practical terms they had to adapt their own language into a written form, while exhibiting enough confidence in their written reports to abandon the oral tradition of oaths and ceremonies.

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THE ROLE OF ACCOUNTING IN PUBLIC EXPENDITURE AND MONETARY POLICY IN THE FIRST CENTURY AD ROMAN EMPIRE

Abstract: Previous authors have argued that Roman coinage was used as an instrument of financial control rather than simply as a means for the state to make payments, without assessing the accounting implications. The article reviews the literary and epigraphic evidence of the public expenditure accounts surrounding the Roman monetary system in the first century AD. This area has been neglected by accounting historians. Although the scope of the accounts supports the proposition that they were used for financial control, the impetus for keeping those accounts originally came from the emperor’s public expenditure commitments. This suggests that financial control may have been encouraged by the financial planning that arose out of the exigencies of funding public expenditure. In this way these two aspects of monetary policy can be reconciled.

INTRODUCTION

This article reviews the literary and epigraphic evidence of the accounts which surrounded the Roman monetary system. Although these provide an early example of public finance accounting, it is an area which has tended to be neglected by accounting historians and classicists alike. The former have concentrated their efforts on the accounts of private individuals rather than of the state, whereas the latter are more interested in the economic implications of Roman monetary policy. Duncan-Jones [1990 & 1994], for example, offers an authoritative and detailed study of the various aspects of money in the Roman economy, but makes scant mention of public accounting or the information flows surrounding the Roman monetary system. A consideration of these factors can provide useful insights into the management of the Roman economy. If, for instance, one

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were to agree with Sugden [1993, p. 235] that Roman coinage was deliberately used by the state as a means of financial control, one might expect to find some evidence of financial planning. Sugden [1993, p. 231], however, does not deal with the accounting implications of his thesis, apart from a brief allusion to the budgetary role of the emperor’s principal financial secretary, the a rationibus. This article explores the rationale behind Roman public accounting in the first century AD. In so doing it contributes to the ongoing debate over the uses of coinage to the Roman state from a different angle. It starts by describing this debate, before moving on to consider Roman accounting historiography. It then examines the role of public accounting at both operational and strategic levels within the Roman monetary system.

ROMAN MONETARY POLICY

There are two opposing schools of thought regarding the management of the Roman monetary system. The first was summed up by Finley [1973, pp. 160-66] when he asked the question: What did the Roman emperors contribute that was new to the management of the economy, with their “unprecedently greater power and greater resources,” compared to the Greek city-states, of say, five hundred years before? The answer was “virtually nothing.” The emperors were governed by the “satisfaction of material wants” rather than any conception of economic policy or the “needs of the economy.” As for the money supply, “money was coin and nothing else.” Its principal use was to enable the state to make payments, usually to the troops. This echoed the views of Crawford [1970, p. 48], who argued that the Roman government lacked a monetary policy.

The alternative view is that the Roman Empire was highly monetized, and that the government attempted to maintain a stable coinage for economic reasons. Sutherland [1951, p. 173] described the imperial coinage as “an indispensable element” of a centrally controlled economy. Lo Cascio [1981, p. 76] argued that the stability of the Roman monetary system in the late Republic and early Empire was “not a necessary one nor the result of chance.” Rather, it was achieved deliberately through monetary policy. More recently Sugden [1993, pp. 230-31] maintained that although control of the coinage alone was not sufficient to ensure successful financial management, nevertheless the state used it to influence revenues and expenditures.
Financial control might have taken different forms. Lo Cascio [1981, p. 76] stated that the Roman authorities had an empirical understanding of monetary policy, which they used both to maintain fixed relationships between the different denominations of coin, and to supply the market with an adequate means of exchange. Sugden [1993, pp. 229 & 231] identified direct and indirect means of financial control. Directly, the state profited by reducing the gold and silver content of coins, to allow for their minting in greater numbers. The effectiveness of this policy depended on Rome's ability to enforce an enclosed currency system. Indirectly, the state was able to increase both its tax-take and money-stock through the increase in inter-regional trade, which according to Hopkins [1980, p. 101], resulted from the payment of taxes in money.

Additional evidence from literature, papyrus documents and coin-finds has resulted in a swing of opinion towards the monetary view of the Roman economy [Greene, 1986, pp. 50, 169]. For example, Howgego [1992, p. 1] wrote that "the possibility of using old coin for making payments means that, at least as regards the restriking of existing coin, decisions to coin might be taken for reasons other than the requirements of expenditure." The evidence is inconclusive, however, and recent studies have undermined the monetary view by questioning the extent of monetization within the Roman economy. Howgego [1992, p. 30] maintained that although the Roman world was monetized, in the sense that money was the normal means of exchange for goods, "agricultural produce, particularly corn, played a substantial role alongside money in taxation, rents, wages, and credit." Based on a study of Roman coin-survivals, Duncan-Jones [1994, p. 32] concluded that the level of monetization in the Roman Empire was "restricted and uneven," and "exchange based on barter was probably widespread below the surface." Such conclusions undermine Hopkin's [1980] trade and taxes theory, and Sugden's [1993] suggested corollary, concerning the implications for financial control.

It follows that there is still doubt over the function of money in the Roman economy. Study of the problem from an accounting perspective helps reconcile the opposing views, as it provides clues to the sophistication of Roman monetary policy by answering two key questions: (i) What was the scope of the accounts surrounding the Roman monetary system in the first century AD? (ii) Why were these public accounts brought into being?
Roman Accounting Historiography

Previous Roman accounting studies have concentrated on the level of sophistication of the accounting techniques. De Ste. Croix [1956, pp. 60-61] demonstrated the rudimentary nature of Roman bookkeeping and the absence of double-entry. Most [1979, pp. 8-11] identified certain flaws in de Ste. Croix's argument concerning the categorization of "debit" and "credit," the use of columns, and the numerical notation of accounts. While rejecting Most's criticism, Macve [1985, pp. 234-57] expanded de Ste. Croix's paper in relation to taxation and business management. He questioned de Ste. Croix's observation that the primitive nature of Roman accounting prevented the state from taxing income rather than capital, arguing that the converse was true. Roman accounts did not calculate income because the state saw no need to tax it. Similarly, Macve did not agree that rational economic decision-making was inhibited by accounting. Rather it was the lack of opportunity of Roman estate owners to benefit from alternative courses of action which resulted in the lack of systematic profit calculations. Other authors have focused on particular accounting records, such as Columella's profitability calculations in his first century textbook on agriculture [Carandini, 1983], or the accounts of the Appianus estate in third century Egypt [Rathbone, 1994].

In all of these cases the authors are concerned principally with the accounts of private individuals rather than of the state. The distinction between the two is not always clear, however, given the difficulty in separating the state's finances from those of the emperor personally [Millar, 1977, p. 189].

A factor which emerges from these works is a consciousness among Romans of the general advisability of keeping accounts. De Ste. Croix [1956, p. 43] notes, for example, that "it seems fairly safe to conclude that men of property at Rome often did write up their permanent account-books about every month." Personal wealth was both "necessary and good" [Finley, 1973, p. 35]. The fact that a citizen's rights were connected to the amount of property he declared was an incentive for keeping accounts [Edwards, 1989, p. 28]. In some cases political expediency determined the need for accounts. In a litigious society in which state officials could be prosecuted for extortion or embezzlement for political ends [de Ste. Croix, 1956, pp. 44-46], and in which the normal activity of young political aspirants was the launching of prosecutions in the law-courts [Grant,
1969, p. 27], it might be beholden on such officials to keep accounts for their own protection.

THE ROLE OF ACCOUNTING IN PUBLIC EXPENDITURE AND MONETARY POLICY

Turning now to the scope of the accounts surrounding the Roman monetary system, there are two levels at which accounts played a facilitating role in the quantification and storage of bullion in the *Aerarium* (treasury), and its issues to the Imperial Mint. First, there is the operational level at which the process was conducted; and second, there is the strategic level, at which decisions were made regarding the timing and quantity of coinage issued, and the mix of metals used.

Howgego [1992, p. 4] has described the various factors affecting the supply of bullion to the *Aerarium*. These included the gains or losses associated with conquest, the productivity of the mines and the balance of payments with the East. The relative importance of these factors fluctuated over the course of Roman history, as did the number and location of the mints in operation at any one time. Nevertheless when one speaks of the Roman monetary system which existed at particular points in time, one is able to draw analogies with earlier or later periods, because of the marked degree of continuity over a prolonged period [Bolin, 1958, p. 47; Howgego, 1992, p. 2]. In particular there was continuity in the central control exercised by the state [Sutherland, 1951, p. 9], and in the translation of procedures from the late Republic to the early Empire [Jones, 1968, p. 101].

Operational Role

Looking at the operational level first, there was a formal organizational structure within the *Aerarium* and Imperial Mint, which included supervision of the staff of freedmen and slaves, and specified lines of reporting. Included on the Mint staff were the *dispensatores*, or accountants, who kept the books. The other workmen can be categorized as skilled artists, unskilled workers or *nummularii*. These were probably state bankers, whose duty it was to receive bullion and obsolete coin, and to bring new issues on to the market [Mattingly, 1923, pp. lvii-lx; 1960, pp. 129-131]. Although there is a complete lack of surviving records, it is possible to infer the existence of inventories from the Natural History of Pliny the Elder, who was able to list the amounts of gold and silver, in cash and bullion, contained within the
At various points in time to 49 BC [Pliny, Natural History, xxxiii, 55-56]. For instance, he noted that in 156 BC "the Roman treasury contained 17,410 pounds of gold, 22,070 pounds of silver, and in coin 6,135,400 sesterces." Such inventories could have been used to exercise physical control over the stocks of precious metals. We do not know the source of Pliny's information. Its inclusion in his encyclopedia suggests its retention within the public records, as it preceded the time of writing.

Effective control of production was established during the Republic. In addition to the inventories, this was achieved by a system of control-marks on the coins and dies, and by stringent mint regulations [Mattingly, 1982, pp. 22-24]. There are occasions when issues of coin contained the inscription "EX A(rgento) PV(blico)," to indicate that they were struck from public bullion rather than bullion drawn directly from the treasury. Mattingly [1982, p. 23] suggests that the moneyers were using state money on its way to the treasury, and that the suffix represented a control-mark, forming part of the procedures for checking the amount of bullion involved.

