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TRANSFORMING THE MEDIEVAL WORLD

USES OF PRAGMATIC LITERACY
IN THE MIDDLE AGES

A CD-ROM AND BOOK

Edited by

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Foreword

It was during the final phase of Special Research Project (SFB) 231, 'Träger, Felder, Formen pragmatischer Schriftlichkeit im Mittelalter' that the idea evolved of utilizing a new presentational method for disseminating the results of our research activities. Our aim was to create a product for the academic world, which would function as a new, multimedia-based point of access to the activities carried out in SFB 231, while also serving as a thorough introduction to the field of literacy and literature in the Middle Ages for the interested general public. The editors benefited from the support of a number of people in the production of this CD-ROM, and we are pleased to be able to take this opportunity to express our thanks for their assistance.

We would first of all like to thank Prof. Dr Peter Johanek, whose original idea it was to create a multimedia presentation on the basis of a CD-ROM, for disseminating the results of the research conducted by SFB 231. He provided us with much support and encouragement, particularly in the early phases of the project. Prof. Dr Volker Honemann was among the first advocates of our CD-ROM. He provided invaluable assistance throughout the project, played an essential role in ensuring its funding, and — as did other project heads within SFB 231 — nurtured the activities of the participating staff by supplying strong support wherever needed.

Prof. Dr Christel Meier-Staubach assumed overall responsibility for the CD-ROM project as chief spokesperson of the Special Research Project. We would also like to thank her for her faith in the work of the editors and her constant support and enthusiasm for our work.

It is due to the generous financial support of the 'Deutsche Forschungsgemeinschaft' (DFG) that the creation of this CD-ROM has been at all possi-

Account Books

FRANZ-JOSEF ARLINGHAUS

INTRODUCTION

For centuries, the livelihoods of medieval people were largely dominated by agricultural activity. It was not until the twelfth century that the practice of trading within towns and cities which had by now begun to flourish, had grown to a significant level. The best examples in all of Europe were the cities of Italy. The wealth of such cities as Milan, Venice, Florence and Genoa — which is the one you can see in this picture — was able to grow as it did as a result of the monopolistic position that the trading merchants of Italy enjoyed between the eastern Mediterranean and western Europe.

These developments took place not only on a practical and commercial level, but they were also accompanied by changes in the way people thought. People were gradually becoming accustomed to following market trends and co-ordinating both their finances and acquisitions of goods which meant that they required a mentality which lent itself to making calculations of costs and benefits. As a result, the merchants slid rapidly into conflict with the Christian ideals of the time and they were often accused of excessive interest in making a profit. In particular, the charging of interest on loans was regarded as unchristian.

This is the reason why many historians today regard the merchants of the late-medieval period as having been the first to display certain traits normally associated with a modern mentality, in that the way in which they thought and acted seemed to be moulded to a great extent by a type of rationality otherwise seldom encountered in this period. Evidence of such behaviour can be seen in the financial tools employed at the time. These Italian merchants

were the first to use items such as cheques and bills of exchange, to employ double-entry book-keeping techniques and to initiate a system of maritime insurance. All of these instruments, the basic features of which are still in evidence today, were originally developed by Italian merchants in the thirteenth and fourteenth centuries.

Here you can see an insurance contract that was concluded in 1393, in which a total of eleven merchants shared the risk of transporting a certain good by sea. Each of the eleven insurers added a sentence to the contract, written in his own hand, stating the sum for which he was prepared to assume liability, and adding his business sign for confirmation.

Of more significance to researchers than bills of exchange and insurance contracts is the development of double-entry book-keeping. The technique, so-called because each and every financial transaction was written down twice, was developed at the beginning of the fourteenth century.

Today, this is regarded as a quick and reliable method of calculating profit and loss. Historians have long held this form of book-keeping as an early expression of a rational mentality, indeed one increasingly oriented towards profit-making. Its use in late medieval Italy was regarded as evidence of the first appearance of a 'modern' mode of thinking, which was eventually to give rise to the development of capitalist economies.

The sociologist, Werner Sombart, summarized this as follows: 'It is simply not possible to imagine capitalism without double-entry book-keeping. They relate to each other as form does to content.' In writing this sentence, Sombart had created research history. By assuming this close association between patterns of thought and book-keeping techniques, historians were now able for the first time to make deductions from business records regarding the prevailing human mentality of the time. The appearance of this new form of book-keeping was seen as the best proof of the existence of rational, early capitalist thinking among merchants of a particular period or region.

Sombart's theory, however, proved unable to withstand closer scrutiny. Basil Selig Yamey demonstrated that it was of little relevance to medieval trading activities what method of book-keeping was employed. He also went on to prove that the account books of the fourteenth and fifteenth centuries played no role at all in the calculation of profit and loss. To quote from his writings: '[. . .] merchants of the period [. . .] did not use their book-keeping, whether by double-entry or otherwise, to keep a regular and accurate check on their capital and profits [. . .]'.

The situation now arising in the wake of Yamey's refutation of Sombart's theory is somewhat paradoxical. An extremely innovative financial instrument was shaped during the late Middle Ages, which is still in use today. However, precisely those people who were the first to use the technique did not properly avail themselves of its potential. If this is the case, how can one explain the fact that such a complex, culturally rooted technique was able to develop in the fourteenth century, even though the merchants of the time were not especially predisposed to it?

