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CONTRIBUTIONS OF JOSEPH HARDCASTLE TO ACCOUNTING THEORY

Abstract: Joseph Hardcastle was one of the foremost authorities on subjects connected with the mathematics of finance and other topics in accounting in the late 19th and early 20th centuries. As a teacher, author, and leader in the profession, he figured prominently in the elevation of accountancy. Hardcastle is relatively unknown in the literature except for having the distinction of scoring the highest grades on the first CPA exam in New York in 1896. However, he was well respected during his time as one of the premier theorists in accounting and was awarded an honorary degree of Master of Letters by New York University. Because of his prolific writings, his teaching of future accountants, and his interactions with members of the Institute of Accounts, he had a strong impact on the “science of accounts,” the dominant accounting theory in the U.S. at the turn of the century.

Joseph Hardcastle, born in England in 1827, is probably best known for being one of only three individuals to pass the first Certified Public Accountant (CPA) exam in New York in 1896. Remarkably, he was just four months shy of his seventieth birthday and received the highest score of those that passed the exam [Flesher et al., 1996, p. 17]. However, Hardcastle was a regular contributor to various early journals about accounting in the U.S., and he became one of the foremost authorities of his time on the theory of accounting. Through an analysis of his articles, the goal of this paper is to reconstruct his theories and contributions to accounting thought and history, and to discuss these theories of accounting as related to the “science of accounts” that dominated accounting thought in the late 19th century U.S.

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This paper is organized as follows. After the introduction, a second section will include a short analysis of the functional approach in explaining the accounting profession in the late 19th century, with an emphasis on the specific knowledge and technical skills required by the profession. The third section will provide background information on Joseph Hardcastle, followed by discussion of Hardcastle's theories on accounting with comparisons to the literature of his time. A conclusion will summarize Hardcastle's contributions to accounting history.

INTRODUCTION

Carnegie and Napier state that it is important to understand the context within which historical events have occurred [1996, pp. 7, 22], and the importance of referencing key personalities who have contributed to accounting development. Since individuals as well as events create history, the study of individuals is crucial in understanding a profession, its history, and the success of its organizations. During the 19th century, many considered accounting in the U.K. to be more mature and established than in the U.S. The historical literature on 19th century U.K. is rich, especially with articles tracing the genesis of its professional accounting organizations and the men involved in forming them [Parker, 1983; Lee, 1996a, b; Edwards, 2001; and numerous others].

In reference to 19th century accountants in the U.S., Miranti [1990], as well as Webster [1954], discuss various participants in the emerging CPA movement. Other histories of accounting in the U.S. have included brief biographies devoted to individuals and their contributions to the development of the profession during the 19th century [Carey, 1969; Previts and Merino, 1998; Loeb and Miranti, 2004]. *The New York Certified Public Accountant* published short articles on the history of accounting in the State of New York starting in the late 1940s and ending in 1972. The New York Society's Committee on History, initially headed by Norman Webster, prepared these articles, which were reprinted in 1995 in *The New York State Society of Certified Public Accountants – Foundation for a Profession*. The majority of the biographies included were accountants whose careers were mostly situated in the 20th century, although three of the articles were on three prominent 19th century accountants – Hardcastle, Charles Ezra Sprague, and Charles Waldo Haskins. In addition, an article on Hardcastle by Flesher et al. [1996] was published in *The CPA Journal* and another on Anson O. Kittredge by Romeo

and Kyj [2000] appeared in the *Accounting Historians Journal*. There have also been published biographies of Sprague by Mann [1931] and Haskins by Jordan [1928].

Considering the number of individuals and the amount of progress accountants made toward professionalism in the 19th century U.S., there have been relatively few published biographies about the founders of the American accounting profession of that century. Accounting must be cognizant of the fact that “when professionalization is studied by following the process of differentiation among ideas, there is some risk of losing sight of the individuals...that shaped the disciplines” [Furner, 1975, p. 306]. Despite the shortfall of biographical work, much professional progress was accomplished in the 19th century U.S.

McMillan [1999] argues that the accounting profession was based upon the establishment of a “community of the competent” during the last two decades of the 19th century. Many leaders of the accounting profession sought to distinguish themselves as professionals by making the claim that there was a “science of accounts.” The idea of the accountant as a scientist dominated the profession’s early pursuit of professionalism. McMillan [1999, pp. 25-26] uses the term “community of the competent” to describe the efforts of the Institute of Accounts (IA) to obtain a level of professionalism for accountants. As Furner [1975, p. 1] states in reference to the professionalization of American social science during the period from 1865 to 1905, “In an age that honored science above other sources of wisdom, it became clear that people who established their ability to study society scientifically would command attention and influence the course of events.” Before the professionalization of accounting and the passage of the CPA law, the U.S. discipline had its indigenous leaders. Accounting members involved in the “science of accounts” and working toward the goal of professionalization included such prominent accounting educators and writers as Sprague, Selden R. Hopkins, E. T. Cockey, Kittredge, S.S. Packard, and Haskins [Romeo and Kyj, 1998, p. 37], as well as Hardcastle, the subject of this study.

Hardcastle’s contribution as a writer and scholar predominantly involved designing and improving bookkeeping systems and focusing on the principles upon which accounting was based. This is in agreement with McMillan’s [1998a, p. 121] suggestion that the late 19th century bookkeeper was more “interested in designing and monitoring new and efficient bookkeeping systems, than in developing and refining the idea of an

independent professional audit.” Hardcastle was instrumental in differentiating the body of knowledge necessary to study accounting scientifically. As one of the leading theorists in the IA, his articles commanded attention and influenced the course of events for the emerging profession. In the next section, the functionalist approach will be used to explain the evolution of professions in general and the development of the professional ideology of accountants in particular.

USE OF THE FUNCTIONALIST APPROACH

Sociological perspectives used in explaining accounting professionalism include the interactionist, the critical, and the functionalist approaches. The interactionist approach views professions as interest groups that strive to convince others of the legitimacy of their claim to professional recognition, including status and power [Haug and Sussman, 1969, p. 153]. Although professions possess the characteristics of autonomy, esoteric knowledge, and service orientation, they must deal with the client and the environment since their services and positions may not be accepted without criticism by others. By co-opting these interest groups, professions try to preserve their positions [Haug and Sussman, 1969, p. 153; Roth, 1974].

The critical perspective, which goes one step further, is based on Weber’s writings on the theory of bureaucratic administration and Marx’s critique of the capitalist mode of production [Willmott, 1986]. This approach analyzes the traits of the group within an economic and political context. Professional groups are seen as a means of achieving collective financial and social mobility by creating exclusive market shelters that set each occupation apart from the other [Parkin, 1979, p. 54]. By legitimate “friendly licensing” or “titles,” professional groups secure control over a specific market for intangible skills, a monopoly over their lines of work, and control over admission into the monopoly [Cairnes, 1887, pp. 66-67; Friedman, 1962, p. 147; Larson, 1977, p. 10]. Professions are seen as one of many interest groups competing for status and power within a larger social, economic, and political context [Willmott, 1986; Richardson, 1988; Chua and Polullaos, 1998].

Both of these approaches could very easily be applicable to numerous events and organizations in accounting during the 19th century. However, the authors feel that the interactionist and critical approaches, which differ from the functional approach in that specific knowledge and technical skills are not the

rationale for the group, are not as applicable in a discussion on an individual level.¹

The functionalist approach, the earliest sociological perspective used in explaining professions, views professionals as honored servants of the public who meet the needs of society because of the skills and attributes they possess. This view purports that organized professions undertake highly skilled tasks that are necessary for the assimilation and smooth operation of society. Organized professions can do so because of the defining characteristics and skills they possess [Carr-Saunders and Wilson, 1933, p. 397; Greenwood, 1972, p. 4]. These characteristics and skills include esoteric knowledge, independence, altruism, and self-discipline [Ritzer, 1972, p. 54]. The skills are supported by knowledge that has been “organized into an internally consistent system, called a body of theory” [Greenwood, 1972, p. 5], or what the accountants in the IA have referred to during the 1880s and 1890s as the “science of accounts.” Possession of skills requires mastery of the theory underlying those skills. Therefore, the acquisition of skills is a practical as well as an intellectual experience. Greenwood emphasized that on-the-job training is not enough; a formal education in an academic setting is necessary.

As corporations grew in the latter half of the 19th century, the need for consistent, independent, and better financial reporting increased concomitantly. The separation of the supply of capital and its management created a new and different market for the public accountant’s services. Leavitt [1896, p. 744], in his exposé on the professional accountant which appeared in several business magazines, stressed the difference between the “ordinary bookkeeper” and the “professional accountant.” He emphasized the investigative nature in the detection of fraud in the accountant’s work:

The professional accountant is an investigator, an inquisitor, a dissector, a detective, in the highest sense in which these terms can be used. It is his business to verify that which is right and to ferret out and expose that which is wrong; to discover and state facts as they are, whether plainly expressed by clear and distinct record, or skillfully concealed by distorted or falsified entries, or

¹Even though the authors elected to adopt the functionalist approach to explain the contributions of Hardcastle, this does not mean that this method has not been criticized in the accounting literature. For example, Robson and Cooper [1990], West [1996], and Willmott [1986] are among those who have been critical of the functionalist approach.

hidden under plausibly arranged figures, or, as in cases not a few, omitted from record entirely. This is his business to read the record, 'the hieroglyphics of accounts,' whether plainly or blindly written; to read, too 'between the lines'; and to interpret, rearrange, and produce in simple but distinct form, self-explanatory and free from mysteries of bookkeeping, the narrative of facts as they are, their relation to each other and results.