Finally at the operational level, accounts were used by the state as a check on the stewardship of its officials. Much of public finance was conducted at a distance because of the dispersed locations of the provinces. Accounts were kept to enable the state to exert some control over the inflows and outflows of revenues and expenditures. The governors in the provinces accounted to the Aerarium in Rome for their expenditure, in addition to any local receipts alongside the publicani (tax collectors) [Jones, 1968, p. 103]. These accounts or rationes evolved in the Republic to provide a retrospective check on the individual governors, rather than as an aid to imperial planning and budgeting [Millar, 1964, p. 38]. Millar suggests that they were used in this novel way for the first time by Augustus, which leads to a discussion of the extent to which accounting played a strategic role in the monetary system.

**Strategic Role**

In many respects Augustus was a watershed in Roman history. His rise to power as principal citizen and commander-in-chief of the army followed a turbulent period of civil wars. He remained in control for forty years until his death in AD 14, and in so doing restored peace. During this time Augustus sought to control the organs of state; and the nature of government
changed to become consolidated in the person of the emperor. This applied not only to politics, but also to the monetary system, which Augustus took under his control. Arguably he could not have done this without the use of accounting information, which is known to have existed, and is discussed in due course.

It has been suggested that the archives and stores of information which were at the emperor’s disposal consisted mainly of the acts and pronouncements of himself and his predecessors [Millar, 1977, p. 266]. Thus his role has been seen as essentially passive, making decisions in response to initiatives from below, rather than actively seeking information. Accounting information, however, represents one of the major exceptions, certainly in the early Empire at least. We know something of the content of these records from literary references and from the Res Gestae (The Acts of Augustus), copies of which were inscribed on temple walls throughout the Empire.

LITERARY AND EPIGRAPHIC EVIDENCE OF ACCOUNTING’S STRATEGIC ROLE

The dependency of the Roman currency on the supply of precious metals implies that it would have been a limiting factor in any budget. Corroborative evidence comes from the debasements following periods of heavy spending, and from the urgency with which the precious metal resources of new provinces were exploited following conquest. Archaeological finds of date-stamped ingots in Britain, for example, suggest that Britain’s lead resources, from which silver was produced by cupellation, were developed rapidly following the Claudian invasion in AD 43 [Frere, 1974, pp. 321-24; Ireland, 1986, pp. 221-24]. Thus, one might ascribe a more proactive role to the inventories alluded to by Pliny, as being needed not solely to safeguard the stocks from theft, but also to plan expenditure and coinage issues, and ultimately to indicate the need to replenish stocks by securing new supplies.

Suetonius [Augustus, xxviii] and Dio [liii, 30,2] record that in 23 BC, Augustus, fearing he was about to die after a long illness, handed over an account (rationarium), which listed public revenues and armed forces. Suetonius [Augustus, ci] informs us that on his death in AD 14 Augustus left “a summary of the condition of the empire” (breviarium totius imperii), which Tacitus describes as containing “a list of the national resources. It gave the numbers of regular and auxiliary troops serving in
the army; the strength of the navy, statistics concerning the provinces and dependent kingdoms; direct and indirect taxation; recurrent expenditure and gifts" [Annals i, 11, 4]. Suetonius and Dio note that it also listed the amounts of cash in the Aerarium, in the provincial fisci, and in the hands of the publicani; and that it included the names of the freedmen and slaves from whom a detailed account could be obtained [Suetonius, Augustus ci; Dio, lvi, 33, 2]. The closeness of this information to the executive authority of the emperor is attested by Tacitus' statement that it was written out by Augustus himself.

There is evidence that the imperial accounts were continued beyond Augustus' reign. Suetonius [Caligula, xvi] and Dio [lix, 9, 4] commented that the “accounts of the empire” (rationes imperii), which had been made public regularly by Augustus, were allowed to lapse by Tiberius (AD 14-37), and revived by Caligula (AD 37-41). It would have been surprising had they not been continued beyond Augustus' lifetime, when one considers the evolutionary character of Roman political institutions in the first century AD. Revolutionary change did not follow the eclipse of the Republic. Rather, Augustus “proceeded by a slow process of trial and error, feeling his way forward with patient care.” The system of government he established was enduring, and “gave the world a large measure of peace and stable government for over two hundred years.” [Scullard, 1976, p. 215].

The Res Gestae is a remarkable account to the Roman people of Augustus' stewardship. It listed and quantified his public largesse, which encompassed distributions to the people, grants of land or money to army veterans, subsidies to the Aerarium, building of temples, religious offerings, and expenditures on theatrical shows and gladiatorial games. It was not an account of state revenue and expenditure, but was designed to demonstrate Augustus' munificence. The significance of the Res Gestae from an accounting perspective, lies in the fact that it was compiled retrospectively towards the end of Augustus' life. This illustrates that the executive authority had access to detailed financial information, covering a period of some forty years, which was still retrievable after the event.

Viewed in conjunction with the literary references, one is struck by the scope of the accounting information at the emperor's disposal, which suggests that its purpose encompassed planning and decision-making, particularly when one considers its closeness to the executive authority. Indeed, it is hard to imagine that financial control could have been exercised
without some financial planning. Although, by itself, the sophisticated nature of the accounts surrounding the Roman monetary system in the first century AD cannot prove that financial control took place, it does corroborate that view.

**Origins**

It remains to consider why these accounts were brought into being. The evidence indicates that the answer lies in the emperor's public expenditure commitments. He was obliged to subsidize the state heavily from his own private funds (*fiscus*), because of the inadequacy of public revenues which resulted in large budget deficits. The scale of these subsidies, and the wealth of the emperor, is apparent from the 2.4 billion sesterces noted in the *Res Gestae* as having been spent by Augustus on the *Aerarium*, the people and the veterans alone [*Res Gestae, Summary, 1*], compared to annual public revenues, which have been estimated hypothetically in the region of 500 million sesterces [Millar 1977, p. 191]. Increasingly, therefore, the emperor's personal finances became intertwined with those of the state [Millar, 1977, pp. 189-201], and he had strong personal motivation to exercise budgetary control over public spending [Brunt, 1966, p. 89].

De Ste. Croix's [1956, p. 43] observation that it was common practice for men of property to keep accounts begs the question of whether the accounts kept by Augustus were a continuation of this. Their national scope and content were fully consistent with the extent of his property. As principal citizen his property transcended that of anyone else, and over the period of his reign became difficult to separate from that of the state. It was not unnatural, therefore, that his accounts should be of national significance.

The manner in which the process was administered further illustrates the connection with the emperor's personal finances. At the center of the management of the Roman monetary system was the emperor's principal financial secretary, the *a rationibus*. The most detailed description of his duties comes from the poet Statius [*Silvae, iii, 3*], from whom we can deduce that in addition to advising on how much coin to issue, he was required to forecast public revenues, and estimate public expenditure. Statius was writing about the reign of Domitian (AD 81-96), which indicates the importance of this office some seventy years after Augustus' death. But how did the office evolve? Brunt
[1966, p. 89] suggests its origins lay in the employment by Augustus of the same staff to administer both his public and private finances, which as we have seen became inextricably linked. Thus he used clerks and accountants from his private staff at Rome to assist him in supervising the public treasury, which entailed them having access to the public records held within the Aerarium. If this scenario is correct, the public accounting records maintained by Augustus, and the budgetary role of the a rationibus under Domitian, can be viewed as part of the same evolutionary trend; and there is no reason to suppose that it excluded the emperors in between. In the case of Claudius (AD 41-54), for example, his private secretaries, including Pallas, his a rationibus, seem to have enjoyed unprecedented political status [Millar, 1977, pp. 74-77].

The dependency on the emperor for subsidies was heightened by the absence of government borrowings, which exposed the state to short-term deficits. These could result in the state defaulting on obligations, seizing large fortunes, or debasing the coinage [Duncan-Jones, 1994, pp. 3-5]. Difficulties in funding army discharge bonuses under Augustus and his immediate successor, Tiberius, led to virtual mutiny [Duncan-Jones, 1994, p. 11]. It follows that although there has been a shift away from the view that coin was minted solely to enable the state to make payments, this role remained vital. Furthermore, the origins of the emperor's accounts in the first century AD appear firmly linked to the state's public expenditure requirements. In this respect, the evidence from the accounts runs contrary to the view that money was used for financial control, because it emphasizes the importance of money to the state for making payments. These two aspects of monetary policy are not mutually exclusive, however, and the one may have been the logical outcome of the other. Effective financial control depended on financial planning, which was initiated by the keeping of the accounts that arose from the emperor's public expenditure obligations. This supports Lo Cascio's [1981, p. 77] argument, that even when the "primary purpose" of government measures was to make payments, "this result was attained by a government aware of, and interested in, what happened to its coinage once it was in circulation."

**CONCLUSION**

The scope of the accounting information surrounding the Roman monetary system in the first century AD supports the
view that coinage was used for financial control. Accounts enabled the state to control the operations of the *Aerarium* and the Imperial Mint, and also the financial dealings of the state's officials in the provinces. The possible uses of this information went beyond facilitating the minting operations; and it was during the reign of Augustus that its potential as an aid to imperial planning and budgeting was first recognized. This represents an exception to the normally passive role of the emperor in not actively seeking information. The *Res Gestae* together with the literary references indicate a wide range of financial information over a prolonged period of time, suggesting that its purpose included planning and decision-making, particularly when one considers its closeness to the executive authority of the emperor. There is evidence in the role of the *a rationibus* under subsequent emperors, and from literature, that these accounts were continued beyond Augustus' lifetime.

The emperor had strong personal motivation to exercise budgetary control over public spending owing to the inadequacy of public revenues, which required him to provide large subsidies. The dependency on the emperor was increased by the absence of government borrowings. Increasingly his personal finances became intertwined with those of the state. This was apparent in the government office of *a rationibus* which evolved out of the management of the emperor's private estate. It follows that although the scope of the accounts supports the proposition that they were used for financial control, the impetus for keeping those accounts originally came from the emperor's public expenditure commitments and the need for the state to make payments. This suggests that financial control may have been encouraged by the financial planning that arose out of the exigencies of funding public expenditure; and in this way these two aspects of monetary policy can be reconciled.

The main way forward for research lies in the coins themselves. Analysis of quantities, composition and geographical distribution provides evidence of the adjustments to the coins' relative weight and content, decisions on when and how much to mint, and the extent to which the currency system was enclosed, all of which have been put forward by previous authors as indicators of financial control. Inevitably the evidence is incomplete owing to the haphazard nature of the coin-survivals. The evidence is still being augmented by the discovery of new finds and the publication of old ones. Studies from alternative perspectives, such as the present one, are useful because they compli-
ment the incomplete evidence from coins. The process can work the other way, however. In this respect, the major inference to be drawn from this article is that financial control, which depended on planning, is likely to have become more developed under Augustus and his successors than before, because it was Augustus who initiated systematic planning information. Coin-research in this direction could help confirm or deny the role of accounting as a facilitator of financial control.