By putting the question in this way, it seems sensible to search for the answer not by examining the mentalities of the merchants, their motives or their way of thinking. In a similar manner to the current discussion concerning the consequences of the new electronic media, this article puts forward the proposition that the medium of writing was itself of central importance to the development of enhanced book-keeping methods. Three hypotheses can be derived from this proposition:

- Firstly, long-distance trading demanded the flexible administration of large amounts of data. The storage of written information on paper is, however, comparatively inflexible.
- Secondly, the discrepancy between what was required and what was possible triggered a self-propelled process, which was largely determined by the demands of the medium of writing.
- Thirdly, this medium-controlled process led to the creation of a structured form of book-keeping and the onset of new types of text.

Italian text: Al nome di Dio, amen. Sia manifesto a ciascuna persona che leggerà o udirà leggere questa scritta come noi, Toro di Berto di Tieri da Firenze per una parte e Francesco di Marco da Prato per l'altra parte, i detti due nominati sono d'accordo di puro e di buono animo di fare compagnia insieme in Vignone questo di Lunedì venticinque d'Ottobre, anni mille trecento sessanta e sette [. . .]

English text: In the name of God, amen. It is hereby communicated to any person who reads this document or to whom it is read that we, Toro di Berto di Tieri from Florence and Francesco di Marco from Prato, that on this Monday, 25 October 1367 in Avignon the two aforementioned with pure and good souls have agreed to do business jointly [. . .]

This is the beginning of a contract, comprising a total of eight pages, with which the Italian merchants, Toro and Francesco, established a trading company in southern France. With an initial capital of 5000 florins this was a

rather modest enterprise, but its scale was similar to dozens of others being run by Italians at that time.

As far as the historian is concerned, this 'compagnia' is nevertheless rather special. It represents the earliest trading establishment from which all the business documentation, from notes to ledgers, are still in existence. It is on the basis of this documentation that this article intends to unfold the theory of the self-propelled development of book-keeping, as introduced here.

PRODUCTION

Book-keeping was Not Taught in Schools but in the Trading Houses

For a medieval merchant, book-keeping was an arduous process. There were numerous types of goods which had to be recorded, and currencies which required conversion, but above all, it was necessary to note down the innumerable small and large credits which they had granted to purchasers. Although many schools were established in fourteenth-century Italy, book-keeping was a subject which could only be learned in an 'apprenticeship'.

The schools taught children to read and write, and also to perform written arithmetic using the new Indo-Arabic numerals. It was with this basic knowledge that an aspiring youth would begin his training with an established merchant, and one of the fields he would gain experience in was the keeping of account books.

In 1398, the 'branch manager' Luca del Sera wrote regarding the 'garzone' (trainee) Marchetto who was employed at the 'head office' in Florence: 'Marchetto is turning out wonderfully. He makes purchases on the market, copies letters and transfers accounts into business letters. And I tell you, if he continues like this, in a year at the most we will be able to entrust him with the budgetary account books.'

The Abacists (arithmetic teachers) conducted intensive discussions among themselves regarding matters of the art of calculating. As book-keeping was not taught at schools, non-merchants did not tend to give the subject-matter much consideration at all. Thus, there was no accepted authority which prescribed a certain type of accounting. It appears that this may have been beneficial to the development of book-keeping. By the time a rich supply of expert literature on the subject appeared after 1500, there were far fewer innovations.

Lack of Specialization: Book-keeping without Book-keepers

Nowadays, every medium-sized company employs a book-keeper and every large organization has its own accounts department. Although trading companies in the Middle Ages could grow to considerable sizes, specialists in this activity were a rarity.

Purchasing and selling goods, acquiring capital, organizing transport, writing account books — all of these activities were performed by the merchant, together with his shareholders and employees. It was rare for there to be any clearly divided areas of responsibility. In particular, in the thirteenth and fourteenth centuries, the period in which the basic techniques were being developed, no such specialization can be determined. It was only at the end of the fifteenth century that the first specialists began to appear.

Unlike the notaries of this period, no connection can be determined between fields of expertise and types of text. This is presumably what prevented the early canonization of certain types of book-keeping. The consequence of this was that a large degree of openness existed when it came to adopting innovations, such as often occurred in the course of company merchants' everyday work with texts.

Cash Transactions were Recorded Somewhat Haphazardly

Notes made by merchants regarding their accounting which went beyond general comments were rare in the fourteenth century. This makes the illustrated note in an account book from 1368 all the more interesting. 'In the cash box in Toro's store we [. . .] found [. . .] 27 pounds and I do not know where they came from [. . .] however, since we have calculated a negative balance, we will enter the 27 pounds here to balance income and expenses. We would enter everything as required but due to the large number of transactions which everybody currently has to perform, we are not able to write as orderliness would require.'

No great effort appears to have been taken to find out the origin of the 27 pounds — which corresponds approximately to the annual income of an employee — by looking through the books. Not even the negative entry of the (allegedly) same amount was deemed worthy of any further attention.

This can be understood by considering what constituted the motives for writing — as far as the merchant was concerned, keeping track of cash

transactions was relatively unimportant. The coins were in the chest and the cash book only became important if there was reason to suspect any irregularities within the company. In the case of credit transactions, however, things were quite different. If the merchant forgot to demand the repayment of a credit, the money was lost. It was therefore vital to keep careful track of these accounts. Even years later, a debtor would still be called upon to repay a few pennies.

