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THE EARLIEST KNOWN TREATISE ON DOUBLE ENTRY BOOKKEEPING BY MARINO DE RAPHAELI

Abstract: Historians of the origins of modern accounting have generally accepted that the earliest known instructional treatise on double entry bookkeeping was the one published by Luca Pacioli in 1494. This paper dispels that view, presenting detailed evidence of an earlier bookkeeping manual from 1475 that has hitherto remained virtually unknown. Using evidence gathered from the text, the paper on which it is written, and the handwriting, this paper speculates on its origins. It also presents an overview of the material taught in that book and compares it with other texts on double entry published up to the mid-16th century. In the course of doing so, a generic bookkeeping curriculum for the period is identified and specialist topics included in the manual from 1475 are noted and discussed. Finally, this paper considers the place of this text in the history of accounting, accounting practice, and accounting education. It concludes that this manual is of major significance in providing insights into how accounting was taught in 15th century Venice, and of which aspects of business it was felt that instruction in double entry was of fundamental importance at that time.

INTRODUCTION

The main objective of this paper is to present an overview of the earliest known instructional treatise on double entry bookkeeping from 1475 and compare its coverage of the techniques of bookkeeping and business-related topics with that of the next three bookkeeping treatises published in that period: Pacioli [1494], Tagliente [1525], and Manzoni [1540]. This is of interest because it reveals the form and coverage of classroom instruction in double entry bookkeeping from what may be its earliest beginnings. It was from these roots that bookkeeping of this form spread and then developed, and ultimately gave rise to an established and consistent method of bookkeeping that, in turn, led to the development of accounting as we know it today.

Acknowledgments: The author would like to thank Professor Franco Rossi, Vice-Director of the State Archives of Venice and Director of the State Archives of Treviso, for his unselfish and committed efforts to assist in this project. Not only for his transcription of the original manuscript and its subsequent translation into Italian, but also for all the guidance and assistance he offered throughout. This research has been supported by a grant from the Chartered Accountants Ireland Educational Trust. The images from *Libr. XV* are reproduced by kind permission of the National Library of Malta, of which archivist and senior assistant librarian Ms Maroma Camilleri and her colleagues Louis Cini and Donald Briffa played an invaluable role in facilitating access to and use of the images and other resources utilized in this project.

The treatise from 1475 begins with a page of instructions in double entry ending with the presentation of a balance sheet lacking an account for capital. On the next page, this is used as the basis for seven journal entries that are entered in a new Journal, all of them involving an account for capital. A further 260 exemplar journal entries are then presented showing how double entry is used to record transactions across a range of business activities. This is a similar approach to those adopted in virtually all the bookkeeping texts¹ that appeared thereafter until at least the mid-17th century. Next, I consider the book that contains the bookkeeping treatise from 1475.

LIBR. XV

The main focus of this paper is the bookkeeping treatise from 1475. The treatise is in manuscript form. It is currently located in the National Library of Malta in Valletta within a set of manuscript books that were once in the possession of Dun Ignazio Saverio Mifsud (1722 - c.1773). Dun Ignazio was a Jesuit priest and a well-known Maltese bibliophile and writer, particularly of religious sermons and local history. In addition to the older manuscript books in his collection, he also compiled a set of 24 self-penned manuscript books. Most of these he labelled *Stromatum Melitensium*. The rest are personal diaries. Among these 24 books is one catalogued by the Library as *Libr. 12*. It contains his diaries for 1756, 1757, and 1758. In it he writes in 1756 that a manuscript book by Benedetto Cotrugli on the art of trade, *Libro de Larte dela Mercatura*, has come into his possession. That book was recently published in facsimile [Sangster, 2014].

Libr. XV comprises of not one, but two manuscript treatises both prepared in 1475. The first is Cotrugli's, a reference book intended to guide a merchant in how to conduct

¹ See, Peragallo [1938] for an overview of these texts.

his business, his home, and his life. It includes five pages providing an overview on double entry bookkeeping. This comprises of a description of what books a merchant should keep (Ledger, Journal, and Memorandum); what should be done with them; that when opening your first ledger your possessions are recorded to debit with the corresponding entry in each case to capital as a credit; that every entry made in the Ledger must be made twice, once to debit and once to credit; and that cash should be recorded as a debit and capital as a credit. An example is given of how to record the opening inventory of cloth and this is followed by one example indicating how to record a sale of cloth for 10 ducats paid in cash, and of how to do so in the three books.²

The second treatise is the manuscript containing instruction in double entry bookkeeping, complementing the introduction of this topic in Cotrugli's text and making *Libr. XV* a more complete guide to business than is offered by Cotrugli. In his diary, Dun Ignazio focuses solely upon Cotrugli's text and makes no mention of the bookkeeping at the end of that text. However, the handwriting found in *Libr. XV* and, in particular, the page numbering of the book, which is in the same hand as the bookkeeping text,³ indicates that both texts were included in *Libr. XV* when it was first bound, and that this occurred when this copy of the bookkeeping manuscript was completed in 1475.

Along with the rest of Dun Ignazio's collection, the book came into the possession of the Library before 1856 when it was included in its first published catalogue of manuscript titles [Vassallo, 1856]. The entry reads (p. 8):

² This is the earliest surviving copy of Cotrugli's original manuscript, which he wrote in 1458 [Zanato, 1993].

³ Palaeographic analysis of the handwriting was conducted on behalf of the author by former Director of the State Archives of Venice, Dott.ssa Maria Francesca Tiepolo.

XV.

Libro de larte dela mercatura edito per benedecto di cotrugli ad Francisco distephano. Ms. cartaceo in 8vo con le iniziali colorate. In fine si legge: Copiato p. mano de marino deraphaeli de Ragusa 1475.

That is,

XV.

Book of the art of trade written by Benedecto di Cotrugli as dictated to Francisco di Stephano. Ms. in 8vo paper with colored initials lettering. In the end it says: Copied by the hand of Marino de Raphaeli of Ragusa 1475.

As with the entries in Dun Ignazio's self-penned books, there is no mention in this library record of the bookkeeping entries at the back of the book.

The bookkeeping text remained unnoticed by scholars until 1989, when it was referred to in a book of *Uncatalogued or incompletely catalogued humanistic manuscripts of the Renaissance* [Kristeller, 1989, p. 328]. The entry begins with a description of *Libr. XV* followed by a description of Cotrugli's text. Then, using the opening text of the treatise as its title: '*Questa sie larregola de libro laqual sie fondamento de ogni quadernier*', which can be translated as, '*These are the rules of bookkeeping*⁴ *that are fundamental to any bookkeeper*', it states:

f. 99-101 blank. 101v (same hand). Questa sie larregola de libro laqual sie fondamento de ogni quadernier. At the end (same page): MCCCCCLXXV adi XVIII decembr. In Neapoli. 101v-121. Financial records, dated 1475. 121v-122 blank. 122v. Religious notes in Latin, by another hand (s. XV).

Four years later, the bookkeeping manuscript was referred to as '*alcune scritture mercantili*' ... '*a scopo d'esemplificazione delle procedure contabili*' ('*some commercial [bookkeeping] entries*' ... '*for purposes of exemplification of accounting procedures*') [Zanato, 1993, pp. 21,22]. Then, in 1998, two Dutch scholars found the entry in Kristeller's book and began to analyze the content of the bookkeeping manuscript. They presented their findings at conferences in Coimbra, Portugal in 1998 and Madrid in 2000.

⁴ The use of the word '*libro*', literally 'ledger' is clearly intended to represent 'bookkeeping', not the name of a specific book. Presumably, this was how this practice was described at that time.

However, despite announcing in 2000 that they planned to publish an annotated edition of the bookkeeping text and subsequently, in a press release published on their website and last updated in 2004,⁵ that they planned to publish it together with a transcription and an English translation, they never did. All that has been published concerning the manuscript is their conference paper from Madrid [van der Helm and Postma, 2000] and an extended review of that paper by Vladimir Stipetić in 2002. In their article, van der Helm and Postma focused upon the people and period of the manuscript rather than looking in detail at the bookkeeping and its pedagogy.

This paper revisits and corrects some of their findings and, for the first time, presents an overview of the bookkeeping and the pedagogy within it, concluding with consideration of its place in the history of accounting, accounting practice, and accounting education. The next section considers the authorship of the text.

The author: The copy of Cotrugli's text in *Libr. XV* was made by Marino de Raphaeli (Marinu Rafaeliju), who identifies himself on the final page of Cotrugli's text as a native of Ragusa.⁶ As will be explained later, he was also the author of the bookkeeping manuscript. While his handwriting suggests he had a humanist education rather than one in an abbaco school,⁷ the breadth of coverage in the bookkeeping text suggests that he had at some point operated as or on behalf of a merchant.

In the bookkeeping manuscript, the names of the principal actors – the business owners for whom the Journal presented in the text is being maintained – are virtually all variants on his own name: Rafael de Nicolò, Rafael, Rafael de Marin, Marin de Rafael.

⁵ Accessed 6/23/15 from <http://home.kpn.nl/annejvanderhelm/cotrugli.html>

⁶ Ragusa is now called Dubrovnic and is in Croatia.

⁷ Schools that provided an education in applied mathematics for business.