REFERENCES


Oldroyd: Role of Accounting... in the First Century Roman Empire


EDWARD WILD: ADVOCATE OF SIMPLIFICATION AND AN ORGANISED PROFESSION IN COLONIAL AUSTRALIA

Abstract: As far as can be established, Edward Wild's book, Bookkeeping by Double Entry Made Easy, was the second book on accounting to be published in Australia. Apart from the presentation of his simplified system of double entry bookkeeping, Wild advocated the establishment of an organised Australian accounting profession in his book. This paper examines the life and career of Wild and describes and analyses the content of his book. The book is placed within the local Victorian context. Possible influences on Wild's writing are examined and the possible influence of Wild on later developments in Australian accounting is addressed.

INTRODUCTION

The accounting literature abounds with studies of the first or early printed books on accounting published in various countries. To date, it has been established by Carnegie and Parker (1994) that the first printed Australian accounting book was written by James Dimelow. Dimelow's book, Practical Bookkeeping Made Easy, was self-published in sets during 1871-73 in Ballarat. So far as is known, the second accounting book published in Australia was written by Edward Wild. His book, Bookkeeping by Double Entry Made Easy, was printed in Melbourne.

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by Sands & McDougall in 1874.¹ In his book, Wild proposed a simplified system of accounting by double entry for widespread adoption and advocated the formation of an association of accountants. Wild's advocacy of a local, organised accounting profession was primarily based on his push for the standardisation of accounting practice under a simplified system and came more than a decade before the advent of the first Australian professional accounting body.² This paper recognises Wild as a pioneering accounting author in the colonial era and aims to augment the literature on accounting development in Australia.³

The content of any book, including books on accounting, is influenced by the author's life experiences, education and social context. Given these perceptsives, this paper examines the life and career of Wild along with the local Victorian context within which Wild's book was written. There follows a description and analysis of Wild's book and a discussion of his arguments for the professionalisation of accounting in Australia. Possible influences on Wild's writing are examined and his possible influence on later developments in Australian accounting is also considered.

WILD'S LIFE AND CAREER

Edward Wild was born in Yorkshire, England in 1806 to John Wild, a publican, and Anna (nee Copely). By the time Wild reached the age of 19 years, he was living abroad in Hamburg, Germany for he married Anna Da Silva there in 1825. Anna Da Silva was born to a merchant father in the Portuguese city of Oporto in 1805. It is therefore unlikely that Wild gained any substantial commercial experience whilst he resided in England. Wild and his wife continued to live in Hamburg for about two years after their marriage before settling in Oporto, Portugal.

Wild was a finance broker in Portugal. At Oporto in 1832, he introduced what was described as the system of Bill Brokerage for fixing the Rate of Exchange for the British Merchants. Wild was sufficiently recognised in Portugal for some 33 British

¹An original copy of Wild's book is held at the State Library of Victoria, Melbourne and also at The British Library, London.
²As the earliest known professional accounting body in Australia, The Adelaide Society of Accountants was formed in November 1885 and incorporated on 30 March 1886 [Parker, 1961; Gavens, 1990, p.386].
³Federation of the six colonies within Australia into the Commonwealth of Australia occurred on 1 January 1901. From this date, the Colonies became known as States.
Merchants to sign a testimonial of 17 December 1845 which acknowledged this accomplishment and his involvement in the finance broking profession for nearly 13 years. A copy of this testimonial written in English was included in *Book-keeping by Double Entry Made Easy* [p.35]. Wild was also involved in the wine trade at Oporto during his 27 years in that city and had experience chiefly in the wine produce of Douro [*The Argus*, 9 April 1860, p.6; *Victoria, Report of the Royal Commission . . ., 1867*, p.116]. Wild departed Portugal in 1854 bound for Melbourne in the Colony of Victoria. While no official shipping records of his arrival were found, residence in Victoria from 1854 is confirmed by death registration records which state that Wild resided in the Colony for 23 years until his death in Melbourne on 23 April 1877.

On his arrival in Victoria in 1854, Wild evidently rendered services as an accountant for he acted for the Hon. J.P. Bear, Member of the Legislative Council of Victoria (MLC), of Messrs. Bear and Son [pp.5 and 13 of Wild’s book]. In 1856, Wild was involved in a partnership with Charles Vaughan in the vocation of estate agents and stockbrokers. The partnership of Vaughan and Wild dealt mostly in the sale and purchase of real estate [Hall, 1968, p.11]. An early land acquisition by Vaughan and Wild was in August 1856 when they purchased the pastoral run of “Maryville” near Morwell [Billis and Kenyon, 1974, p.153]. According to Billis and Kenyon, the partnership held a total of 12 other pastoral runs in Victoria at different times during the period 1856-64. Wild also held in his own right the “Saintfield”

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1 A dedication referring to this testimonial was published in the Oporto newspaper, *N. Coallisao*, of 9 January 1846. The dedication provided evidence of the signing of the testimonial by the British Merchants. The dedication was subsequently translated into English by a Thomas Smith in Liverpool, on 26 January 1846 [p.36 of Wild’s book].

2 Messrs. Bear and Son were stock and station agents in Victoria [Brownfoot, 1979, p.230].

3 Vaughan was Inspector of General Markets in 1845, a member of the Committee of Mechanic’s Institute of Melbourne from 1846 to 1848 and the Treasurer of the Institute from 1854 to 1855. He practised as an accountant in Collins Street, Melbourne in 1846 and was the first Treasurer of the Melbourne Building Society, established in 1847. In public life, he was a Mayor of Fitzroy Council, and a Member of the Legislative Council of Victoria from 1856 until his death at St Kilda in June 1864 [Garryowen, 1888, p.439; Billis and Kenyon, 1974, p.153; Askew, 1982, p.171; Serville, 1991, p.447]. Billis and Kenyon [1974] was first published in 1932.

4 There was no formal structure for the trading of shares in Melbourne until the establishment of a Stock Exchange in 1861 [Hall, 1968, pp. vii and 13-47].
pastoral run near Merton from 1858 to January 1860 [Billis and Kenyon, 1974, p.160]. By 1860, Vaughan and Wild were operating a brewery in the Melbourne suburb of Collingwood. In 1861, the brewery became known as the Cambridge Brewery when the partners shifted the business to Cambridge Street, Collingwood. By 1869, the firm of Crisp and Co. had acquired the brewery which later was traded under the name “Star Brewery” [Duetsher, n.d.].

On publication of his book, Wild was 68 years of age and had taught bookkeeping at the Collingwood School of Design and the Auxiliary Artisans’ School of Works. These institutions were founded in 1871 and 1872 respectively by Joel Eade [Rundle, 1972, p.124]. Wild undertook to teach his system of bookkeeping at these institutions “in order to prove the simplicity and efficacy” of the system and pointed out that after three lectures “three of the lads are sufficiently advanced to be able to teach others” [p.6 of Wild’s book]. It is not known when Wild began to teach bookkeeping or whether he taught at these institutions on a full-time basis or on a casual or visiting basis. Wild stated in his book that he had spent 50 years as an accountant; the first 10 under the “old system” of accounting and 40 years under the system he proposed “to introduce to his fellow accountants and the public” [p.37]. Wild’s long experience as an accountant evidently dates from his time in Germany and embraces his pursuits as a finance broker and involvement in the wine trade in Portugal, and his activities as an estate agent and stockbroker, investor, brewer and bookkeeping teacher in the Colony of Victoria. He had evidently developed his simplified system prior to arriving in Australia in 1854.

Wild was an ardent lover of music and for many years was a liberal patron of various musical institutions in Melbourne. In his later years he became reduced in circumstances [The Australasian Sketcher, 12 May 1877, p.19; Victorian Municipal Directory, 1878, p.81].

LOCAL VICTORIAN CONTEXT

The main stimulus to economic growth in Victoria in the early colonial period was the gold rush in the 1850s. The gold rush “transformed the quiet pastoral colony founded only 16

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8On 12 December 1864, Wild stated that he had been engaged as a brewer in the Colony for “over four years” [Victoria, Report of the Select Committee ..., 1865, p.20].
years earlier into an El Dorado" [Sykes, 1988, p.63]. The influx of gold seekers brought the advent of a more stable and permanent class of people who engaged themselves in mercantile and trading pursuits [Turner, 1973, p.364]. The spurt to the economy was to such an extent during this period that it was claimed Melbourne "in 1852 was probably the most expensive place in the whole world to live in" [Turner, 1973, p.375]. In Melbourne suburbs such as Emerald Hill (now South Melbourne), Collingwood and Richmond "the cost of land was prohibitive of picturesque display, and crowded blocks of cottages, tightly fitting the allotments and flimsy terraces, were the order of the day in 1853" [Turner, 1973, p.368].

Collingwood became known as the brewing capital of Australia [Dunstan, 1987, p.18]. Dunstan explained the growth of the brewing industry in Victoria during the 1850s-1870s as follows:

In 1856 Victoria had thirty-five breweries, and in the city area of Melbourne bounded by Flinders, Spencer, La Trobe and Spring Streets there were 136 inns and taverns. Of course, many of them were just holes in the wall, fearful dens where the she-oaks and swipes could only be imagined. The breweries had evocative names, the Dublin, the Cambridge, the Phoenix, the Eagle and the Star. The peak was reached in 1871 when there were 126 breweries in Victoria turning out 13,061,145 gallons, brilliantly impressive for a colony that had a population of less than 800,000. That was 16.3 gallons a head [Dunstan, 1987, pp.6-7] (emphases added).

Given this dramatic growth reflecting the propensity for inhabitants to consume beer, the Victorian government understandably took a strong interest in the conduct of the industry during this period. In 1864, a Government Select Committee enquired into the progress and present condition of the manufacture in the Colony of tobacco, cigars and spirits under different duties and of ale and porter under an import duty. This enquiry was followed by a Royal Commission enquiry into the operation and effect of the Wine and Spirits Sale Statute, No. 227. Wild presented evidence at both of these enquiries.