Medieval Book-keeping was Teamwork

Book-keeping in this period required that work was literally carried out by a team. The illustration here is taken from an account book originating from the city of Siena in the year 1394, and it is an impressive example of what this teamwork entailed. Since it was often the case that transactions were recorded in two books (a credit repaid in cash was noted both in the cash book and the debtors book), it was often necessary to balance the two accounts. It was also common practice first of all to enter numerous everyday transactions chronologically, but otherwise in an unordered manner, in a kind of note book. The merchants inspected these entries at certain intervals. The entries were then entered into a second book, in which transactions were ordered by customer and not by date.

Both of these activities suggest the co-operation of at least two merchants. Even account book pages written by a single hand were likely to have been the work of two people — one merchant reading out entries from one book and the other recording them in a second.

These joint activities with regard to the account books went further than one would expect. An analysis of the handwriting shows that not only whole account books, but often single pages and sometimes even single entries were written by two, three or even four different people.

Four 'Hands' on One Page

This page from an account book is taken from the 'Ricordanze' F of the Datini/di Berto trading company, and was written at the end of September 1371. It contains four accounts, each separated by a horizontal line. Each account terminates with the statement that the amounts had been carried over to another account book, and each respective page number is stated precisely

(62, 192, 216). The entries from the 'Ricordanze' had now been recorded in the 'Memoriale' — as shown by the abbreviation 'm'.

A closer analysis of the handwriting shows that at least three, and probably four, merchants were involved in writing the various sections of this one page. There is no evidence that each writer had his own particular writing task to perform (e.g. accounts written by X, checking and carrying over written by Y).

Book-keeping appears to have been an everyday activity in the fourteenth century, and so it was performed by a number of employees in addition to their other tasks. There was no specific book-keeper who was responsible for this activity. Since company employees were subject to frequent change, the account books can be regarded as a reflection of the general concept of book-keeping, as was common among merchants at that time. An examination of the handwriting is therefore also valuable for an understanding of the sources.

Four 'Hands' on One Page

Interactive Screen: Explanatory Notes

The first three entries were made by one merchant but the note beginning on line 6 stating that the three entries had been carried over from the 'Ricordanze' to the 'Memoriale' was written by a different hand. This is particularly clear from the last word in line 6: the style of the word 'la Gianeta', a name, is different to that in the first line.

After the horizontal stroke (line 8), a third writer makes his appearance. The latter made all the following entries with the exception of the indications of the amounts carried over. The word 'September' ('di settembre'), occurring in lines 2, 9, 12, 13 and 18, serves as a 'guide word'. The first three occurrences (lines 2, 9, 12) differ greatly from each other, whereas in lines 9, 13 and 18 the word was obviously written by the same person.

An analysis of the sum entries carried over (lines 6–7, 12, 16, 21) is somewhat more difficult, since the samples of text are only short. Three out of the four notes contain the legend 'a uscita' ('on the expenses page'). The writing in lines 7 and 12 is very similar, despite the confusion which may occur as a result of the 'a' occurring as a capital letter in one instance. The letters 'u' and 's' in the word 'uscita' in line 16 are clearly different to those in the first two lines. It is highly probable that this is the work of a fourth writer.

The very short entry on line 21 does not contain our 'guide word'. The appearance of the expression 'posto al memoriale', however, does correspond closely with the handwriting of the entry in lines 6–7.

RECEPTION

Account Books were Intended Primarily for Internal Company Use

In the Middle Ages, account books were intended almost exclusively for internal company use. Nowadays there are government bodies, such as tax authorities, which perform the functions of controlling and inspecting the book-keeping of individual companies. Although the Italian cities had by now developed a sophisticated method of tax collection, this did not, with few exceptions, involve inspection of the merchants' business documentation.

Account books were generally written by merchants for merchants.

However, the trading companies began early on to keep different books for different business areas. Initially, the prime purpose of this was of course to channel the flow of information and increase its clarity.

The use of different types of books also meant, however, that different reading purposes existed within the company. Not every member of the personnel shared the same level of interest in each account book. The 'trainees' generally kept the book in which foodstuffs purchased at the market were recorded, but it was read and checked by someone of higher rank within the company. Extracts from the accounts were often copied into letters, so enabling them to be read by remote business partners.

These voluminous books give a good idea of the central role that writing and book-keeping had come to play in the world of the merchants of the Late Middle Ages. You can zoom into the account books to view more precise information on each of them.

Account Books for Use by the Bosses: Checking Up on the Employees

The entries seen here are taken from the 'Quaderno di spese di casa', or 'Budgetary expenses book', kept by the Datini/di Berto company. Both owners and employees lived and worked at this time in Avignon in an apartment which was adjacent to the store. Since living expenses were financed from a joint account and purchases were made by different people, it was advisable to keep a record of the expenses.

One reason for recording expenses for candles, rice and herrings may also have been to keep the level of spending under control. It can also be assumed from the way in which such information was treated that there was another important reason: if the merchants were really primarily interested in keeping

effective track of their expenses, they would have calculated interim balances more frequently and more regularly than they in fact did. Since such calculations were performed rarely, if at all, it is safe to assume that the main reason was to keep check on the activities of the member of staff responsible for purchases, in particular, regarding the money he was entrusted with.

This type of book-keeping, the main aim of which was simply to keep a momentary check on the employees, hardly required any further revision. Once the expenses from a certain period had been noted and these notes compared with the purchases made, the check on staff was complete. The motivation for preparing the information needed for general cost-control purposes was, at most, slight.

Reading and Writing Account Books — Without Actually Having Held it in One's Hand

Merchants wrote their account books primarily for internal company use. The business documentation was, however, also used to exchange information between trading companies.

