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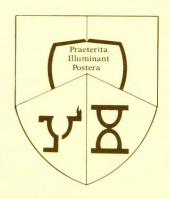
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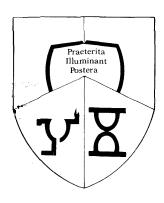


# The Accounting Historians Journal

June 1994 Volume 21, Number 1

Research on the Evolution of Accounting Thought and Accounting Practice

Published by
The Academy of Accounting Historians



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June 1994 Volume 21, Number 1

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## June 1994

# Volume 21, Number 1

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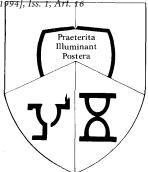
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Volume 21, Number 1	Volu	ıme	21,	Nur	nber	1
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June 1994

# **CONTENTS**

Main Articles	
Special Section: A Tribute to Luca Pacioli and His Era	
Goodbye to My Friend Luca Pacioli  — Ernest Stevelinck	1
Comments on Some Obscure or Ambiguous Points of the Treatise (De Computis et Scripturis) by Luca Pacioli — Esteban Hernández-Esteve	17
Early Accounting in Northern Italy: The Role of Commercial Development and the Printing Press in the Expansion of Double-Entry From Genoa, Florence, and Venice — Geofrey T. Mills	81
The Double-Entry Bookkeeping Method Applied in Spain to Account for Transactions Related to the Minting Process of Gold and Silver in the Sixteenth Century — Rafael Donoso Anes	97
Accounting Systems Practiced in the Near East: 1220-1350 — Cigdem Solas and Ismail Otar	117
Medieval Traders as International Change Agents  — Michael Scorgie	137
Other Articles	
The Nature and Influence of Managerial Accounting During the New South Movement: The Case of a Charleston Printer — Roger B. Daniels	145
and Linda M. Plunkett	145
A Historical Analysis of the "Marriage Tax Penalty"  — John Brozovsky and A. J. Cataldo, II	163
The Development of Accounting and Internal Control for the National Land System of the USA	100
— Michael P. Schoderbek	189

et al.: Accounting Historians Journal, 1994, Vol. 21, no. 1	
The Changing Form of the Corporate Report  — Tom Lee	215
Initial Efforts of Kenneth W. Stringer to Develop a Statistical Sampling Plan — James J. Tucker, III	233
The Institutional Effects of Leadership: The US GAO and its Audit Report Review Process — Onker N. Basu	255
1993 Accounting Hall of Fame Induction	
Introduction — Ray J. Groves	275
Induction Citation — Thomas J. Burns	277
Response — Richard T. Baker	280
Ad Hoc Reviewers In Recent Months	285
Contents of Research Journals	286

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Ernest Stevelinck
BRUSSELS, BELGIUM

# GOODBYE TO MY FRIEND PACIOLI1

I studied accountancy without ever hearing about him. I would have liked to have heard the lecturer, leaving off — for a time — the doctoral tone he employed for teaching debits and credits, to look into the life of this forerunner of accountants and to talk to him about his work. But it is a safe bet that he himself did not know of the existence of one who was later to be called the *Father of Accounting*.

The last World War (1940-1944 in Belgium) gave me some leisure, a physical infirmity in the right eye preventing me from serving my country by bearing arms. I took advantage of this situation to study accounting and history in depth, and finally, the history of accounting. It was then that I made acquaintance with this venerable ancestor of ours.

After hostilities were over, I met Robert Haulotte, who was also very interested in accounting history. We had numerous telephone conversations in the evening about a series of articles we were writing together (*Galerie des grands auteurs comptables*). Eventually, those conversations led to a commitment to publish a book on Luca Pacioli which compelled us to study closely his life and his work on accounting.

Later on, I became acquainted with a painter who had translated Pacioli's *Divina Proportione* into French. This Frenchwoman — Mademoiselle Sarrade — was also fond, like us, of this genial precursor and we therefore exchanged many letters on this subject.

Now, both of my correspondents on Pacioli are gone. Mademoiselle Sarrade died January 8th, 1987 and Robert Haulotte on October 6th the same year. I alone remain of the three to

¹ This paper is written in the memory of Mademoiselle Sarrade and Robert Haulotte. As usual, this paper has been corrected — gently and diligently — by Miss Anna Dunlop to who I am infinitely indebted. *Nil novi sub sole:* as Cardan said, speaking of Pacioli, "Without him, my own work would not be what it is". I can say, speaking of Miss Dunlop, "Without her, my own work could not be what it is."

celebrate the fifth century of the publication of Pacioli's Summa de Arithmetica.

From the notes I have amassed, some coming directly from both of the above-mentioned friends, I should like to recall the man who was Luca Pacioli from Borgo San Sepolcro, a Franciscan monk of the second half of the 15th century.

Having familiarized myself with him for nearly 50 years via his works, he seems like a friend to me. Somehow, it seems to me that I have met him ... with his enthusiasms and his intransigences, his assurance of being the apostle of a good cause, the care he took to detail before us his works and his labors, taking into account his corroborations in order to prove the veracity of his assertions. All of this from a simple detour taken in a mathematical demonstration, with a poignant ingeniousness.

His physical appearance is known to us by three good portraits. The first two, owed to the brush of the great painter, Piero della Francesca born himself at Borgo San Sepolcro some thirty years before Luca, portray him at about age 30. The salient features are those of a young monk, serious and meditative, his inward glance that of one who pursues in himself his own reflections.

First, there is the painting, "Pale Urbinate," now at the Pinacoteca di Brera in Milan, representing "La Madonna col Bambino Gesu" and the donor, Frederic di Montefeltro, kneeling before her. Ten other personages form a circle behind this group, and Luca Pacioli is the second from the right. In the second painting, "Virgin, Child and Saints," Luca Pacioli is on the left with a book in his hands. Formerly at the Church of Sant' Antonio in Perugia, this painting is now in that city's art gallery.

The third portrait is still more striking. The artists of this remarkable work remains unknown — despite the flood of ink speculation it has caused and a signature difficult to interpret. Pacioli is around 50 years old and presents himself with the authority of a mathematical demonstration. Square face, firm chin, straight look, with a wave of the hand, he is the evocative expression of confidence. In fact, all we know from Luca's own pen, on his life and work, introduce us to a man who cannot conceive of being in doubt.

He directed his life between two roads on which, in his mind, he travelled at the same speed. He is a monk, with the certitude conferred by faith. He subsequently said that he was a professor of sacred theology. He is also a mathematician, and mathematics were for him the exact science *par excellence*.

When, in the course of his reflections, he came to unite theology and science, his amazement was unlimited. So much so that, speaking about sole proportion in three terms, he says it is divine, comparing it to the Holy Trinity with the one and only God in three persons. Further, being in ecstasies over the mathematical virtues of this same proportion — superior for him to all others — he compares it to Christ's law, coming to perfect and not to abolish the ancient law.

That serious-minded people may speak of naivety is of no importance to him. You have only to see the unyielding face of Pacioli to understand that it is useless to waste time in discussion.

It is likely that his uncompromising personality was not irrelevant to some adverse reaction from the monks of Borgo. What happened *circa* 1509 in the Franciscan monastery when a papal bull sent Pacioli there with the responsibility for the restoration of good order?

As you might expect, he was unwelcome. As a last straw to the friars' fury, Pacioli, old and perhaps in poor health, was permitted to be served his meals in his room and was exempted from singing in the choir. It was war: the keys were refused to Luca, who was naturally upset. The Director-General of the Order tried to intervene without success. The intervention of the Borgo Captain of the Guards was necessary, not to reconcile both parties, but to come to an agreement.

One is always at a disadvantage when one treads — even unintentionally — on the toes of someone else. And the monks' feet, bare in sandals, must have been that much more sensitive. Was this resentment, forsaking Christian charity, the starting point of calumnies touching Pacioli's intellectual honesty? One has the right to pose the question.

However that may be, the life of Luca Pacioli was pursued with the rigor of a straight line. Born at Borgo around 1447 as he was, we can only make suppositions on his early education.

One day a solution must be found to quash the legend propagated by the bitter pen of Vasary, writing that our author owed his mathematical knowledge to Piero della Francesca. This theory does not consider that at the time Pacioli was old enough to learn, the painter, in complete maturity of his own powers, was kept far from his native town because of the commissions he received. It would be more logical to believe that

Uncle Benedetto, called "Biardo," a soldier by profession and consequently of a scientific bent, was capable of introducing Luca to the rudiments of calculation.

We know, however, that as an adolescent Luca was an apprentice in the family of Folco di Belfolci — who was well versed in business. Business knowledge leads to accounting knowledge. It is worth noting that for a long time mathematical books had devoted a large section to business problems. The books of Pacioli do not violate this tradition. They were destined — as agreeably said by Pellos the Nicean — for "merchants and honest people." Luca, however, did not remain long at this stage, and around the age of 17, he went to Venice to perfect his mathematical training.