In 1871, the population of Melbourne was 206,780 which represented 28.9 per cent of the total population of the Colony

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9Turner [1973] was first published in 1904.
of Victoria. In the early 1870s, Melbourne consisted of “a core of impressive facades interspersed with mean dwellings and shops, and its circles of suburbs stretching out for miles” [Serville, 1991, p.148]. On visiting Melbourne in 1872, John Walter Cross, in a private letter to his mother, described a city in transition and commented “I daresay however in time when it is all finished that it will be a himposing hediface (sic)” [Brown, 1971, p.442]. This comment caught the tone of the precocious growth and development which occurred in Melbourne in the 1880s when it overtook Sydney as the major commercial and social centre of Australia and became known as “Marvellous Melbourne” [Blainey, 1958, pp.125-137; Davison, 1978, pp.229-257]. The first professional association of accountants established in the Colony of Victoria was The Incorporated Institute of Accountants, Victoria. Founded in April 1886, this body was registered on 1 March 1887 under the Companies Statute 1864 [Australian Society of Accountants, 1963].

DESCRIPTION AND ANALYSIS OF WILD’S BOOK

Wild’s book had both a short title, Book-keeping by Double Entry Made Easy, and a long title like many other books of its period [Parker 1984]. The long title was Book-keeping by Double Entry Made Easy. The Original Italian System of Book-keeping by Double Entry Simplified. The use of the phrase “Italian System” is rather surprising at this late date [Parker, 1984]. Wild’s choice of title may have been influenced by Dimelow who used “made easy” in the title of his book. In writing his book, Wild intended to widen the use of double entry bookkeeping which he viewed as too complex under the “old system”. Wild’s focus is elucidated in his introduction which stated:

Mr Wild, in introducing his simple method of keeping accounts, claims no originality for the principle, but merely modifies the old Italian system of double entry, which he has brought to such simplicity that any intelligent person, male or female, can become a competent book-keeper in three or four lessons, either by personal attendance or by correspondence, proof of which will appear in documents thereto annexed [p.3].

Wild claimed that his “new” system of bookkeeping was “first

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10 Victorian Year-Book 1931-2, p.38.
11 His letter to Mrs William Cross was dated 13 April 1872.
Wild’s approach to simplification was to substitute a “Register” for the conventional day book, cash book and journal. The function of the Register was to record the details of daily transactions. These were posted at the same time in the ledger, thus enabling a balance sheet to be expeditiously prepared. Wild believed that the old system was too burdensome and did not permit the timely preparation of a periodic balance sheet. Wild claimed other advantages of his system including the following:

(i) rendering confusion of entry and the falsification of amounts impossible, and omission or error liable to immediate correction;
(ii) the use of the Register to act as a proof of the ledger;
(iii) ease of copying the contents of the Register for absent partners;
(iv) the reduction in office expenses on account of savings in labour;
(v) the widespread applicability of the system including in mercantile, pastoral, mining, legal and railway pursuits, and also in government [pp.3-4].

Wild also emphasised in the introduction of his book, the ease with which a knowledge of his system could be conveyed while pointing out that “the complicated system taught in schools, and adapted by the mercantile community, is one not easily imparted to youth . . .” [p.4].

Following the introduction [pp.3-5], is a section [pp.6-9] headed “Popular Education” which included reproductions of testimonials, and also correspondence with the Melbourne Chamber of Commerce. In this section, Wild argued for the adoption of bookkeeping as an additional “free subject” at “State Schools” [p.6]. Testimonials provided by John Montgomery Templeton and Joel Eade were reproduced in the book to support the adoption of Wild’s system for teaching purposes. Acknowledged as the Founder of The National Mutual Life Association of Australasia Ltd (National Mutual) which was registered on 12 August 1869, accountant Templeton initially occupied the position of actuary and, on his death in 1908, held the positions of chairman and managing director of the organisation (The National Mutual Life Association of Australasia Ltd, 1969, pp. 4, 6, 9, 13 and 136). On 2 July 1874, Templeton was actuary and secretary of National Mutual when he wrote of Wild’s success in teaching the system at the
Collingwood School of Design and stated this was "in itself a strong argument in favor of the introduction of your system to the public (i.e. State) schools" [p.7 of Wild's book; Jordens, 1976, pp.252-253]. Eade's testimonial of 4 July 1874 referred to the ease with which certain lads at the two institutions he founded and presided over were taught bookkeeping by Wild with himself in attendance. In expressing his approval of Wild's system, Eade stated "under the present systems of book-keeping much time is wasted in stuffing youths with methods which are of little practical use to them when they enter upon business life" [p.7].

In the absence of any local professional accounting body, Wild sought the imprimatur of the Melbourne Chamber of Commerce without much success. In a letter to Wild of 6 October 1874, B. Cowderoy, Secretary of the Melbourne Chamber of Commerce, stated:

I have now the honor, by desire of the committee [a sub-committee], to express their opinion that the system of keeping accounts which you submitted in the documents accompanying your letter is likely to prove a valuable one for businesses of a limited character, and especially useful for the commendable object you are seeking to promote so zealously and disinterestedly, viz., the familiarising the youths of the colony with the principle of double entry. I am, at the same time, however, to state that the committee doubt very much whether your system should be found capable of meeting the requirements of a varied and extensive business [p.8 of Wild's book].

Despite the doubts raised in this correspondence about the adaptability of the proposed system to a large and varied business, Wild proceeded to publication in the absence of any attempt to convince readers of the invalidity, if any, of the criticism received.12

There followed a set of illustrative accounts [pp.10-33] presented in the absence of instructions as to how to make the entries in the accounts. The accounts were of "George Simmons", a merchant, which illustrated the use of a Register

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12In a letter to B. Cowderoy of 9 October 1874, Wild sought to meet with the members of the sub-committee who reviewed his manuscript in order to convince them to reconsider their decision. In his reply of 13 October 1874, B. Cowderoy advised of the inability of the Chamber to meet Wild's request for such a meeting [pp. 8-9 of Wild's book].
with a set of hypothetical transactions (see extract in Appendix A) and the updating and balancing of the ledger by the Register. A balance sheet was presented as a product of the system. In illustrating the Register, Wild explained:

... that the employer has before him daily the details of every day's transactions, which are at the same time posted in the Ledger, from which, at any moment by proving the correctness of the Ledger by the Register, as per form following [as reproduced in Appendix B], a Balance Sheet is furnished without further references [p.12].

Although the illustrative accounts were intelligible to Wild, they might have been of limited assistance to some readers in the absence of complementary oral instruction. Such instruction, of course, would have been provided by Wild or others who had acquired knowledge of his system.

Wild adopted a "how to" approach to bookkeeping and intended to make double entry more accessible to anyone seeking to "become a competent book-keeper" [p.3 of Wild's book]. Like most of his contemporaries, Wild did not examine issues of asset valuation. Nevertheless, he was concerned about the ability to produce accounts on a timely basis. This ostensible objective was commendable as was his desire to familiarise youths in the new Colony of Victoria with the principle of double entry. The further development of Wild's professional career, however, may have been another intended consequence of the publication of his book. Wild suggested in his introduction that "young men will find it to their advantage to article themselves to Edward Wild for instruction on this method of account keeping..." [p.5].

Wild's book was almost certainly not published in Britain. His views on local endeavour elucidate the decision to publish his book in Australia. On the issue of the ready availability of imported ales from Britain, Wild argued for the support of local enterprise in an essay written most likely in the 1860s titled "A Few Words: Protectionists, Freetraders and Patriots Generally". In this essay, Wild stated:

... do not think so meanly and disparagingly of the land of your adoption as to suppose that British skill,

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13A copy of this undated essay printed by Fergusson and Moore, Melbourne is available at the La Trobe Library of the State Library of Victoria.
British energy, British ability, and British domination cannot produce the same results in Australia which they do in the mother country (pp.3-4).

Wild's support for colonial enterprise suggests that he did not find it to be essential to publish *Book-keeping by Double Entry Made Easy* in the "home country".

**WILD'S ARGUMENTS FOR AN ORGANISED ACCOUNTING PROFESSION**

Wild's call for the establishment of an association of accountants was one of the earliest, if not the earliest, documented call for an organised accounting profession in Australia. However, Wild's earlier interest in the issue of professionalisation is evident from his comments made to the Royal Commission in 1866. With respect to brewing, Wild stated:

>To have the trade [brewing] more efficiently conducted, and to secure proper persons to take charge of it, we think something like Licensed Victuallers' Hall ought to be established . . . and a board appointed to examine all applicants for licenses as to their knowledge of the quality of the liquors they may have to purchase and supply to the public. I think that is one of the important things. *I would make the publican's business a profession.* [Victoria, *Report of the Royal Commission . . .*, 1867, p.115] (emphasis added).

The first professional accounting body had been established in Scotland for over two decades when Wild advocated the establishment of an organised profession in Australia in 1874. The first body, The Society of Accountants in Edinburgh, was founded in 1853 and was granted a charter in 1854. In England, The Incorporated Society of Liverpool Accountants and the Institute of Accountants (London) were formed in 1870 as the earliest English bodies [Parker, 1961, p.337]. In the nineteenth century, factors such as the growth of large-scale organisations, the development of the limited liability company, high levels of

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14The emergence of professional accounting bodies in England almost 20 years after the formation of The Society of Accountants in Edinburgh has been attributed to the availability in Scotland of more practical education and more favourable bankruptcy laws from an accountant's perspective. Scottish accountants also developed close links with the legal profession. Courts in Scotland were more prepared to recognise the standing of accountants than were the English courts [Edwards, 1989, pp.277-278].
insolvency and the advent of income tax brought demands for particular accounting services [Parker, 1989, p.12]. As stated by Parker [1989, p.12]:

These demands led to the emergence of specialist experts who came together to discuss common problems, to distinguish competent and honourable practitioners from incompetent and dishonourable ones, to raise their status and to protect their material interests.

Hence, the advent of professional associations of accountants. A cornerstone of professionalisation was the implementation of a system of examinations for entry into the profession and the adoption of tiered membership structures. This concept of how members of a social stratum establish and preserve their status, and how collective social mobility is achieved has been defined as "social closure" [Larson, 1977; Macdonald, 1985, p.541].

Nineteenth century Australian accountants were active importers of the British model of the accounting profession [Macdonald, 1936, p.17; Brentnall, 1938, p.64; Parker 1989, pp.12-19; Carnegie, 1993, p.61]. Australian accountants were successful in forming bodies from 1885 that were intended to elevate the status of their calling. Some 11 years earlier, Wild proposed the desirability of professional accounting qualifications in stating:

One important advantage to the mercantile public in the establishment of an Accountants' Association would be that certificates of ability of persons applying for situations might be issued by the association to persons submitting themselves for examination, and the possession of such a certificate should be accepted as sufficient guarantee that the holder was competent to discharge the duties demanded by (sic) him [p.37 of Wild's book].