In 1370, Datini/di Berto from Avignon ordered 2000 crossbow bolts from Carroccio Carrocci in Genoa by letter. Within a few weeks, the Genoese had acquired the goods from Milan, and forwarded them to Avignon.

Carrocci also enclosed a letter to Datini/di Berto, in which the Genoans listed in detail their costs for goods purchased and expenses incurred. At the end of the list, they demanded that Datini/di Berto credit their account to the sum of 23 pounds ('[. . .] e tanto ponete noi debiamo avere'). In fact, the account is almost a word-for-word copy of the letter written by Carrocci.

This shows us three things:

- Incorporating the business partners' book-keeping in the transaction constituted a form of cash-free trading;
- It made sense to co-ordinate the methods of book-keeping as performed by the different companies at least with regard to their basic functions, for instance their division into 'credit' and 'debit' sections. As a consequence:
- At least parts of the account books from the Datini/di Berto trading house were also 'written' and 'read' remotely by another company, in other words, without these ever actually seeing the books.

Viewed in this way, the reading and writing of account books was evidently not only a matter of concern to the company keeping them.

The 'Secret Book' and the Signatures of Two Witnesses

Even though the merchants wrote their account books primarily for themselves and their staff, it had to be expected that at times there would be third parties who requested inspection of the books. This eventuality was also taken into account by the book-keepers.

A particularly clear example of this is the 'Secret Book' ('Libro segreto') kept by the Datini/di Berto company. The fact that, right on the first page, it is stated that the 'Secret Book' was intended for 'Any person who reads this document or to whom it is read' may appear surprising at first. The book contains both the shareholder contracts of the two partners, and also states the company capital, and interim accounts. Understandably, it was desired to keep information such as this secret as far as possible.

On the other hand, in the event of conflicts arising between the business partners, it could at times have been necessary to present this book to a court. It therefore made sense to formulate the texts to accommodate this eventuality and so to adopt modes of expression typically found in the legal documents of the time, such as 'any person reading this document'.

Secrecy was of course only maintained as long as the company remained in existence. When Francesco and Toro dissolved their trading company in 1373 they even called on two business friends who confirmed the correctness of the dissolution agreement contained in the 'Secret Book' by giving their signatures (see illustration below).

Account Entry as a 'Memo' — Once the Debt had been Paid, the Entry was Deleted

Nowadays, book-keeping is performed primarily as a means of calculating the profit and loss situation of a company. In contrast, it is clear from the structure of medieval business documentation that this was not originally the main aim of such documentation.

For instance, no efforts were made at all to compare purchase and sale prices, to allow for certain items to receive greater attention. The merchants

drew 'balances' by counting the money in the cash box and conducting an inventory of currently held stock. For them, this was all that was required.

Data which would have been of relevance in a balance sheet could hardly be found in the books. The only items recorded with any consistency were the debts owed by the company and the numerous credits they had granted. The main purpose of the book was therefore to record the claims and liabilities of the company.

As can be seen in the entry illustrated here, on 24 March 1371, Datini/di Berto acquired three small hammers from Tegnica di Zanobi. Since payment was not made immediately, the transaction was noted, as were hundreds of others, in the account book. The second entry is a record of the debt repayment being performed on 5 April.

As far as the company was concerned, the transaction was now closed and was therefore of no further significance for its book-keeping. The entry was simply crossed out without the addition of new 'solidi' (shillings) being noted anywhere else in the books. The main aim of the book-keeping was evidently to record individual transactions. The integration of the information thus noted in a balance sheet was neither possible nor intended.

FORM

The Inherent Dynamism of Developments in Book-keeping was Due to the Inflexible Nature of the Medium of Writing

More than any other businessmen in this period, Italian merchants were prepared to sell goods on credit, even to consumers. It was necessary to record such transactions, since losing track of a credit resulted in financial loss.

The large amount of data involved was one important element in the development of book-keeping. Even the credit notes kept by the relatively small Datini/di Berto trading company filled about 10,000 pages in more than thirty account books over five years. A total of around 100,000 entries were made over this period.

But there was also a further problem. There was a constant flow of new information which was associated with certain previously-written entries. For example, on 15 March 1371, Tegnica di Zanobi bought a number of goods on credit from Datini/di Berto. It is probable that not even Zanobi himself was able to predict that he would be making further purchases on the 22nd day of the same month, a transaction which also required writing down. The

recorded data was subject to constant alteration and it was impossible to predict whether, when and how much information would be amassed for a particular customer.

The high degree of flexibility demanded by the necessary act of data storage came into conflict with the relatively fixed nature of the recording medium. Nowadays, computer-aided book-keeping is able to sort information according to date or customer with ease; alterations and additions can be performed at any time. But an entry made in a book is far more difficult to change. The real problem was therefore not so much the volume of data but the inflexible nature of the medium used for recording it. The large amount of data involved only served to compound the problem.

The thesis is that the combination of the large volume of data and the inflexible storage media triggered off a self-propelled process, which ultimately led to the creation of structured forms of book-keeping. This process was almost exclusively controlled by the conditions under which the medium was put to use, and not through any conscious decision by the merchants.

Gathering Together Scattered Entries through the Process of Copying

Since it was impossible to predict when information would need to be recorded for a particular customer, and how much information this would be, the merchant first of all listed all the transactions chronologically. For this purpose, he used a separate book, known as a 'Ricordanze'. Thus, the entries made for a certain customer were distributed over several pages. For instance, information concerning goods sold on credit to Zanobi between 15 March and 19 April 1371 can be found on pages 15, 22, 24 and 32, scattered between dozens of entries for other customers.