These names may have been invented by de Raphaeli, or they could have been members of his family. This second hypothesis is consistent with one family to which van der Helm and Postma [2000] speculated Marino de Raphaeli may have belonged, the family of Rafael de Nicolò. Born in Ragusa between 1405 and 1409, he had six children, the fifth of whom was Marinu (Marin or Marino). He also had a great nephew called Rafael de Marin. Thus four of the names of principals in the bookkeeping text, and there are only five in total, could have been members of this Ragusan family. If this was the family of Marino de Raphaeli, he would have been, at most, in his early 30s when the bookkeeping manuscript was written in 1475.

Taking this family connection one stage further, Rafael de Nicolò is the principal actor in the opening chapter, a chapter concerning how to make the first bookkeeping entries for a new business. All the other chapters are mainly devoted to recording entries relating to different activities or aspects of a business, activities that might be undertaken by other members of the same family in which the founder of the family business does not participate. It is not difficult to imagine how de Raphaeli could build-up a picture across the lessons of each member of the family being responsible for one or more parts of the business; and using this scenario to switch from talking about what one member of the family was doing in one section to what another was involved in, in the next.

The origins of the manuscript: Based on prices and other names mentioned in the text, van der Helm and Postma believed that de Raphaeli constructed the treatise from four or five existing texts, and that some of these dated from the 1430s. In their opinion, de Raphaeli then took these materials and combined them into one volume using dates and scenarios relevant to how it was to be used. He sets the context firmly in Venice and dates

everything in 1475 and 1476, but these dates are not always entered correctly, such as referring in places to a date for a transaction already recorded that is misplaced by some months, or even a year. While van der Helm and Postma suggest that this is due to careless copying from these original texts by de Raphaeli, in his copying of Cotrugli's manuscript de Raphaeli showed that he was a methodical and careful copyist.

Furthermore, comparison of the handwriting in both manuscripts shows that he did not set down the words and numbers on the sheets in the bookkeeping manuscript, something that went unobserved by van der Helm and Postma. The inclusion of a second person in this process suggests that the more likely explanation for the errors in the bookkeeping text was that they occurred during the process of dictation by a tutor to his pupil. All the evidence in the text suggests that the tutor, not the scribe, was Marino de Raphaeli.

The pupil: Business in the mid-15th century was very much a family activity. Whether or not the tutor was himself the son of a merchant, it would be a natural approach to present each topic as if it were part of the tutor's family's business. During dictation, to avoid confusion the pupil would have been wise not to change any names. To do otherwise would risk making errors in entries involving that person. However, it does appear that after initially using the names provided by de Raphaeli, he did. The only name that is used in this role that is not either a derivation of de Raphaeli's own name or one that could be of a member of his family is Zuan de Domenego. This name does not appear until the ninth of the thirteen topics, by which point the pupil would have been used to recording the elements of each entry and better prepared to start changing the name of the principal

actor to his own, and no other name is used for a principal actor thereafter. It is also the name used in the final debit entry in the treatise:

Per	Chottoni de raxon de ser Maffio M***chofo, ⁸ de vaiuda de ducati 180, a provexion de mi Zuan de Domenego a 2 per C ^o del vender.
------------	--

That is,

Dr	Cotton attributable to ser Maffio M***chofo, 180 ducats, on which commission to me, Zuan de Domenego, is at 2 per cent of the sale.
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The entry is incomplete – there is no credit element and no amounts are entered either within it or in the space to the right where the original currency was converted into the currency of account in all the other entries. It has no relation to the context of the section in which it appears and its visual appearance in the text is more that of a self-invented note, an aide memoire of something said at the end of his last class in answer to a question he had asked of his tutor. Otherwise, why is it incomplete?

Taking these points together – use of a non-Raphaeli family name mid-way through the course, its use in the final example when it had no context with the rest of the final section, and the unfinished nature of the entry – it seems very plausible that the person who wrote down the dictated text was Zuan de Domenego, and the name certainly belongs to a Venetian: it is in Venetian dialect. The Italian equivalent is Giovanni di Domenico. A Zuan Domenico, member of the noble Venetian family Zane, made his will in Venice on October 10, 1415 [Wheeler, 1995, p. 225].⁹ While searches in the Venetian archives in 2014 found no trace of Zuan de Domenego, it is very possible he was a member of this noble family. If so, this may explain how he or his family could afford to pay for the

⁸ The text indicated by *** has been lost due to insect damage to the paper.

⁹ Wheeler mis-read the date of the entry as 1475.

creation of an ornately decorated copy of Cotrugli's text, plus a course on double entry bookkeeping, something that will be returned to later in this paper.

Before considering the manuscript further, the point raised by van der Helm and Postma concerning the large number of errors in the text must be revisited. Leaving this unresolved casts doubt on the care and attention to detail of de Raphaeli. This, in turn, could lead to a conclusion that the bookkeeping manuscript was prepared in haste and with little thought, and may have had little to do with what was actually needed in coverage of this subject at that time and place. Eliminating this criticism gives more credence to the coverage in the manuscript as being indicative of what was generally considered important in the education of an aspiring merchant at that time. Doing so is not difficult when the classroom context of its construction is considered.

Errors: Many of the errors in the text can be explained as being the result of mistakes made by someone under the pressure of taking down dictation. Names were misspelt, words were abbreviated, and nouns were misspelt and so changed their meaning. Someone writing-down dictated text does not stop to think about a lack of consistency, and the tutor does not check what has been written down. These are all problems I experienced when taking down dictation for many years in both elementary school and high school, as did my classmates, and there is no reason to expect it to have been any different in de Raphaeli's classroom. The context, of a classroom in which teaching was mainly by dictation, explains most of the errors found in this manuscript.

The other errors, in calculations and in dates, can also be explained by the context of the classroom. The former can be attributed to the pupil who, set the task of making the

conversion from one currency to the currency of account^{10,11} in which all entries were recorded in the columns to the right of each entry, or of calculating percentages – calculations any teacher of this subject would require him to do from time to time – made mistakes. Errors in dates can, however, be attributed to the tutor but, once again, in the context of the time when this took place, these are understandable. It is unlikely that this was the only time de Raphaeli had used or intended to use his material to teach. Making a fresh copy was laborious so, perhaps in order to avoid making his copy untidy and consequently more difficult to use in future, de Raphaeli updated the dates mentally as he dictated the text to the student and never changed them in his own copy. If he sometimes forgot to make a change or did so inconsistently, this would explain why errors in the choice of month occurred, sometimes even the year. An example can be seen in the fourth journal entry of the section on accounting for a silk shop [f112r-115r], which is set in September 1475, but implies at the end of the entry that the payment on a rental contract being recorded is for six months, while the amount recorded is the rent for one year:

<p>Dr Expenses for rent and wages. <i>Cr</i> Cash. [Paid to] Ser Antonio Contarini, for a workshop located in Rialto, number 8. Leased today, the aforesaid [September 5], the year 1475, for 24 ducats per year. Expires March 5, 1476. lire 2 soldi 8 denari - piccoli -</p>

Anyone experienced in revising a bookkeeping textbook for a new edition would confirm that errors in dates are almost unavoidable at some point during that process: some of the old dates in examples are overlooked and left unchanged, or changed

¹⁰ A ‘currency of account’ was used throughout Italy for the maintenance of accounting records in double entry. It was needed in order to cope with a wide range of currencies in common use, so that all account entries within a set of ledgers were made in the same single currency. The double entry system of bookkeeping cannot work without the use of a single currency for all such entries.

¹¹ The Venetian currency was the gold ducat. The currency of account used by de Raphaeli is lire, soldi, denari, piccoli. There were 10 lire in a ducat, 20 soldi in a lira, 12 denari in a soldo, and 32 piccoli in a denaro. For more on these currencies, see Rossi [2012].

incorrectly, no matter how often the text is checked prior to publication. If no checking takes place or if updating is occurring during dictation, it would be surprising if no such errors occurred. The pupil wrote down what he heard, grateful to get each word and each number written down before the tutor was too far ahead to keep pace, and never stopping to question whether what the tutor had said was correct, or whether he had heard him correctly. Next, I consider how the instruction is presented.

The manner in which instruction is presented compared to other contemporary texts: In trying to understand the past, consideration of the surrounding context is essential [Miller and Napier, 1993, p. 631], and is no less so in this case: how someone would approach teaching bookkeeping to the son or the apprentice of a merchant and what topics he would include. While Pacioli's text of 1494¹² is clearly close in time to de Raphaeli's manuscript, and useful in indicating what bookkeeping techniques might have been considered important to cover, that treatise is of a very different style to de Raphaeli's and is so in a way that minimizes its utility in this analysis of the coverage of business-related topics within these texts – Pacioli focused on teaching the principles of double entry for anyone to follow, and did so in a very generic way with no particular detail presented of any specific form of business activity. Consequently, Pacioli's text can be used to confirm that certain business-related topics were of generic interest, but little else. In contrast, de Raphaeli's treatise uses its 267 exemplar journal entries to explore how to record each of a range of possible transactions in a number of very different business contexts and, as will be demonstrated, so did the two other texts included in this study.

¹² *Particularis de Computis et Scripturis (Concerning Reckonings and Recordings)*, which was included on folios 197v-210v of Pacioli's compendium of mathematics, *Summa de Arithmetica Geometria Proportioni et Proportionalita*.

