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Pacioli, Manzoni, Oldcastle and
Ympyn re-visited

1

Let me begin by making two indisputable statements about the *De scripturis* section of Luca Pacioli's *Summa de arithmetica* ...

First, it is the first printed exposition of double entry bookkeeping.

Second, several books on bookkeeping and accounts published in the 1540s include passages that are the same as, or closely similar to, passages in *De scripturis*.

The simple explanation for this would be that Pacioli himself wrote the text of *De scripturis*, and that it directly or indirectly influenced, in varying degrees, the books in question published in the 1540s. These books are:

Domenico Manzoni, *Quaderno doppio* "" (1540).

Hugh Oldcastle, *A profitable treatyce* ... (1543).

Jan Ympyn, *Nieuwe instructie* "" (1543)

Ditto *Nouvelle instruction* (1543).

Ditto *A notable ... woorke* (1547).

However, the matter is not at all as clear as this. In particular, in the early 1900s Fabio Besta, *il maestro di Ca'Foscari* (University of Venice), was convinced that the *De scripturis* was not at all original. Instead, it was taken, very largely, from a manuscript exposition on the subject, written in the Venetian dialect, which was being used in commercial schools in Venice. According to Besta, that supposed manuscript - of which no copy has been found - was a very harmonious and very accurate work (... *una piu armonica e molto piu accurata operetta* ...), of which Pacioli's *De scripturis* was a not praiseworthy reworking (... *un poco laudabile rifacimento* ...).

Furthermore, Besta used differences and similarities between the Pacioli text and the Oldcastle text to support his conclusion that Pacioli and Oldcastle had used the same pre-Paciolian manuscript source. (Besta believed that Oldcastle, in London, had obtained a copy of the manuscript from an English merchant returning from Venice. As regards Ympyn, Besta assumed that one Juan Paolo di

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Bianchi, who is mentioned in a rather confusing prologue in Ympyn's books, gave Ympyn a copy of the supposed Venetian manuscript.)

2

I will not go over the details of Besta's arguments and evidence for his judgement that Pacioli's *De scripturis* was not original. (Indeed, Besta claimed that if, *quod non*, the *De scripturis* was original, it would have been the most original part of the *Summa* itself, if not perhaps the only original part.) Many of the points made by Besta are only suggestive, at most; and some are plainly incorrect.

But I must mention a somewhat different version of Besta's harsh conclusion. The well-known economic historian, the late Raymond de Roover, wrote in 1970 that the *De scripturis* was not original. According to de Roover, Pacioli simply incorporated in the *Summa* a manuscript that was used in commercial schools in Venice. But Pacioli was not a plagiarist, wrote de Roover, because the Venetian manuscript had already entered the public domain. Pacioli used the source material, without acknowledgement.

3

According to Besta (in an early journal article), Oldcastle's book of 1543 gives the *coup de grace* to Pacioli's reputation as an original author on the subject of bookkeeping and accounts. Besta was sure that Oldcastle used the same manuscript as Pacioli, and that he translated it into English.

No copy of Oldcastle has survived. But in 1588, John Mellis, a schoolmaster like Oldcastle, published a book *A briefe instruction* Mellis explained that he was re-issuing Oldcastle's work, of which he had a copy - "a jewell so commodious". He, Mellis, had simply "beautified" and "enlarged" Oldcastle's text in "divers places". And he added an illustrative set of account books "for the better and plainer understanding and practice" of the subjectmatter of the text.

Besta did not know that Mellis in fact had added material to the Oldcastle work. Besta referred to some of this material which is in Mellis but not in Pacioli. He thought that this material had been taken by Oldcastle, from the Venetian manuscript, but that Pacioli had chosen not to use that particular material. It was proof of the existence of the manuscript, in Besta's view.

One example of this material (in Mellis but not in Pacioli) is a general rule for

identifying the accounts to be debited and credited when recording a transaction. In Mellis this rule, which is “to be learned as well as by rote [i.e. by heart] as by reason” is: “All things received, or the receiver must owe to all things delivered, or to the deliverer”. Besta quotes the rule from Mellis. Besta did not know that Mellis was a plagiarist. The passage in question was taken, without acknowledgement, by Mellis from James Peele’s *Pathe way to perfectnes ...*, published in 1569. Other apparent novelties in Mellis, some of which also were referred to by Besta, were also taken from earlier English publications - as in fact, was much of the material in Mellis’s illustrative set of Pacioli’s alleged plagiarisation of an earlier manuscript.

Stripped of Mellis’s borrowings from other English authors, it would seem that Oldcastle’s text was a very faithful translation of selected chapters of *De scripturis* (though there are one or two mis-translations). Oldcastle did not, it seems, include an illustrative set of account books - in this respect his book also mirrored *De scripturis*.