Wild presented two examples of persons who had no knowledge of any method of accounting to support this argument for credentialism in Australian accounting. One of these involved a merchant whose bookkeeper "was in the habit of taking home the books to be made up from slips of paper furnished by him to a party to whom he paid £2 per week" [p.37].

Wild's advocacy of an organised profession was primarily based on the belief that an accounting body's members would be able to stipulate the adoption of certain methods of accounting. More particularly, Wild linked the establishment of an associa-
tion of accountants with the need he perceived for the adoption of a uniform simplified system of bookkeeping. He argued that the adoption by the members of an accounting body of "one uniform method of simplifying the Italian system of Book-keeping by Double Entry ... would be a great boon to employers, several of whom have confessed that they do not understand the system of keeping books at present in use" [p.37].

It was not until 1974 when the Australian professional accounting bodies first instigated attempts to regulate accounting by means of the adoption of accounting standards.\textsuperscript{15} Although professional accounting standards are concerned with the standardisation of specific accounting practices rather than with the structure of accounting records, it is evident that rules for either involve the mandating of actions to be taken by members in preparing accounts. Perhaps, not surprisingly, Wild's call for the adoption of a common, simplified system of bookkeeping was not deliberated upon by the professional accounting bodies formed in Australia in the nineteenth century. His death in 1877 was certainly a hindrance to the further development of arguments for simplification of account keeping. Nevertheless, his ideas about professionalisation may have advanced the process of social closure in Australia.

\textbf{POSSIBLE INFLUENCES ON WILD'S WRITING}

Early Australian writers on accounting including Wild did not reference each others' works nor indeed any other text. However, Wild may have been influenced by Edward Thomas Jones who wrote \textit{Jones's English System of Book-keeping by Single and Double Entry} ... published in 1796. Wild perhaps learned from this text which, as the first English work on accounting to achieve international acclaim, was translated into various languages including German (Yamey, 1956, p.314). It may have also been available in Australia.\textsuperscript{16} Jones attacked the

\textsuperscript{15}Statement of Accounting Standards AAS1 "Profit and Loss Statements" [ASA and ICAA, 1973] was the first accounting standard to be issued by the Australian accounting bodies for mandatory application by members of these bodies in accounting periods ending on or after 1 December 1974.

\textsuperscript{16}There survives at least two original copies of \textit{Jones's English System of Book-keeping by Single and Double Entry} ... in Australia. A copy of the sixteenth edition is held in a private archive in Melbourne, while a copy of the eighteenth edition is located at the State Library of New South Wales. Both of these editions were edited by Theodore Jones (son of Edward Thomas Jones) and were published in London during or around the 1860s.
Italian system of double entry as being "delusive, conducive to error, and capable of being converted into a cloak, for the vilest statements that designing ingenuity can fabricate" (Yamey, 1956, p.313). His volume of 1796 advocated a new method of bookkeeping by single entry along with changes in the organisation of books of account. In order to eliminate errors in posting from the journal to the ledger, Jones used the day book as the book of original entry and posted to the ledger from the day book. Like Jones, Wild sought to simplify the Italian system of double entry and did not approve of separate waste-books and journals. However, Wild did not promote single entry bookkeeping.

In Australia, Wild's book was preceded by Dimelow's Practical Book-keeping Made Easy. Like Wild, Dimelow was an Australian immigrant and taught bookkeeping in the Colony of Victoria. Dimelow's book was written primarily for a commercial college environment while Wild's book, although of similar orientation, was also intended to reduce the complexity of accounting for those in commerce. However, apart from a tenuous link relating to the use of "made easy" in the titles of their respective books, there is no evidence to suggest that Dimelow had any influence on the form and content of Wild's book.

WILD'S INFLUENCE ON LATER DEVELOPMENTS IN AUSTRALIAN ACCOUNTING

Due to his death in 1877, Wild was not one of the pioneers of the organised Australian accounting profession although his ideas about professionalisation may have advanced the process of social closure in Australia. Although it is difficult to assess, his simplified system of double entry accounting appears to have been of limited commercial appeal as witnessed in the comments of the Melbourne Chamber of Commerce which recommended the system with qualifications. However, it seems to have been suitable for the relatively small undertakings that Wild would have been familiar with in the Colony, and also for teaching purposes. Further, Wild's system was possibly in need of active proponents to ensure its use in organisations and educational establishments following his death. Wild is perhaps best seen as an advocate of a local, organised accounting profession, and a proponent of the teaching of bookkeeping in State schools and the widespread use of double entry accounting in colonial Australia. It was not until August 1912 when the Victorian gov-
ernment announced that a commercial course would be introduced into the State's new high schools and higher elementary schools [Blake, 1973, pp.464-468; Murray-Smith & Dare, 1987, p.93].

CONCLUSION

As far as can be established, *Book-keeping by Double Entry Made Easy* was the second book on accounting to be published in Australia. Wild's book supported accounting development in various ways. He not only promoted the adoption of his simplified system of double entry but also called for the teaching of bookkeeping in public schools and advocated the formation of an organised accounting profession in Australia. Despite his concern for accounting development, Wild also appears to have been concerned with self-promotion in publishing his book. Nevertheless, he sought to demonstrate how easily a knowledge of his system could be imparted.

Wild's early advocacy of an organised profession was primarily based on his perception of the need for an accounting body to mandate the adoption of a simplified method of double entry accounting. In effect, he hinted at developments which occurred a century later in 1974 when the Australian professional accounting bodies began to regulate accounting by means of the issue of accounting standards for mandatory application by members. Wild's death in 1877 meant that he did not witness the advent and development of an organised Australian accounting profession or the adoption of a commercial course in state schools. Notwithstanding, he may be regarded as an early public advocate of accounting development in colonial Australia.

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17The subsidisation of commercial education in Victoria was recommended by the Board of Inquiry on the Working Men's College (now Royal Melbourne Institute of Technology) in its final report of 8 May 1911 [Murray-Smith & Dare, 1987, p.125].
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The following illustration of the use of the Register is reproduced from Wild's book, pp.10-13.

**REGISTER.**

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Fol. in Ledger</th>
<th>Saturday,</th>
<th>No.of</th>
<th>Cr.</th>
</tr>
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<td>1</td>
<td>To George Simmons, for Capital</td>
<td>1</td>
<td>1000 0 0</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>“ Jno. Payne, Oats, as per Invoice No.1</td>
<td>2</td>
<td>25 0 0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>“ Wm. Hadfield</td>
<td>3</td>
<td>150 0 0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>“ Sands &amp; McDougall</td>
<td>4</td>
<td>10 0 0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>“ Commercial Bank, Cheque No. 1</td>
<td>5</td>
<td>10 0 0</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>“ Cash</td>
<td>6</td>
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<td></td>
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<tr>
<td>14</td>
<td>“ Petty Cash</td>
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<td>0 15 0</td>
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<table>
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<th>Monaday,</th>
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<td>7</td>
</tr>
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<td>6</td>
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<tr>
<td>2</td>
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<td>17</td>
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| 1205 15 0 |

**CONTRA.**

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<td>“ Oats a/c.-100 bushels</td>
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</tr>
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<td>6</td>
<td>“ “ 500</td>
<td>4</td>
<td>100 0 0</td>
</tr>
<tr>
<td>7</td>
<td>“ Bran- 500</td>
<td>2</td>
<td>50 0 0</td>
</tr>
<tr>
<td>9</td>
<td>“ Charges-Stationery</td>
<td>4</td>
<td>10 0 0</td>
</tr>
<tr>
<td>10</td>
<td>“ Cash</td>
<td>5</td>
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<tr>
<td>11</td>
<td>“ Wages</td>
<td>6</td>
<td>2 0 0</td>
</tr>
<tr>
<td>12</td>
<td>“ House Expenses</td>
<td>“</td>
<td>3 0 0</td>
</tr>
<tr>
<td>13</td>
<td>“ G. Simmons-Private a/c</td>
<td>“</td>
<td>2 0 0</td>
</tr>
<tr>
<td>14</td>
<td>“ Petty Cash</td>
<td>“</td>
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</tr>
<tr>
<td>15</td>
<td>“ Charges as per Petty Cash Book</td>
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<tr>
<td>“ Oats a/c.-4000 bushels</td>
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<tr>
<td>“ Maize- 2000</td>
</tr>
<tr>
<td>“ Jno. Payne, as per contra</td>
</tr>
<tr>
<td>“ Hadfield, as per contra</td>
</tr>
<tr>
<td>“ Hadfield-My Acceptance, 3 mos</td>
</tr>
<tr>
<td>“ Flour a/c.-20 tons</td>
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<p>| 4672 0 0 |</p>
<table>
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<th>Cr.</th>
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<tr>
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<td>To Bills Receivable No1 &amp; 2 for Discount</td>
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<tr>
<td></td>
<td>2</td>
<td>&quot; Bran a/c. Sales-25 bushels</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>&quot; Bencraft, as per Invoice No. 6</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wednesday,</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>To Oats-3000 bushels</td>
<td>23</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>&quot; Maize-1500</td>
<td>24</td>
</tr>
<tr>
<td>24</td>
<td>3</td>
<td>&quot; Melbourne Omnibus Co., as per contra</td>
<td>17</td>
</tr>
<tr>
<td>23</td>
<td>4</td>
<td>&quot; Jno. Thomson, as per contra</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>&quot; Cash, as per contra</td>
<td>2</td>
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<tr>
<td></td>
<td>9</td>
<td>Fol. in Ledger</td>
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<tr>
<td>22</td>
<td></td>
<td>22nd September,</td>
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<tr>
<td></td>
<td></td>
<td>By Commercial Bank Bills 1 and 2,</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>&quot; proceeds of Bills</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot; Discount a/c., on Bills 1 and 2</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot; Cash, as per contra</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td>&quot; Malt a/c.-700 bushels</td>
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<td></td>
<td>23rd September,</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>By Jno. Thomson, as per contra</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot; Melbourne Omnibus Co., as per contra</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td>&quot; Cash, as per contra</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td>&quot; Discount, as per contra</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot; Bills Receivable, No.3, as per contra</td>
<td>4</td>
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<td></td>
<td>&quot; Commercial Bank, paid in</td>
<td>5</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>No.of Trs.</th>
<th>2</th>
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<tbody>
<tr>
<td>500</td>
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</tr>
<tr>
<td>210</td>
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<td>0</td>
</tr>
<tr>
<td>675</td>
<td>0</td>
</tr>
<tr>
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<td>0</td>
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<tr>
<td>525</td>
<td>0</td>
</tr>
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<td>675</td>
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<td>514</td>
<td>7</td>
</tr>
<tr>
<td>8456</td>
<td>7</td>
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</table>
## APPENDIX B