The earliest contemporary example of the same exemplar-based form of instruction as de Raphaeli's dates from 1525. In his Venetian textbook on double entry, Giovanni Antonio Tagliente covers a smaller range of business-related topics but, unlike de Raphaeli who presents virtually all his journal entries without explanation, Tagliente includes an explanation before each one. This was presumably done because a printed book is made to be read and the reader needs to be told what would have been said had a tutor been teaching the reader face-to-face, which is always more than is noted down when being taught by dictation: teachers intersperse their dictation with extra details to which they wish their students to listen, but not write down, and these added details and explanations are spoken at normal pace rather than at the slow pace of dictation. The extent of this additional instructional material in Tagliente's book is sometimes very noticeable, as illustrated by the text at the end of his coverage of accounting for a voyage *in persona*. When de Raphaeli completes his last entry on this topic, he simply stops and moves to the next subject. Tagliente closes the topic as follows:

*I have now finished describing the orderly exposition of the accounting records relating to a voyage 'in persona' in the most convenient way in which it can rightly be claimed to be done. Although I have explained everything using Venetian currency, you can deal with any sort of money in the same way taking into account the places where you went with your merchandise. Furthermore, although I explained the method as it relates to transporting the merchandise of a single person, you should observe the same procedures if you transport merchandise belonging to more people, since they all meet the same conditions. As I explained, I only include the case of one person so that you may understand it more easily. [Tagliente, 1525, p. 42]*¹³

There are a few exceptions in de Raphaeli's manuscript where greater detail is given, such as the first page [folio 101v], which is mainly a set of instructions in how to make entries in the Journal and in the Ledger. Other detailed instructions appear on the pre-penultimate page [folio 120r] and, in particular, on the final page [folio 121r]. These apart,

¹³ Translated into modern Italian by Franco Rossi. Translated into English by the author.

the rest of the text comprises of two inventories of possessions and liabilities on folios 101v and 102v, though the second is implied rather than actually presented; and a series of 266 journal entries organized within 13 themes, plus one journal entry that is incomplete at the end of the text.

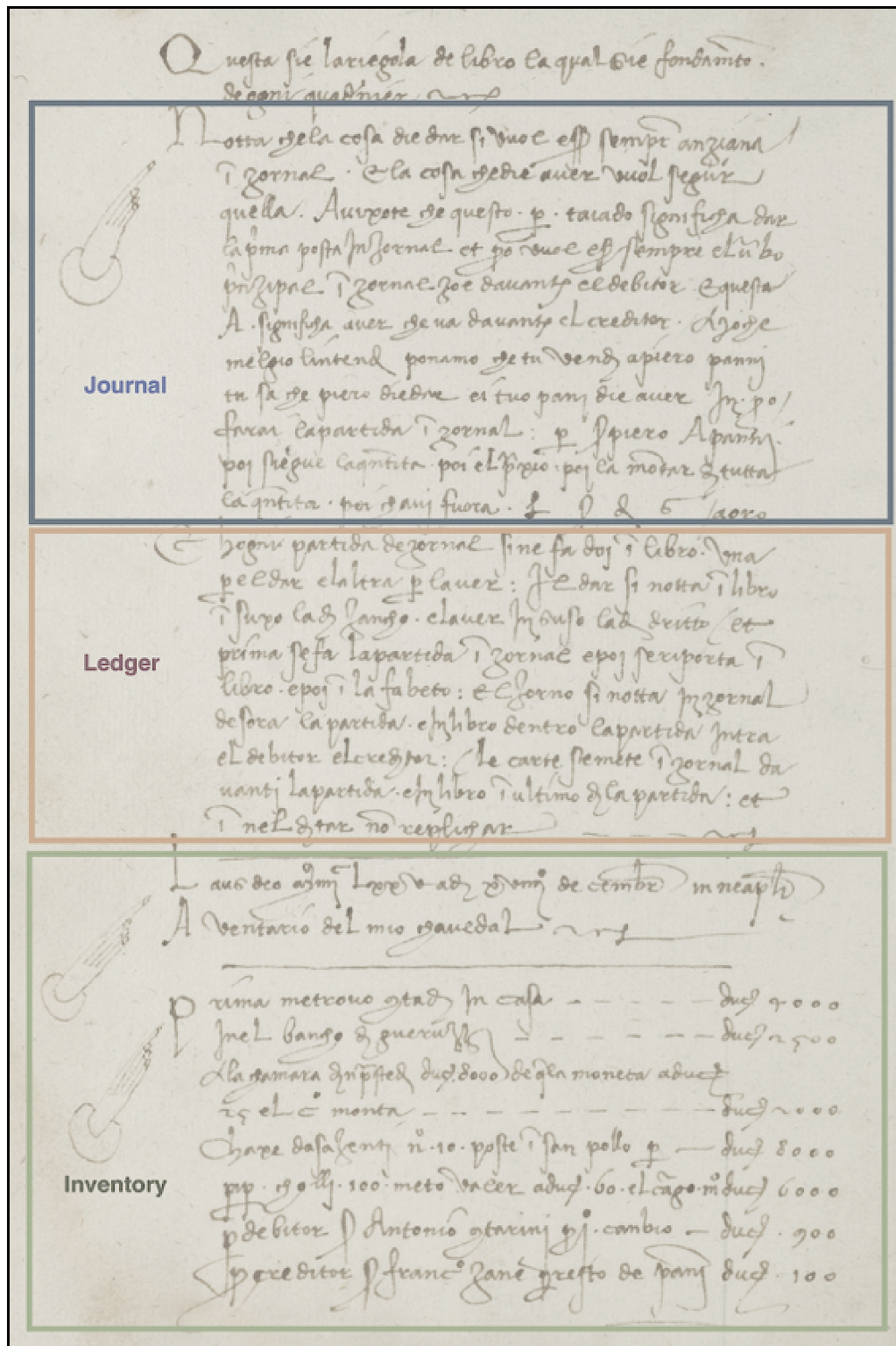
Four pages are missing from the manuscript, suggesting that it originally contained examples of approximately 300 journal entries, more than double the number presented by Tagliente.

The topics covered in de Raphaeli's manuscript are a mixture of the clearly generic – what would be taught to anyone studying this subject, something we can confirm from Pacioli's text intended for the masses of small businessmen – the more specialized, but probably generic in the context of time and place, and the clearly specialized. Before analyzing the content in detail, the next section starts by looking at where the teaching begins in de Raphaeli's treatise.

DOUBLE ENTRY BOOKKEEPING BY DE RAPHAELI

As shown in Figure 1, the first page of the bookkeeping manuscript explains how to make entries in the Journal and in the Ledger; then how to prepare an Inventory of all the items you are introducing into your business or, to be more precise, all the items you possess or owe. Figure 2 presents a translation of this page into English. Figure 3 shows the second page of the manuscript, on which appear the entries in the Journal relating to the items in the Inventory. Figure 4 presents the translation of this page, excluding a mathematical calculation in the bottom half of the page that has no relevance to the rest of the text.

FIGURE 1
The topics on the first page of de Raphaeli's manuscript¹⁴



¹⁴ Image courtesy of the National Library of Malta.

FIGURE 2
Translation of the first page of de Raphaeli's manuscript^{15,16}

These are the rules of bookkeeping that are fundamental to any bookkeeper.

Note that in making entries in the Journal the debit must always be entered first and the credit must always be entered after the debit. I draw to your attention this 'P' with a cut through its tail (pronounced 'per') at the beginning of the entry in the Journal, which means 'to give' and must always be the first verb in the entry. That is, it must precede the [name of the] debtor. 'A' means 'to have', and must precede the [name of the] creditor. For you to better understand, let's say you sell cloth to Piero. You must make sure that Piero is recorded as a debit and your cloth as a credit. First write the entry in the Journal as follows: P (debit) Ser Piero, A (credit) cloth; followed by the quantity, then the price, then the total amount for the quantity, and then enter the equivalent amount in gold lire, soldi, denari, and piccoli outside (in a column to the right).

From every entry in the Journal, two are made in the Ledger, one for the debit and the other for the credit. The debit is shown in the Ledger on the left-hand side and the credit on the right-hand side. First you make the entry in the Journal and then you make each entry in the Ledger, and then add the accounts to the alphabetic index.^a The date is recorded in the Journal above the entry and inside the entry in the Ledger, between the debtor and the creditor. The foliation is noted in the Journal before the entry and in the Ledger it is written at the end of the entry, and the description is not repeated [when making the entries in the Ledger].

Praise God, December 19, 1475, Naples

Inventory of my capital^b

First, I find I have cash at home	ducats	4000
In the Gueruzzi bank	ducats	2500
In the Chamber of State Loans, 8000 chamber ducats at 25		
ducats per 100 chamber ducats, totals	ducats	2000
House for rent, ^c number 10, in the San Polo district	ducats	8000
100 loads of 'cholli' peppers, which I believe are worth		
60 ducats per load, totalling	ducats	6000
Debtor: Ser Antonio Contarini at par	ducats	900
Creditor: Ser Francesco Zane for the rest of the cloths	ducats	100

Notes:

^a The alphabetic index comprised of a list of all accounts organized under their initial letter, along with the folio numbers where entries to each account were made.