In the meantime, he certainly learned Latin, since all scientific books of this period — from *Euclid's Elements* onwards — were written only in that language. Having become aware of this difficulty, Pacioli was later to write in the Italian vernacular, so as to be understood by the majority.

It was again by a businessman (and rich merchant), Rompiasi, that Pacioli was boarded and received like a son. In return, he served as tutor for the sons of the house. On account of this merchant, Pacioli also travelled on ships carrying goods, as he has told us. It was job training, apprenticeship on the site, that he remembered much later when he was to write on bookkeeping.

From this period, three constants take shape that we shall discover in Pacioli's character. First, an unlimited intellectual curiosity. Second, his passion for work. Of that he makes no bones: "From my earliest years," he said, "I have been so habituated to study that I have never done anything else from my cradle days." And third, the enthusiastic desire to make profitable to others the knowledge acquired by himself through hard work.

# FIRST WORK, 1470

Pacioli acquired algebra skills when he was just 23 years old. This algebra, which resolved many of his problems, was the subject of his first work (unfortunately, lost today). This book was for the use of his cherished pupils, Bartolo Francesco and Paulo Rompiasi. It seems obvious that his sojourn in Venice with a businessman laid the foundation of the 1494 treatise on Double Entry.

Those who claim that this text not only may have been inspired, but even copied from pre-existing works, have certainly not taken the pains to read our author and to appreciate, so to speak, his very particular style. Some headings are based on knowledge certainly acquired only from direct experience. For example, the inventory drawn up at the beginning of the specimen accounts matches too precisely those used by a certain type of merchant and thus does not resemble the accounts which appeared in the Rompiasi books. Because nothing equals the text itself for appreciating Pacioli's patient explanations, let us seek his counsels:

To begin with, the merchant must make diligent inventory, in the following manner: he writes on a sheet of paper or in a special book all that he has in this world—his personal belongings, household goods and estate. He begins with the things that are more valuable and easier to lose, such as ready cash, jewels, silver, because his estate, such as house, lands, lagoons, valleys, fishponds and the like, cannot be mislaid as can personal belongings and household goods. The possessions must be written down one by one. The inventory must always mention first the date, the place and the merchant's name.

Luca even gives in Chapter III a model inventory with all the necessary explanations:

In the name of God, on the 8th day of November, 1493 in Venice. The following is the inventory of myself N... of Venice, street of the Apostles. I have written by my own hand — or have had written down by so-and-so — this inventory of all my possessions, personal belongings, household goods, estate, debts and credits which I possess on the day mentioned above. In the first place, I confirm that I have in cash, between gold and silver coins, so many ducats, of which so many are gold Venetian and so many gold Hungarian; so many Papal, so many Sienese and so many Florentine florins. The remainder is composed of silver and copper coins of various kinds, i.e., troni, marcelli, carlini (of both the Pope and the King), Florentine grossi and Milanese testoni etc.

So we see, passing before our eyes, one by one, all the possessions and all the debts of our merchant, with all the detail necessary to identify them.

On the style of living of these rich merchants, a proof which seems quite natural for Luca is given further on in the book:

If you lend some jewels or gold or silver table services to some friend for 8 or 15 days, particulars of same must not be put into the ledger, but must be recorded in a book of reminders, because in a few days they are to be returned. Thus also, if things of a similar kind were lent to you, they must not be placed in the ledger, but make a note of the matter in the reminders book, because you have to return them very soon.

At this time, a Venetian merchant was not just anyone, even when — after the taking of Byzantium (Constantinople) by the Turks in 1453 — relations with the Orient were inevitably modified. I have given in a previous article the list of goods shown in the ledger of Giacomo Badoer, a Venetian merchant *circa* 1439. In that inventory, very similar to the one given by Luca, one can however find an item which has, fortunately, disappeared in *Summa*. In the middle of spices, skins and pelts, textiles and gems, and ginger, slaves appear — counted by heads like cattle. This business was so prosperous that it constituted a third of the turnover.

As for the manner in which Badoer kept his ledger, it conforms to those described by Giovanni Antonio Tagliente in his Luminario di Arithmetica of 1525 (two years after the second edition of Summa), suppressing the memorial and the journal. The transposition was made directly — with all desired details — in both accounts of the ledger, connecting one to the other. Certainly these accounts are by double-entry, but the absence of the journal leads to readjustments which would have shaken our friend Pacioli.

Absence of biographical documents concerning Piero della Francesca leads historians to make suppositions which are almost impossible to transform into certainty. Were Piero and Alberti well-known to each other? Did they even meet? One common point alone is certain between these two geniuses: the Court of Urbino, which made use of their talents. Apart from that, nothing is sure.

Even at the period of the Renaissance, a man such as Alberti is rare. Descended from Florentine aristocracy, his scientific knowledge was immeasurable. Handsome as a young god, he excelled in all sports, while he took the classical studies with unbridled ardor. He did so much that, at 20, his health was

affected. He had to rest. He did so by writing a comedy in the antique style, with such a pen that scholars for a long time believed it to be an original from Latin antiquity.

After that, the architect of Malatesta's Temple at Rimini consecrated himself to mathematics, and that led him to codify the rules of perspective and to the editing of his *de re oedificatoria* written in Latin, an epitome of knowledge on architecture, both ancient and modern.

Such a man most assuredly would not have associated himself with — and above all entertained at home — an ordinary student. It can be presumed that it was on the recommendation of Piero that Luca was allowed this honor. Surely he found great profit from it.

It is at this time that Pacioli rejoins two of his brothers in the Order of Franciscans. And a little later (circa 1475) we shall see him — as we have said — under the portrayal of St. Peter the Martyr in the "Pale of Brera" by Piero della Francesca. This is also the period when the University of Perugia appointed Pacioli to the Chair of Mathematics.

That was the occasion for Luca to write a second work, dedicated to his new students. This text is that much more precious in that it is the only manuscript we have from Pacioli before *Summa*, this text provides, therefore, a direct approach to analyzing *Summa*.

# SECOND WORK, 1476

The book, the author says, discusses mathematics and particularly algebra, but in a way less elaborate than the manuscript of 1470. The work contains, however, 396 pages which deal with rules of three and of companies, *baratti* or barter, false position, *meriti* or interest, business transactions and currency. Without entering into details, the problems of companies are those in which several merchants participate in making a purchase, each of them taking shares in a more or less considerable part of the capital, in proportion to which the profit is to be divided.

In the problems of barter, the merchant gives wool in exchange for cloth or spices, and the calculations of interest concern money invested or borrowed for a short or long time period, at a low and a high rate of interest.

There are also numerous pages concerning geometry and algebra, and "subtle questions" and mathematical games, before

ending with the "merchant tariff which is of great utility."

Compared to the content of *Summa*, one can see that the manuscript of 1471 constitutes a projection of it already very advanced. You have here a proof of the coherent and comprehensive spirit that has been identified as being one of the constants of Pacioli's character. He does not detour — as many others of his time did — to astronomy and still less to astrology. He preserves in his first research efforts and always extends them with the aim of being useful to all, rendering knowledge accessible to the greatest number of readers.

One may be surprised to observe a monk, having taken a vow of poverty, preoccupied with business and commerce. That would be to misunderstand Pacioli badly. Assuredly, more than gold and silver, for him the most enviable wealth consists in the knowledge of mathematics — the science without which nothing can exist. It is with mathematics that the Great Architect created the universe, this world being represented by five regular bodies. This science is naturally indispensable, as much to philosophy as to fine arts, to the art of war as to commerce.

It is for this reason, as Pacioli says in the beginning of his *Divina Proportione*, that "God having endowed him with this science, and having himself been engaged in it since the age of his tender nails [this expression is his own] he shall be its enthusiastic apostle. I shall be the professor *par excellence*." It is notable that this is the only title he assumes, whereas — with an admirable modesty — (and all due respect to his detractors) he declares all his working to be compilation. He is accordingly writing in the common vernacular in order to be read by those whom the failure to understand Latin would have barred from the knowledge.

That was not without disadvantages for his style, for which style purists have naturally reproached him. If it is true that fifteenth century Italy had a language, it is also true that dialects were numerous. Add to that the fact that he was writing, transposing, and translating from Latin texts, Pacioli was often obliged to forge his own words or to slip in terms since fallen into disuse.

Finally, and particularly, he is the master writing for his pupils, in the same matter that he spoke to them, with — alas — the same repetitions. Unceasingly, he announces his preoccupation of being brief, but incessantly his style marches from sentence to sentence, with the desire not to omit anything.

Here are some lines about merchants which will give you a taste of this very particular style:

Useful exhortations and beneficial advice on being a good merchant:

As I have said, you shall diligently take note of all the things you have in belongings and estate, one by one, even if they number ten thousand, mentioning their condition and nature, if deposited in a bank, or if placed in loans. All must be named in good order in the inventory, giving all the marks, name, surname, as detailed as possible, because things can never be too clear to a merchant on account of the quantity of cases that might occur in business, as he who daily works in business knows. The proverb is right when it says that more points are required to make a good merchant than a Doctor in Laws.