Proof of Ledger by Register and Particulars of Stock

<table>
<thead>
<tr>
<th>Description</th>
<th>Total DR. side of Ledger</th>
<th>Total CR. side of Ledger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geo. Simmons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Bank</td>
<td>1504 7 6</td>
<td>1000 0 0</td>
</tr>
<tr>
<td>Bills Receivable</td>
<td>1175 0 0</td>
<td>500 0 0</td>
</tr>
<tr>
<td>Jno. Payne</td>
<td>25 0 0</td>
<td>25 0 0</td>
</tr>
<tr>
<td>Oats-Stock, 1150 bushels</td>
<td>925 0 0</td>
<td>794 13 9</td>
</tr>
<tr>
<td>Hadfield</td>
<td>1575 0 0</td>
<td>1575 0 0</td>
</tr>
<tr>
<td>Bran</td>
<td>50 0 0</td>
<td>54 1 3</td>
</tr>
<tr>
<td>Sands &amp; McDougall</td>
<td></td>
<td>10 0 0</td>
</tr>
<tr>
<td>Charges</td>
<td>10 15 0</td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>524 7 6</td>
<td>524 7 6</td>
</tr>
<tr>
<td>Wages</td>
<td>2 0 0</td>
<td></td>
</tr>
<tr>
<td>House Expenses</td>
<td>3 0 0</td>
<td></td>
</tr>
<tr>
<td>Simmons-P.A.</td>
<td>2 0 0</td>
<td></td>
</tr>
<tr>
<td>Petty Cash</td>
<td>3 0 0</td>
<td>0 15 0</td>
</tr>
<tr>
<td>Customers</td>
<td>171 5 0</td>
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</tr>
<tr>
<td>Maize-Stock, 500 bushels</td>
<td>625 0 0</td>
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<tr>
<td>Discount</td>
<td>23 2 6</td>
<td>3 15 0</td>
</tr>
<tr>
<td>Bills Payable</td>
<td></td>
<td>1425 0 0</td>
</tr>
<tr>
<td>Sanders &amp; Co</td>
<td></td>
<td>270 0 0</td>
</tr>
<tr>
<td>Flour-Stock, 20 tons</td>
<td>270 0 0</td>
<td>367 10 0</td>
</tr>
<tr>
<td>Bencraft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malt-Stock, 700 bushels</td>
<td>367 10 0</td>
<td></td>
</tr>
<tr>
<td>Jno. Thomson</td>
<td>675 0 0</td>
<td>675 0 0</td>
</tr>
<tr>
<td>Melbourne Omnibus Co.</td>
<td>525 0 0</td>
<td>525 0 0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8456 7 6</strong></td>
<td><strong>8456 7 6</strong></td>
</tr>
</tbody>
</table>

Anthony G. Hopwood and Peter Miller, Eds., *Accounting as Social and Institutional Practice* (Cambridge University Press, 1994, 265 pp., $19.95)

Reviewed by
Ross E. Stewart
Seattle Pacific University

In the last fifteen years new understandings of accounting have emerged because the study of accounting has been contextualized within the broad spectrum of the human sciences. This broader perspective has brought a new vitality to accounting research and has enriched our understanding of accounting practice. Accounting research has emerged from being almost exclusively wedded to financial economics and psychology to being more completely interdisciplinary. Organizational theory, sociology, political theory, anthropology, history, philosophy, linguistic theory, communication theory, theology, critical theory, etc., have contributed to this enriched understanding of accounting. Accounting practice is no longer seen as a neutral, benign technology reporting the facts of organizational life. Rather accounting practice is interested, problematic, and shapes the context in which it operates.

Hopwood and Miller have collected together in this book a representative sample of work that illustrates this view of accounting research and practice. The editors have taken work primarily published in *Accounting, Organizations and Society* and have had the authors condense, rewrite their articles or synthesize two or more articles into one, for a broader audience. Indeed the goal of the series that this book is published in, Cambridge Studies in Management, is to take specialized academic work and make it accessible for a broader audience. The papers are written by academics who come out of a British research tradition, and the contexts of analysis are primarily British except for Thompson, Hoskin and Macve (a U.S. context) and Miller and O'Leary (a U.S. context).
What is interesting for readers of *The Accounting Historians Journal* is that the papers are primarily historical analyses of accounting. They are historical analyses which explore the actual consequences of accounting rather than its stated rationales, and they explore the social and institutional bases of accounting rather than presuming a purely technical or economic autonomy for accounting. Accounting intersects with concerns such as national and organizational efficiency, industrial productivity, organizational rationality and professionalization. The result is studies that examine “the conditions, capacities and consequences of accounting” [Miner, p. 5].

Thompson (Ch. 2) and Hoskin and Macve (Ch. 3) both give an account of the rise of double entry bookkeeping (DEB). Thompson’s analysis is informed by rhetoric and the institutions of the church, pedagogic apparatuses and the publishing house. Hoskin and Macve describe DEB as part of the changes in information technologies in the thirteenth and fourteenth centuries. Their analysis does not dwell on the technique of DEB per se but rather sees the emergence of the technique as part of broader societal and institutional changes. Hoskin and Macve use Foucault’s knowledge-power schema to further describe how accounting is a disciplinary device. Their analysis links the genesis of accounting’s modern power to the educational technology of the examination and to institutions such as West Point Military Academy.

Miller and O’Leary (Ch. 4) give a Foucault-inspired analysis of standard costing as a “technology of government.” They make connections to the scientific management movement and show how accounting calculations became part of the discourse on the “efficiency” of individuals, organizations and the State. Standard costing caught the individual in a web of calculative norms and standards which enabled a program of government. “Between the worker and the boss was interposed a calculative apparatus that claimed neutrality and objectivity” [p. 112]. Bougen (Ch. 6) uses Foucault’s concept of “regimes of truth” in a similar way in a historical case study of accounting in the Remold Company. He suggests that managerial regimes of truth are powerful because of “their capacity to demonstrate that certain organizational arrangements are beyond contention” [p. 139].

Loft’s essay (Ch. 5) and the Copper et. al. paper (Ch. 11) address professionalization issues and the role of the state. Loft’s essay addresses the professionalization of cost accountants and the emergence of cost accounting in the United King-
Dom during the 1910s and 1920s. National efficiency is mentioned as a reason for the importance of cost systems, as is the efficient use of labor. Similar insights are given by Tomlinson (Ch. 7) in his analysis of labor productivity. He mentions the importance of cost accounting systems and in particular standard costing and budgeting as being part of a broader discourse on productivity measurement. National efficiency themes are also explored in McSweeney’s essay (Ch. 10) on the Financial Management Initiative launched in 1982 in the U.K. by the Thatcher government and in Armstrong’s paper (Ch. 8) on the intersection of management accounting and industrial relations in the U.K. from the 1960s to the 1980s.

Power (Ch. 12) gives an insightful analysis of the way auditing has become a generalizable social practice in the U.K.. He describes the audit society as one where “newly perceived dangers can be ritually purified and reconciled to existing managerial and economic practice” [p. 313]. Power describes the paradoxical nature of auditing. Audit technologies have become part of the managerial discourse of performance, quality, accountability and governance. Yet “the performance of audit itself is far from being unambiguous and free from public dispute” [p. 313].

Hopwood et al. (Ch. 9) describe the emergence and decline of the value-added statement in the U.K.. This paper in many ways is paradigmatic of the other papers in this book. The authors point out the ambiguous nature of value-added and describe three arenas in which the value added discourse took place. The authors chart the shifting patterns of relations between agencies such as the government, trade unions, the accounting profession and the changing nature of these institution’s concerns within the three arenas of accounting standards, macroeconomic management, and industrial relations and information disclosure. The authors describe this complex interplay as an accounting constellation in which a network of particular practices, processes and institutions “governed how value-added might function as a calculative, administrative and discursive practice” [p. 225]. The decline of interest in value-added occurred because “the arenas out of which it emerged had been subject to significant discontinuities ... Devoid of its specific social condition of possibility, value-added was little more than a mere technical accounting possibility” [p. 231]. Accounting is shown to both shape and facilitate the contexts in which it operates. It has no essential role or function in
society, and its consequences can be unintended. Accounting emerges in a multiple of fields.

The papers are introduced by Miller (Ch. 1) in an essay that gives a broad perspective on this literature and enables the reader to contextualize the papers in the book. He suggests that the study of accounting as a social and institutional practice is in its early stages, and he offers a future agenda for accounting research in this area. This book is a welcome addition to the literature. It would be excellent assigned reading for upper division undergraduate majors, as well as for graduate students. It would also be useful for researchers outside of the accounting discipline to gain an understanding of the increasing significance of accounting in society. This book demonstrates that accounting is increasingly one of the most influential bodies of expertise in the United Kingdom. It would be interesting to see whether a similar body of work can be collected together in another national context with the same conclusion.


Reviewed by
Marc I. LeBow
Virginia State University

Russia is situated astride Europe and Asia. As such, both Western (European) and Asian (Occidental) cultural influences have interacted to make the nation a unique blend of diverse cultural extremes. This has made Russia very difficult for Westerners to understand. Winston Churchill described Russia as an enigma wrapped in a paradox.

Despite these difficulties, understanding Russia is important to Western European historians. Russia is still a major power on the world stage. It is also a significant factor in the new independent nations that were once part of the greater Russian/Soviet empire. Addressing the turmoil in these countries may require the understanding of the West. Russia is also rich in natural resources that are drawing the investments of many Western companies. Understanding Russian economic development and how Russia deals with outside influences will help Westerners deal with and understand Russians and the nations on the periphery of greater Russia.
One way to gain a greater understanding of Russia’s economic development is to study the parallel development of accounting theory and practices. Wolodymyr Motyka’s book is an important contribution to the body of literature about the development of Russian accounting.