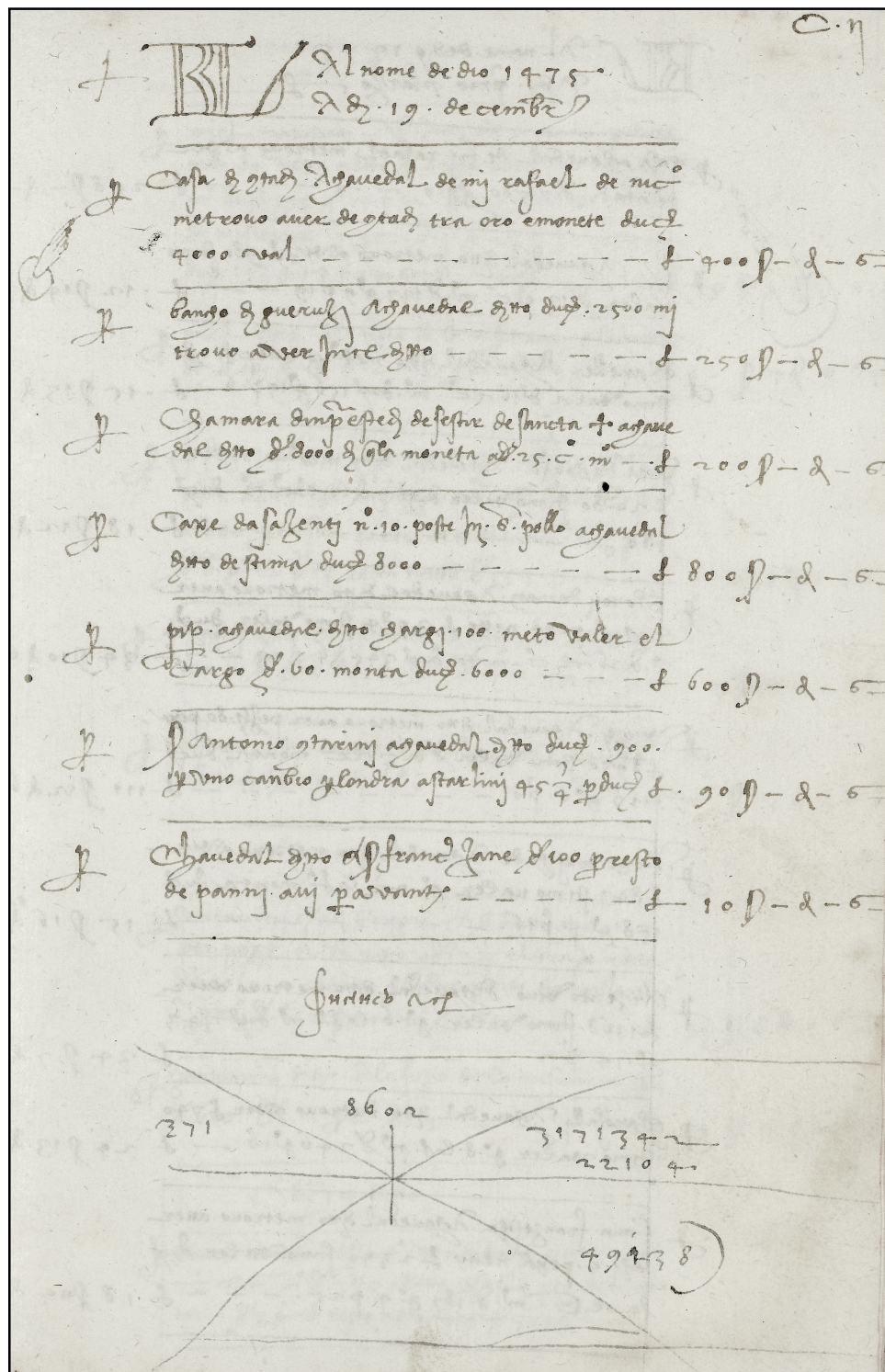
^b *'Aventario del mio chavedal, et cetera'* – literally, *'inventory of my capital, etc.'* The meaning of 'inventory' in this case is wider than its modern-day meaning in accounting, representing an enumeration, description and evaluation of the elements of an estate – that is, a statement of what someone is worth. To avoid confusion with modern usage of the term, 'inventory', a preferable translation may be *'statement of my capital'* or *'statement of my wealth'*.

^c *'Chaxe da sazentì'* – in Venice, *'le case da sazentì'* were lower quality dwellings usually intended as an additional benefit for the family servants or for entities linked by patronage to the Venetian noble houses. It was in dwellings of this type that most Venetian artists of the Renaissance lived as tenants. However, as is revealed later in the manuscript, the meaning used in this case is the modern one of *'Case d'affitto'* – houses for rent.

¹⁵ Transcribed and then translated into modern Italian by Franco Rossi. Translated into English by the author.

¹⁶ In response to requests from Portuguese colleagues, a Portuguese translation of this figure is presented in the Appendix.

FIGURE 3
The second page of de Raphaeli's manuscript: the first journal entries¹⁷



¹⁷ Image courtesy of the National Library of Malta.

FIGURE 4
Translation of the second page of de Raphaeli's manuscript¹⁸

102					
<i>KL</i> ^a In the name of God, on December 19, 1475					
<i>Dr</i>	Cash at home. <i>Cr</i> capital of I, Rafael di Nicolò. I find I have cash in coins of gold, silver, and alloy, 4000 ducats. Worth:	lire 400	soldi -	denari -	piccoli -
<i>Dr</i>	Guerruzzi Bank. <i>Cr</i> capital above. 2500 ducats that I have there.	lire 250	soldi -	denari -	piccoli -
<i>Dr</i>	The Chamber of State Loans, located in the district ^b of Sancta Croce. <i>Cr</i> capital above. 8000 ducats in the currency of the Chamber. At a ratio of 25 ducats per hundred, totals	lire 200	soldi -	denari -	piccoli -
<i>Dr</i>	N° 10 house in San Polo. <i>Cr</i> capital above. Estimated to be worth 8000 ducats.	lire 800	soldi -	denari -	piccoli -
<i>Dr</i>	Pepper. <i>Cr</i> capital above. 100 loads. I consider the value of a load to be 60 ducats. Overall 6000 ducats.	lire 600	soldi -	denari -	piccoli -
<i>Dr</i>	Ser Antonio Contarini. ^c <i>Cr</i> capital above. 900 ducats, at an exchange rate in London of £45¼ per ducat.	lire 90	soldi -	denari -	piccoli -
<i>Dr</i>	Capital above. <i>Cr</i> Ser Francesco Zane 100 ducats for the remainder of the cloth previously received.	lire 10	soldi -	denari -	piccoli -

Notes:

^a Abbreviation of '*kalendae*'. The '*Kalendae*' corresponded to the first day of each month in the Roman calendar and occurred on the new moon. The term was used to indicate a date in the double entry accounts of the Cartularium Magistrorum Sapientum in Genoa in 1340 and earlier by Genoese notaries recording maritime loans, debts, partnership agreements, and other contracts in 1157 [Martinelli 1974]. It is likely that it was used for this purpose elsewhere also, but no records have survived from that period other than those of Genoa. The use of *KL* in this manuscript is not to indicate the first of the month, but the first activity being recorded in the month. Some later authors of instructional bookkeeping texts also included this term including Casanova [1558a, b], though he reverted to using it to indicate the first day of the month.

^b '*Sestiere*' could also be 'parish' or 'neighbourhood'.

^c This could be a real person, belonging to an aristocratic lineage, or a fictional character introduced as an example of a merchant. The same is true of Francesco Zane in the next entry. Both the Contarini and the Zane were among the 12 noble houses of San Polo. Antonio Contarini reappears later in the manuscript as the captain of a galley and an Antonio Contarini was a captain appointed to the command of the Flanders Galleys trading between Venice, England, and Flanders in 1474. A Francesco Zane was living in the sestiere of San Polo in the 1460s and 70s, as were several other members of the Contarini and Zane families [Brown, 1864; Wheeler, 1995].

The approach and content of the manuscript: The pedagogy of the first two pages is consistent with that found in later instructional texts – a brief introduction to double entry,

¹⁸ Transcribed and then translated into modern Italian by Franco Rossi. Translated into English by the author.

the Journal, then the Ledger; an inventory of what is owned and owed; and the journal entries relating to it – but the reference to Naples before the inventory on the first page appears out of place. It is possible that de Raphaeli originally prepared his manuscript while in Naples copying Cotrugli's or he could have introduced himself to his pupil as having just returned from there, weaving a story around this when dictating the first page. Whatever the reason for mentioning Naples, everything else in the manuscript and even the paper upon which it is written – it dates from the north-east of Italy in the late 14th and early 15th century¹⁹ – points to the teaching taking place in the Venetian Republic, most likely in Venice itself.

De Raphaeli does not make use of this material later in the manuscript. It is as if this is simply a demonstration of how to begin maintaining a record of your business presented in the first lesson, probably on December 19, 1475, the date given in the text. Once that lesson is completed, the teacher moves on to what appears to be an extended case study of a business and records its transactions in a Journal. This begins on the third page when de Raphaeli opens a new Journal, and does so by recording the entries from another inventory. He does not, however, present this inventory before doing so, presumably because the pupil was assumed to know how to prepare one from the example on the first page. Having made these journal entries for the second inventory, he goes on to make various entries relating to the activities of this second business.

Another anomaly can be seen at this point. The first inventory is dated December 19,

¹⁹ Two watermarks are present. The first is watermark number 3118 in Briquet's [1907] catalogue of watermarks (www.ksbm.oew.ac.at/_scripts/php/loadRepWmark.php?rep=briquetandrefnr=3118andlang=fr), indicating that it is Italian paper produced in the late 14th and early 15th century: Briquet found six different Italian examples, all from the north-east of the country, the earliest in Ferrara in 1388 and the latest in Vicenza in 1421. It was used in Venice in 1404.