Who can enumerate the cases in which the merchant must intervene, at sea, on land, in time of peace and plenty, in time of war and famine, in time of comfort and in time of loss?

In those circumstances, he must know what path to take in the markets and at fairs, which are held in one place, or in another.

For these reasons, it is correct to say that the perfect merchant must resemble a cock, which is the most watchful creature in existence and keeps its nocturnal vigils in winter or in summer, never resting. It is said of the nightingale that it sings all through the night, but this can be verified only in summer during hot weather, and not in winter, as experience is ready to show. It is also said the head of the merchant must have a hundred eyes, yet these are not enough to give him fair warning of what he must say or do.

Annibal Caro describes with humor this style as "ash pan," but he adds immediately afterwards that this ash contains also much gold. Witness the emphatic evidence of the great mathematician, Cardan, insisting that without Pacioli, his own work would not be what it was. Thanks are due, therefore, to this remarkable teacher who was at the true take-off of the mathematical revival in Italy and surrounding countries.

It is worth noting the care he took to precede his works with a detailed table of contents, which facilitated searching in

his abstruse discourse, permitting the reader to arrive easily at the desired chapter. The table of *distinctio 9 of the treatise* alone requires a good two pages. If there are some who find that longish, it is, for Pacioli, only work done conscientiously.

In the introduction of his *Divina Proportione*, he explains his point of view:

... how praiseworthy it is by God and men that one who, having received as a gift some particular natural talent, should convey it willingly to others, because he awakens love in them and merits eulogy and honor, taking for his own the sacred motto: "What I have learned without a model I communicate willingly and cheerfully. The significance of these gentle words," he adds, "is graven in my mind as durably as in marble." It was natural for me to act thus with all and particularly when it concerns the faculties which I have received from God in the noble and necessary science of mathematics.

Pacioli the man is encapsulated in full in these last two sentences.

# THIRD MANUSCRIPT, 1481

Leaving Perugia for Zara about 1480, he wrote in that town a third manuscript, the loss of which is particularly unfortunate. Speaking of this work in his *Summa*, he tells us, in fact, that the work of Zara is composed of difficult problems requiring deep comprehension.

This seems to be the case in the *Libellus*, the text printed in 1509 at the end of the *Divina Proportione*, which is the cause of the most serious accusations made against Luca Pacioli. The fact that some persist — even without proof — in declaring this text about bookkeeping not to be original is of little importance, since the author himself does not claim it as an original work, but only one of compilation. On the other hand, the text of the *Libellus* is, in the vernacular, exactly the same as that of the *Quinque corporibus regularibus written*, or rather translated, into Latin, and offered by Piero della Francesca, after 1482, to the young Duke of Urbino.

This text is a group of geometrical problems, solved mostly by algebra and calling for very difficult calculations because they are so complicated. An example will give you an idea: — the volume of a body of 72 bases is obtained by the sum of 13

square roots diminished by the sum of 5 square roots. When one sees that those roots require 9 or 10 numbers, followed by fractions which count the same quantity of numbers of the denominator and of the numerator, because at that time, one could not use decimals, much less calculating machines, finding the solution is baffling. One is especially amazed at the man who was capable of devising such a treatise. One thinks also of the "difficult cases requiring deep comprehension" and above all of a brain accustomed to these disconcerting calculations. To credit a painter, even a great painter, who says of himself that he is aged and in poor health with this sort of exercise is, to say the least, incredible.

Because the "Pale di Brera" was finished — and badly finished — by Berrugete, Piero was probably coming to grips with some serious infirmity. He gave a text to the Duke of Urbino, who is placed prominently in the picture, which was neither dedicated nor signed. It was astonishing because it avoided color in favor of geometry. It was written in the common vernacular, but the figures were very well finished, as you would expect from the hand of a great painter.

Seven years later, the Duke of Urbino, protector of Piero, died when his son and heir was 10 years old. It was to this child that Piero offered a text written in Latin with a dedication, so that everyone would know the author, though the first half of this dedication was an exact copy of the introduction to chapter III of *Vitruvius*. In the second half, Piero asserts as his own the *Prospectiva Pingendi* given to the young Duke. It is on that work that Vasary — and others after him — founded their opinion that Luca had appropriated the work of his great elder, taking advantage of ease of access he would have at the Urbino library, where he could have purely and simply copied it.

Was not the opposite more plausible? Perhaps, to assist the aged and abandoned painter, this young compatriot, still proud to have been included in a painting by the Master, could have translated Piero's Zara manuscript to permit him to recommend himself to the good offices of his protectors?

If Luca was dishonest, why did he not "lose" a text which I do not suppose would figure among the library's treasures, given its highly specialized contents? Indeed, where and from whom could Piero, at this time, acquire the necessary knowledge for the composition of a text bristling with difficulties? How can one reconcile the work required to effect interminable

calculations with the fact that the painter said himself he was weakened with age? How, above all, could the master painter of perspective, Piero, only succeed in illustrating his manuscript with false figures, constructed crookedly? On the other hand, the drawing of both regular and irregular bodies was for Luca Pacioli a problem more difficult than calculations. This is evident in *Summa*.

Later, in 1496, Luca's meeting with Leonardo de Vinci removed all difficulties in the representation of solid bodies in *Divina Proportione*. Beforehand, since 1489, Luca had himself constructed his solid bodies, and Leonardo probably drew from those models.

Nevertheless, the accusation brought against Pacioli, disseminated by Vasary in the sixteenth century, and by others too, particularly by Mancini in the twentieth century, do not agree with the most elementary logic. These humorless detractors think they know better. To be fair, Luca has also happily found reliable defenders.

The limit of absurdity in the calumnies came from an anonymous and undated *Abaco*, assigned by Mancini to Piero, because there are in it problems from the *Libellus* and also the whole of the problems which end *Summa*. This *Abaco*, if it is not signed is, however, presented like this (I translate word for word):

Having been persuaded, by a person to whom I can refuse nothing, to write something about the mathematics necessary for merchants, I shall do it, not through presumption, but to obey, trying with God's help to satisfy Him, that is to say write something concerning barter, interest and companies, beginning with the rule of three and the rule of position and, if it please God, to satisfy Him, something on algebra.

Beyond the fact that there is no mention of geometry, can you imagine merchants asking a painter to instruct them in the necessary mathematics for their trade! With great seriousness, but without an ounce of good sense, Margaret Daly Davis has, again in our time, defended this undefensible supposition.

The contemporaries of Pacioli were fortunately more perspicacious. Luca's university career was continuing at Perugia, Zara and Rome, and he went to Venice in 1494 to work on the proofs being printed for *Summa*.

# FOURTH WORK, 1494

This Summa, which well merits its name, contains Distinctio 9 Treatise, a chapter on bookkeeping, but the author warns that before studying this section it is necessary to have learned, thanks to preceding chapters, to be a fast calculator. "In order to be able to possess this qualification," he says, "I have given in the other sections of this book the rules and canons necessary for each operation, so that each diligent reader can learn them by himself. For anyone who has not assimilated them, it will be useless to study what follows." That is clear! But if the reader must make some effort, the author too will have taken great trouble to relate in detail the entries in the Memorial, the Journal and the Ledger, with multiple examples.

For those who are interested in the history of accounting, the reading of Luca Pacioli's treatise on double-entry bookkeeping is indeed the first thing to undertake. As this text is today available in most languages, no difficulty will be encountered.

I will, for my part, merely recall the sentence which comes nearly at the end of the chapter on bookkeeping:

With attentive and devoted study, make the effort to become a good bookkeeper. I have amply shown you in this excellent work how to become one. I have given you all the rules, and the places where you can easily find them are indicated in the table of contents which is given at the beginning of this treatise. And think to pray to God for me, so that I can, for His praise and glory, continue to work to the best of my ability.

These prayers were probably heard, since, two years after the appearance of *Summa*, Pacioli was called by Ludovico Sforza to the court of Milan, as a commentator on Euclid. It is there that he met Leonardo da Vinci. These two men, outwardly so opposite, were in fact admirably complementary. From their collaboration, not to say their friendship, emerged *Divina Proportione*, Luca's fifth text, prepared in manuscript for the Duke of Milan, with illustrations representing the solid diagrams drawn by Leonardo. The arrival of French armies in Italy drove both our friends to Mantua. Evidence is missing on their subsequent relationship.

# LATE WORKS, 1509-1512

As for Luca, he was teaching at Pisa, Perugia, Bologna and Florence (where, it seems, he mostly resided), and at Rome be-

fore becoming occupied in 1509 with the printing of his last works. These were a translation of Euclid, which replaced that of Campanus, but enriched with remarkable commentaries; and the printed edition of the *Divina Proportione*, dedicated this time to Soderini. This edition contains not only the text of the 1498 manuscript, but also a treatise on architecture very close to Vitruvius, of whom some passages are quoted in full, a very good "alphabet" and the famous *Libellus*, of which we have spoken. A lost text, *de Viribus quantitatis*, written by Pacioli around 1512 remained in manuscript.