The smooth running of society, which is the goal of the functionalist approach, is subject to social and economic conditions. The separation of the functions of ownership, which is risk bearing, and the control function of management can result in situations that may be detrimental to the owners of capital if there is no goal congruence or control. Highly skilled tasks of professional accountants thus become necessary to ensure proper stewardship and control. This became especially important as the great merger movement in the U.S. began in the 1890s. In addition, innovative entrepreneurs like Andrew Carnegie began using advanced methods of accounting developed during the 19th century to secure an edge in running and buying businesses [Lamoreaux, 1985, p. 38].

These advanced methods of accounting called for conscientious, skilled, and experienced personnel in matters of accounts, corporate law, and auditing (fraud detection) far above the capacity of a counting-house bookkeeper of that time whose daily work was a repetition of the preceding day's work. Thus, a marked distinction was made between the function of a professional public accountant and that of a bookkeeper, creating a demand for professional public accountants. In the major cities of New York, Boston, Chicago, and Philadelphia, corporations, banks, and receivers were employing public accountants. Executors were also beginning to understand the advantages of employing experienced experts ["Advantage of Expert Accountants to Investors," 1894, p. 457]. But there was a major distinction between the professional accountant in the U.S. and his British counterpart; the U.S. was an unregulated environment. There were few regulations governing commerce and no federal or state laws requiring independent audits. In Britain, companies were legally required to go through an annual audit by the specific act of Parliament granting their charter or by acts regulating their particular industry. On the other hand, the phenomenal growth of the country and the different industries in the U.S. created an environment that called for efficient accounting systems. Modern, efficient, scientific accounting was the topic

of lectures at accounting meetings and the topic of articles in business magazines [McMillan, 1998a]. The emphasis was on the development of accounting systems for the different lines of business. What might be a good method of bookkeeping for one line might not be good for another.

By employing the functionalist perspective, which is characterized by the competencies and skills necessary for the emerging profession, the authors hope to demonstrate Hardcastle's importance in the establishment of the accounting profession in the U.S.

BACKGROUND INFORMATION

After Hardcastle graduated from the York and Ripon Diocesan Training School in 1847, his initial vocation, which continued for 17 years, was in education (see Appendix 1 for a short summary and timeline of his life). He taught at various schools and was also superintendent of schools in Belize, British Honduras for three years before immigrating to the U.S. His first position in the U.S. was as first assistant principal of Grammar School No. 38 in New York for six years [Committee on History, 1951, p. 127]. His background in education, as well as his considerable ability in mathematics ["Joseph Hardcastle, C.P.A.," 1899, p. 572], not only helped him in preparing his articles, which were written clearly, succinctly, and thoroughly, but also provided him with the impetus to become an accountant.

His accounting career started in 1864, when his first client was Peter Gilsey, who was involved in real estate. One of Gilsey's sons, a student of Hardcastle's, recommended that his father consult Hardcastle about a difficult mathematical income-tax problem requiring knowledge of sinking funds. The state income-tax commissioners accepted Hardcastle's recommendations, and, as a result, he remained Gilsey's accountant for approximately 42 years [Rice, 1951]. Thus, all of Hardcastle's experience in accounting occurred in the U.S., different from many of the U.K. accountants who emigrated to the U.S. in the latter half of the 19th century as already experienced accounting professionals, frequently Chartered Accountants. It is fairly apparent that Hardcastle was an employee of Gilsey rather than Gilsey a client of Hardcastle. Aside from Gilsey, the authors could not find any evidence of other clients of Hardcastle.

Hardcastle did not advertise his services as a public accountant in the accounting journals. He was not listed as a public accountant by Littleton [1942, p. 31] until 1898, after

he passed the CPA exam, nor was he listed as one of 122 public accountants published in the journal *Business* in 1896 ["The Public Accountants of New York City," 1896, p. 383]. Even though the first examining board was normally strict in denying prospective CPAs who did not meet the public accounting experience requirement, the New York State Board of Examiners was willing to recommend him for a waiver based on this experience to become a CPA [Committee on History, 1951, p. 125]. Since two of the members of the Board of Examiners, Sprague and Haskins, were members of the IA and were quite familiar with Hardcastle's work, the examining board doubtlessly held Hardcastle in high esteem.

The question then becomes, why did Hardcastle elect to sit for the exam if he probably could have applied for a waiver? The reason becomes more evident when one considers Hardcastle's background. Considered a scholar throughout his whole life, he was probably very confident not only of his accounting knowledge but also of his testing abilities. For example, as a young man, he won the grand prize of a three-year education scholarship for the York and Ripon Diocesan Training School for Teaching. He also won the position of principal of the head school in Belize, British Honduras by a competitive examination and subsequently rose to the position of superintendent of the whole colony. When he first came to New York, he obtained a principal's certificate by examination ["Joseph Hardcastle, C.P.A.," 1899, p. 572]. One can only speculate, but his background in writing technical articles, his experience at taking exams, his mathematics skills, and the positions he held in the IA may have created sufficient confidence for him to decline the waiver and opt to sit for the first CPA exam.

Hardcastle joined the IA, in which he was a charter member, in 1882; the New York State Society of Certified Public Accountants in 1897; and the American Association of Public Accountants in 1905. As a member of the IA, he made the first solo presentation in the history of the Institute, "The Origin of Calculations as Deduced from Languages," and made at least seven other presentations [Romeo and Kyj, 1998, pp. 51-55]. He was for many years chairman of the Institute's Committee on Lectures and also one of its first chief examiners. In this position, he was elected as a fellow in the plan to introduce membership grades within the IA ["Institute of Accounts of New York," 1887, p. 68]. Thus, he examined for admission some of the best accountants in New York City and helped establish standards

of entry into the profession [Romeo and Kyj, 1996, p. 12].² Through the positions he held, the lectures he gave, and the essays he wrote, he became one of the key players in providing the intellectual and scientific movement in which the IA flourished.

In addition, he was a lecturer at the Koehler's New York School of Accounts, and, in 1901, he was appointed to the faculty of the New York University (NYU) School of Commerce, Accounts, and Finance as professor of the principles and practice of accounts [Committee on History, 1951, p. 127].

Arguably, Hardcastle's greatest contribution to accounting lies in his extensive authorship of numerous theoretical articles and presentations published in the earliest U.S. accounting periodicals. Hardcastle helped develop the body of knowledge necessary for an emerging profession by identifying accounting, auditing, actuarial, and mathematics of finance issues affecting the professional accountant. Through an environment in which accounting was examined from a scientific approach, Hardcastle, as well as many other American accountants, was able to help expand the accounting knowledge to make it more effective and contribute to the growth of industry and commerce.

The first accounting journal in the U.S., *The Book-Keeper*, was started on July 20, 1880, and Hardcastle began contributing articles to this journal in 1882. By the late 1880s, he became a regular contributor to the journal *Business* and wrote monthly articles, probably for compensation, in that journal for many years. He became one of the leading advocates dedicated to promoting the "science of accounts" and elevating accounting to the rank of a profession.

His reputation was not confined to the U.S., for some of his articles were reprinted in London's accountant papers. He also received a very flattering notice in the *Ragionaria* of Milan, Italy, concerning his articles published in *Business* ["Notes on the Biography of Joseph Hardcastle, 1951"].

ACCOUNTING THEORIES OF HARDCASTLE

As mentioned previously, the establishment of the "community of the competent" dominated accounting during the late 19th century in the U.S. [McMillan, 1999]. One way Hardcastle

²The duty of the Examining Committee was to report to the Board of the Institute whether applicants met various qualifications – good moral character, proper experience requirement, and sufficient knowledge of accounting. The applicants were tested orally before the Examining Committee [Romeo and Kyj, 1996, p. 12].

became a primary proponent of the “science of accounts” is through his writing more than 65 articles published in various journals between 1880 and 1905 [Committee on History, 1951, pp. 128-132]. The functionalist perspective is characterized by the competencies and skills that become necessary in a rapidly changing economy. A discussion will follow on a survey of the accounting techniques written by Hardcastle, including actuarial concepts, depreciation, cost accounting, and other topics. Since many of these techniques are still applicable today, this section will help historians in discerning the origin of accounting theories developed in the U.S. Thus, one of the reasons for the study is to determine whether “it will be of assistance in deciding whether present practices have been adopted after a long period of trial and a careful evaluation of alternatives, or were the result of an unhappy string of accidents” [Wells, 1978, p. 36]. However, in many cases, it will be difficult to ascertain whether Hardcastle developed some of the theories himself or borrowed them from other accountants.

Actuarial Concepts: Hardcastle’s [1883a, pp. 17-20, 35-37] second published article, a lecture delivered before the IA and published in *The Book-Keeper*, was evidence of his advanced grasp of theories on actuarial concepts and interest on money. His numerous years of experience working as an accountant in real estate helped him to apply many of these interest concepts to accounting articles throughout his lifetime. For example, Hardcastle [1883b, p. 89] displays how to calculate the present value of a bond:

The present value of a bond = the yearly return from bond *times* the present value of an annuity for the number of years the bond has to run at the rate per cent. the investment is yielding us *plus* the present value of \$100, payable when the bond matures at the same rate per cent.