1475 and this is also the date when the journal entries relating to it are made. When he presents the journal entries from the second inventory, he does so using a date that is over 8 months earlier, March 1, 1475, perhaps having told his pupil something along the lines of, *“That first inventory is our inventory today. During the rest of our lessons, we shall see how we reached this position.”*²⁰

A glance at the manuscript as a whole suggests that these are entries in a single Journal over a period of just over 8 months with the dates in the text progressing chronologically from the beginning of the Venetian year at that time, on 1st March, up to the date of the final entries on 7th November, but that is far from the case. The journal entries are for many different business activities and at least four different merchants. Table 1 shows the changes in ownership, the topics covered, and the number of journal entries in each section of the manuscript.

²⁰ Unfortunately, because four pages of entries have been lost, it is impossible to verify whether this was the case.

TABLE 1
The contents, number of journal entries, and changes of ‘owner’ in the manuscript

Section ²¹	Folios ²²	Began	Merchant	Topics	J/Es	
I	101v-102r	Dec 19	Rafael de Nicolò	General instructions, <i>aventario</i> and its journal entries	7	
I	102v-105v	Mar 1	Rafael (presumably the same person)	Entries of another <i>aventario</i> , purchases, sales	57	
III	105v-106v	Apr 11		Buying/selling for account of another	21	
IV	107r	May 4		Voyage to Beirut, commissioned to someone	8	
V	107v	16		<i>Camera d'Imprestedi</i> (Government Bonds)	8	
VI	108r	June 6	Rafael de Marin	Partnership, with voyage <i>in persona</i> to the Levant	8	
VII	108v-109r	14		Voyage to Alexandria, commissioned to someone: 108v purchases, etc. 109r shipping	6 6	12
VIII	109v-111v	Aug 1	Marin de Rafael ²³	Partnership, with voyage <i>in persona</i> : 109v-110v purchases, etc. 110v-111v shipping, conduct business by barter in several seaports	15 16	31
IX	112r-115r	Sep 4	Zuan de Domenego	Partnership of a 'silk shop', with complete cycle from formation to selling the finished products	55	
X	115v-116r	Oct 1		Construction of a building	18	
XI	116v	14		Let of houses, bad debts, and the 'Tenth'	9	
	117 and 118 missing					
XII	119r-120r	29		Bills of exchange (with ' <i>protesto</i> ') and some instruction	23	
XIII	120v-121r	Nov 2		Maritime insurance and some additional instructions regarding maritime insurance, voyages and balancing the ledger	10	
					267	

Source: van der Helm and Postma [2000, p. 174] amended and extended by the author.

Normally, each of these ‘owners’ would have his own Journal, but no indication is given of a different Journal being used, apart from it being clear that a different ‘owner’ is involved from the different name of the owner in the first entry. There is no reason given for this approach, but it was presumably done so as to highlight changes in the nature of the business without over-complicating things by having the pupil open a new Journal

²¹ Section numbers have been added. They are not numbered in the manuscript.

²² A folio is two pages, one on the front and the other on the back of one sheet of paper. Folio 102r is the right-hand page in an open book. 102v is on the back of that page, i.e., it is the left-hand page you will see if you turn over page 102r. The pages in the manuscript are numbered in folios on the right-hand pages. An example is shown at the top right of Figure 3: *Cij* (102). Being a right-hand page, this is folio 102r.

²³ The Italian equivalent of this name, which is in 15th century Venetian dialect, is Marino di Raffaele or, because spelling had not yet become consistent, Marino de Raphaeli.

each time the ownership changed.

As to what de Raphaeli may have been saying during his classes, Pacioli's bookkeeping treatise [1494] and Tagliente's of 1525 provides many statements that would likely have been made at that time by a Venetian bookkeeping tutor.

The instruction process: From the beginning, a focus is placed upon learning that the capital account is credited whenever the owner makes a contribution to the business and that possessions, purchases, and expenses are debited. Six of the seven entries on page 2 and all the 10 entries on page 3 involve a credit to the capital account. The eight entries on page 4 are for purchases and expenses relating to purchases, as are the first two entries on page 5. These are followed by the first entry for a sale. This follows what would be expected in any new business: capital is invested in the form of assets that are then used to make purchases and pay for expenses, and this would precede any sales being made. It also has the pedagogical advantage of reinforcing an awareness of what should be debited and what should be credited where capital, assets, purchases, and expenses are involved. Unfortunately, as soon as the start-up period covered in the first few pages has passed, sales and other forms of entries become more common and the ability of any teacher to reinforce the allocation to accounts of the debits and the credits as a result of repetition of similar events is diminished by the variety of transactions taking place. However, de Raphaeli enhances the clarity of the approach by limiting the number of entries on each topic. Furthermore, by clearly separating different business activities and processes into their own sections, there is a clarity of method apparent throughout the text. If someone was taught using this approach, he would be aware of which section in his textbook was

relevant, and could go to it and rapidly identify the correct entry to make.²⁴

The coverage

There are three major topics in the manuscript. In the first five pages, the focus is upon learning how to make entries. The 64 example journal entries in Sections I and II lack complexity and cover the basic mechanics of operating a double entry Journal. So long as business was relatively straightforward it would likely have been adequate for someone to begin to maintain his own Journal in double entry. From that point forward, the focus is more specialized. Complex issues are introduced or extended within more specific contexts – brokerage fees, bank transfers, promissory notes, customs duty, maritime insurance, barter, compulsory investments in Government bonds, bills of exchange including dishonored bills – and the treatment of each of these is demonstrated in the entries made.

The second major topic is presented in Sections IV, VI, VII, and VIII: voyages, four in all. Before they begin, Section III provides the necessary background in recording entries when conducting business on behalf of someone else, something that was part and parcel of these ventures. The importance of these activities to Venetian commerce at that time cannot be understated: “[t]he large role of commission agents and joint ventures in Venetian business organization made viaggio accounts especially useful there” [Lane, 1970, p. 191]. These activities were what distinguished Venice from its competitors and made it the great trading center it became [Cessi, 1917; Lane, 1966, 1973; Puga and Trefler, 2014].

²⁴ A similar comment was made by Yamey [2010, p. 147] concerning Manzoni’s [1540] textbook.

Accounting for voyages: One of the major forms of business in Venetian medieval society, and the precursor of the joint stock company, was the limited liability-based *colleganza* in which what you invested was all you could lose [Lane, 1966, pp. 56-65; Baskin and Miranti, 1997, p. 48]. *Colleganze* were formed for single voyage ventures and dissolved upon the return of the ship to Venice. Large profits could be made, often over 100 per cent [Puga and Trefler, 2014, p. 169]. For example, in the 1470s Beledi ginger cost around 14 ducats for 210kg in Alexandria and around 70 ducats in Venice; even the less profitable pepper cost about 70 ducats in Alexandria and around 100 in Venice at wholesale prices [Ashtor, 1976]. A *colleganza* is the form of business in Sections VI and VIII. Section VIII is the more advanced and more detailed. It begins by recording the formation of the *colleganza*:

Dr	Cash box.	Cr	The company of myself, Marin de Rafael, of master goldsmith Zorzi, and Ser Zuan de Fiorio of Ragusa. I hereby give 500 ducats for my share in the profits and losses, by the conditions set out in the Agreement of fellowship agreed between us.	lire 50	soldi -	denari -	piccolo -
Dr	as above.	Cr	as above. 500 ducats contributed by master goldsmith Zorzi for his share in the profits and losses.	lire 50	soldi -	denari -	piccoli -
Dr	as above.	Cr	as above. 500 ducats contributed by Ser Zuan de Fiorio for his share in the profits and losses.	lire 50	soldi -	denari -	piccoli -

Many journal entries later, all the purchases have been made and the voyage can begin.

The remaining funds of the *colleganza* are taken on the voyage by one of its members.

The others stay behind.

Dr	Cash. Cash for the Ponente ²⁵ voyage (that I, Marin de Rafael) made in person. Cr The company account, for 524 ducats, 12 denari that I have in cash to trade during said voyage.	lire 52	soldi 9	denari -	piccoli -
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The first three journal entries illustrate how a *colleganza* was funded by the investors according to a strict formula that defined the association and the sharing of profits and risks. The investors were either *stantes* who remained at home or *procertans* (also known as *tractans*) – travelling merchants who took-on the risks of the journey. As shown in the last journal entry above, the role of Marin de Rafael in this *colleganza* is that of a *procertan*. These roles were no more permanent than the *colleganza* and, not infrequently, a *stante* in one could be seen acting as the *procertan* of another, and vice versa.

Colleganze evolved from sea loans, a practice dating back to Roman times where investors lent money to finance a voyage and received a high rate of interest upon conclusion of the venture but, in exchange, accepted the risks of piracy and shipwreck. *Colleganze* added the sharing of profits. The investors were often people of modest means who, by pooling their money (even small amounts), could participate in the benefits of maritime trade that was otherwise limited to the wealthier social classes [Puga and Tefler, 2014, p. 756]. There were two main forms, two sided and one-sided. The bilateral form emerged in the 10th century and typically involved investors who stayed at home contributing two-thirds of the capital and receiving half of the profit. By the early 13th century it had been replaced by the unilateral form whereby the profit was shared in the same proportion but the contract arrived at it in a different way: the stay at home investors contributed two-thirds of the capital and received three-quarters of the profit relating to their investment, i.e., $\frac{3}{4}$ of two-thirds of the profit = $\frac{1}{2}$. Acting as a *procertan* was

²⁵ A voyage to the Mediterranean via the east, south, west and north-west coastline of Italy that could include such ports as Naples, Civitavecchia, Livorno, and Genoa.

considered a material capital contribution and some *colleganza* agreements recognized this by allowing a *procertan* to participate in the profits without providing any capital to the venture – see, for example, Puga and Trefler [2014, pp. 770-771]. From an accounting perspective, the *colleganze* were tightly controlled by the Venetian authorities and accounts of each voyage had to be prepared within 30 days of the ship’s return [Lane, 1966, pp. 58-9].