As the title explains, the two volumes of the book are an annotated bibliography of Russian language publications on accounting from 1736-1917. The book consists of two different parts: an annotated bibliography of articles related to accounting published in Russia before the Russian Revolution of 1917 and an essay about the development of accounting in Russia accompanied by tables and appendices. The articles included in the bibliography were selected based on the title of the article, any description of the article available in the literature, and any additional information available in the source material. If there was any indication that the article dealt with accounting issues, it was included in the bibliography. Many of the articles selected were from booksellers’ catalogs and other sources where the original work no longer exists. Where additional information about the contents of the article is available, the author provides a short description. Most references, however, involve little more than the title of the work, the author, and whatever references are available to identify the work. For those conversant in Russian and the various languages of the peoples included in the greater Russian Empire, a transliteration of the original material is also included.

The articles are listed in chronological order. By perusing the titles, the reader can gain an understanding of the various external influences on the development of Russian accounting theory and how these influences became greater as Russia increased trade with outside nations. The articles also give the reader a sense of the development of various industries in Russia. Many of the articles deal with accounting for agriculture, railroads, banking and credit-loan societies, and government entities. This information is also detailed in the Thematic Indexes of the Articles.

Most readers will find the Introductory Essays and Appendices included in the work of greater interest. Motyka identified three areas important in the development of Russian accounting: Western European influences and government edicts issued by various Tsars and Tsarinas, the growth of accounting education in various educational institutions and trade schools, and the development of accounting literature. Motyka’s essays give
the reader an in-depth understanding of both the influences driving the development of accounting and why those influences were not sufficient to overcome the Russian animosity toward the adoption of outside accounting practices. As a result of these factors, Russia still does not have a well-established accounting profession. Understanding the reasons accounting did not develop before the Russian Revolution helps the reader understand the factors preventing the development of an independent accounting establishment.

This work is a valuable addition to the body of knowledge about the history of accounting in Russia. The essays with accompanying tables and appendices illuminate the growth of accounting in Russia while the annotated bibliography of articles complements that understanding. The lessons about the slow growth of modern accounting techniques in pre-revolutionary Russia provide a model that may be illustrative of modern Russia and illustrative to other less developed societies. Accounting historians and those working to develop accounting systems in non-Western cultures will find this work to be a valuable source of information.


Reviewed by
Scot A. Stradley
University of North Dakota

The world should take notice when a book about economic theory and economic history is issued in paperback after being published in hardback. The interpretation of the phenomena is difficult, though. Is it an attempt to lower price to increase the quantity demanded for an otherwise lackluster performance, a marketing plan to expand sales of a differentiated product, or a genuine attempt to respond to the large demand that developed as a consequence of the response to the first edition? This writer believes that the latter is the actual fact.

Such an introduction is appropriate since this book is another contribution to the historical literature produced by doubters and skeptics. The book addresses the history of economic thought as a means of approaching its more serious purpose of evaluating the origins of the present crisis in economic
theory regarding its inability to predict economic phenomena. Economics suffers from an adherence to mechanistic modelling in a static framework and fails to consider economic problems from the viewpoint of dynamics rather than statics.

The book is, at least in Part 1, “The Present State of Economics,” not original in its viewpoint. Economic theory has a long history of criticism both of its form and its content. Omerod follows much of this tradition without citation in order to advance an argument that economics has become preoccupied with a paradigm of statical mechanics based on intimate connections with the history of science. Further, economic science developed an “abstract” human being, rational economic man, to make its mechanistic explanations of economic behavior work. The model is less than plausible and has failed to successfully predict economic phenomena. Its failure is the source of the current crisis.

This failure is moreover a failure in public policy. Omerod, whose own work must be admired for its mixture of theoretical discussion and historical examination, presents evidence drawn from the major late twentieth century economies that intertwines with his argument that orthodoxy has failed. The greatest danger of this is rightly shown to be misguided public policy makers. Omerod makes a good case that public policy, misled by economists’ reliance on general equilibrium models based on the behavior of rational economic man, have generally made mistakes that result from considering only the statical framework. A proper approach to modelling requires incorporating historical perspective to produce a dynamic model, rather than a static model.

Transforming method requires giving up the idea of general equilibrium through time. The perspective is more like that found in biology and geology, and Omerod is to be complimented for using an interdisciplinary approach, where equilibrium is a temporary state of affairs. Equilibrium ends when some substantial change in any or all the variables results in a catastrophic shift in the relationship. Shocks change the level of the equilibrium and the way the system producing the finite equilibrium works. Omerod uses biological literature to illustrate this idea of change, but strangely does not mention Stephen Jay Gould’s concept of “punctuated equilibria,” or similar ideas in geology. He also does not mention the small literature on catastrophic change in economics such as Hyman Minsky’s work on systematic financial fragility, or Charles
Kindelberger's numerous contributions to this conceptual perspective.

Omerod's book is highly recommended because it is written very well and would serve as an excellent trade book for a public perplexed not only by what they experienced in their college economics course, but also concerned about the direction and stability of the existing and transforming market economies. The book would also serve the undergraduate and graduate student that senses the "crisis" in economics and is frustrated by the great inertia which prevails in all systems of natural and social philosophy. The book not only finds fault with the past, but offers an alternative for change. The mathematical economist and the econometrician should read this since their skills are required in both the old order and the new order, should chaos theory come to be integrated into equilibria theory. In fact the mathematical and statistical challenges are substantially greater.

The economic historian should read this book as well. Scientific method once advocated that hypothesis be developed after one had engaged in a thorough examination of the evidence. This did not mean consulting government data. Omerod really advocates historical perspective as the necessary foundation of both economic statistics and theory. Both would gain and economic science would increase in stature because the new dynamic method would succeed where linear, mechanistic economics did not. The theorist would especially benefit from the historical perspective because it teaches that institutions are important economic variables. This advice to the economics profession was also delivered when Douglass North won the Nobel Prize for making the same point.

Omerod offers an interesting synthesis of mechanistic and chaotic science. His own model combines shocks from the institutional domain to the general equilibrium system. The model is used to examine the unemployment problem in the advanced industrial nations. The model has important implications for policy makers. The result is a common criticism of economic orthodoxy combined with an emerging dynamic approach to modelling written in a manner that both expert and neophyte can understand the modern literature in political economy.

Reviewed by
Christopher J. Napier
London School of Economics

This book contains both a critique and a demonstration. The critique is aimed at what Snooks identifies as the absence of realism in modern deductive economics, manifested particularly by a downgrading of any historical perspective. To Snooks, modern economic theory ignores the dimension of time, so that even attempts to represent an economy dynamically often manifest themselves as a series of static equilibria with little attempt to explain how the economy moves from one equilibrium to the next. The demonstration of the relevance of a historical perspective draws on past research by Snooks into the medieval English economy, particularly as revealed by Domesday Book. Snooks argues that European economies during the last millennium have been subject to great waves of economic change lasting between 150 and 300 years. By demonstrating these waves, Snooks attempts to persuade us not only that economic theory, lacking a historical dimension, is unable to deal with important long run forces in the economy, but also that the waves continue and imply a danger of economic stagnation and instability in the very near future similar to that identified by Snooks as characterising the end of the Middle Ages.

Bashing theoretical economics has become rather fashionable in recent years, and accusations of the irrelevance of much economic theory (particularly the more abstruse mathematical approaches) to real-world problems can be found not just in the literature of economic methodology but also spill over into accounting (as exemplified by the attacks on positive accounting theory). Critics such as Donald McCloskey have questioned the foundations of modern economic theory, ironically in the opinion of Snooks, who regards the cliometric school of economic history for which McCloskey is “the main apologist” [p. 137] as being more about deduction from theory than the analysis of historical data. Snooks develops his critique of deductive economics in the first part of the book by discussing the struggles between the deductivists and the historicists in nineteenth century Britain, leading to the triumph of Alfred Marshall’s “scientific economics” over the historical approaches of such as
Cunningham and Ashley. He compares different traditions of economic history — the "custodians of real time" [p. 117] — in order to determine whether any of these traditions is capable of putting time back into economics. The British social and economic tradition leading to writers such as J. H. Clapham, and the American cliometric tradition characterised by Nobel laureates Robert Fogel and Douglass North, are both found inferior to an Australian tradition combining analytical and quantitative approaches to economic history, which Snooks identifies with Timothy Coghlan and his successors Edward Shann and Sydney and Noel Butlin. Snooks sees the work of Coghlan in particular as pioneering national accounting two generations before its reinvention in Britain and the U.S.A. in the 1930s.

In the second part of the book, Snooks is consciously writing in the Coghlan tradition. This part of the book begins with a discussion of the usefulness of Domesday Book as a source of economic data about Norman England, and attempts to construct a macroeconomic model of the feudal system. Underlying this interest in the economy of 900 years ago is a central methodological question: is it helpful to analyse the behaviour of individuals in feudal society in terms of the "economic man" of the deductive theorists? In other words, were feudal barons and others economically rational? Snooks concludes that his statistical analysis based on Domesday Book suggests that the primary motivation of decision-makers was material self interest, so that "human motivation throughout time is basically unchanging" [p. 229].

Overall, this is an interesting and stimulating book. While at first sight it is not of direct relevance to the work of accounting historians, both the critique of a timeless deductive economics and the emphasis on the careful analysis of historical data are worthy of attention, even if we are sceptical of Snooks's own belief in a timeless notion of "rational economic man".


Reviewed by
Alan J. Richardson
Queen's University

A colleague of mine claims to work in the "oral tradition" preferring to interact with his audience and deal in real-time
events rather than allow his ideas to grow stale on paper to be reinterpreted at a distance. Most academics, however, seek to publish their ideas to meet the expectations of their universities and for its own intrinsic rewards. It is also the case that published material forms the bulk of what practitioners and students study as accounting knowledge. *Policing Accounting Knowledge*, edited by Tinker and Puxty, provides a window into the processes by which ideas get into print and the ways in which those processes shape knowledge. This is a rare collection of manuscripts and correspondence which deserves a wide reading by both the producers and consumers of accounting knowledge.

The book reprints Watts' and Zimmerman's (1978) "The Demand for and Supply of Accounting Theories: The Market for Excuses" along with the reviewers' comments and correspondence between the editor of *The Accounting Review* (Stephen Zeff) and the authors. This is followed by three papers (and their associated reviews and correspondence) critical of Watts' and Zimmerman's article which were submitted to, and ultimately rejected by, *The Accounting Review*. The first, by Boer and Moseley (1980), was never published. The second, by Laughlin, Puxty and Lowe (1980), appeared in the *Journal of Accounting and Public Policy* in 1983. The third, by Williams (1983), appeared in *Accounting, Organizations and Society* in 1989. The editors contribute an introductory chapter entitled "The Rise and Fall of Positive Theory" and a conclusion entitled "Policing Accounting: The Sociology of Knowledge as Praxis."