We know little about the last years of this man who wrote that he was often tired, exhausted by work and staying up late. In 1514, the Pope offered him a chair of mathematics at the Sapienza in Rome. It seems that Pacioli was more often at the monastery in Borgo.

He died in 1517. This date has been found recently by Japanese accounting historians. After this, who may venture to say that the accounting influence of Luca Pacioli does not extend, even to the present, to the far corners of the earth?

# 1894-1994

The four hundred year anniversary of the printing of *Summa* was not a very great success. Very few accounting historians were active at that time. Carl Peter Kheil, the most important of them, translated into Czech the chapter of *Summa* relating to bookkeeping. This work was printed in 1894, the anniversary year of the publication of *Summa*.

It may be presumed that, pressed by time to publish his translation in the year of the 400th anniversary, Carl Peter Kheil hurried the work a little. On reading the printed text, he decided not to distribute it, this translation being, in his opinion, unsatisfactory.

We realized, my colleagues Robert Haulotte and myself, when we undertook the translation of the work of Luca Pacioli into French, how it is sometimes difficult to understand the numerous abbreviations of which the author made use, or to define the meaning of some words chosen to represent things that exist no more.

However, Kheil's manuscript and some copies of his translation have been conserved. That has allowed author Hugo Raulich, former teacher at Kheil's private school, to transcribe in 1933 in Czech an expurgated translation of Luca Pacioli's

accounting work, based on the one undertaken by Kheil. That translation was published in 1940 in the technico-commercial Czech lexicon published under the direction of Joseph Fuska.

Shall we see other translations in other languages on the occasion of the five hundred year anniversary? That is not impossible. In any case, to see the present activity of some accounting historians' groups to fittingly honor this half millennial, one can be sure that their combined efforts will be successful.

Esteban Hernández-Esteve BANCO DE ESPAÑA

# COMMENTS ON SOME OBSCURE OR AMBIGUOUS POINTS OF THE TREATISE DE COMPUTIS ET SCRIPTURIS BY LUCA PACIOLI\*

Abstract: Recently, the author translated Luca Pacioli's treatise De Computis et Scripturis into Spanish. During the translation, the author faced a series of points contained in the text which are not clear and which present some difficulties of interpretation.

This paper shows the main points that are confusing, what constitutes their difficulty, the interpretations given by different specialists and, finally, the interpretation given by the author himself with the reasons he had to adopt it. In this way, it is to attempt to clarify the question, to offer a basis for judgement to those who are interested in this subject and, above all, to submit the position and interpretations adopted by the author to open discussion.

Among the various doubtful and obscure points, the following ones are considered in this paper: the contradictions and ambiguities observed by some authors in regard to the treatment of the balance and closing of accounts; the discrepancies shown in several passages of the *Treatise* which give ground to the hypothesis that this *Treatise* is actually the result of the juxtaposition of two or more different texts, written at different moments and for different purposes; the particularities of two payment methods of the purchases which Pacioli distinguishes expressly (by *ditta* and by *scritta di banco*); some ambiguities regarding the way to keep the accounts with banks and official bodies; various instructions concerning the location of the accounts in the Ledger, the situation of the date, and so on, which seem paradoxical and contradictory; and other ambiguities.

<sup>\*</sup>A version of this paper was presented at the 16th Annual Congress of the European Accounting Association held in Turku, Finland, April 28-30, 1993. I thank very much Prof. Basil S. Yamey for his kind observations to this previous version. I also acknowledge with thanks the useful comments made by Carlo Antinori, Antonio Goxéns Duch, Pierre Jouanique, Yannick Lemarchand, Antonio Lopes de Sá and Ernest Stevelinck. All of them have contributed improvements to the paper. The remaining faults and errors are entirely my responsibility.

# INTRODUCTION

When I recently translated Luca Pacioli's treatise *De Computis et Scripturis* into Spanish, a series of obscurities and difficulties of interpretation were uncovered.<sup>1</sup>

In this paper, I intend to discuss — though without any pretensions of exhaustiveness — the main obscurities encountered, their difficulty, the interpretation given by a number of scholars who have studied the subject and, finally, my own interpretation and the reasons that led me to consider it as the most correct. This paper is thus an attempt to clarify the questions raised, to offer a basis for judgment to those who are interested in it and, above all, to submit my approach and interpretation to open discussion.

As I point out in my introduction to the translation, Pacioli's prose is surely neither easy nor fluent. Baldi and Annibale Caro, among old authors, and Federigo Melis, among modern ones, have already mentioned this.

The difficulties of this prose are many: it is written in a half Tuscan, half Venetian language: it is still unpolished and lacking clear and precise rules; the book itself is incunable with the typographical limitations and; above all, it is complicated by abbreviations characteristic of that time. For all these reasons, Luca Pacioli's *Treatise* contains various types of anomalies, inaccuracies, ambiguities and obscurities that will be convenient to group in different categories for the purpose of this analysis.

First, there are purely typographical anomalies and irregularities or mechanical errors. We shall not lose much time on them, although I shall point out the main ones.

Second, we shall study a small group of obscurities and ambiguities which are basically of a linguistic nature and whose interpretation may cause headaches to translators, though they do not really affect the technical aspect of the work.

The third group consists of points whose doubtful interpretation does affect in one way or another the accounting, commercial or banking explanations given by the Franciscan monk of Borgo Sansepolcro. This is the largest group of difficulties, obscurities and ambiguities.

<sup>&</sup>lt;sup>1</sup>Luca Pacioli: De las cuentas y las escrituras. Título Noveno, Tratado XI, de su Summa de Arithmetica, Geometria, Proportioni & Proportionalita, edición y traducción por Esteban Hernández Esteve, con una reproducción fotográfica del origina, Asociación Española de Contabilidad y Administración de Empresas (AECA), Madrid (1994).

Finally, I shall explain some details or passages that make us doubt whether the particular Treatise *De Computis et Scripturis* is really a single work entirely written on the same occasion and for the same purpose.

# TYPOGRAPHICAL ANOMALIES

In this section, I shall mention three irregularities and one anomaly or curiosity of little importance.

The first one appears in Chapter 11. When mentioning the terms and expressions which introduce and identify the debit and credit accounts in the Journal entries. Pacioli says that they are Per and A. i.e., From or Debit and To or Credit, respectively: "Of which, the first one, From, is always written at the beginning of each entry because the debtor must be specified in the first place and the creditor immediately after, separated by two lines, in this way:".2 The text next shows two parallel vertical lines. However, in the examples of Journal entries provided throughout the Treatise, Pacioli or his printer do not use two lines as a separation mark between the debit and credit accounts, the latter being introduced by the preposition To, but simply use a full stop or a colon. This typographical anomaly has already been extensively discussed by Basil S. Yamey in 1974, specifying that, at that time, the expression virgolette meant two slanting lines.3

<sup>&</sup>lt;sup>2</sup>The original sentence, maintaining Pacioli's spelling but completing the abbreviations and using the current punctuation rules, as I shall do in all the quotations from Pacioli's text, is: "Deli quali, sempre nel principio de ciascuna partita si mette el Per, pero che prima si deve specificare el debitore, e di poi immediate el suo creditore, diviso lun dalaltro per doi virgolette cosi:"

<sup>&</sup>lt;sup>3</sup>Basil S. Yamey: "Two Typographical Ambiguities in Pacioli's 'Summa' and the Difficulties of its Translators", originally appeared in *Gutenberg-Jahrbuch*, Mainz, 1974, and reprinted later in Basil S. Yamey: *Essays on the History of Accounting*, New York (1978). In his well-known work *La Ragioneria*, Fabio Besta mentioned this anomaly and pointed out that the correct translation of virgolette was "lines", though without specifying whether vertical or slanting: "L'uso largo delle due virgolette, nell'antica loro forma di due lineette, tra i due titoli dei conti richiamati in ogni articolo di giornale, appare solamente, per quanto si sa, nell'ultimo quarto del secolo decimo quinto", i.e., "The current use of two virgolette, in their old form as two small lines, between the two names of the concerned accounts in every Journal entry, appeared first, as far as it is known, in the last quarter of the 15th century." *La Ragioneria*, second edition, Milan, 1916, Vol. III, p. 376. Actually, it seems that both vertical and slanting lines were used. In the set of entries included by Domenico Manzoni in his *Quaderno doppio col suo giornale*, two slanting lines are used before the term *To* to sepa-

Another typographical anomaly due to printing circumstances appears in Chapter 12. When Pacioli explains in Chapter 14 how to show that Journal entries have been posted to the Ledger, he says: "An as of one Journal entry you post two to the Ledger, you will draw two transverse lines on the Journal entries as you post them. That is, if you post first the debit entry. you will draw the line at the beginning of the entry, thus showing that it has already been recorded on the debit side of the Ledger. And if you post the credit entry, you will draw the line at the end, on the right hand side, where the entry ends, to show that you have already posted it to the credit side of the Ledger."4 Then, he adds: "These lines are as shown above in the first Cash entry, one of them is called the debit line and the other the credit line,"5 referring to an entry debited to the Cash account and credited to the Capital account provided as an example to explain how the first entry of the Inventory should be posted to the Journal.