During the Ponente voyage of Marin de Rafael, the 524 ducats and 12 denari of cash taken aboard were used to pay charges for port licenses, city gate levies, freight, and storage. No cash was used to purchase merchandise and all sales and purchases were settled by barter. The cloth that had been purchased and loaded in Venice was bartered for wheat, wheat for slaves and, finally, all the slaves were traded for sugar. After the final slave is sold in Saragoza, Marin de Rafael embarks for Venice with the sugar. No further entries are made for this *colleganza* but, upon his return, the sugar would have been sold and the *colleganza* dissolved leaving a large profit to be shared between the three investors of which, because he made the voyage *in persona*, Marin de Rafael received half.

This is the last of the four voyages included in the manuscript. The others show how to record entries for a voyage made by an agent (Section IV); another simpler example of a *colleganza* where one of the parties accompanied the voyage (Section VI); and Section VII again involves an agent in a more detailed series of transactions than the one in Section IV. During the course of recording these four voyages, 59 journal entries are made, virtually as many as are presented in teaching the basics of double entry. To these

can be added nine journal entries relating to maritime insurance²⁶ in Section XIII, making accounting for voyages the largest topic in this manuscript.

The other main focus in de Raphaeli's manuscript is upon a partnership formed to create and operate a silk shop, on which there are 55 journal entries in Section IX. As silk is one of those products that may be brought back from a voyage, there is a synergy in this content that may imply the background of the pupil to whom the manuscript is being dictated. It is unlikely that a bookkeeping tutor of that period would only have had examples of one form of business from which to construct his lessons. There were many trades in 15th century Venice and he probably selected the specialist topics most relevant to his current pupil.

Generic topics: The material on the basics of double entry, double entry for purchases, expenses, sales, and income, brokers' fees, loans, interest, book transfers, banking, bills of exchange, etc. was most likely generic and always included irrespective of who he was teaching. Given the nature of Venetian business, this was probably also the case for the material on accounting for voyages that, while specialist in form, was almost certainly included in virtually all bookkeeping courses. Once these materials began to be printed in books, leaving no opportunity for the 'teacher' to add something 'special', a clearer vision of what was routinely covered in bookkeeping instruction becomes more apparent, making the distinction between generic and specialist topics more readily identified. To that end, the next section compares Tagliente's text with bookkeeping texts published up until the mid-16th century.

²⁶ Maritime insurance was a speculative activity during this period, and one that carried risks for those who offered it, but it was one much used by the *colleganza*. For more information on this topic, see Lopez and Raymond [1955, pp. 255-265].

A COMPARISON WITH PRINTED BOOKKEEPING TEXTS

In 1938, Edward Peragallo published his Ph.D. dissertation on the origin and development of double entry bookkeeping. In Chapter 5 [pp. 53-77], he presents an overview of the works on bookkeeping published between 1458 and 1558. These were Cotrugli [1458], Pacioli [1494], Tagliente [1525], Manzoni [1540], and Casanova [1558]. He also mentioned a few authors of summarized unoriginal works based on one or other of these but dismisses them as contributing nothing. In this study, the focus is upon the first four plus de Raphaeli's treatise from 1475. This provides a continuity of time and place and enables trends to be identified. Casanova's two exemplar-based texts from 1558 are not included as doing so would add little to what is found in these others apart from the overwhelming emphasis on barter in the second, and much shorter of his two texts.

Pacioli [1494]: This treatise is far more generic than the others. It was written principally for the small businessman who wished to teach himself the basics of double entry. Unlike de Raphaeli, Pacioli focused mainly upon the principles of double entry, and how to record assets, purchases and expenses, barter, and brokers' fees. While he mentioned venture accounting, he never extended his examples to the specifics of voyage accounting, nor to topics equivalent to accounting for a silk shop or construction of a building. In addition to the inclusion of 25 journal entries, he also presented 19 examples of how to make entries in a Ledger, along with instructions in how to close the existing books and then open-up a new Ledger and Journal, additional details on which de Raphaeli is silent, though there is a brief comment about closing the Ledger on the final page of his text and, as can be seen in Figure 2, how to make entries in a Ledger is mentioned (in an incomplete

way) in the Introduction.

Tagliente [1525]: Tagliente provided instruction in a far more extensive and, at times, more varied way than de Raphaeli, and used many less journal entries to do so: 137 compared to de Raphaeli's c. 300. He devoted many examples to purchases and sales on credit and cash; to settlement of accounts by part-payment, full payment, and by barter; maintaining bank accounts, transferring amounts between accounts using book transfers, and dealing with promissory notes. There are also example entries recording accounts for household expenditure, personal expenditure, rentals, repairs to buildings, tax, personal use of goods, loans, interest, and commission. After covering these more generic topics in 76 journal entries, he devoted much of the rest of his text to accounting for voyages (42 journal entries), with the one apparently specialist topic appearing in the final part: accounting for a dowry, marriage-related expenses, and the subsequent repayments following the death of the bride (19 journal entries).

Voyage accounting – After beginning with entries relating to sending an agent on a voyage, coverage swiftly shifts to focus upon entries for a voyage *in persona*. It is a far more complex and more varied section than any of the four on voyage accounting in de Raphaeli's manuscript, and includes alternative scenarios and alternative treatments. Strangely it does not include any mention of *colleganza*, partnerships, or maritime insurance; and the additional detail is often reinforcing the more basic accounting and other topics covered elsewhere in the text rather than adding to the coverage of voyage accounting *per se*. Its inclusion in this book reflects the nature of the economy of Venice without giving the impression that it may have been written with a particular person in

mind, i.e., someone whose future lay in involvement in ventures of this type.

Dowry accounting – These entries include recording payment in cash, on credit, and by barter; and what to do if the wife dies and some of the dowry must be repaid. Rarely can 19 journal entries have described so well an aspect of medieval life of which few are aware; and, at the same time, recapped so many basic bookkeeping entries in an entirely unique context. At first glance, these entries on accounting for a dowry could be attributable more to a desire to entertain while teaching a difficult subject (double entry bookkeeping) than to a perception that all the readers of his text needed to know how to account for any dowry they may receive. However, analysis of the next printed text sets that hypothesis aside.

Manzoni [1540]: Manzoni reverted to de Raphaeli's approach and separated his instructional text from his example entries, but he based the topics covered and their sequence in that instructional text upon Pacioli [Geijsbeek, 1914, p. 29] rather than Tagliente. As a result, while his examples continued in the style of de Raphaeli and Tagliente, they lacked the instructional narrative accompanying the entries that are to be found in the latter. Instead, in the monetary column to the right of each entry, Manzoni places a description of the type of event it depicts. As de Raphaeli and Tagliente had done, Manzoni's entries portrayed a business over a period of time and, as with Tagliente, a single businessman was involved throughout. The entries cover an entire year from 1st March compared with the 8 months of de Raphaeli. As all four of these texts did, and also Cotrugli [1458], his examples begin with the merchant's inventory of what he owns and owes. Initially he focuses upon entries for purchases and sales, balancing accounts to

identify profit when all the inventory of each traded item is sold. This balance is then transferred to an account for profit and loss.

Manzoni includes all the generic topics found in de Raphaeli and Tagliente, but devotes considerably more coverage to accounting for household expenses, something Tagliente also covered, but not de Raphaeli. Pacioli discussed it but he did not illustrate it with examples. Manzoni also has several entries on letting and renting, repairs, and construction of a wall; entries for a granary where wheat and beans are stored; and seven entries relating to investments and winnings in Venetian lotteries (*lotto pizolo* and *lotto grande*) that are treated as extraordinary gains in his profit and loss account. Neither the granary nor the lottery are included in any of the other texts.²⁷ Thirty-three entries are included on wedding accounting and accounting for two dowries, one given by the merchant (for his sister's marriage) and one received (for his own marriage). He complicates this further by showing how to record a dowry from yourself (the bridegroom to himself) to supplement the one received from the father of the bride. Like Tagliente, he also shows how to account for the bequests and repayments relating to a dowry received on a dead wife (of the merchant) and the remaining balance is transferred direct to capital, not to profit and loss. Accounting for voyages is included – the merchant owns his own ship – and extends to accounting for losses arising from pirates, something briefly covered by de Raphaeli in his section on maritime insurance, but not Tagliente.²⁸

The inclusion of dowry accounting and household accounting in these texts:

²⁷ Lotteries were introduced to Italy in Milan in 1448 but did not become commonplace until February 1522 when there was an upsurge in privately run lotteries during the Venetian Carnival. The practice was immediately banned in Venice and then immediately replaced by official lotteries organized by the State. [Welch, 2008].

²⁸ More details of Manzoni's coverage of various subjects, including household accounting, can be found in Phillips [2001].