In the same article, Hardcastle [1883b, p. 89] then calculates the current value of the bond assuming that the coupons are cashed semi-annually:

...Thus a 7% bond due in twenty years, interest payable half-yearly, will be treated as a 3 ½% bond running forty years, interest payable yearly. In our solution we require two sets of tables: the one, giving the present value of an annuity of \$1 for a number of years, at different rates per cent.; and the other, the present value

of \$1, due at the end of a number of years, at different rates per cent.

A few years later, Hardcastle [1892, pp. 26-27] wrote an article in which he discussed and analyzed the use of a present value of an annuity and the computation of a sinking fund by using a comprehensive example. Because of his mathematical and accounting background in real estate, many of his articles on time value, bonds, etc. could, with minimal modification, be used in modern treatments of the subject. However, when he discusses the bookkeeping of bonds, there are some differences from today's accounting. Rather than debit or credit a discount or premium in a bonds account (he used both in his examples), he extends the total amount into a profit-or-loss account, charging the premium and discount to the income statement for the year the bonds were sold. He also, logically, considered the sinking fund as a contra-bonds payable account rather than as an investment [Hardcastle, 1892, p. 26]:

The sinking fund is a bookkeeping contrivance, by means of which we can easily tell how much has been provided toward payment of the debt, and it is an offset to the debt, so as to show by taking the difference between the debt and the sinking fund account the amount of the debt unprovided for.

In this article, he mentions depreciation for probably the first time. He states that if the money raised by bonds were used for a plant or other asset subject to depreciation, then an amount would be debited to the income statement:

Debit profit and loss with sinking fund, \$1366.66, and credit depreciation account with the same. If there is any objection, from the circumstances of the case, credit reserve account with \$1366.66, instead of depreciation.

Later, Hardcastle [1901b, p. 470] recognized that premiums on bonds do have to be amortized, although he continued to use the term depreciation:

Practically or theoretically, there is an equal periodical income coming in, part of which goes to the payment of interest on the investment, and part to the depreciation of the bond or of the lease – in the case of the bond to wiping out the premium of the bond, and in the case of the lease to wiping out the whole of the lease.

The issue of accounting for bond discounts and premiums was

debated for many years. Accountants either immediately wrote off the premium or discount, or, if not, they treated them as a deferred charge or credit. Accountants' theoretical attacks on these methods continued into the 1960s [Vangermeersch, 1996b, p. 380]. In the *Accountants' Index* [1921], articles concerning the amortization of discounts and premiums do not appear until approximately 1910, even though Sprague [1904, pp. 38-40] used the term in his text of lectures at NYU. In Sprague's text, which is a clear elucidation of nominal and effective rates of bonds, he acknowledges Hardcastle in the preface for valuable suggestions and assistance.

In the first of his 1887 articles, Hardcastle [1887a, p. 4] presented a table showing the equivalent effective rates of various nominal interest rates when calculated yearly, semi-annually, quarterly, monthly, daily, and every moment. Compound interest, as applied to loans and their calculations, is also discussed in later articles the same year [Hardcastle, 1887b, pp. 43-44, 66-67].

In January 1896, Hardcastle began another series in *Business* called "Sparks from an Accountant's Anvil." He emphasized the importance of completing the sales cycle before recognizing any gains or losses and the necessity of having knowledge of present value computations. He suggested "all transactions in bookkeeping should represent present values, except when they are in condition of transition" [Hardcastle, 1896, p. 36]. He continued in this series with examples of present value tables (p. 90), uses of perpetuities in accounting (p. 140), valuing leases, deferred annuities (p. 185), and the illustration of sinking funds (p. 229).

In 1898, Hardcastle [1898, pp. 753-756] discussed the effective rate of interest as used in an installment sale in which the payments are made over a ten-year period. Hardcastle determined the present value using tables and allocated the yearly payments between interest and reduction of the principal.

Depreciation: Hardcastle wrote five short articles in a series that relates to one of the earliest expositions on depreciation in the U.S. In the first article, in November 1896, Hardcastle [1896, p. 477] separated assets subject to depreciation into three categories:

1. The class from which there comes a regular income, which is assumed to be fixed, but at the end of some fixed time ceases, and yields a certain rate per cent.,

- either leaving a residuum (as a bond) or not (as a lease)...
2. The class of goods used in business, such as machinery, boilers, and furniture. They are subject to natural depreciation from wear and tear, and some of them depreciate from new inventions taking their place, or special improvement made in their line ...
 3. The class which consists of intangible goods, but which retain or lose their values according as the business with which they are connected is prosperous or otherwise, such as good-will, franchises, preliminary expenses (i.e., cost of organizing the business), etc.

It is interesting to note that it was not until the 1936 revision of "Uniform Accounting" published by the IA, that the term intangible asset appeared on the sample balance sheet [Vangermeersch, 1996a, p. 337]. In the same article, Vangermeersch also suggested that the first noted U.S. reference to intangible assets was in an editorial, "Intangible Values in Balance Sheets," published in the *Journal of Accountancy* in 1916. Dicksee and Tillyard never did use the term intangible in their 1906 text. Hardcastle [1897a, p. 49] wrote that he did agree with Dicksee that no harm could come by allowing goodwill to remain on the books of the business. Thus, it is not necessary for the goodwill account to be written down.

Hardcastle [1896, p. 477] was also aware of the risk associated with three categories of intangibles:

... The goods under these three classes all have a life more or less definite. Those under the first class have a definite life, and may or may not have a residuum; those under the second class have a life indefinitely definite, much like the life of man, i.e., have an average existence, but may be cut short in that existence, or with care and by circumstances may be extended beyond the average period, and the goods of this class have a residuum. The last is distinguished from the first and second classes by the goods under it having a very uncertain existence, which may be very short and is very long, but they have no residuum.

In terms of estimating depreciation, with the exception of certain intangible assets, Hardcastle [1896, p. 477] recommended an accelerated method of depreciation:

Experts have observed the normal life of various goods, and these have been given us: It has been assumed that

the depreciation is greatest in the earliest and least in the latter part of the life; it has likewise been assumed that the law of decrease in value is similar, except opposite to the law of compound interest. This law is called the law of diminishing balances.

His example and method of calculation is similar to the accelerated methods explained in modern textbooks. The depreciation for the first year on an asset that cost \$10,000 and using 5% would be \$500, the second year \$475, the third year \$451.25, etc. In the next article in the series, he presented tables with various rates to make the calculations easier [Hardcastle, 1896, p. 510].

Hardcastle's [1897a, p. 15] entry for depreciation at the end of the first year was:

<i>Profit and loss</i>	<i>\$1,500</i>	
<i>To depreciation fund account</i>		<i>\$1,500</i>

And the presentation in the balance sheet was:

<i>Cost of</i>	<i>\$10,000</i>	
<i>Written off for wear</i>	<u><i>1,500</i></u>	<i>\$8,500</i>

The depreciation-fund account is the same as modern-day accumulated depreciation and would increase each year by the amount of depreciation charged to profit and loss. Approximately a year later in 1897, Frederick W. Child, also a member of the IA, presented a paper to the Institute on the use of an account to accumulate and report depreciation reserves [Previts and Merino, 1998, p. 157]. Since Hardcastle and Child were members of the IA, there must have been interactions and discussions on this topic.

What makes these articles especially interesting is the thoroughness and clarity of the topic covered at a time when there was a lack of a clear definition of depreciation. Referring to court cases in the late 19th and early 20th centuries, Woodward [1956, p.73] suggested that "it was not established whether depreciation was an expense, or a distribution of income." Not until 1909 was there acceptance of the idea of depreciation as a cost of doing business; in fact, it was only accepted due to the U.S. Supreme Court's handing down its decision on the matter in *Knoxville v. Knoxville Water Company* [Woodward, 1956, p. 73]. Saliers [1939, p. 23], referring to the first income tax law of March 1, 1913, wrote:

...No uniformity of procedure existed, there was little known concerning the life characteristics of physical

property, and standard rates of depreciation were a thing of the future. Many distinctions now clearly understood were then but vaguely recognized. Depletion, obsolescence, and inadequacy had then received but scant consideration; since then volumes have been written to clarify and apply these terms. Although depreciation was recognized as expense, its part in the cost of manufacture and in the cost of producing services generally was not well understood.

Hardcastle [1899, p. 115] also suggested using depreciation and doubtful-account reserves before a division of profits is declared on partnerships:

Before a division of profits be declared the profit and loss account shall be debited with say 10 per cent. On diminishing balances on the fixed capital subject to depreciation and depreciation account credited with the same. The depreciation account shall in the balance sheet be always treated as an offset to the fixed capital subject to depreciation. There shall also be two reserve accounts – one the reserve account for doubtful debts, and the other the general reserve account. The former shall be credited with...percent of the debts owing the firm remaining unpaid arising during the term of which the balance is the closing up, as a contingent fund to meet bad debts; and the latter or general reserve account shall be credited with...per cent of balance remaining in the profit and loss and the profit and loss account debited.