However, in this entry (which appears in Chapter 12), there is no line across the body of the entry. Instead, in the left margin of the text, there is a sentence written vertically which says: "debit line." No doubt, the typographical difficulty of drawing a line across the letters in the printed text led the printer to adopt this solution. Yamey also mentioned this typographical diffi-

rate the debit and credit accounts. The same is done in Alvise Casanova's work Specchio lucidissimo and in Angelo Pietra's Indrizzo degli Economi, printed in Mantua in 1586. By contrast, in his two books Ein Teutsch verstendig Buchhalten, published in Nuremberg in 1531, and Buchhalten, zwey künstliche und verstendige Buchhalten, published in Nuremberg in 1546, Johann Gottlieb uses precisely the two vertical lines adopted by Pacioli in his Treatise to separate the wording of the debit and credit accounts in the Journal. Wolffgang Schweicker does the same in his work Zwifach Buchhalten, sampt seinem Giornal, des selben Beschlus, auch Rechnung zuthun etc., printed in Nuremberg in 1549 by Johann Petreius. Schweicker explains that he was living in Venice when he wrote his book.

<sup>4&</sup>quot;E così come duna de giornale ne fai 2 al quaderno, così a quella partita che del giornale levi farai doi righe a traverso so che vai levando; cioe, se prima tu la metti in dare, prima farai una riga atraverso verso al principio de la partita, che dinota esser posta in dare al quaderno, e si la metti in havere... farai laltra depennatura, verso man dextra, dal canto dove finesci la partita, che denotara esser messa in havere".

<sup>&</sup>lt;sup>5</sup>"Le qual linee staranno come disopra in questo vedi figurato a la partita prima dela casa, luna ditta linea de dare e laltra de havere".

<sup>6 &</sup>quot;Linea del die dare."

culty in the article in which he discussed the previous one [Yamey, 1978].

In this same chapter, Pacioli explains how to cancel entries in the Memorandum after posting them to the Journal by drawing a transverse line to cross them out. But he warns: "And if you do not wish to draw a line across the entries, you shall tick the first letter of the entry, or the last one, as it was done at the beginning of this entry." However, this tick mark does not appear anywhere.

The following observation does not refer to a typographical anomaly and is not even a real error. It is a simple curiosity or inaccuracy in the author's explanation. In Chapter 16, he describes the way to post stocks of goods owned by the merchant from the Inventory to the Journal. The example given to illustrate this case is ordinary ginger in bulk which is the seventh entry in the Inventory. The previous entry, which is illustrated with an example, is the second one in the Inventory, i.e., jewels of various types. Pacioli assigns to both accounts the third folio of the Ledger. He warns and even recommends in various passages, as it was customary at that time, to use the same folio of the Ledger to keep more than one account when the accounts in question are not expected to originate much movement and will, therefore, not require more space. However, it clearly seems exaggerated to presume that six accounts (2 through 7) can be included in the same folio.

# LINGUISTIC OBSCURITIES

In this section, I shall describe a few ambiguities and obscurities of Luca Pacioli's *Treatise* which are difficult to understand and interpret. Some of them are obviously related to accounting or commercial issues but, it seemed to me, that the difficulty is essentially of a linguistic rather than technical nature. For this reason, these anomalies have been separated from the accounting, banking or commercial ones and are included in this section, although this criterion can, of course, be discussed.

The first difficulties of this type appear in Chapter 3, where there are several expressions whose meaning could not be clearly established and a few curiosities. For example, it is curi-

<sup>7 &</sup>quot;E se tu non volessi traversare la partita con una linea, e tu lanciari la prima lettera del principio dela partita, o vero lultima, commo al capo de questa e fatto."

ous to observe that Pacioli uses the term *çoie* or *gioie*, i.e., jewels, to describe precious stones.<sup>8</sup>

In this same Inventory entry covering jewels, Pacioli includes some *rubini coculegni* that a few translators interpret as conical rubies. Carlo Antinori points out, however, that they could be rubies coming from Cochin, in the East Indies, on the Malabar Coast.<sup>9</sup>

Another curiosity which has intrigued scholars in this chapter is the use of the word *pironi* instead of *forchette* to designate forks. *Pirone* is a word of Greek origin which has given its name to the fibula bone in French and Spanish. Researchers cannot understand how it came to be used in Venice with the meaning of fork, since the current meaning of this word in modern Italian is *lever*, *bar*, *pin*, *handspike* or *bolt*. In any case, Jäger, the

<sup>&</sup>lt;sup>8</sup> Ernst Ludwig Jäger, who did the first translation of the Treatise to a foreign language in: Lucas Paccioli und Simon Stevin, nebst einigen jüngeren Schriftstellern über Buchhaltung. Skizzen zur Geschichte der kaufmännischen, staatlichen und landwirtschaftlichen Buchführung, Stuttgart, 1876, translates the word as jewels, Kleinodie. In contrast, Balduin Penndorf: Abhandlung über die Buchhaltung 1494. Nach dem italienischen Original von 1494 ins Deutsche übersetzt und mit einer Einleitung über die Italienische Buchhaltung im 14. und. Jahrhundert und Paciolis Leben und Werk versehen von..., Stuttgart, 1933, already translates it as precious stones, Edelsteine. John B. Geijsbeek: Ancient Double-Entry Bookkeeping. Lucas Pacioli's Treatise (A.D. 1494 — the earliest known writer on bookkeeping) reproduced and translated with reproductions, notes and abstracts from Manzoni, Pietra, Mainardi, Ympyn, Stevin and Dafforne, Houston, 1914, translates the term as jewels. Pietro Crivelli: An Original Translation of the Treatise on Double-Entry Bookkeeping by Frater Lucas Pacioli. Printed in Italian Black Letter, and Published in Venice in 1494. Translated for the Institut of Book-Keepers Limited by . . . , London, 1924, also translates it as jewels, the same as R. Gene Brown and Kenneth S. Johnston: Pacioli on Accounting, New York, 1963, whereas Robert Haulotte and Ernest Stevelinck: Luca Pacioli. Sa vie. Son oeuvre, Vesoul, 1975, translate the word as precious stones, pierres précieuses. This translation is also adopted by Ramón Cárdenas in his version of Luca Pacioli work: Summa de Arithmetica, Geometria, Proportioni et Proportionalita . . . Distinctio Nona, Tractatus XI, De Computis et Scripturis (De las Cuentas y la Escritura). Venecia, 1523, 2ª Edición. Versión y arreglo al español: Ramón Cárdenas C.: Traducción, prólogo y revisión: Dr. Giorgio Berni (Second Edition), UANL, Monterrey, N. L., Mexico, 1991. Carlo Antinori: "Il Trattato dalla 'Summa' del Paciolo. A cura di ...", in Summit. Gli speciali di Summa. Supplemento al n. 40 di Summa, November 1990, translates it, on the contrary, as gioie, jewels, in his version into modern Italian.

<sup>&</sup>lt;sup>9</sup> Jäger translates the term *coculegni* as *Kegelförmig*, conical, whereas Penndorf translates it as *dickgeschliffen*, an usual type of cutting in old times, based on Manzoni's expression *cuogolo*. Brown and Johnston, Haulotte and Stevelinck and Geijsbeek do not mention the term. Crivelli and Cárdenas leave it untranslated.

first translator of the *Treatise* into a foreign language, already translated the term correctly, using the word *Gabeln*, forks.<sup>10</sup> Carlo Antinori obviously does the same in his version of the *Treatise* in modern Italian.

We also find in this chapter a word, *verçini*, which has caused some difficulties for translators. In his German version of 1933, Balduin Penndorf translates this term as *Brasilholz*, i.e., brazilwood, a type of wood that was used for red dyeing. R. Gene Brown and Kenneth S. Johnston do the same in their translation into English of 1963, calling it *brazilwood*. In most of the other translations consulted, the term is not translated — an example that I have followed in mine, although mentioning these observations in a footnote. 11

<sup>&</sup>lt;sup>10</sup> Crivelli does not translate the term in the text. However in a vocabulary added at the end of his work, he attributes to this word the meaning of a peg.