Since information was recorded in the form of ink on paper, the only way of introducing a new order to the entries thus fixed was to copy them. This required a second book, known as the 'Memoriale', which was based on the entries made in the 'Ricordanze'. At intervals of a few weeks, the merchants checked through the 'Ricordanze' and copied all the hitherto unpaid credits into the 'Memoriale'. Once transferred, the entry in the 'Ricordanze' was deleted. Zanobi's purchases, referred to above, noted in the 'Ricordanze' on sheets 15, 22 and 24 and ten further pages, were gathered together in the 'Memoriale' on sheet 6 verso. Sheet 7 contained the accounts of a further customer, sheet 8 those of another, etc. This enabled the creation of relatively concentrated sets of data.

But what happened when sheet 6 was full but it was still necessary to add further entries to Zanobi's account? Sheet 7 was already taken up with the account of another customer. The solution was to total the sums contained on sheet 6 — all seventeen of them — and to transfer the sum total to the next available page in the 'Memoriale', where further entries could then be made. The last entry on sheet 6 contains the following note at the bottom: 'Continued in the Debit section further back in this book on sheet 24: 25 pounds, 7 solidi, 6 denarii'. This is the total sum calculated for sheet 6 and it is with this amount that the continuation of the Zanobi account on sheet 24 begins (it is the second account on this sheet). It is noted at the beginning of these entries that this represents the continuation of an account begun earlier in the 'Memoriale'. It was then possible to continue transferring the entries from the 'Ricordanze' in the manner described above. After sheet 24 was full, the account continued on sheet 36. Like pearls on a string, now entries could be added constantly, thus forming a long and virtually endless chain.

The Division of the Book into Credit and Debit Sections as a Tool for Solving Data Processing Problems

The creation of such a chain of entries required the individual links of the chain to be structured as uniformly as possible. For this reason, the notes taken from the 'Ricordanze' were sorted in the 'Memoriale' not only by person but also according to whether the respective sum was a credit or a debit. This was not done by splitting the page into two sections but by dividing the book itself into a debit section at the front and a credit section at the back.

When, on 24 March 1371, Zanobi delivered three small hammers to Datini/di Berto 3 without immediately receiving the nine solidi in payment, the transaction was first noted down on sheet 24 of the 'Ricordanze'. From Zanobi's point of view this represented a credit. Datini/di Berto therefore transferred the entry into the rear, credit section of the Memoriale, on sheet 187. A short time later, the nine solidi were paid and the entry deleted.

The division into credit and debit sections was not done for the purpose of creating any kind of balance sheet. This is made clear from the fact that it is the book, and not each page, which is divided into two sections. The aim was to simplify the process of continuing an account on a new page, making it necessary only to add together the entries on the full page. The common division of a balance sheet today into credit and debit sides therefore has its origins in the solution of a data processing problem.

Summary

To summarize the above, the primary function of medieval book-keeping was to record data as a memory aid. Due to the volume of data and the inflexible nature of the recording medium, it was only possible to perform this function by reprocessing the data that had already been recorded. Although the motives of the writer remained unchanged, this gave rise to a self-propelled process in which the merchant was allocated the role of the passive participant. The result was a well-structured system of book-keeping. The structures thus created could, as was the case in the Middle Ages, continue to be used as memory aids. They can also, as is the case today, be used primarily for the calculation of profit and loss.

TECHNOLOGY

The Influence of Culture on Writing Techniques: Table or Text? Part 1

The technology of accounting can not simply be derived from the aims and wishes of the scribes or from their material possibilities. Writing had always borne the imprint of its specific cultural forms, something from which the user could not easily free himself.

The simple technique of entering written information into a clearly structured table is almost as old as the phenomenon of writing itself. A great many records of work performed and dues paid have been passed down to us from as far back as the Babylonian period. At that time, the table was still the dominant form of writing.

Even today, it is extremely common for information to be presented in the form of a table. It is not only used to benefit from the enhanced clarity it offers for recording and displaying data. The individual figures in the illustration shown here, taken from a bank brochure, are not even legible in the original document. In association with the computer screen, the intention is simply to depict the table as a potent form of presentation, without the actual content being of any significance. It can be displayed in this way, because in today's writing culture, the presentation of tables suggests 'rationality' and 'objectivity'.

The way in which information is presented in writing is therefore not solely determined by the findings of an analysis of purpose versus usability. At various times, the different forms of writing were each 'charged' with sets

of culturally specific values, and these, as well as other factors, played an essential role in determining their use.

The Influence of Culture on Writing Techniques: Table or Text? Part 2

At first glance, the accounts found in Italian account books seem to be no more than three-column tables. Closer inspection reveals, however, that the table is in fact nothing more than a frame for full-text entries. Every entry consisted of a complete sentence, which was skilfully divided across the three columns. The sentences themselves were joined together by the conjunction 'and', and so formed a continuous text. The actual position of the information on the page does not bear any semantic significance (in contrast to 'real' tables). For this reason, it is possible to remove the format used by the medieval writer without the risk of losing any clarity of meaning. This is made clear by the transcripts and translations.

The fact that the merchants did not choose to create tables in their books was in no way due to any lack of skill. 'Real' tables can occasionally be found in letters and handbooks, including those from the Datini/di Berto company. Unlike today, this method of presenting information was not regarded in a positive light at the time. The dominant and most widely accepted model for presenting text at that period was, particularly in Italy, the use of continuous prose, as practised by notaries. The merchants were forced to adopt this prevailing writing culture of the late Middle Ages. The technique of breaking the sentence up into three parts across three columns can therefore be seen as an adaptation by the merchants of the dominant form of writing to meet their particular book-keeping requirements.