4

Those historians who accept that the *De scripturis* is an original piece of work by Pacioli have tended to over-state the extent to which Manzoni and Ympyn copied Pacioli’s text - while noting, of course, that Manzoni and Ympyn each added an illustrative set of account books. For example, Bonalumi (1880) wrote that Manzoni’s text was a most faithful copy and true reproduction of Pacioli’s. The opinion of Professor Enrico Viqano (1968) is that Manzoni’s expository text was taken from Pacioli, except for some slight and unimportant modifications.

Such an unflattering view of Manzoni’s contribution is misleading. For example, Manzoni, who practised as well as taught bookkeeping in Venice, added a long section “Del modo & ordine di redrizar scrittura 6 libri” - broadly, on how to review and adjust inadequately or poorly kept ledgers.

Manzoni’s originality - or, at least, improvement on *De scripturis* - is also evident in other parts of his book, for example in his chapter 11. He notes there that the whole difficulty about (double entry) bookkeeping is to know how to discern the particular accounts to be debited and credited in the ledger for any particular transaction. (This sentiment is not in Pacioli, but quite often occurs in later publications on bookkeeping and accounts.) Manzoni then gives some guidance, based on the notion that in most ordinary commercial transactions four “terms” occur, namely there is one who gives, another who receives, something which is

given and received, and the cause. (... *uno che da, l'altro che riceve, et quella cosa che vien data o ricevuta, & enche /a causa ...*). There is nothing like this in Pacioli.

Ympyn, like Manzoni, departed quite considerably from *De scripturis*, if that was their model, as I believe it must have been. Most importantly, both Manzoni and Ympyn largely avoided Pacioli's long chapter 34, the title of which reads (in English translation) as follows: "How one closes all the accounts in the old ledger, how and why, and of the summa summarum of debit and credit, the last check of the balance".

This chapter 34 is puzzling. It is confusing, and seems to mix up at least three presumably alternative treatments of the very important subject of checking, balancing and closing a ledger, and opening its successor. Like Oldcastle in this respect, Manzoni has no exposition of the subject in his text. Manzoni must have relied on the illustrative material in his model set of account books to serve as guidance to the reader. Ympyn has a short, clear chapter, and refers readers to his model set of account books, which has several distinctive features. One of these is that the merchant or his bookkeeper transfers the balances on various merchandise accounts, representing unsold goods, to a "remaining goods" account ("*Overschiefende goeden*"), the balance of which is then transferred to the closing balance account. The entries in the closing balance account then are the basis for opening the accounts in the new ledger.

The *De scripturis*'s confused chapter 34 on what is a key subject, together with the absence of an illustrative set of account books, means, in my view, that the *De scripturis* would not have been an effective or satisfactory medium of instruction for an auto-didact or for use in a commercial school. Both Manzoni and Ympyn were far superior in this regard. The expository text in Ympyn, in particular, has the merit of clarity and brevity. Ympyn was an experienced merchant, and, according to Raymond de Roover, he may have used material from his own account books in his illustrative set of accounts. His book undoubtedly influenced some later sixteenth-century books in Dutch and English; and the original Dutch and French versions may have been significant in spreading the use of the double entry system by merchants in the Low Countries - though it must be added that the extent of the actual use of the system in the sixteenth and seventeenth centuries is itself debatable, as is also the practical significance of Ympyn's books.

5

One feature of Manzoni's book warrants a brief discussion. Manzoni illustrated what, in effect, was Pacioli's *summa summarum*, discussed briefly by him in chapter

34 of *De scripturis*. Manzoni did not use that name, but instead called his accounting statement *Summa de tutte le partite poste in Quaderno, si in dar come ancho in havere*. It closely follows Pacioli's prescription. But, as Edward Peragallo (1938) explained: "Manzoni, as well as Pacioli, fell into a grave error when he took off his *summa summarum*." The way it was compiled meant that the *summa summarum* "was bound to balance in all cases, even if the ledger were full of errors ... ". It was therefore of no use at all. It was not a check on the ledger's accuracy. It is not surprising that no real-world example of such a statement has survived: none would have been compiled in practice. In due course Manzoni must have realised its futility. He omitted his illustration from later editions of his book.

I now explain briefly how Manzoni closed the old ledger and opened its successor. Each open account in the old ledger - the ledger marked with the sign of the cross (*Quaderno doppio signa to +*) - is closed off with an entry to transfer its balance to the new ledger marked with the letter A (*Libro A*). For example, the closing credit entry made in the cash account reads as follows: ... *per si medema porto in libro A, per saldo di questa* The balances on the open accounts are then entered in the corresponding accounts in the new ledger. There is no balance account in Manzoni's ledger-closing procedure (in which the *summa summarum* is not involved at all).