<sup>&</sup>lt;sup>11</sup>Crivelli leaves also the term untranslated, but in the vocabulary provided at the end, the meaning attributed to it is also brazilwood. Haulotte and Stevelinck leave it untranslated. Antinori calls it legno verzino, which actually means brazilwood. However, as Antonio Lopes de Sá also observes in his comment to this paper, it is difficult to understand how people knew in Venice, in 1494, a product coming from a land which was incorporated to the crown of Portugal in 1500. Though it is known that navigators such as Vicente Yáñez Pinzón, the companion of Columbus, Alonso de Ojeda together with Americo Vespucio, and Diego de Lepe had visited the coast of Brazil, until the 22nd April 1500 it was not taken by Pedro Alvarez Cabral for the king of Portugal. On this day, Cabral landed at Porto Seguro and called the land "Isla de la Vera Cruz" (Island of True Cross). This is surely what has compelled more than one translator to leave the term untranslated. Nevertheless, we must not forget the fact that the name "brazil," which comes from the Old German brasa, i.e., fire, seems to be older than American's discovery and that the product itself, in the broad sense of red dyeing wood, was already known before this discover. Precisely, this wood gave its name to the land of Brazil. In fact, it seems that a tradition from the 13th and 14th centuries said that somewhere within the Atlantic Ocean there was a mysterious land where the forest produced a great deal of the dyeing wood used at that time to dye red; due to the color it gave, this wood was called brazilwood, (i.e., firewood). The cartographers of that time thought that this land was an island and located it in the middle of the Atlantic Ocean on the same latitude as the Land's End Cape in England. The first people who arrived at Vera Cruz found plenty of red dyeing wood, so they thought they had discovered the true land of brazilwood; they began to call the land in this way and, eventually, the name Brazil prevailed over Vera Cruz. Consequently, it is possible that the verzino or brazilwood mentioned by Pacioli, although not true brazilwood as we know it nowadays, (that is, wood from the tree Caesalpina echinata) were a sort of red dyeing wood, for instance campeche wood (Haematoxylon campechianum), which grows on the Caribbean coasts, or sapanwood (Caesalpina sappan), which grows in India, etc. Moreover, one must not forget that some varieties of Caesalpina which also produce red dyeing wood grow in

Chapter 9 contains a passage whose interpretation has recently raised some doubts. This passage, which refers to time purchases, starts and concludes as follows: "E cosi quando tu facesse le tue compre a tempo, commo se costuma ale volte farsi de guati overo biade, vini, sali e curami ... E così de liguati, o biade specificar tanto el migliaio, e tanto lo staro, o el moggio, o la corba dele biade, commo insul chiusi de peroscia si costuma, e de guati, al Borgo Sansepolcro nostro ... ", i.e., "And thus, if you make time purchases, as people sometimes do when buying fodder grass or cereal, wine, salt and hides ... The same occurs with fodder grass or cereal for which you will specify the price by unit of measure, so much the thousand pounds, the staro, the moggio or the basket of cereal, as it is customary in Chiusi of Perugia, or of grass, as in our Borgo Sansepolcro...". The meaning of biade in modern Italian is indeed "fodder cereal." To translate guati, I have adopted the interpretation usually given to this term, i.e., "grass" or "hay." However, Pierre Jouanique has recently pointed out to me that in modern Italian the expression guado means "woad," a plant whose leaves provide a tinctorial substance used as blue dye. The distinguished French accounting historian deduces that Pacioli did not refer to hay but to woad because it does not seem reasonable that hav should be sold in baskets. On the other hand, I myself must add that, although the translation of biade in modern Italian is, as we said, fodder cereal, there is a diminutive, biadetto, which is the blue pigment used by painters. It is thus possible that the two expressions used by Pacioli in this passage, biade and guati, may refer to tinctorial substances, as I explain in a footnote in my work. I have, however, retained the traditional translation.

The continuation of this passage also contains a term which has been incorrectly interpreted in all the translations consulted. The passage goes on as follows: "Al Borgo Sansepolcro nostro, Mercatello, Santangnilo, Cita de Castello, Furli, etc.". This sentence has traditionally been translated in the following way: "As in our small market of Borgo Sansepolcro, Santangelo, Città di Castello, Forli, etc." However, Pierre Jouanique drew again

the Antilles. In fact, the Tariffa de tutti costumi, cambi, monete, pesi, misure e usançe di lettere di cambi e termini di dette lettere che ne paesi si costuma, e in diverse terre, which is included in the Summa as Tractatus XII of the Distinctio nona, mentions in folio 223 r° a verçino colombino, "which must be thick and red, of good color." In this way, the term verzino used by Pacioli might possibly refer to a sort of red dyeing wood after all, even if it was not brazilwood proper.

my attention on the possibility that the word *Mercatello* did not refer to a small market but to the town of that name located on the Metauro River, precisely at the confluence of the Meta and Auro torrents which give rise to that river. I believe that the meticulous French researcher is absolutely right, considering that there is no reason to assume that the ortographic sign which separates *nostro* from *Mercatello* is placed there out of fancy. On the other hand, all the towns mentioned by Pacioli in this context are close to one another. The name of Santangelo may refer to two towns: Santangelo in Lizzola, near the coast and Pesaro, and Santangelo in Vado, on the same Metauro River, as Mercatello; Città di Castello is near Sansepolcro, a little further south; and the most distant one, Forli, stands to the north, near Ravenna.

In Chapter 10, Pacioli mentions for the first time in his *Treatise* the "escripture menute" that some translators have translated as "small records" or "minor records." This expression reappears later in various parts of the *Treatise*, though not in relation to short or scarcely important records. It appears that Pacioli used this term to refer to "loose records," as opposed to account books which formed a bound volume.<sup>12</sup>

Although the meaning of an expression used by Pacioli in Chapter 17 has been more or less correctly interpreted, it has plunged almost all translators into perplexity. Referring to the need to record everything and not to rely on memory, the distinguished Franciscan monk says: "Formarai la partita in giornale e quaderno per ordine, depennando e segnando in tutti lochi, che non tescordi, perche al mercante bisogna altro cervello che de beccaria." The most current translation of the sentence has been: "For the merchant needs a different brain to that of a butcher." Is believe the key to a correct interpretation can be

<sup>&</sup>lt;sup>12</sup> Jäger translates the term as kleine Handschriften, i.e., small handwritten records, practically the same as Penndorf who calls the scripture menute kleine Schriftstücke. Geijsbeek avoids the problem, calling them other instruments of writing. Crivelli translates them as trifles, the same as Brown and Johnston. Haulotte and Stevelinck also avoid the problem, translating the expression as missives, and Cárdenas calls them escrituras menores, minor records. Antinori translates them literally as scritture minute.

<sup>&</sup>lt;sup>13</sup> In effect, Jäger translates this passage as follows: "Denn dem Kaufmann ist ein besserer Verstand von Nöthen als dem Metger." Penndorf adopts a similar version: "Weil dem Kaufmann ein anderer Verstand nötig ist als dem Fleischer." Geijsbeek follows the same line in his translation: "Because the merchant must have a much better understanding of things than a butcher," the same as

found in Carlo Antinori's translation into modern Italian: "Poiché al mercante occorre altro cervello di quello che si vende nelle beccherie." Guided by this interpretation, I have translated the complete passage as follows: "You will have to post them all to the Journal and to the Ledger, one by one, in order, duly canceling and indicating all the things so as not to forget them, for the merchant needs a live brain and not those sold by butchers," which is certainly a little freer version than Antinori's.

At the end of the last paragraph of Chapter 32, there is an expression, "Ideo etc." which has usually been omitted by translators. Pierre Jouanique points out to me, however, that Ideo introduces a request to intercede. Elsewhere, Pacioli asks his readers to pray for him. In this case, he writes only the first word of the final formula of the Confiteor in Latin: Ideo precor ... et vos fratres, orare pro me ad Deum Dominum nostrum, i.e., "I thus beg ... and you brothers to intercede for me with God our Lord."

In Chapter 35, the following passage on how to dispatch the post has also caused doubts and difficulties to the various translators:

"Haverai in tuo studio overo scritoio una tassca, nela quale reporrai lettere che li amici te dessero che tu con le tuoi mandasse, alora se dici che la mandi a roma, mettila in tasca di roma, e se a firença in quella de firença, etc. E poi nel spaciare del fante pigliale con le tuoi al tuo respondente in quel tal luogo le manda, perche el servire sempre e buono e anche susa dar suo beveragio per esser servito. Atorno esso cinta compartita come si fa in piu taschette, cioe in tante quante sonno le terre e luoghi in le quali fai le toe facende, come diciamo: Roma, Firençe, Napoli, Milano, Zenoa, Lion, Londra, Bruça, etc. E sopra ditte taschette per ordine scriverai il suo nome, cioe a luna dirai Roma, alaltra Firença, etc., in le quali poi reporrai le lettere che per quelli luoghi te fossero mandate da qualche amico che la mandasse."

Crivelli: "For the merchant requires a different brain to that of a butcher." Brown and Johnston attribute a similar meaning to this expression: "The businessman must understand things better than the butcher." Likewise, Haulotte and Stevelinck interpret it as: "Car un marchand doit montrer plus de compréhension des choses qu'un boucher," and Cárdenas as: "Porque el comerciante necesita otros sesos que no sean los del carnicero," i.e., "Because the merchant needs another brain than that of a butcher."