Hardcastle treated the account on the balance sheet as an offset to the fixed capital subject to depreciation. In addition, Hardcastle [1899, p. 180] suggested allocating depreciation to a manufacturing company's cost of goods produced and to a trading company's expenses: "The depreciation of fixed capital in a manufacturing business is merged into the cost of the goods produced. In a trading business it becomes an offset to the profits." Two key concepts were developed in the texts and journals during the early 20th century. First, it was determined that a yearly deduction from the original cost of an asset should be made to allow for deterioration. Next, the modern-day components of depreciation – wear and tear, the passage of time, obsolescence – began to be recognized [Downey, 1996, p. 199]. Hardcastle [1896, p. 476] also discusses these concepts in his article:

But wear and tear are not the only things with which

we are here concerned. There is the danger of our goods becoming worthless for the purpose for which the goods are used, by reason of some new invention which puts the owner of it in such an advantageous position that the one without the new invention cannot compete in the world of trade with the one using the invention.

Appendix 2 displays a sample of U.S. books written in the 19th and early 20th centuries, and whether their authors mention anything about depreciation. Most omit the topic altogether except where it is mentioned as a term to reduce asset values. The exceptions are Kittredge and Sprague, both active members of the IA who would have had contact with Hardcastle.

Kittredge and Brown [1897, pp. 27, 61, 83] mention reserves for depreciation in their classification of accounts; however, they include it under the liability accounts. They do illustrate an account “reserve for fixtures depreciation” in which the debits and credits to the account are carried to a loss-and-gain account. Kittredge and Brown mention depreciation again, but are still not clear about the type of account since it is debited only at the end of the year when the books are closed. They also mention that in some factories “the percentage to be charged to orders is determined somewhat after the fashion above described, and then the amount is allowed to accumulate on the credit side of depreciation account.” This is the closest Kittredge and Brown come to a modern version of accounting for depreciation.

Sprague [1908, p. 58] has only one page on depreciation and calls the allowance account an “offset or an adjunct to the principal account.” It is used to present two different valuations when computing depreciation. He is not clear whether it is a depreciation expense, but Sprague does state that depreciation is not a liability.

Even though Hardcastle made no references to previous works on depreciation, there were numerous articles and texts written about the subject in both the U.K. and the U.S. during the late 19th and early 20th centuries. As indicated by the sample of books in Appendix 2, there was no accepted theory of depreciation. There were still discussions in the literature as to whether depreciation was a valuation of assets or an allocation problem [Brief, 1967, p. 37]. In addition, the “reserve account” was sometimes considered a liability account or a contra asset. For example, accounting authors such as Wilkinson [1901, p. 953], Teichmann [1906, p. 104], and Knight [1908, p. 192] all wrote after Hardcastle and still considered the “replacement reserve account” a liability, leaving the assets intact.

Hardcastle's theories on depreciation are not original, for apparently they build on an article in *The Accountant* written by Ladelle, published six years previously.³ Ladelle [1890, pp. 5-10] considered depreciation an allocation problem, disregarding market fluctuations. He also utilized a reserve account that would be increased each year by the amount of depreciation. This is an excellent example of where Hardcastle may not have developed any new procedures, but his articles were clearly a modern and comprehensive presentation of the topic. Hardcastle not only wrote on what he probably considered the most scientific approach concerning depreciation, but also expanded the discussion to include much more theory and examples.

Cost Accounting: Hardcastle, through the publication and presentation of his articles, was one of the leading cost accounting educators in the U.S. of his time. Some theories and concepts on cost accounting were obviously discussed in IA meetings because a few authors, such as Kittredge and Hardcastle, wrote about cost theories within a year or two of each other. Metcalfe, who wrote the classic text, *The Cost of Manufactures*, made at least one presentation to the IA and one to the American Society of Mechanical Engineers as early as 1886, titled "The Shop-Order System of Accounts," which was published in *The Office* in five segments [Metcalfe, 1886, pp. 10-11, 19-20, 30-32, 48-50, 64-66].

Many cost historians have neglected to reference 19th century American periodicals because they were probably not aware that these journals existed [Romeo and Kyj, 2000]. For example, Garner [1954, p. 341], unaware of American writers like Hardcastle and Kittredge, wrote nine propositions about cost history. Three of those propositions are presented below:

1. English cost accountants contributed a large proposition of the original ideas and procedures before 1900. After that date the American theorists and practitioners forged ahead of their British contemporaries, the latter never regaining their relative standing.
2. The third element of cost (factory overhead) was comparatively neglected in the period before 1900,

³Brief [1967, p. ix] considers Ladell's article as one of three "classic articles on the depreciation of a single machine." The other two articles were published later by Hotelling, "A General Mathematical Theory of Depreciation" (1925) and Anton, "Depreciation, Cost Allocation and Investment Decision" (1956).

but after that date more attention was devoted to it than to the other two elements of costs combined.

3. Industrial engineers, rather than cost or general accountants, took a more active interest in costing problems in the early development of the subject in this country.

A summary of Hardcastle's theories published in *Business* would indicate that American cost accountants also took an active interest in costing theory, along with the industrial engineers of the late 1890s. If Garner had been aware of the accountants operating in the environment of the "community of the competent" in the IA, he may have modified his propositions.

In the January 1898 issue of *Business*, Hardcastle started a series of comprehensive articles on cost accounting. Although he may not have originated many of the concepts, he refined and wrote of them in a lucid and comprehensible manner. In the first article in the series, he recognized that the cost of a manufactured item consisted of the following [Hardcastle, 1898, p. 28]:

Generally speaking, the cost price of an object to the manufacturer will be: Cost of the raw material entering into the object, plus the cost of the labor expended on it, plus all other direct expenses furnished for it, plus its proportionate share of the general expenses, the proposition being fixed in accordance with reason and experience.

He later defined general expenses as "all the expenditures rendered necessary by the wants of trading or a manufacturing business, which can not be directly imputed to any special operation of the business, and consequently must be equitably distributed over the total operations of a business house as the operations arise, or over the goods manufactured in a workshop or factory" (p. 221). He also classified general costs into two categories – those which concern the production and those which concern their sale (pp. 221-222) – as well as into fixed and variable, just as Metcalf had done 12 years earlier (p. 29):

1. Those which cannot be modified during a business term, i.e., between the making of two consecutive balance sheets, and which are considered fixed.
2. The variable general expenses, which may be at any time modified to the advantages of the business.

Fixed general expenses would include rents, taxes, insurance, management's salaries, depreciation, and subscriptions to

technical periodicals. Variable general expenses would include maintenance of fixed capital, commissions, gifts and presents, advertising, stationery, utilities, oils and lubricants, steel for tools, and wood for models. Even though he was considering a manufacturing company, his variable general expenses did not distinguish manufacturing and selling components.

Hardcastle then stated that the proportionate share of the general expenses must be estimated. He recommended the cost of the labor as preferable, since it is less fluctuating, for determining the base:

Also if the total general expenses for the month *are* divided by the total cost of the labor for the month, the quotient will give the amount of the general expenses for that month to go to each dollar of value of labor during that month.

The problem of using actual costs in determining the quotient, or the co-efficient as Hardcastle called it, was recognized in his article:

1. It implies that we should have to wait till the end of the month before we could obtain this quotient or co-efficient.
2. The irregularities in production will cause great variations in the co-efficient and consequently in cost price.
3. The cost price of an article when business was slack would be placed too high to allow a sale to be made, and our warehouse would be filled with like articles of different cost prices.

Hardcastle used a general expense account that was credited for the amount applied to the jobs as calculated by the co-efficient used. This account would also be debited for all of the sundry and other overhead accounts, including depreciation. At the end of the month, the two sides would be compared to determine the differences (pp. 293-294):

This is carried on for the whole of the business term, and the difference of the two sides will give the excess or deficiency of the estimation of the general expenses for the year, which excess or deficiency at the end of the term is carried into the profit and loss account.

The merchandise account was used as an account to represent finished goods and was debited with the direct materials, direct labor, and general expenses (p. 294). However, in an article

written three years earlier, Hardcastle (1895, p. 330, *emphasis added*) was more explicit in explaining finished goods and work-in-process:

We will assume that the finished goods are kept stored (*Store Account*), that semifinished goods are in the factory (*Factory Account*) and the raw materials in the warehouse (*Warehouse Account*).

Hardcastle gave examples of cost procedures similar to those used today. For example, cost of materials would be transferred from the warehouse account to the factory account (work-in-process) along with labor and other manufacturing costs, and cost of goods would be transferred to the store account (finished goods). His sales account would include both components of the selling price of the goods sold and the cost of goods sold transferred from the store account.

Hardcastle [1898, p. 222] was also ahead of his time in recognizing the importance of cost-volume-profit analysis. He showed great insight concerning the use of accounting information, especially the impact of fixed and variable costs on profits:

The great art of the manufacturer consists in increasing his output without increasing his fixed and variable general expenses, in order to lower the co-efficient for the general expenses and to keep down the cost price of the goods he sells. This art is tributary to accounting, which favors or trammels its proprietor according as it is well or badly ordered.

He was aware of the challenges a company faced in understanding overhead in order to compete effectively in the marketplace (p. 221):

The volume of the general expenses forms no small part of the cost of merchandise, and they are the part more likely to escape the notice of the manufacturer than the prime costs. For this reason it is necessary to place them, in a classified form, constantly before the manufacturer, the classifications being made according to the requirements of the business, so as to guide the merchant in the regulation of them, in order that he may produce at the least cost, and not be one to fall by the wayside in the competitive struggle for existence....The general expense account, or, rather, its subaccounts, require the closest attention, because of their complexity.