The Influence of Culture on Writing Techniques: Roman Numerals or Indo-Arabic Numbers? Part 1

In the European Middle Ages, the most frequently used numeral system was that developed by the Romans. The 'modern' numerals were passed on to us by the Arabs, although they actually originated from India. The system in use today first came into common use in the course of the thirteenth century. One advantage of this system, besides the fact that it possessed a numeral for zero, was that it enabled written calculations to be performed on paper.

Despite the advantages of the Indo-Arabic numerals, many merchants had considerable reservations about using them. In around 1300, a number of Italian cities forbade their use in business documentation, as they were allegedly too easy to forge.

Despite this, the use of these new numerals spread quickly. By the first half of the fourteenth century, special Arithmetic Schools, where pupils learnt how to perform calculations using the modern numerals, grew up all over central and northern Italy, often financed by local councils.

This note was found between the pages of a 600-year-old cash book. The words 'Uscita' (expenses) and 'Entrata' (revenue) can be found above each interim calculation. The columns reflect the complex coin system in use at the time, which did not use the decimal system.

Although the merchants performed their calculations with the aid of the new numerals, these symbols only played a subordinate role in the account books and letters. Other 'rules' applied when it came to writing down amounts of money.

The Influence of Culture on Writing Techniques: Roman Numerals or Indo-Arabic Numbers? Part 2

In the Late Middle Ages, merchants made increasing use of the newly introduced Indo-Arabic numbers when performing written arithmetic operations. However, in the account books, they made simultaneous use of a number of different number systems side by side.

As can be seen here, certain areas of the page were reserved for particular types of numerals. The pages were numbered using the 'new' numerals, whereas the year of the entry at the top of the page was usually recorded in Roman numerals but sometimes also in Indo-Arabic ones. The money sums listed in the column on the right were recorded in Roman numerals as were the numbers stating the amounts of goods in the column on the left. The sums entered in the middle column were often written out in full-text form, but Roman and Indo-Arabic numerals were also sometimes used.

The sums of the entries on a page were written in Roman numerals when they were explicitly stated to be as such. If a sum was simply written down in the form of a note, or without any explanatory text, Indo-Arabic numerals were often used.

This varied use of numeral systems can hardly have been due to legal regulations. The phenomena illustrated here as techniques reflect the domi-

nance of a writing culture influenced both by religious and by legal texts. At the same time, an independent, cultural contribution on the part of the merchants is discernable in the structure of the texts. The result is a text which does not seek to hide its various socio-cultural roots.

ABSTRACT

What today forms the basis of modern book-keeping was originally developed in Italy between 1200 and 1500. The reason for the evolution of new book-keeping techniques is usually explained in terms of the mentality of the merchants in the Late Middle Ages, which had begun developing into a more rational, calculating one. However, Basil S. Yamey has demonstrated that the medieval account books were not kept with the aim of keeping track of the success of the merchants' business transactions. So the question is, why did sophisticated methods of book-keeping develop when this was never the intention of precisely those people who created and used the account books?

This article attempts to locate the foundations of the new method of book-keeping within a self-propelled process in which the medium of writing played a central role. The problem was that there were large amounts of data, all of which required flexible treatment, but the storage medium employed — writing on paper — was fixed in nature and therefore highly inflexible. The only way of attaining the required degree of flexibility in this type of information storage was to perform intensive reprocessing of the raw data. The motivation of the merchants was simply for the books to constitute a memory aid, and this aspect remained unchanged throughout the reprocessing, or revision process.

This revision process, which was rendered necessary by the storage medium employed, gave rise to new text forms, which also can be derived from the use of writing itself. A specifically medieval style of writing (full text rather than tables) formed the cultural framework. The new text forms offered additional unintended possibilities, over and above the function of the account book as a notebook, but it was not until much later that full use was made of this.

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APPENDICES

PRODUCTION

Lack of Specialization: Book-keeping without Book-keepers

Transcript 1

Mccclxxi	190
<hr/>	
A la Gianeta Grande che sta cho' noi al xxii di setembre	lb. 0 s. Xviii
A rati a uno giudeo per una chalota meza o piccola	lb. ii s. viiii
A uno menature ? per virare ? i meno? post al Memoriale E a charta 62 la Gianeta e l'altre ii partite messi a uscita a carta 192	lb. 0 s. v
<hr/>	
G uilielmo Beroviere ebe del nostro di xxiii di setembre	
i docina di montoni nori che ne de fare chaperoni da bacinetto messi a uscita di xxvii di setembre a carta 192	lb. ii
ci avemo di xxviii di setembre	
i docina chaperoni fa e fune paghato	
<hr/>	
A dona Andreona per settsierti di cinghie messo a uscita detto di a charta 192	s. iiiii d. vi
<hr/>	
A Lio che fa gli arnesi de avere di xxiii di setembre per	
i arnese di ghanba e di choscia e per	
i bacinetto traversato a gran visiera posto al Memoriale E a charta 219	

RECEPTION

Account Books for Use by the Bosses: Checking Up on the Employees

Transcript 2

Account page from Quaderno di spese di casa No. 143, fol. 2^v.