The difficulty lay in making the part starting with *Atorno* agree with the preceding one. I have translated this controversial part in the following way: "With respect to the above, you could also have a belt or panel with as many pockets as business places...," i.e., have a belt or panel with various pockets instead of a separate bag for each business place, although this translation can also be questioned.<sup>14</sup>

In the last section of the *Treatise*, which is unnumbered and comes immediately before the examples of Ledger entries provided at the end of the work, there is an expression which could not be interpreted satisfactorily: "lane di limistri." Some translators have not translated the word limistri. However, in his English version of the *Treatise*, Crivelli translates this expression as mixed wool, the same as R. Gene Brown and Kenneth S. Johnston. In contrast, Balduin Penndorf considers it to mean exactly the opposite and translates it into German as *reine Wolle*, i.e., pure wool. <sup>15</sup> Carlo Antinori believes *Limistri* can be the name of the town where the wool originated, suggesting it was the Irish town of Limerick. I have chosen to leave the word untranslated with a reference to the various interpretations in a footnote.

<sup>&</sup>lt;sup>14</sup>In his translation, Jäger avoids the problem, considering the second part as a simple repetition of the first. More precise, Penndorf says: "Man kann die Briefe auch im Kreise herum auf mehrere Taschen verteilen . . . ", i.e., "The letters can also be distributed in several bags in a circle . . . ". Geijsbeek also tries to be faithful to the text, although not quite successfully, as it seems, saying: "You should have several little compartments, or little bags...". Crivelli gives an original interpretation: "By the messenger who is belted with the parcel of letters which is made up of several pockets ... ". A similar interpretation is given by Brown and Johnston: "The messenger wears a belt with several pockets for carrying letters." Haulotte and Stevelinck introduce a small difference: "Le sac du courrier peut comporter autant de petits compartiments ou poches ...", i.e., "The mail bag may be divided into as many small compartments or pockets . . . ". This translation is also adopted by Cárdenas: "Respecto a la valija, ésta irá dividida en tantas pequeñas bolsas ...", i.e., "With respect to the bag, it will be divided into as many small pockets . . . " and Antinori: "Il sacco del corriere può avere tanti piccoli compartimenti o taschette . . . ". This interpretation could be plausible but I did not dare to adopt it because I do not clearly understand how this way of delivering the mail could work and also because this description is not really in accordance with the following explanations.

<sup>&</sup>lt;sup>15</sup> Jäger sincerely puts a question mark instead of translating *limistri*, although it seems that he is also inclined to think that it is the place of origin. Geijsbeek also leaves the term untranslated, whereas Haulotte and Stevelinck omit the word. Cárdenas leaves it untranslated, explaining in a note that "Al parecer, no ha sido posible encontrar el verdadero significado de dilimistri," i.e., "It has apparently been impossible to ascertain the real meaning of dilimistri."

## TECHNICAL OBSCURITIES AND AMBIGUITIES

This section deals with the obscurities, inaccuracies and ambiguities which effect more directly explanations on commercial, banking and, above all, accounting customs and practices.

The first difficulty is chiefly conceptual. It appears in Chapter 1 and refers to the three things basically needed by anyone who wishes to engage in business activities. According to Pacioli, the main one is "la pecunia numerata e ogni altra faculta sustantiale, Juxta illud phy unum aliquid necessariorum (sic) est substantia. Senca el cui suffragio mal si po el manegio traficante exercitare." Leaving aside the error of printing necessariorum instead of *necessarium*, this passage has caused serious difficulties to translators and scholars because nobody knew how to interpret the concept of sustantia or sustantiale in this context. In my Spanish version, I have translated the passage as follows: "The main of them is cash money and any other patrimonial good which can be converted into money, since without money or means of payment, it is difficult to negotiate. As the Philosopher already said: only one thing is necessary: the substance, that is, the patrimony." I based this translation on Pierre Jouanique's interesting analysis of the use of the Latin term substantia by Pacioli in this juridical and commercial context. This term is the translation of the Greek word ousia used by Aristoteles - who is "the Philosopher" referred to by Pacioli - to designate the essential part of things, i.e., what remains in things that change. According to Jouanique's interpretation, the term substantia or patrimony refers to what remains to the abstract global concept of all property owned as a whole while its specific components (money, goods, real state, etc.) change [Jouanique, 1987, p. 253]. On the other hand, it should be remembered that in modern Greek the concept of patrimony is precisely designated by the word periousia. In any case, this interpretation is totally familiar to German scholars because one of the meanings of Substanz is still that of real or actual capital. The expression "von der Substanz zehren" means, in financial slang, "to live off the capital" or "to eat up one's capital."16

<sup>&</sup>lt;sup>16</sup>According to what has been said, Jäger correctly translates the expression "e ogni altra faculta substantiale" as "jene andere Vermögenssubstanz," i.e., "and any other good or patrimonial capital." Penndorf does the same. Geijsbeek finds it more difficult and says only: "The most important is cash or any equivalent,"

Another complicated expression in this sense is found in Chapter 3 where, referring to the precautions to be taken when entering deposits made in banks and credit entities, it is said that: "E nota el milesimo che respondano a tempo per tempo acio sappia quando vengano li so pro, e quanto per cento respondino." Although the meaning of the expression seems clear to all or almost all translators, a number of them had some difficulty in finding the correct translation. My own version reads as follows: "Also note the year in which the deposit falls due and the maturity dates, so that you may always know when interest is due and what percentage you should receive." 17

without going more deeply into the subject. Crivelli does not understand the expression either and says: "Or any other substantial power." Brown and Johnston get nearer to the true meaning of the sentence, translating it as: "The most important is cash, or some equivalent economic power." Haulotte and Stevelinck translate the expression in the narrow sense: "La principale chose est la monnaie métallique ou tout autre moyen de paiement," i.e., "The main thing is coin or any other means of payment." Cárdenas translates it literally: "La principalísima es el dinero contante, así como de otros bienes sustanciales," i.e., "The very main thing is cash money, as well as other substantial goods." Antinori gives a similar interpretation: "La principale è la moneta contante e ogni altro valore corrente," i.e., "The main thing is cash money and any other current value or good." In my opinion, the importance of the sentence lies in the expression "and any other patrimonial good" and the sentence can be completed in the sense that Pacioli apparently wanted to stress, by adding, as I did, "which can be converted into money."

<sup>17</sup> Interpreting correctly the meaning of the expression, Jäger translates it as: "Erwähne auch die Jahreszahlen, welche dem Verfall der Zinse entsprechen, damit man weiss, wann letztere verfallen, ferner wie viele Procente dieselben betragen," i.e., "Also indicate the year in which interest is due, so that you can know the maturity date and the percentage to be applied." Penndorf attributes to these words the same meaning: "Bemerke auch die Jahreszahlen, die der Fälligkeit entsprechen, damit man weiss, wann die Zinsen Fällig sind, und wieviel Prozent sie betragen." Geijsbeek is a little less accurate: "And you must also see that dates are put down precisely so that you know when everything falls due and what the per cent is." Crivelli is even more inaccurate, saying: "Take note of the date on which they reply to you from time to time, so that you may know what is due to you and what percentage they are answerable for." Brown and Johnston translate the expression in the same sense: "Carefully note the dates of their correspondence, so that you know the amount due you and what percentage they are answerable for." Haulotte and Stevelinck provide, in my opinion, the most correct translation among those reviewed up to now: "Je note aussi quand le dépôt fut effectué et pour quelle durée afin d'en connaître le jour de l'échéance, ainsi que le pourcentage qui doit le rétribuer," i.e., "I also note when the deposit was made, and for how long, in order to know the maturity date, as well as the percentage to be applied to it." Cárdenas is not sure that the word millesimo used by Pacioli means year. For this reason, he leaves it untranslated, although he indicates in a

In Chapter 6, an expression used throughout the treatise appears for the first time. This expression has apparently been misunderstood by some translators. I refer to the expression cavar fora, i.e., to take out. When talking about the entries made in the Memoriale, the Memorandum, it is said that: "In questo tale (the Memorandum) non fa caso a che moneta si cavi fore, commo nel giornale e quaderno, che di sotto se dira, etc. El quadernieri asetta tutto poif lui quando de li pone in giornale." The sentence refers to the cash amounts of operations that had to be carried to the money column, i.e., out of the body of the entry.18 The expression "sacar fuera" was used with the same meaning by Castilian bookkeepers in the sixteenth century. In this case it is explained that, when posting the entries to the Memorandum, the kind of money (i.e., ducats, pounds, pennies, etc.) which was carried to the money column did not matter. The contrary occurred with the Journal and Ledger where the money of account always had to be the same so that homogeneous money columns could be added up. This did not matter in the Memorandum because the bookkeeper would convert them all into the required money of account when posting the entries to the Journal. It should be pointed out that we are exclusively referring to the money column since the money in which operations were actually carried out was obviously recorded in the entry's explanation. 19

note that it apparently represented the last two figures of the corresponding millenium, i.e., the year referred to and, by extension, also the date. However, his translation basically corresponds to the meaning of the expression: "Y anota el millesimo que corresponda en cada caso, los porcientos (réditos) que te corresponden, etc.", i.e., "And note the millesimo which corresponds in every case, the percentage (yield) applicable to you, etc.." Antinori's translation is, of course, perfect: "Nota anche quando il deposito fu effettuato e per quale durate, per sapere quando siano riscuotabili gli interessi e a quale percentuale corrispondano," i.e., "Also note when the deposit was made and for what period of time to know when interest is due and what percentage is to be applied."