Hardcastle presented a comprehensive discussion with

examples of a manufacturer using process costing in the same series. He called it “continuous manufacturing of objects or of merchandise of the same nature.” The materials, expenditures for labor, and general expenses, by means of a coefficient, are entered into the journal, with the total of the three equaling the cost-price of the merchandise or objects produced (p. 434). He was also familiar with the problem of beginning and ending inventory for a work-in-process problem:

In these kinds of work, it is necessary to keep an account of the materials remaining on hand when the work is brought to a rest, for the material remaining will, in the next term of operations, be utilized, hence the necessity of an adjustment, to show the quantity of material used and the quantity remaining.

In addition, he discussed in elaborate detail the accounting for materials as they pass through various stages and steps.

Garner was not alone in ignoring a great source of cost theory by not knowing about the articles published in *The Office* and later *Business* by some of the great accountants of the 19th century. Wells [1996, pp. 228-229] suggested that allocation procedures were common in all branches of engineering in the period from 1880 to 1910, but rare in accounting journals, and that the pioneers of cost accounting were not accountants but engineers in the U.S. He also stated that it was a common belief that many of the problems of allocating overhead costs were discussed in the literature from the early 20th century and that most of the participants were American engineers. Again, Hardcastle most likely did not invent the theories and concepts he proposed. Fleischman et al. [1991] also disproved that possibility by demonstrating the existence of effective cost accounting systems in practice during the early part of the Industrial Revolution. However, Hardcastle’s series of articles in *Business* on cost accounting, even though written much later, may be one of the more comprehensive and clear discussions on cost theories written in the 19th century U.S.

Miscellaneous Topics: Hardcastle’s expertise included a strong history of accounting, a skill that is evident in his writings when he, on many occasions, mentions the origins of accounting terms and concepts [e.g., Hardcastle, 1882, pp. 336-338]. He also wrote a series of articles about the history of bookkeeping from the Roman age until the 19th century [Hardcastle, 1890] and gave a summary of the history of the IA [“Institute of Accounts,”

1889, p. 74]. Hardcastle [1899, p. 299] segmented bookkeeping into three periods: “the first, the period giving rise to single entry; the second, the period which gave rise to double entry; and the third, the modern period.” The last period also featured double-entry accounting, but it included all the new theory developed within Hardcastle’s lifetime.

In a discussion at the IA’s meeting in 1883, the subject for discussion for the evening was the necessity of the daybook and journal as the only proper connecting links between a transaction and the ledger entry. Hardcastle presented arguments in favor of “the voucher system. The only principal book here is the ledger. This is really an older system than the Italian, but it had its birth before the world could use it, or before the world wanted it” [“The Day-Book and Journal,” 1883, p. 90].

In correspondence to the editor in *The Office*, Hardcastle [1886, p. 46] discussed the calculation of purchase discounts. In a subsequent letter to the editor, he displays his background as a teacher by simplifying the calculation in the following rule: “Write the discounts as decimals, and subtract each one from unity. The product of the several remainders take from unity; then the result will give the compound discount expressed decimally.”

Hardcastle [1888, p. 15] wrote two parts of an article on prices and profits. After explaining the problems with estimating the value of stock too high or low, he suggests two rules for estimating the value of stock on hand:

For merchandise for which there is a ready sale, and which is in good condition, the estimate may be taken as that price which it would cost us to replace it. Merchandise here is placed as a representative of any circulating capital – but if the account represents fixed capital, the values should be the value to the firm, as a running concern, such as plant fixtures.

For merchandise not in a good condition, out of fashion, the value should be a break-down value, for this merchandise should be sold off at any price rather than be kept on hand, becoming less and less valuable, so as to deceive us in our financial showing.

These two rules combined were a rudimentary predecessor of the lower-of-cost-or-market method developed in the 20th century and incorporated into GAAP by Accounting Research Bulletin No. 29, issued in 1947.

In 1895, Hardcastle [1895, p. 155] called attention to the

problems of misclassifying capital accounts, or economic accounts as he called them:

Some persons go so far as to call the balance of the positive economic accounts liabilities, but the more enlightened accountants are beginning to see the absurdity of doing so, and make capital accounts distinct from the liability accounts.

Subsequently, after a discussion of the differences between English and American accounting, he listed various examples of “motions”; that is, rules reflecting why there are changes in accounts (p. 196):

The principal results of these motions may be stated thus:

1. We can increase assets at the expense of other assets.
2. We can increase assets by increasing our liabilities.
3. We can increase assets and increase our economic condition.
4. We can decrease assets by decreasing our liabilities.
5. We can decrease assets by decreasing our economic condition.
6. We can provide insurance to meet losses in assets.

This system of classifying accounts differs from the traditional one used by many American authors who still classified accounts as real, personal, and fictitious [Hatfield, 1908, pp. 67-69]. Hardcastle’s approach and analysis is similar to the proprietary theory developed and presented by Sprague [1880, 1889] and developed more fully in Sprague’s 1908 text [Previts and Merino, 1998, p. 154]. An amusing aside note about “The Algebra of Accounts” [Sprague, 1880] is a letter from Hardcastle to Sprague, published in *The Office*, correcting the phrase “by analogy” used for the terms debtor and creditor. In response to Hardcastle’s letter, Sprague pleaded amnesia to the use of the phrase [“Institute of Accounts,” 1889, p. 74].

In 1895, Hardcastle [1895, p. 330] suggested two accounts – a merchandise account which is debited with the original cost of goods and credited with the “cost of goods sold on the basis of the cost contained on the debit side of the account” and a trading account containing elements of selling prices, cost of goods sold, and expenses. It was not until the early part of the 20th century that the literature suggested separating merchandise, sales, and cost of goods sold into individual accounts. Many texts and articles combined all three of these accounts into one, thereby mixing sales with costs.

Some of the other topics in this series included the following: classification of accounts (p. 34), marginal utility (p. 233), misleading balance sheets, and revenue statements (p. 441).

In May 1897, Hardcastle started a series on “logismorgraphy” in the journal *Business*, a series which is based on an early theory of agency developed by Joseph Cerboni, the author of *Theory and Practice of Accounts* [Hardcastle, 1897b, p. 141, 1897c, p. 203]:

According to this theory, the persons concerned with a business form two general classes, those having to do with its management, and those outside the management, but having business relations with the owner of the business.

The first class comprehends those in the management of the business. These are subdivided into three functional classes, the proprietor class, simply called the proprietor, the administrator class, simply called the administrator, and the custodian class, simply called the custodian.

...all accounts can be contained in two collective accounts, the one giving the equity of the proprietor from the proprietor’s point of view, and which is called the Proprietor’s Account; the other giving the Agencies’ Account, from the agencies’ point of view and that both these accounts are concerned with the whole of the subject matter – i.e., the substance of the business, and nothing besides.

The basic premise of logismorgraphy involves dividing the various accounts into groups, then sub-dividing them even more as needed. Hardcastle’s command of languages, in this case Italian, is evident when he made a rebuttal to a logismorgraphy review in the *Accountants’ Magazine* (a Scottish journal) in the December 1897 issue of *Business*. The *Accountants’ Magazine* called them “Mr. Hardcastle’s theories.” Hardcastle replied, “They are not my theories; they are Cerboni’s theories, a man who has done more than any other man of the age for accounting” [Hardcastle, 1897d, p. 361]. He continued his rebuttal as follows:

Logismorgraphy is not a mere variation of Double Entry, but it is an extension of the ideas of accounting, and Cerboni, as another Luca Da Borgo, is the presenter of it to the accounting world. I am afraid that our Scottish friend knows nothing of the modern Italians and their accounting works, otherwise he would bow with re-

spect before them, and be ready to sit at the feet of their learned professor.

Shortly after these articles appeared, Sprague also wrote a few articles on logismorgraphy in *Accountics*. He was not as optimistic as Hardcastle; he felt that the logismorgraphic journals did not display the entries simply and clearly. However, he did propose that constructing the proprietor's account differentially and the agency account integrally were the two most indispensable developments of the theory [Sprague, 1898, pp. 73-75, 117-121]. This new Italian method was an example of how much Hardcastle and Sprague advocated the development of accounting as a science. As McMillan [1998, p. 28] mentions, "the ideal of the science of accounts had become a sufficiently profound reality to these men that they looked for new methods which could reveal new principles that had previously remained hidden."

Hardcastle's theory on treasury stock was many years ahead of its implementation in practice. Vangermeersch [1996c, p. 586] suggests that both Bentley in 1911 and Montgomery favored the asset approach in treasury-stock accounting, while W.T. Sunley, Jr. made a classic argument for the contra-equity viewpoint in 1915. Hardcastle [1899, p. 242] had argued that treasury stock should be a negative to the capital account in 1899, years before Sunley's contra-equity argument:

There is an account called treasury stock, which is often improperly considered as an asset, instead of a negative to the share capital account. It represents stock of the company, which the company either has not yet disposed of, or which, for some reason, after having once been issued by the company, has again come into its hands.

During the late 1890s, there was some disagreement about how organizational costs should be treated in the financial statements, either as an asset or expensed in the period incurred. Hardcastle (p. 243) suggested that organization expenses (he called them preliminary expenses) be gradually written off. He did theorize that they did not belong with the assets and should be a contra (negative) capital account.