The editors' objective with this collection is to show how the editorial review process affects what is published and how the social identity of authors and reviewers affects this process. In short, that the review process is more affected by social forces than by philosophies of science. They conclude that the review process does not meet the basic conditions for scientific practice (using Popper as the exemplar of this method) and, further, that the institutional structures within which accounting knowledge is created precludes these conditions ever being met.

There is a tension in the editorial essays in that the editors see Watts' and Zimmerman's article as marking a change in methodology from normative to positive and inaugurating a deregulation movement within the accounting academy. Their critiques of the editorial process thus must simultaneously deal with changes in the political economy of the U.S. (a move to the right) associated with the election of Republican presidents and
changes in the research agenda of accounting academics. As a theoretical position, I appreciate that the authors do not want to separate the nature of the review process from the substance of the material which is under review. Unfortunately, at times it is not clear whether the focus of this volume is on Watts' and Zimmerman's theorizing or the review process which brought this article to print.

The book is essentially an archives of publication correspondence for four interrelated articles. It is an incomplete archives in that it does not include those critiques of Watts and Zimmerman that successfully made it into The Accounting Review such as Christenson (1983) or Hines (1989) nor does it include the reviews from other journals that enabled two of the three papers to appear in print. As is true of all archival sources, there are multiple interpretations which can be placed on the documents presented. The greatest strength of this collection is that it provides the basic source documents on which further debate about the nature of the sociology of knowledge in accounting can be based.

This book covers some of the same ground as Cummings' and Frosts' (1985) examination of the publishing process in organizational science. That volume includes two case studies of articles passing through the publication process (one successful; one unsuccessful) and a wealth of introspective articles by editors, reviewers and authors as well as commentaries by outside observers (including a psychiatrist!). I would highly recommend the Cummings and Frost book to anyone concerned with the sociology of knowledge. It is particularly useful reading as a prerequisite to Policing Accounting Knowledge both to sensitize readers to the issues which you will encounter and for the realization that the phenomenon documented is not unique to accounting. Indeed I am sure that similar data could be generated on other issues in the accounting literature (for historians the "Relevance Lost" thesis comes easily to mind as one which has not been thoroughly debated in The Accounting Review).

In the same way that Tinker and Puxty challenge us to understand the publication process in a broader context, this book must also be seen in context. It is part of Tinker's continuing effort to change the nature of academic research in accounting and the way in which the American Accounting Association and its house journals (of which The Accounting Review is preeminent) operate. The journal which Tinker co-edits, Critical Perspectives on Accounting, is based on alternative reviewing meth-
ods (e.g. there is the option for reviewers to name themselves to authors) and an editorial policy which encourages wide variation in the substance and format of papers. The success of this journal suggests that *Policing Accounting Knowledge* will have a receptive audience.

REFERENCES


Reviewed by

Dean Neu and Eric Powrie
University of Calgary

I cannot give you the formula for success, but I can give you the formula for failure, which is: Try to please everybody.

*Herbert B Swope (1882-1958)*
*American Journalist*

This quotation holds true when it comes to establishing financial accounting standards. It is impossible to satisfy all, or even most, of those who will be affected by the standards.

Robert Van Riper, in his book *Setting Standards for Financial Reporting: FASB and the Struggle for Control of a Critical Process*, provides a retrospective look at the competition that exists in financial reporting and its impact on the standard-setting process. Van Riper was a senior member of the Financial Accounting Standards Board (FASB) - the private standard-setting body entrusted with the task of setting financial accounting standards - from 1973 to 1991 and is well qualified to provide an insider's perspective on the opposition to both the FASB and
some of its more controversial standards. For example, Van Riper details how opponents predicted that more stringent reporting requirements would result in dire consequences for corporate America in their attempt to attract capital in the financial markets and to remain competitive in the world economy. Even with proof of these consequences nowhere in sight, the government and some corporations questioned whether the FASB ought to be entrusted with the task. Some practitioners have warned that the standards would not become "generally accepted," charging that the theoretical bases for the FASB's proposed standards have taken precedence over all practical considerations. Others have seen the Board as incapable of balancing the interests of financial statement issuers with those of users.

Van Riper defends the role of the Board. He believes that political neutrality and insulation from corporate lobbyists is the FASB's greatest quality. If accounting standards were determined in response to politicized views, Van Riper argues, "only the very biggest and strongest would be left holding the high cards" [p. 191]. Worse yet, accounting standards would become ineffective and internally inconsistent. This would create confusion for the preparers of financial information. "With the rules being set on a negotiated, case-by-case basis, they would not know how to anticipate the next rule making. The auditors and users of financial information would confront even greater confusion" [p. 191].

Van Riper chronicles why the FASB came into existence, the process by which standards are derived and many of the contentious issues surrounding the Board's decisions. Van Riper does not take us by the hand on a guided tour of the so-called Ivory Tower but rather, through a compilation of *quotes du jour* from Board members and critics alike, the reader gets a sense of what guides the Board's decisions. Through this dialogue, one gets the impression that maybe the FASB is not as insulated from the real world as many critics would have us believe.

A common complaint has been that *de facto* accounting standards were being established without due process. Van Riper rejects this claim citing that "the FASB is in the position of having a more open and democratic process than is required of federal agencies under the Administrative Procedure Act of 1947 and the Sunshine in Government Act of 1947" [p. 86]. He notes that public input is elicited on specific topics, the FASB meetings are open to the public, agendas are announced in advance and copies of the discussion papers are available in ad-
vance of meeting dates. The explanation offered by Van Riper for the perceived insularity of the Board is, "When strongly held views of constituents are rejected by the decision makers, even when good reasons are set forth for doing so, it is only human nature for the convinced advocates of the rejected views to complain that their position was not properly considered" [p. 104]. Interestingly, another often-heard complaint is that the FASB's due process takes far too long.

While Van Riper admits that the FASB is not perfect, he does not offer much in terms of strategies for improvement. His arguments are made from the position that any alternatives to the present system will have far worse consequences. Van Riper acknowledges that the Board's agenda does not always deal with the most important issues and resolution is not usually accomplished in a timely manner. He implies that greater speed in standard setting would result in a greater number of standards issued and this is bound to arouse opposition [p. 192]. To the suggestion that the Board position itself on the "cutting edge" and anticipate the most pressing and contentious issues, Van Riper flatly replies that "cutting edges are not greatly admired in the conservative world of financial reporting" [p. 193].

Van Riper's account of the activities of FASB provides us with an insider's perspective on standard-setting, albeit an account that does not stray far from the "official" story-line. This is perhaps both the greatest strength and the greatest weakness of the book. On the positive side, the book highlights the myriad of pressures brought to bear on the FASB. Yet, Riper's lack of distance and lack of theoretical reflection on the process of standard setting is sure to leave some readers dissatisfied. For example, Van Riper's matter-of-fact descriptions of the emergence of standard-setting issues doesn't capture the complexities and richness of the process that Joni Young (1994) highlights in her work on the FASB standard-setting process. For Young, it is necessary to examine how accounting issues emerge, how they are constructed as "problems" and how "logics of appropriateness" influence FASB outputs if we wish to understand the process of standard-setting. Thus, for readers interested in such processes, Van Riper's account is tantalizing but unsatisfactory.

This leads us to a final question: who are the intended users of this book? Is it the accounting student? Is it the accounting historian? Is it the practitioner? Perhaps it is an appeal to all of the FASB's nay-sayers. It may be true — you cannot try to please everybody!
## CONTENTS

### Articles
- The Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies  
  - Vivien Beattie, Stella Fearnley
- Earnings Forecast Revisions and Security Returns: Canadian Evidence  
  - Sean M. Hennessey
- Harmonisation of Accounting Measurement Practices in the European Community  
  - Don Herrmann, Wayne Thomas
- Recent Evidence on Australian Current Value Accounting Practices: Is the Phoenix Rising from the Ashes?  
  - Stewart Jones, Kerry Love
- The Nature and Rationale of a Conceptual Framework for Financial Reporting by Islamic Banks  
  - Rifaat Ahmed Abdel Karim
- The Information Contained in Reconciliations to Earnings Based on US Accounting Principles by Non-US Companies  
  - Lynn L. Rees

### Commentaries
- David Solomons and British Accounting  
  - R. H. Parker
- David Solomons (1912-1995)—An Appreciation  
  - Stephen A. Zeff

### Book Review
- Christian Lefebvre and John Flower, European Financial Reporting Series. Belgium  
  - Ann Jorissen
Announcement

Editors
James Guthrie and Lee Parker

Abstracts and keywords .................................................. 2

Readability of annual reports: Western versus Asian evidence
John K. Courtis ............................................................... 4

Scottish chartered accountants: internal and external political relationships, 1853-1916
Ken Shackleton .............................................................. 18

Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure
Rob Gray, Reza Kouhy and Simon Lovers ................................ 47

Methodological themes
Constructing a research database of social and environmental reporting by UK companies
Rob Gray, Reza Kouhy and Simon Lavers ................................ 78

Book reviews ................................................................. 102
AD HOC REVIEWERS 1994-1995

Urton L. Anderson, University of Texas at Austin
C. Edward Arrington, Louisiana State University
Charles E. Boynton, University of North Texas
Linda J. Bradley, University of Charleston
Richard E. Brown, Kent State University
Raymond J. Clay, University of North Texas
Edward N. Coffman, Virginia Commonwealth University
David J. Cooper, University of Alberta
Christopher J. Cowton, Templeton College
Hans J. Dykxhoorn, Western Michigan University
Martha M. Eining, University of Utah
Haim Falk, Rutgers University
Robert Fleming, Northern Michigan University
James C. Gaa, McMaster University
Horace R. Givens, University of Maine
Mary E. Harston, St. Mary's University
Leon Hay, University of Arkansas
Roxanne Johnson, University of Scranton
Bruce S. Koch, University of North Texas
S. J. Lambert, University of New Orleans
Stephen E. Loeb, University of Maryland
William Luker, University of North Texas
Lawrence A. Matika, Lawrence Technological University
Rodney R. Michael, Michigan Technological University
Paul J. Miranti, Rutgers University
Kenneth S. Most, Florida International University
George J. Murphy, University of Saskatchewan
C. W. Noke, London School of Economics
David Oldroyd, University of Newcastle
Robert H. Raymond, University of Nebraska
Robert Ricketts, Texas Tech University
Sajay Samuel, Bucknell University
Paul Shoemaker, University of Nebraska
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Neil A. Wilner, University of North Texas

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