(a) Dowry accounting – From this analysis, it is clear from de Raphaeli, Tagliente, and Manzoni's texts that voyages and their accounting were extremely important to aspiring Venetian merchants in the 15th and 16th century and were considered an important element to include in the teaching of double entry. Manzoni's coverage of weddings and two different dowries, three if you include the self-paid one, suggests that their inclusion was more than just something added for a bit of light relief. In fact, as shown by Puga and Trefler [2014], in the 15th and 16th centuries marriage was used by the Venetian nobility to manipulate and dominate the galley trade that was the principal form of transport for the *colleganza*. It was in galley convoys that most of these voyages were undertaken and the marriages that secured and underpinned the monopoly over this trade required that those involved took good care to account for dowries received and given. This was crucial because dowries were, in effect, loans repayable on the death of the wife or death of the husband followed by remarriage of the wife. In many cases, knowing how to account for a dowry would have been viewed as completely compatible if included with instruction in accounting for voyages. The absence of any coverage of this topic in de Raphaeli's text when it is included in the other two examples of teaching by exemplars – not Pacioli, who rarely used examples – does not undermine this hypothesis, for we do not know what was on the four pages missing from his manuscript.

(b) Household accounting – As with accounting for dowries, the inclusion of household accounting in Pacioli, Tagliente, and Manzoni suggests it may have been included on the pages that are lost from de Raphaeli's manuscript. As these texts demonstrate, household accounting was not separated from business accounting at that time and would have been a part of any merchant's records.

A CORE CURRICULUM FOR THE MID-15TH TO MID-16TH CENTURIES

It is easy for us today to overlook marriage and dowry accounting and domestic accounting when considering why certain topics may be viewed as important to include in textbooks like these and there is little doubt that they would have been included in the generic curriculum of double entry instruction in Venice at that time, and probably were on those pages lost from de Raphaeli's text. Table 2 is based upon the common content of these texts and presents indicative content of the core curriculum studied in any bookkeeping course at that time:

TABLE 2
A curriculum for a 15th and 16th century Venetian course in double entry bookkeeping

<ul style="list-style-type: none">• the basics of double entry: debits and credits, the principal books and how to make entries in them• opening a journal for a new business• purchases and expenses• sales and income	<ul style="list-style-type: none">• brokers' fees• banking• loans• interest• book transfers• bills of exchange and promissory notes• settlement by various forms including barter and use of credit	<ul style="list-style-type: none">• conversion of any currency into the currency of account• letting and renting• household accounting• voyage accounting• partnership• marriage accounting and dowry accounting
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THE NATURE OF THE COURSE

Closing the books, extracting a trial balance, preparing a *summa summarium*, and closing an account so that the balance could be transferred to a new account later in the same ledger are all missing from Table 2. Although covered briefly by Pacioli and in greater detail by Manzoni, closing the books and extracting a trial balance were arguably unnecessary for a course intended to cover the basics of double entry bookkeeping,

especially in Venice where account books typically remained unclosed for years [Lane 1945] because “*the way Venetian commercial enterprise was organized,*²⁹ *Venetian accounting did not provide the material for periodic preparation of balance sheets*” [Lane, 1977, p. 190].³⁰ The same could be said for the preparation of a *summa summarium* that both Pacioli and Manzoni recommended as a check device to ensure entries were correct. However, this cannot be said for being able to close a book when it was full or close an account and reopen it in the same ledger. These were necessary knowledge for anyone intending to maintain his own books or the books of someone else. Their absence is explained by the nature of the course presented in each text. Pacioli and Manzoni devoted coverage to making entries in a Journal and in a Ledger. De Raphaeli and Tagliente taught only how to make entries in the Journal, not the Ledger, and these topics omitted from Table 1 are processes you perform with the latter, not the former. On this evidence, it can be concluded that these two account books were often taught separately, probably with the course on the Ledger viewed as being at a more advanced level.

WHERE DOES THIS TREATISE LIE IN THE HISTORY OF INSTRUCTION IN DOUBLE ENTRY BOOKKEEPING?

De Raphaeli’s manuscript is the earliest known instructional treatise on double entry bookkeeping. Because it focuses upon the Journal, a book that only started to be used at the beginning of the 15th century,³¹ the material within it must date from the 15th century, and not before. We know of no other tutors of bookkeeping in Venice before the 16th century. Nor do we know of any elsewhere, even in Florence, where double entry first

²⁹ Lane is referring to venture accounting, such as for a *colleganza*.

³⁰ In Lane’s opinion, “*The theoretical treatises of the sixteenth century provide examples of closing books within a short period only by depicting unrealistic operations*” [1977, pp. 189-190].

³¹ The earliest known use of a journal dates from 1408 [Martinelli, 1974, p. 744].

emerged, despite its being so commonplace there that it was second nature to people from all walks of life to use it, as attested by the thousands of personal account books from the 14th and 15th century that have survived from that city [Goldthwaite, 2009, 2015]. If bookkeeping was taught as opposed to learnt in the workplace, and de Raphaeli's treatise indicates that it was, the lack of any other examples suggests that this was very rare indeed and almost certainly done privately, 1-to-1, otherwise it is inconceivable that no other examples exist.

As mentioned earlier, van der Helm and Postma [2000] believed that de Raphaeli's manuscript was constructed from a small number of separate instructional texts. While that is possible, de Raphaeli could have sourced them from entries in Journals from real businesses. In fact, there is no reason to presume that he did not. Only the first page, with its brief instructions in making entries in the Journal and in the Ledger, is clearly written for instruction on topics that must precede any examples, and that could easily have been written by de Raphaeli. This manuscript may, therefore, be the first instructional manual ever written on double entry bookkeeping. Whether it was or not, it is part of a stream of teaching with exemplars that continues to the present day, and is the first that we know of that type.

CONCLUSION

Taking what we know about the paper used in this book, which indicates that the bookkeeping part was written in the Venetian Republic, the fact that de Raphaeli's copy of the Cotrugli manuscript was prepared in Naples in 1475 [Zanato, 1993, p. 48; Sangster, 2014, p. 8], that the bookkeeping part was written down in late 1475, that they were both bound together at that point, that Marino de Raphaeli appears to have been the author of

the bookkeeping treatise and Zuan de Domenego his pupil, and a member of one of the old noble Houses of Venice, a plausible scenario can be constructed concerning how this all came to be.

First, however, the reason why de Raphaeli travelled to Naples should be addressed. On the basis of differences between the four surviving versions of Cotrugli's text,³² Zanato [1993] believes that between 1458 and 1474 a master copy (α) of Cotrugli's manuscript was made and then two copies (f and n) were made from that copy. One copy (f) made its way to Florence where two copies were made c.1485, while the other (n) stayed in Naples. All of these first three manuscript copies (α , f , and n) and the original have been lost. Zanato further believes that in 1475, the copy (n) held in Naples (not the original nor the master copy) was used by de Raphaeli to make his copy of the book; and that by 1573 (n) had arrived in Ragusa where it was copied (g – since lost) and then (g) was taken to Venice so that the text could be printed. However, because all surviving copies contain the same error in the short chapter on double entry bookkeeping, whereby debits are described as being written on the right and credits on the left,³³ an alternative and, arguably, more convincing hypothesis can be proposed that fits all the known facts as recounted by Zanato. This error must have been in the original or in a master copy (α), but it is far more likely to have occurred during the initial dictation than when a scribe prepared the master copy from the original. This is especially so in this case because the original manuscript was completed very quickly by Cotrugli before he set off on an ambassadorial mission for the King of Naples [Zanato, 1993, p. 47].

³² Manuscripts copies written in 1475, 1485, and c.1485 (Zanato [1993, p. 48]; and the first printed version of 1573.

³³ Cotrugli wrote [1475, f34r], *'ogni partita deve havere scriptura da entrambi dui li lati dal foglio, çoè dala banda dextra del libro lo de' dare e dala senestra lo de' havere'* ('every entry must be written on each of the two sides of the ledger, i.e., the debit on the right side of the book and the credit on the left').

Assuming this to be the case, a different chain of events can be proposed, one that would have certainly required de Raphaeli to travel to Naples. The original was kept by Cotrugli in Naples and passed to his wife upon his death. At that time, it was the only copy of the book. Cotrugli passed through Ragusa on his ambassadorial mission in 1458 and told people there of his new book. De Raphaeli, who came from Ragusa, learnt of it there.

In 1475, the family of Zuan de Domenego wishing to give their son some assistance in setting-up in business, decided to short-cut the usual apprenticeship route towards obtaining the necessary bookkeeping knowledge, a route that could take as long as 5 years [Guerzoni, 2008, p. 552; Goldthwaite, 2009, p. 84]. To do so, they employed a tutor, Marino de Raphaeli, to teach him all he needed to know. The family also wanted their son to have a reference guide to support him in his mercantile activities. De Raphaeli knew that Cotrugli's book had been left with his wife upon his death in 1469. Rather than employ someone else, he suggested that he travel to Naples and make a copy. Having done so, he returned with his copy to the Venetian Republic, where he proceeded to teach his pupil the art of double entry by dictation. Upon completion of his assignment, he presented de Domenego with his copy of Cotrugli's text. De Domenego then placed his manuscript copy of de Raphaeli's dictated bookkeeping manuscript – the earliest known example of instruction in double entry – at the back of the Cotrugli text, numbered the folios of both texts into one sequence, and then bound them together in one volume.

Whatever the accuracy of this scenario, it is supported by the evidence. Even if it is not correct, the fact remains that it was through a sequence of events such as these that this book, currently held in the National Library of Malta, came into being.