Another topic of modern interest is Hardcastle's determination of extraordinary profits and how they should be handled for partnerships. His treatment of extraordinary profits and losses was to separate them from ordinary profit-and-loss items and utilize a general reserve account (p. 111):

Extraordinary profits and losses, i.e., such as do not

usually occur but are accidental in nature, shall as they arise be carried to the general reserve account. The remaining profit and loss should now be duly divided and carried into each partner's profit and loss account.

In the same article, Hardcastle determines that the book-keeping of a partnership is the same as that of a sole proprietor, with the exception of the mutual relations of the partners at the beginning of the partnership, the balancing of the books at the end of the period, and the dissolution of the partnership. Hardcastle [1901a, pp. 346-348, 386-388, 1901b, pp. 470-472] continued to write about partnership liquidation and depreciation in future articles.

Hardcastle wrote two *Journal of Accountancy* articles in 1905, and others for *Accountics* and the *New York Accountants and Bookkeepers' Journal* late in life. He was a prolific writer until his death in 1906. In addition to the numerous journal articles, Hardcastle [1903] authored a book which was a compilation of lectures presented for the aid of the students at NYU. The first chapter of the book integrates the personalistic theory-to-trustee accounting [Hardcastle, 1903, pp. 6-9]. Leon Hay [1961, p. 104] acknowledges Hardcastle, as do Gottsberger, Loomis, and Sprague, as setting "the pattern used by most authors down to the present time" in his discussion of executorship reporting. A book on "accountics" was purportedly in preparation at the time of his death. He died June 16, 1906, as a result of an accident when he was thrown to the ground by a horse and wagon in New York City ["Obituary," 1906, p. 232].

CONCLUSION

Drawing from the functionalist perspective, Hardcastle enhanced the profession by developing and disseminating the accounting competencies and skills necessary for the emerging profession. As one of the leading proponents of the scientific basis for the development of accounting theory, he helped provide the intellectual and theoretical skills necessary. His codification of topics such as actuarial concepts, depreciation, and cost accounting helped expand the accounting knowledge to the practitioner and, thus, made accounting more efficient and effective.

Hardcastle began his professional career in education, teaching for approximately 18 years in grammar and private schools. His second career, in accounting, lasted more than 40 years. Hardcastle's last six years combined both careers when he came back to education as a lecturer at Theodore Koehler's

School of Accounts and as professor of principles and practice of accounts at NYU. His writings demonstrate that his early career as a teacher and his background in mathematics enhanced his status as an accountant and educator. Many of his early articles were on building associations and time value matters related to real estate. Many, if not most, of the topics Hardcastle wrote about were practiced, discussed, or written about previously. However, few accountants had Hardcastle's gift of disseminating accounting information to the emerging profession in such a succinct, clear, and logical manner. He may have begun his career in teaching, but the teaching never left his career.

Because Hardcastle was aware of the accounting theory being developed in Britain, he could utilize and expand on theories developed there without deferring to the Company Acts to prejudice his writings based on the law. He also had an advantage over British accountants by being a prominent member of the IA and basing his theories on scientific reasoning in an unregulated environment. During the 1880s and 1890s, at the end of each lecture given to the IA, a discussion of the subject followed with accountants like Hardcastle, Sprague, Harney, Kittredge, and Packard participating, allowing the presenter to answer the questions.

In using the functionalist approach to explain professionalism and the contributions of Hardcastle, accounting professionals are viewed as honored servants of the public. Professionals meet the needs of society because of the skills and attributes they contribute to the assimilation and smooth operation of society. It was in this environment, the "community of the competent," that the accounting profession in the U.S. worked toward jurisdictional legitimacy by developing accounting as a science.

Because fields of professionalization constantly change over time [Larson, 1977; Abbott, 1988], skills solidly supported by knowledge became necessary in the rapidly changing economy of the late 19th century. The accounting profession continued to define and delineate its area of expertise into a body of theory with the help of Hardcastle. He continued to develop this "science of accounts" through his later years as he wrote monthly articles for *Business*, and later *Business World*, on a wide variety of accounting topics.

Even though Hardcastle wrote prolifically in accounting for almost a quarter of a century, he is relatively unknown today.⁴

⁴This statement is probably true for most 19th century accountants in the U.S. with the exception of Sprague and Haskins.

If it were not for his having the highest score on the first CPA exam, he would rarely be acknowledged in the literature. There are a few reasons for this. First, many early accounting authors took great liberties in borrowing ideas from each other. Many articles written in the 19th and early 20th centuries did not cite any sources, even though different authors such as Hardcastle may have covered the topic previously. Second, Hardcastle was not as politically involved as were many of his more well-known peers. Other than serving as chief examiner of the Institute and chairman of the Institute's Committee on Lectures, his political involvement in accounting was minimal. However, it is interesting that, recently, accounting historians have started to recognize the contributions of 19th century accountants who were members of the IA and who flourished in the environment that McMillan [1999, pp. 25-26] called the "community of the competent." Their contributions to the "science of accounts" are well documented [see Miranti, 1990; McMillan, 1998a, b, 1999; Romeo and Kyj, 1998]. Many of the journals in which Hardcastle wrote had a life of only a few years or are not readily accessible to accounting historians. Until recently, many of these journals have been almost totally ignored by those writing the history of U.S. accounting. Most of the articles in these early journals are not even listed in the first *Accountants' Index*, published in 1921.

However, Hardcastle did not go without recognition from his peers during his lifetime. A year before he died, NYU conferred upon him the honorary degree of Master of Letters and made him an honorary alumnus ["Joseph Hardcastle," 1906, p. 53]. The citation used to confer upon Hardcastle this degree in 1905 reads as follows [Jones, 1941]:

For the degree of Master of Letters:

JOSEPH HARDCASTLE, of the city of New York, Professor of the Principles and Practice of Accounts in the School of Commerce, Accounts and Finance of New York University.

Born and educated in England. Removing to America, he served as Assistant Principal in Grammar School 38. For forty years an honored expert accountant in this city, at the age of seventy, he was the first to receive the degree of Certified Public Accountant from the Regents of the State of New York. He has taken a prominent part in the elevation of accountancy to the rank of a profession. For many years a contributor to the periodicals of his profession and writer of text books recognized as

authoritative in their field. Teacher, author, and leader in his profession, he is recommended for the honorary degree of Master of Letters.

Hardcastle, a regular contributor to various early accounting journals in the U.S., became one of the foremost and respected authorities on subjects connected with the mathematics of finance and other general topics in accounting. Some of his writings on leases, bonds, depreciation, and cost accounting are very similar to today's theory with little modification. As a teacher, author, and leader, he figured prominently in the elevation of accountancy to the rank of a profession. He and Sprague may have been America's premiere 19th century theorists who developed and disseminated accounting practice and procedures to the practitioners to help the profession meet the demands of emerging markets.

REFERENCES

- Abbott, A. (1888), *The System of Professions: An Essay on the Division of Expert Labor* (Chicago: University of Chicago Press).
- Accountants' Index, A Bibliography of Accounting Literature to December, 1920* (1921), 1988 reprint in Brief, R.P. (ed.), (New York: Garland Publishing, Inc.).
- "Advantage of Expert Accountants to Investors" (1894), 1894 reprint by *The Banking Law Journal*, Vol. 10, No. 9: 457.
- Allen, G. (1885), *Allen's Forty Lessons in Practical Double Entry Book-Keeping* (Newbern, NC: N.B. Richardson).
- Brief, R.P. (1967), "A Late Nineteenth Century Contribution to the Theory of Depreciation," 1984 reprint in Brief, R.P. (ed.), *Depreciation and Capital Maintenance* (New York and London: Garland Publishing, Inc.): 3-14.
- Cairnes, J.E. (1887), *Some Leading Principles of Political Economy Newly Expounded* (London: Macmillan).
- Carey, J.L. (1969), *The Rise of the Accountancy Profession: From Technician to Professional 1896-1936* (New York: American Institute of Certified Public Accountants).
- Carnegie, G.D. and Napier, C.J. (1996), "Critical and Interpretive Histories: Insights into Accounting's Present and Future through its Past," *Accounting, Auditing & Accountability Journal*, Vol. 9, No. 3: 7-39.
- Carr-Saunders, A.M. and Wilson, P.A. (1933), *The Professions* (London: Oxford).
- Chua, W.P. and Poullaos, C. (1998), "The Dynamics of 'Closure' amidst the Construction of Market, Profession, Empire and Nationhood: An Historical Analysis of an Australian Accounting Association, 1886-1903," *Accounting, Organizations and Society*, Vol. 23, No. 2: 155-187.
- Committee on History (1951), "Joseph Hardcastle," 1995 reprint in Grant, J. (ed.), *The New York State Society of Certified Public Accountants – Foundation for a Profession*, (New York: Garland Publishing, Inc.): 125-132.
- Crawford, J.M. (1898), *The Cleveland Accountant* (Cleveland: published by the author)
- "The Day-Book and Journal" (1883), *American Counting Room*, Vol. 7, No. 2: 89-94.