G		iovedì a dì vi di marzo	
per	chandele iii libre	s. vi	
per	riso e mandorle	s. i	d. ii
per	aringhe	s. iii	d. iiiii
per	cavoli	s. o	d. iiiii
per	insalate		d. iiiii

Th		ursday 6 March	
for	candles, iii pounds	s. vi	
for	rice and almonds	s. i	d. ii
for	herrings	s. iii	d. iiiii
for	cabbage	s. o	d. iiiii
for	lettuce		d. iiiii

RECEPTION

Reading and Writing Account Books — Without Actually Having Held it in One's Hand

Transcript 3

Letter written by the Carroccio Carrocci company in Genoa, to Francesco Datini, in Avignon. This contains a listing of the costs incurred in purchasing goods plus expenses. The instruction to credit the sum to the Carrocci account in the Datini books occurs several times (ponete che dove noi dobbiamo; ponete a nostro conto che dove noi dobbiamo). Below, after 'Somma' is the instruction to credit the sum to the company location there 'where we should have' (literally).

Al nome di dio. Fatto a dì xx di genajo 369

F rancesco e chompagni Charoccio e chompagni salute. A dì detto vi mandamo sotto, lettera di Toro di Berto, il vostro socio (?), lettera dove a primo vi diremo quando leve nostro chonto

d eremo di chassa i di verettoni vi mandamo per la barcha di [Auslassung] a questo videte quelio ci avete a pone[re] a nostro chonto

p onete che dove noi dobbiamo a dì xii di genajo

+ virettoni saldati chassa i m ii a lb. xv il m lb. xxx

per i chassa vote s. x

per recare a chasa e chasa e leghare s. iii

per libre x di chotono a l'uno a s. iii libra lb. s. xxx

per i spedichameto s. iiiii d. vi

per chanovacci e chorde e spagho s. viii

per nostra fatica s. vi d. vi

Somma lb. xxiii s. ii di genovini d. s. ii di genovini e tanto ponete noi debiano avere

E ponete a nostro conto che dove noi dobbiamo a dì xx di genajo [. .]

Transcript of the Carroccio Carrocci account in the Datini/di Berto account book. The list in the letter shown above was taken as the draft for the entry in the account book. This can be seen from the uncritical manner in which the formulation 'per nostra faticha' (more or less 'for *our* efforts'), is used. In the account book, the formulation should correctly have been 'for *their* efforts'.

	mccclxviii a di xxiii di genaio		
A	vemo da Genova a di xxiii di genaio da Choroccio Charocci e Tomaso de Michele e chompagni una balla, la quale si parti di lae a di [Auslassung] di genaio per lo chamino di marsilia. Erani entro chomo diro		
N	ella detta balla in chassa di vogliata segnato [Zeichen]		
^m / _{ii}	di verettoni saldi de Genova per lb. xv [per] m di genovini	lb. xxx	
x	libre di chotone bianco a s. iii di genovini libra	lb. i	s. x
per	una chassa		s. x
per	leghare e rechare a chasa		s. iii
per	i spedichamento		s. iii d. vi
per	canovacci, chorde e spagho		s. viii
per	nostra faticha		s. vi d. vi
	Somma lb. xxiii s. ii di genovini d. s. xxv il fior. di Genova		
p	osto che Charroccio Charocci e Tomaso de Michele debiano avere al Memoriale .d. a charta ccx la detta soma		

RECEPTION

*The 'Secret Book' and the Signatures of Two Witnesses***Transcript 4**

The first lines in the shareholder contract entered in the 'Secret Book' (AS, Prato, FD, Libro segreto No. 152, fol. 2^v):

'Al nome di Dio, amen. Sia manifesto a ciaschuna persona che legerà o udirà leggere questa scritta come noi Toro di Bertto di Tieri da Firenze per una parte, e Francescho di Marcho da Prato per l'altra parte, i detti due nominati sono d'acordo di puro e di buono animo di fare compangnia insieme in Vingnone questo di Lunedì XXV d'Ottobre, anni MCCCLXVII [. . .]'

'In the name of God, amen. It is hereby communicated to any person who reads this document or to whom it is read that we, Toro di Berto di Tieri from Florence and Francesco di Marco from Prato, that on this Monday, 25 October 1367 in Avignon the two named of pure and good soul have agreed to do business jointly [. . .]'

Transcript 5

The end of the dissolution contract of the company Datini-di Berto from 1373, as entered in the same Secret Book. The dissolution contract was countersigned by two witnesses (Archivio di Stato, Prato, Fondo Datini, Libro segreto No. 152, fol 16^v).

Ed io Arigho di Ser Piero sono stato presente alla detta scritta fatta per mano di Toro e di Franciescho detto; e però mi soscrivio qui di mia mano l'anno e l' di detto.

And I Arigho di ser Piero was present when this document was written by the hand of Toro and the named Franciescho; and I therefore sign here with my own hand in the said year on the said day.