The analysis in this study of the series of Venetian bookkeeping texts published between the late-15th and mid-16th century has revealed the material considered important in that location, both the basic techniques of double entry bookkeeping and the business-related contexts considered most relevant to anyone studying this subject. These contexts reflect the core nature of Venetian trade and commercial activity of that period: voyage accounting, including accounting for a *colleganza*, the principal means by which Venice rose to be the dominant commercial power it remained until at least the end of the 16th century. Concerning de Raphaeli's treatise, it is unlikely that we shall ever know if this was the only manuscript of its type, but there can be no doubt that, as the first known example of how double entry bookkeeping was taught, it holds a very special place in the history of accounting, accounting practice, and accounting education.

REFERENCES

- Baskin, J.B. and Miranti, P.J. (1997), *A history of corporate finance* (Cambridge, UK: Cambridge University Press).
- Ashtor, E. (1976), "Spice prices in the Near East in the 15th century," *Journal of the Royal Asiatic Society of Great Britain and Ireland*, Vol. 1: 26-41.
- Briquet, C.-M. (1907), *Les Filigranes* (Paris: A. Jullien).
- Besta, F. (1909), *La Ragioneria*, 2nd Edition (In 3 Volumes), Facsimile Reprint, 2007 (Rome: Rirea).
- Brown, R. (1864), 'Captains of the Flanders Galleys', *Calendar of State Papers Relating to English Affairs in the Archives of Venice, Volume 1: 1202-1509*, pp. CXXXII-CXXXIV. Accessed 6/23/15 from www.british-history.ac.uk/report.aspx?compid=94080
- Casanova, A. (1558a), *Ordine, Modo et osservantie, che gli fattori debbeno tenere gli conti delle amministrate facuita, and mandare a gli loro padroni, ouer maestri* (Venice: Comin da Trino).
- Casanova, A. (1558b), *Specchio lucidissimo nel quale si vedeno essere diffinito tatti i modi ... che si deve menare nelle negotiamenti della Mercantia* (Venice: Comin da

Trino).

- Cessi, R. (1917), "Note per la storia della società di commercio nel medio evo in Italia," *Rivista Italiana per le Scienze Giuridiche*, Vol. LIX: 1-95; 181-224.
- Flori, L. (1636), *Trattato del modo di tenere il libro doppio domestico col suo esemplare* (Roma: Lazzari Varese), 1667 reprint.
- Goldthwaite, R.A. (2009), *The Economy of Renaissance Florence* (Baltimore, MD: The Johns Hopkins University Press).
- Goldthwaite, R.A. (2015), "The Practice and Culture of Accounting in Renaissance Florence," *Enterprise & Society*, Available on CJO 2015 doi:10.1017/eso.2015.17.
- Guerzoni, G. (2008), "The administration of the Este Courts in the XV-XVII century," *Micrologus Nature, Sciences, and Medieval Societies*, Vol. XVI: 537-567.
- Kristeller, P.O. (1989), *Iter Italicum Volume IV: Great Britain to Spain* (Leiden: Brill).
- Lane, F.C. (1945), "Venture Accounting in Medieval Business Management," *Bulletin of the Business Historical Society*, Vol. 19, No. 5: 164-173.
- Lane, F.C. (1966), *Venice and history* (Baltimore: The John Hopkins Press).
- Lane, F.C. (1970), "Doubles entry bookkeeping and resident merchants," *The Journal of European Economic History*, Vol. 6: 177-191.
- Lane, F.C. (1973), *Venice, a maritime republic* (Baltimore: John Hopkins University Press).
- Lopez, R.S. and Raymond, I.W. (1955), *Medieval Trade in the Mediterranean World* (New York: Columbia University Press).
- Manzoni, D. (1540), *Quaderno doppio col suo giornale, nouamente Composto, and diligentissimamente ordinato, secondo il costume di Venetia...* (Venetia: Comin de Tridino de Monferrato).
- Martinelli, A. (1974), *The Origination and Evolution of Double Entry Bookkeeping to 1440*. PhD Dissertation. North Texas State University.
- Miller, P. and Napier, C. (1993), "Genealogies of Calculation," *Accounting, Organizations and Society*, Vol. 18, Nos. 7/8: 631-647.
- Pacioli, L. (1494), *Summa de Arithmetica Geometria Proportioni et Proportionalita* (Venice: Paganino de' Paganini).
- Peragallo, E. (1938), *Origin and Evolution of Double Entry Bookkeeping: A Study of Italian Practice from the Fourteenth Century* (New York, NY: American Institute Publishing Company).

- Phillips, T. (2001), "The Romance of Double-Entry Bookkeeping," *American Mathematical Society Feature Column*, October. Accessed 6/26/15 from www.ams.org/samplings/feature-column/fcarc-book1
- Puga, D. and Trefler, D. (2014), "International Trade and Institutional Change: Medieval Venice's Response to Globalization," *The Quarterly Journal of Economics*, Vol. 129, No. 2: 753-821.
- Rossi, F. (2012), «*Melior ut est florenus*». *Note di storia monetaria veneziana* (Roma: Viella).
- Rossi, F. (2013), Personal correspondence with the author concerning the analysis he had made of these two texts.
- Sangster, A. (2014), *Libr. XV: Cotrugli and de Raphaeli on business and bookkeeping in the Renaissance* (Stirling: Lomax Press).
- Sangster, A., Stoner, G.N., and McCarthy, P. (2008), "The Market for Luca Pacioli's *Summa Arithmetica*," *The Accounting Historians Journal*, Vol. 35, No. 1: 111-134.
- Stipetić, V. (2002), "Marin Rafaeli of Ragusa on Double-Entry Bookkeeping in 1475: a Recent Discovery by Anne J. van der Helm and Johanna Postma," *Dubrovnik Annals*, Vol. 6: 123-129.
- Tagliente, G. (1525), *Considerando... el Laudabile Modo de Tenere Conto de Libro Dopio Cioe, el Zornale, el Libro con Lalphabetto Secondo el Consueto de Questa Inclia Citta di Venetia...* (Venice: publisher unknown).
- Van der Helm, A.J. and Postma, J. (2000), "La Riegolo de Libro. Bookkeeping instructions from the mid-fifteenth century," in G.J. Previts and Hernández-Esteve, E. (eds.), *Accounting and History* (Madrid: Asociación Española de Contabilidad y Administración de Empresas): 147-178.
- Vassello, C. (1856), *Catologo dei Codici e dei Manoscritti Inediti che si conservano nella Pubblica Biblioteca di Malta* (Valletta: Stamperia di Governo).
- Welch, E. (2008), "Lotteries in Early Modern Italy," *Past and Present*, No. 199: 71-111.
- Wheeler, J.R. (1995), *The Sestiere of San Polo: a cross section of Venetian society in the second half of the fifteenth century*. PhD Thesis. University of Warwick, U.K.
- Yamey, B.S. (2010), "The market for Luca Pacioli's *Summa de Arithmetica*: some comments," *The Accounting Historians Journal*, Vol. 37, No. 2: 145-154.
- Zanato, T. 1993, "Sul testo della "Mercatura" di Benedetto Cotrugli (A proposito di una recente edizione)," *Studi Veneziani* N.S. Vol. XXVI: 15- 65.

APPENDIX

Portuguese translation of the first page of de Raphaeli's manuscript

Estas são as regras de escrituração que são fundamentais para qualquer guarda-livros.

Note-se que em fazer entradas no Diário o débito deve ser sempre feito primeiro e o crédito deve sempre ser inserido após o débito. Chamo a vossa atenção para este 'P' com um corte através de sua cauda (pronuncia-se 'por') no início da entrada no Diário, que significa 'dar' e deve ser sempre o primeiro verbo na entrada. Ou seja, ele deve preceder o [nome do] devedor. 'A' significa 'ter', e deve preceder a [nome do] credor. Para você entender melhor, vamos supor que você vender pano para Piero. Você deve se certificar de que Piero é registrado como débito e seu pano como um crédito. Primeiro escrever a entrada no Diário da maneira seguinte: P (débito) Ser Piero, A (crédito) pano; seguido pela quantidade, então o preço, em seguida o montante total para a quantidade e, em seguida, insira o montante equivalente em liras de ouro, soldos, denari, e piccoli fora (em uma coluna à direita).

A partir de cada entrada na Diário duas são feitas no Livro-razão, um para o débito e o outro para o crédito. O débito é mostrado no Livro-razão no lado esquerdo e o crédito no lado direito. Primeiro você faz a entrada no Diário e, em seguida, você faz cada entrada no Livro-razão, e depois adicionar as contas para o índice alfabético. A data é gravada no Diário acima da entrada e no interior da entrada no Livro-razão, entre o devedor e o credor. A folheação é anotado no Diário antes da entrada e no Livro-razão está escrito no final da entrada, e a descrição não é repetida [ao fazer as inscrições no Livro-razão].

Louvado seja Deus, 19 de dezembro de 1475, Nápoles.

Inventário de meu capital

Primeiro, eu acho que eu tenho dinheiro em casa	ducados	4000
No banco Gueruzzi	ducados	2500
Na Câmara dos Estado Empréstimos, 8000 ducados de câmara a 25		
ducados por 100 ducados de câmara, o total	ducados	2000
Casa para alugar, número 10, no bairro de San Polo	ducados	8000
100 cargas de pimentas 'cholli', que eu acredito que vale a pena		
60 ducados por carga, totalizando	ducados	6000
Devedor: Ser Antonio Contarini ao par	ducados	900
Credor: Ser Francesco Zane para o resto dos panos	ducados	100