- Dicksee, L.R. and Tillyard, F. (1906), *Goodwill and its Treatment in Accounts*, 1976 reprint (Arno Press, New York):
- Downey, A.M. (1996), "Depreciation," in Chatfield, M. and Vangermeersch, R. (eds.), *The History of Accounting – An International Encyclopedia* (New York: Garland Publishing, Inc.): 198-201.
- Edwards, J.R. (2001), "Accounting Regulation and the Professionalization Process: An Historical Essay Concerning the Significance of P. H. Abbott," *Critical Perspectives on Accounting*, Vol. 12, No. 6: 675-696.
- Fleischman, R.K., Parker, L.D., and Vamplew, W. (1991), "New Cost Accounting Perspectives on Technological Change in the British Industrial Revolution," in Graves, O.F. (ed.), *The Costing Heritage: Studies in Honor of S. Paul Garner* (Harrisonburg, VA: Academy of Accounting Historians): 11-25.
- Flesher, D.L., Flesher, T.K., and Previts, G.J. (1996), "Joseph Hardcastle: The First Person to Pass the CPA Exam," *CPA Journal*, Vol. 66, No. 4: 17-19.
- Friedman, M. (1962), *Capitalism and Freedom* (Chicago: University of Chicago Press).
- Furner, M.O. (1975), *Advocacy & Objectivity: A Crisis in the Professionalization of American Social Science 1865–1905* (Lexington: University Press of Kentucky).
- Garner, S.P. (1954), *Evolution of Cost Accounting* (Tuscaloosa: University of Alabama Press).
- Greenwood, E. (1972), "Attributes of a Profession," in Pavalko, R. (ed.), *Sociological Perspectives in Occupations* (Itasca, IL: F.E. Peacock Publishers, Inc.): 3-16.
- Hardcastle, J. (1882), "Origin of Calculation as Deduced from Evidence in Language," *The Book-Keeper*, Vol. 5, No. 56: 336-338.
- Hardcastle, J. (1883a), "On the Theory of Life Insurance," *The Book-Keeper*, Vol. 6, Nos. 62/63: 17-20, 35-37.
- Hardcastle, J. (1883b), "Technical Discussions, Rate of Bond-Income," *The Book-Keeper*, Vol. 6, No. 66: 89-90.
- Hardcastle, J. (1886), "Trade Discounts," *The Office*, Vol. 1, No. 3: 46.
- Hardcastle, J. (1887a), "A Common Standard for Interest," *The Office*, Vol. 2, No. 8: 4.
- Hardcastle, J. (1887b), "Interest," *The Office*, Vol. 2, Nos. 10/11: 43-44, 66-67.
- Hardcastle, J. (1888), "Prices and Profits, or a Chapter in Accountics," *The Office*, Vol. 4, No. 20: 15-16.
- Hardcastle, J. (1890), "Talks on Accounts," *The Office*, Vol. 6, Nos. 8/9/12: 227-228, 251-252, 325-326.
- Hardcastle, J. (1892), "A Corporation Issuing Bonds," *Business*, Vol. 12, No. 2: 26-27.
- Hardcastle, J. (1895), "Accounts as Tools of Business," *Business*, Vol. 15, Nos. 1-12: 33-34, 76-77, 114-116, 154-155, 195-196, 233-237, 265-266, 297-298, 329-330, 363-364, 404, 441-442.
- Hardcastle, J. (1896), "Sparks from an Accountant's Anvil," *Business*, Vol. 16, Nos. 1-6, 11-12: 35-37, 90-91, 139-140, 185-187, 229-230, 273-274, 477-478, 510.
- Hardcastle, J. (1897a), "Sparks from an Accountant's Anvil," *Business*, Vol. 17, Nos. 1/2: 15-17, 48-49.
- Hardcastle, J. (1897b), "Theory of Accounts," *Business*, Vol. 17, Nos. 3-6: 80-81, 112-115, 141-142, 173-174.
- Hardcastle, J. (1897c), "Logismography," *Business*, Vol. 17, Nos. 7-12: 203-204, 235, 273-275, 303-304, 335-337, 366-370.

- Hardcastle, J. (1897d), "A Review of a Review," *Business*, Vol. 17, No. 12: 361.
- Hardcastle, J. (1898), "Practical Accounting," *Business*, Vol. 18, Nos. 1-12: 28-30, 101-104, 171-173, 221-223, 293-295, 363-367, 434-435, 490-492, 562-564, 625-627, 689-691, 753-756.
- Hardcastle, J. (1899), "Practical Accounting," *Business*, Vol. 19, Nos. 2/3/4: 110-113, 179-181, 242-245, 299-301.
- Hardcastle, J. (1901a), "Practical Accounting," *Business*, Vol. 21, Nos. 9/10: 346-348, 386-388.
- Hardcastle, J. (1901b), "Depreciation in its Application," *Business*, Vol. 21, No. 12: 470-472.
- Hardcastle, J. (1903), *Accounts of Executors and Testamentary Trustees: Lectures before the New York University School of Commerce, Accounts, and Finance* (New York: New York University School of Commerce, Accounts and Finance).
- Hatfield, H.R. (1908), "Review of the Philosophy of Accounts," *Journal of Accountancy*, Vol. 7, No. 1: 67-69.
- Haug, M.R. and Sussman, M.B. (1969), "Professional Autonomy and the Revolt of the Client," *Social Problems*, Vol. 17, No. 2: 153-160.
- Hay, L.E. (1961), "Executorship Reporting – Some Historical Notes," *Accounting Review*, Vol. 36, No. 1: 100-104.
- Hoffmann, J.V. (1899), *Bookkeeping: As it is Practiced in Large Business Houses* (Baltimore, self-published).
- "Institute of Accounts of New York" (1887), *The Office*, Vol. 2, No. 11: 68.
- "Institute of Accounts" (1889), *The Office*, Vol. 6, No. 35: 74.
- Jones, T.F. (1941), letter from the director of the Library of New York University to H.O. Voorhis, secretary of New York University, dated November 27, Webster Archives, University of Mississippi Library.
- Jordan, W.G. (1928), *Charles Waldo Haskins – An American Pioneer in Accountancy* (New York: Prentice Hall, Inc.).
- "Joseph Hardcastle" (1906), *Business World*, Vol. 26, July 15: 53.
- "Joseph Hardcastle, C.P.A." (1899), *Business*, Vol. 19, September: 572.
- Kittredge, A.O. and Brown, J.F. (1897), *The Self-Proving Accounting System* (New York and Toronto: Self-Proving Account-Book Company).
- Knight, A. (1908), "Depreciation and Other Reserves," *Journal of Accountancy*, Vol. 5, No. 3: 189-200.
- Ladelle, O.G. (1890), "The Calculation of Depreciation," 1984 reprint in Brief, R.P. (ed.), *Depreciation and Capital Maintenance* (New York and London: Garland Publishing, Inc.): 3-14.
- Lamoreaux, N.R. (1985), *The Great Merger Movement in American Business, 1895-1904* (Cambridge: Cambridge University Press).
- Larson, M.S. (1977), *The Rise of Professionalism: A Sociological Analysis* (Berkeley: University of California Press).
- Leavitt, T.M. (1896), "Bank, Corporation and Other Accounting," *Bankers' Magazine*. Vol. 52, No. 6: 744.
- Lee, T.A. (1996a), "Identifying the Founding Fathers of Public Accountancy: The Formation of the Society of Accountants in Edinburgh," *Accounting Business & Financial History*, Vol. 6, No. 3: 315-335.
- Lee, T.A. (ed.) (1996b), *Shaping the Accountancy Profession: The Story of Three Scottish Pioneers* (New York and London: Garland Publishing, Inc.).
- Littleton, A.C. (1942), "Directory of Early American Public Accountants," 1988 reprint in Zeff, S.A. (ed.), *The U.S. Accounting Profession in the 1890s and Early 1900s*, (New York: Garland Publishing, Inc.): 1-44.