(Similarly the signature of the second witness, Nastagio di Ser Tomaso)

RECEPTION

Account Entry as a 'Memo' — Once the Debt had been Paid, the Entry was Deleted

Transcript 6

Abbreviation: s. = 'solidi' (shillings)

T iii	egnìa di Zanobi dee avere a di xxiiii di marzo per martelini della torre a chollo chorto, a reccho Jachopo per s. tre l'uno	s. viiii
A iii	nne auto a di v d'aprile, porto Francho martelini della torre da feciere; per i detti iii auti da lui come apare di sopra e pero cancello	s. viiii
T iii	egnìa di Zanobi should have on 24 March for hammers 'della torre' with a short shaft, for Jacob, at three solidi each	s. viiii
R iii	eceived brought on 5. April by Francho, [for] hammers 'della torre da feciero', for the said three, received [from him], as stated above; and I therefore delete the entry	s. viiii

RECEPTION

Culturally-specific Characterization of Writing Techniques: The Account: Table or Text? Part 1

Notes on the cuneiform texts

What you see here is the first part of a fifty-line cuneiform table from the temple of Nippur, Babylon from 1306 BCE (on the right is the transcript of the previously illustrated original). The meaning of the column headings and the numbers noted in the columns can only be derived by studying the relative positions of the numbers and terms in the table. Albert T. Clay explains: 'The first six columns give the payments for the first six months. In the seventh, the total (naphar) for the first half year is given. In the fourteenth column the amount for the second half year is recorded. The sum total for the year is found in the fifteenth column. In the sixteenth, at the top of which is the word a-wi-lu-tum 'men', the stage in life of the individual is indicated, as well as the relation of the recipient to the head of the family. KAL(zikaru) means 'man' or 'adult'; SAL, or the feminine determinative, 'woman'; KAL-TUR [. . .] 'adult son'; SAL-TUR [. . .] adult daughter [. . .] At the top of the last column, MU-BI-im means 'their (his) name(s).' The forty-seventh line of the table (not illustrated) contains the total sums of the 7, 14 and 15 columns for the first and second six-month periods of the year and for the total year.'

From: Albert T. Clay, *Documents from the Temple Archives of Nippur Dated in the Reigns of Cassite Rulers* (Philadelphia, 1906), plate 25, No. 58, transcript p. 32, no. 15, notes pp. 34ff.

Illustration taken from the brochure *Wegweiser maxblue Depot*, Deutsche Bank 24, p. 11.

Culturally-specific Characterization of Writing Techniques: The Account: Table or Text? Part 2

Transcript 7

Transcript of the account of Tegnia di Zanobi, AS, Prato, FD, Memoriale 'E' No. 55, fol. 6^v.

(Abbreviations: fl. = florin, lb. = pound, s. = 'solidus' [shilling], d. = 'denarius' [penny])

	T	egnia di Zanobi de' dara a di xv di marzo per	
i		banto di vaccha grande d'una e mezza pelle per fl. tre e s. dodici, porto Filippo	lb. iiii s. iiii
ii		paia di tanaglie mezane da mulattiere della Torre per s. otto paio, porto Francho	s. xvi
E		dee dare a di xxii di marzo per	
vi		paia di tanaglie mezane ancinello da mulattiere dela Torre per s. otto d. sei il paio, porto Francho	lb. ii s. xi
E		deono dare a di xxvi di marzo 1371 per	
i		dozina di fibbie da cinghuroli de ratali per s. uno d. sei	s. i d. vi
E		dee dare a di xxvii di marzo 1371 per	
^m / _{xvi}		di chiovi di ferro sellerini istagnati per s. sei d. sei mille, porto Francho	lb. v s. iiii
		(further entries)	

The text from the same account in continuous text form:

Tegnia di Zanobi de' dara a di xv di marzo per i banto di vaccha grande d'una e mezza pelle per fl. tre e s. dodici, porto Filippo lb. iiii s. iiii; ii paia di tanaglie mezane da mulattiere della Torre per s. otto paio, porto Francho, s. xvi. E dee dare a di xxii di marzo per vi paia di tanaglie mezane ancinello da mulattiere dela Torre per s. otto d. sei il paio, porto Francho, lb. ii s. xi. Edeono dare a di xxvi di marzo 1371 per i dozina di fibbie da cinghuroli de ratali per s. uno d. sei s. i d. vi. E dee dare a di xxvii di marzo 1371 per ^m/_{xvi} di chiovi di ferro sellerini istagnati per s. sei d. sei mille, porto Francho, lb. v s. iiii (further entries).

Translation of the account

	T	egnia di Zanobi should give on 15 March for	
i		large cow hide from one and a half furs for three fl. and twelve s. delivered by Filippo	lb. iiii s. iiii
ii		pairs of tongs from the mule drover della Torre for eight s. per pair, delivered by Francho	s. xvi
and		he should give on 22 March for	
vi		pairs of 'ancinello' tongs from the mule drover della Torre for eight s., six d. per pair, delivered by Francho	lb. ii s. xi
and		he should give on 26. March 1371 for	
i		dozen 'de ratali' belt buckles, for one s., six d.	s. i d. vi
and		he should give on 27. März 1371 for	
^m / _{xvi}		iron saddle rivets, tin-plated, for six s., six d. per thousand, delivered by Francho	lb. xv s. vii d. vi
		(further entries)	

Translation of the account in continuous text form

Tegnia di Zanobi should give on 15 March for i large cow hide from one and a half furs for three fl. and twelve s. delivered by Filippo, lb. iiii s. iiii; ii pairs of tongs from the mule drover della Torre for eight s. per pair, delivered by Francho, s. xvi. And he should give on 22 March for vi pairs of 'ancinello' tongs from the mule drover della Torre for eight s., six d. per pair, delivered by Francho, lb. ii s. xi. And he should give on 26 March 1371 for i dozen 'de ratali' belt buckles, for one s., six d., s. i d. vi. And he should give on 27 March 1371 for ^m/_{xvi} [16 thousand] iron saddle rivets, tin-plated, for six s., six d. per thousand, delivered by Francho, lb. xv s. vii d. vi (further entries).