6

The seventh chapter of Pacioli's *De scripturis* is headed (in my English translation): "Of the manner in which in many places all mercantile books are authenticated, and why and by whom". In it Pacioli describes how account books were officially authenticated, by designated authorities in cities like Perugia. He describes the procedure. He recommends the custom of authentication which "merits much praise". In particular, he claims, it will be more difficult for a dishonest merchant to keep two books, one of which to show to buyers and the other to sellers. Some merchants "perjure themselves in this way, and do great evil".

There is no counterpart to this chapter on authentication in the Oldcastle book, presumably because it would have been of no interest to merchants in England. In fact, Oldcastle also omitted other parts of *De scripturis* which discussed Venetian banks, taxes and business practices, presumably for the same reason.

Manzoni, on the other hand, included a chapter on the authentication of mercantile account books. The heading of the chapter is as follows: *Del modo*

come in alcuni luoghi se habino ad autentica li libri mercadanteschi, e perche, & da chi. This is almost word-for-word the same as in *De scripturis*. The contents are also similar. Manzoni also mentions the dishonest practice of a merchant having two books in order to deceive customers and suppliers. Ympyn's chapter 5 is rather different, although some of it is evidently Paciolian. The major part describes the practice in many centres in Italy of having mercantile courts or tribunals empowered to adjudicate disputes between merchants. The judges were called "Consuls of Merchandise". In Venice, the place where those consuls "keep their court is hard by [i.e. near] that which is called The Bursse, which is a place where merchants certain times of the day resort in like manner as they do in Lombard Street in London. And their court is called in the Italian tongue Rialto that is English, the Royalty". (I believe the correct explanation of the word "Rialto" is different: it is a corruption of "rivo alto" [high embankment].)

Later in the chapter Ympyn refers to Perugia. "But in Peruse [= Perugia] is the custom [for merchants] to carry their books into the consuls' chamber to authorise them ... ". And he sets out the procedure. But Ympyn does not mention the alleged practice of some dishonest merchants of keeping duplicate books.

Authentication of account books in Perugia brings me back to Fabio Besta. Besta wrote that the corrections and additions Pacioli must have made to the supposed Venetian manuscript were neither many nor important. He identified these supposed changes. According to Besta, the discussion of the Perugian custom probably was an addition that Pacioli made to the manuscript. Now, here there is difficulty for Besta's central thesis. Both Manzoni and Ympyn refer to the Perugian practice. According to Besta, Manzoni and Ympyn did not use *De scripturis* as a source. They would presumably have obtained that information from the supposed manuscript used by them - as well as by Pacioli. And, in that case, Pacioli's discussion would not have been an addition he made to the manuscript, but would have been something he had taken directly from that manuscript. For Besta to suggest otherwise, as he did, would have meant that Manzoni and Ympyn had taken the material from Pacioli's *De scripturis* - and Besta ruled out the possibility of such borrowings from Pacioli. On his own reasoning, therefore, Besta seems to have been too generous to Pacioli on this one occasion. However, we need not try to disentangle Besta's apparent contradiction.

I In general, it is much simpler to suppose that Pacioli did write *De scripturis*, and that Manzoni, Oldcastle and Ympyn took material, to a greater or lesser extent, from Pacioli. It is prudent to dismiss Besta's thesis altogether - at least unless and until the Venetian manuscript miraculously comes to light.

7

Girolamo Cardano was a colourful Renaissance man - among other things, he was a famous physician, mathematician and astrologer. In his book, *Practica arithmeticae* written in Latin and published in Milan in 1539, Cardano included a short discussion of double entry bookkeeping. It is not a helpful text.

According to Besta, it is neither perspicacious nor harmonious (... *e ne perspicuo ne armonico* ...). Besta observes that it is probably the only publication regarding double entry bookkeeping that is derived directly from the *Summa* of the Franciscan from San Sepolcro. It is what one might call a back-handed compliment.

8

In spite of weaknesses and deficiencies in *De scripturis*, and in spite of Besta's and de Roover's doubts about Pacioli's originality, one must pay tribute to what is a milestone in the history of bookkeeping and accounts. The publication of Pacioli's *De scripturis* led the way; and others followed.

I note, in conclusion, that Pacioli was the first of several distinguished mathematicians to have written on the subject of bookkeeping and accounts. I have already mentioned Cardano. Simon Stevin was another. He wrote a book on mercantile accounting, to provide instruction for his pupil and friend, Prince Maurice of Nassau. Nicolaas Struyck, a Fellow of the Royal Society, London, corrected and augmented an edition of Abraham de Graaf's *Instructie van het Italiaens boek-houden* (second half 18th century). George Peacock, author of *Treatise on algebra* (1830), wrote the long entry on bookkeeping included in the *Encyclopedia Metropolitana* (1817-1845). The entry consists mainly of an English translation of parts of Pacioli's exposition of the double entry system. Finally, my last example. Arthur Cayley wrote a short book of twenty pages called *The principles of book-keeping by double entry*, written earlier but first published in 1894. Cayley described double entry bookkeeping as one of the "two perfect sciences".