- Loeb, S.E. and Miranti, P.J. (2004), *The Institute of Accounts: Nineteenth-Century Origins of Accounting Professionalism in the United States* (London and New York: Routledge).
- Mann, H.S. (1931), *Charles Ezra Sprague* (New York: New York University).
- Mayhew, I. (1884), *The Eclectic Complete Book-Keeping* (Cincinnati: Van Antwerp, Bragg & Co.).
- McMillan, K.P. (1999), "The Institute of Accounts: A Community of the Competent," *Accounting, Business & Financial History*, Vol. 9, No. 1: 7-28.
- McMillan, K.P. (1998a), "Efficient Accounting Systems: Justifying US Accounting Practice in an Unregulated Commercial Environment," *Accounting History*, NS Vol. 3, No. 1: 115-142.
- McMillan, K.P. (1998b), "The Science of Accounts: Bookkeeping Rooted in the Ideal of Science," *Accounting Historians Journal*, Vol. 25, No. 2: 1-34.
- Meservey, A.B. (1882), *Meservey's Book-Keeping* (Boston: Thompson, Brown, and Company).
- Metcalfe, H. (1886), "The Shop-Order System of Accounts," *The Office*, Vol. 1, Nos. 2-6: 10-12, 19-20, 30-32, 48-50, 64-66.
- Miranti, P.J. (1990), *Accounting Comes of Age: The Development of an Accounting Profession 1886- 1940* (Chapel Hill: The University of North Carolina Press).
- Neal, E.V. and Cragin, C.T. (1909), *Modern Illustrative Bookkeeping* (New York: American Book Company).
- Nelson, R. (1885), *Nelson's New Book-Keeping* (Cincinnati: published by the author).
- "Notes on the Biography of Joseph Hardcastle," (1951), Webster Archives, University of Mississippi Library.
- "Obituary" (1906), *Journal of Accountancy*, Vol. 2, No. 3: 232.
- Packard, S.S. (1868), *Theoretical Training in the Science of Accounts* (New York: published by the author).
- Packard, S.S. and Bryant, H.B. (1878), *The New Bryant & Stratton Counting-House Book-Keeping* (New York: Ivison, Brakeman, Taylor & Co.).
- Parker, R.H. (1983), "Founding Fathers – Scots Almost to a Man," *Accountancy*, Vol. 94, No. 1081: 19.
- Parkin, F. (1979), *Marxism and Class Theory: A Bourgeois Critique* (London: Tavistock).
- Peirce, T. (1890), *Exercises in Book-Keeping* (Philadelphia: Bark & McFetridge Printers).
- Previts, G.J. and Merino, B.D. (1998), *A History of Accountancy in the United States*, 2nd. edn. (Columbus: Ohio State University Press).
- "The Public Accountants of New York City" (1896), *Business*, Vol. 16, No. 8: 383.
- Rice, P.N. (1951), letter to Norman E. Webster, dated April 25, Webster Archives, University of Mississippi Library.
- Richardson, A.J. (1988), "Accounting Knowledge and Professional Privilege," *Accounting, Organizations and Society*, Vol. 13, No. 4: 381-396.
- Ritzer, G. (1972), *Man and His Work: Conflict and Change* (New York: Appleton-Century-Crofts).
- Robson, K. and Cooper, D. (1990), "Understanding the Development of the Accountancy Profession in the United Kingdom," in Cooper, D.J. and Hooper, T.M. (eds.), *Critical Accounts* (London: Macmillan): 366-390.
- Romeo, G. and Kyj, L. (1996), "Admission by Examination: 'Joining the Club' during the Late 19th Century," *CPA Journal*, Vol. 66, No. 12: 12.
- Romeo, G. and Kyj, L. (1998), "The Forgotten Accounting Association: The Institute of Accounts," *Accounting Historians Journal*, Vol. 25, No. 1: 29-55.

- Romeo, G. and Kyj, L. (2000), "Anson O. Kittredge: Early Accounting Pioneer," *Accounting Historians Journal*, Vol. 27, No. 2: 117-144.
- Roth, J.A. (1974), "Professionalism: The Sociologist's Decoys," *Sociology of Work and Occupations*, Vol. 1, No. 1: 6-23.
- Rowe, H.M. (1899), *Commercial and Industrial Bookkeeping* (Baltimore: Sadler-Rowe Co.).
- Royall, J.P. (1884), *Manual of the Elements of Book-Keeping* (Columbia, MO: Herald Printing House).
- Saliers, E.A. (1939), *Depreciation Principles and Applications* (New York: Ronald Press Company).
- Schwartz, G.W. (1897), *Office Routine and Bookkeeping: A Method of Teaching the Science of Accounts* (New York: American Book Company).
- Smithdeal, G.M. (1887), *Smithdeal Practical Business Colleges* (Richmond, VA: Johns & Co.).
- Sprague, C.E. (1880), "The Algebra of Accounts," 1889 reprint, *The Office*, Vol. 6, No. 36: 91-92, and Vol. 7, No. 38: 122-123.
- Sprague, C.E. (1898), "Logismography I," *Accountics*, Vol. 2, Nos. 4/5: 73-75, 117-121.
- Sprague, C.E. (1904), *The Accountancy of Investment* (New York: Business Publishing Company).
- Sprague, C.E. (1908), *The Philosophy of Accounts*, 1972 reprint (Houston: Scholars Book Co.).
- Teichmann, M. (1906), "Depreciation," *Journal of Accountancy*, Vol. 3, No. 2: 101-105.
- Vangermeersch, R. (1996a), "Intangible Assets," in Chatfield, M. and Vangermeersch, R. (eds.), *The History of Accounting – An International Encyclopedia* (New York: Garland Publishing, Inc.): 336-338.
- Vangermeersch, R. (1996b), "Liabilities," in Chatfield, M. and Vangermeersch, R. (eds.), *The History of Accounting – An International Encyclopedia* (New York: Garland Publishing, Inc.): 380-382.
- Vangermeersch, R. (1996c), "Treasury Stock," in Chatfield, M. and Vangermeersch, R. (eds.), *The History of Accounting – An International Encyclopedia* (New York: Garland Publishing, Inc.): 586-587.
- Webster, N.E. (1954), *The American Association of Public Accountants 1886-1906*, 1978 reprint (Arno Press, New York).
- Wells, C.R. (1897), *Teacher's Guide to the Practice System of Business Training and Bookkeeping* (Rochester, NY: Williams & Rogers Publishers).
- Wells, M.C. (1978), *Accounting for Common Costs* (Urbana, IL: Center for International Education and Research in Accounting).
- Wells, M.C. (1996), "Engineering and Accounting," in Chatfield, M. and Vangermeersch, R. (eds.), *The History of Accounting – An International Encyclopedia* (New York: Garland Publishing, Inc.): 227-229.
- West, B.P. (1996), "The Professionalization of Accounting: A Review of Recent Historical Research and its Implications," *Accounting History*, NS Vol. 1, No. 1: 77-102.
- Wilkinson, G. (1901), "Depreciation of Plant," *The Accountant*, August 31: 953.
- Williams, L.L. and Rogers, F.E. (1888), *Theoretical and Practical Book-Keeping* (Rochester, NY: Williams & Rogers Publishers).
- Willmott, H. (1986), "Organizing the Profession: A Theoretical and Historical Examination of the Development of the Major Accountancy Bodies in the U.K.," *Accounting, Organizations and Society*, Vol. 11, No. 6: 555-580.
- Woodward, P.D. (1956), "Depreciation –The Development of an Accounting Concept," *Accounting Review*, Vol. 31, No. 1: 71-76.

APPENDIX 1

Timeline of Joseph Hardcastle's Life

1827	Born April 22, in Skipton in Craven, Yorkshire, England
1840-1844	Attended Free Grammar School
1844-1847	Attended York and Ripon Diocesan Training School on scholarship
1847-1850	Appointed instructor at York and Ripon Diocesan Training School
1850-1854	Opened a private school at Peterhead, Scotland
1854-1855	Moved to Leith in Scotland
1855-1858	Principal and Superintendent of Schools at Belize, British Honduras
1858-1864	Moved to NY and within one month's time received a principal's certificate. Taught as the first assistant in Grammar School No. 38 for six years. Had under his charge two sons of Peter Gilsey.
1864-1906	Accountant for Gilsey Estate and Family
1882	Charter member of the Institute of Accounts
1896	Passed all four sections of the first CPA exam
1900-1901	Lecturer at Theodore Koehler's NY School of Accounts
1901-1906	Professor at NYU School of Commerce, Accounts and Finance
1905	Received honorary degree of Master of Letters, NYU
1906	Died June 16 as a result of an accident with a wagon on June 8, 1906.

Source: Committee on History [1951]

APPENDIX 2

**Sample of Texts Written in the 19th and Early Part of the
20th Century and Their Comments on Depreciation**

<u>Date</u>	<u>Title</u>	<u>Author(s)</u>	<u>Comments</u>
1909	<i>Modern Illustrative Bookkeeping</i>	Neal, E. Virgil and Cragin, C.T.	no mention of depreciation
1908	<i>The Philosophy of Accounts</i>	Sprague, Charles E.	see text
1899	<i>Bookkeeping: Large Business Houses</i>	Hoffmann, John V.	no mention of depreciation
1899	<i>Commercial and Industrial Bookkeeping</i>	Rowe, H.M.	no mention of depreciation
1898	<i>The Cleveland Accountant</i>	Crawford, J.M.	no mention of depreciation
1897	<i>The Self-Proving Accounting System</i>	Kittredge, A.O. and Brown, J.F.	see text
1897	<i>Teacher's Guide to the Practice System of Business Training and Bookkeeping</i>	Wells, Charles, R.	no mention of depreciation
1897	<i>Office Routine and Bookkeeping: A Method of Teaching the Science of Accounts</i>	Schwartz, George W.	no mention of depreciation
1890	<i>Exercises in Book-Keeping</i>	Peirce, Thomas	no mention of depreciation
1888	<i>Theoretical and Practical Book-Keeping</i>	Williams, Louis L. and Rogers, Fernando E.	no mention of depreciation
1887	<i>Smithdeal Practical Business Colleges</i>	Smithdeal, G.M.	no mention of depreciation
1885	<i>Nelson's New Bookkeeping</i>	Nelson, Richard	no mention of depreciation
1885	<i>Allen's Forty Lessons in Practical Double Entry Book Keeping</i>	Allen, George	no mention of depreciation
1884	<i>The Eclectic Complete Book-Keeping</i>	Mayhew, Ira	no mention of depreciation
1884	<i>Manual of the Elements Book-Keeping</i>	Royall, John P.	no mention of depreciation
1882	<i>Meservey's Book-Keeping</i>	Meservey, A.B.	no mention of depreciation
1878	<i>The New Bryant & Stratton Counting-House Book-Keeping</i>	Packard, S.S. and Bryant, H.B.	uses the terms depreciation to represent a reduction of value.
1868	<i>Theoretical Training in the Science of Accounts</i>	Packard, S.S.	no mention of depreciation