<sup>&</sup>lt;sup>18</sup>In her *Glossary of Medieval Terms of Business. Italian Series 1200-1600*, Cambridge, Mass., The Medieval Academy of America, 1934, p. 71, Florence Edler interprets the expression "cavare fuori" with this same meaning and quotes, moreover, as an example the corresponding text of Luca Pacioli in folio 200 r.

<sup>&</sup>lt;sup>19</sup> Jäger did not understand at all this passage that he translates as follows: "Denn bezüglich dieses Buches ist es nicht, wie im Journale und Hefte, gleichgiltig, was für Münzen man ausgiebt oder einnimmt," i.e., "Because in this book, the kind of money used for payments or collections is not unimportant, as in the Journal and Ledger." The translator interprets that the expression cavar fora means to spend, to pay. In contrast, the meaning given by Penndorf to the

In Chapter 9, there is another term which has also created much confusion among most translators. When describing the forms of payment to be used to purchase merchandise, Pacioli mentions payment "per asegnatione de ditta." Considering that today ditta means "business firm" in Italian, it is not surprising that some translators have translated the expression as "drawing a bill of exchange against a business firm." This is how it has been translated for instance by Carlo Antinori or Ernst Ludwig Jäger who uses the expression "Anweisung einer Firma." I do not believe this translation is correct. Others have limited themselves to translate it as draft, bill of exchange or payment order. This is more correct, though the translators who used

expression is more correct: "Denn in diesem Buche ist die Geldsorte, die du auswirfst, nicht so von Bedeutung wie im Journal und Hauptbuch," i.e., "Because in this book the kind of money recorded in the margin is not so important as in the Journal and Ledger." Geijsbeek understands that it is not necessary to reduce the monies to a single money of account but he does not get the meaning of cavar fora: "As far as this book is concerned, it is not as important to transfer to standards the various kinds of coin handled as it is with the journal and ledger." Crivelli does not understand it so well: "Because in this book it is not necessary to separate the monies as in the Journal and Ledger." Brown and Johnston do understand the basic meaning but, the same as Geijsbeek, they avoid the problem of translating cavar fora: "It is not necessary to standardize monies in this book, although it is required in the Journal and Ledger." Haulotte and Stevelinck do the same: "Dans ce livre, il n'est pas nécessaire de réduire à une commune unité monétaire les diverses espèces de monnaie, comme c'est le cas pour le Journal et le Grand Livre," i.e., "In this book, it is not necessary to reduce the various kinds of money to a single money of account, as in the Journal and Ledger." Cárdenas also follows the same line: "Porque en este libro no tiene caso en qué monedas se anoten las transacciones; no pasa lo mismo con el Diario y el Mayor," i.e., "Because in this book, it does not matter in which money transactions are recorded, as opposed to the Journal and Ledger." Although Carlo Antinori knows perfectly the meaning of cavar fora, he does not consider it necessary in this case to specify the question and simply translates as the previous translators: "Perché in questo libro non è necessario ridurre a una comune unitá monetaria, tutte le specie di monete come invece si deve fare nel Giornale e nel Libro Mastro."

<sup>20</sup>Penndorf provides an interesting interpretation, although he translates "asegnatione de ditta" as "Anweisung weiner Bürgschaft," i.e., delivery of a guarantee. Based on Ehrenberg (Das Zeitalter der Fugger, Jena, 1922, II, p. 124), to him the word ditta means Zahlungsversprechen, promissory note, and in this case, he believed that the expression used by Pacioli referred to the guarantee given by a bank in relation to the payment order drawn by a client against his current account. This interpretation cannot be totally discarded, although it seems exceedingly complex. Actually, ditta was a simple payment order against a bank, an antecedent of the modern check, as explained in another note. Geijsbeek translates the expression as draft, without going into details. Crivelli

this term do not seem to have actually understood the meaning of the expression. Even before the times of Luca Pacioli, the word *ditta* originally had a perfectly determined meaning: it was a verbal payment order — hence the name *ditta* — that a client gave in person to his bank to pay against his current account a cash amount to a given beneficiary who was also present.<sup>21</sup> Later, payment orders evolved to written instruments that gave rise, in the course of time, to modern checks. However, in Italy and even in Catalonia, the name *ditta* continued to be used for this purpose for many years [Conde y Delgado de Molina, 1988]. Therefore, I understand that payment "per asegnatione de ditta," as mentioned by Pacioli, should be translated as draft or payment order against a bank and this is how it appears in my version.<sup>22</sup>

bothers to specify a little further and translates it as "a firm's draft." Brown and Johnston, on the contrary, translate it only as draft. Haulotte and Stevelinck use, however, the expression "lettre de change tirée sur une maison commerciale," i.e., "bill of exchange drawn on a trading house." Cárdenas leaves it untranslated in the text but correctly explains in a note: "Puede traducirse como 'orden de pago' o 'giro' a cargo de un banco, previo depósito expreso, de acuerdo con una práctica de la época," i.e., "It can be translated as 'payment order' or 'draft' against a bank, after making a deposit in same, as it was usual at that time."

<sup>21</sup>This is how it is explained, among others, by Federigo Melis: "una girata orale, pronunciata dal beneficiario alla presenza del trattario, a somiglianza di quanto avveniva fra girante e giratario di conto presso le banche di giro." See his work "Una girata cambiaria del 1410 nell'Archivio Datini di Prato," in Federigo Melis: La banca pisana e le origini della banca moderna, Florence, 1987, p. 303. An interesting and well-known controversy arose precisely on this question some years ago between Abbot P. Usher and Raymond de Roover, on one side, and Federigo Melis, on the other. The first two authors thought that in Italy, in the 14th century, all payment orders to banks had to be transmitted verbally and necessarily required the presence of both parties. On the contrary, Melis defended the idea that, although this was the current usage, it did not exclude the existence of written orders delivered to the bank by messengers, or even by the beneficiaries themselves, without requiring the presence of the bank's client.

<sup>22</sup> In his kind observations to this work, Carlo Antinori reasserts that, in his opinion, "assegnatione de ditta si interpreta come ordine di pagamento a una ditta, mediante lettera di cambio" of which, as he points out, Luca Pacioli provides an example in folio 167 vº of the Summa. And this without taking into account, as he says, that if it were not so "la forma di pagamento mediante ordine con lettera di cambio non sarebbe stato contemplata perchè non indicata." Indeed, Antinori is right on this point but it should not be forgotten that, in the fifteenth and immediately following centuries, the bill of exchange was not used as a payment instrument among merchants, unless payment was to be made abroad and in a currency different from that used in the town where it was drawn. On the other hand, Pacioli does not seem to use in his Treatise the expression ditta, as assumed by Antinori, in the current sense of firm, concern or company. Finally,

An observation made by Pacioli in Chapter 12 with respect to the valuation of assets has caused much perplexity to more than one scholar. Pacioli says: "Ponendoli (to the goods) tu per te un comun pregio. E fallo grasso piu presto che magro. Cioe, se ti pare che vaglino 20, e tu di 24, etc., acio che meglio te habia reuscire el guadagno," i.e., "And you will value them (the goods) according to your own judgment at their current value that should be rather high than low. For instance, if it seems to you that a thing is worth 20, value it 24, and you will thus obtain a greater profit." If this observation is considered a formal accounting valuation rule, it is really disconcerting. No wonder that several authors have severely criticized this statement, attributing it to a lapsus of the author.23 In my opinion, however, we should not give so much importance to what I believe to be a mere subtlety of a crafty merchant which has nothing to do with an accounting overvaluation criterion of assets. If you try

the expression assegnatione de ditta does not appear at all in the treatise on exchanges mentioned by Antinori, nor is there any reason to assume that this expression could be synonimous with lettera di cambio. In effect, Luca Pacioli devotes folios 167 ro (there is a typographical paging error, since the folio is numbered 168 instead of 167) to 173 vo of his Summa to the Tractatus quartus none distinctionis under the title De cambijs seu cambitionibus that he translates in the general index as Dechiaratione de tutte sorte cambi, cioe reale, secco, fittitio e come o vero diminuto, qual di loro sea licito e laudabile secondo la sancta chiesia e commo se intenda ciascuno secondo luso mercantesco. In this treatise, Pacioli explains the four types of exchanges he distinguishes, adding numerous practical examples. However, when he refers to the documentary instrument of exchange, he always mentions the lettera di cambio.

<sup>23</sup> Among them, Carlo Antinori says that it is "un consiglio errato," i.e., "a wrong advice" and that "si tratta di un autentico invito all'annacquamento del capitale, anche se trattandosi di valutazione iniziale non si migliora il guadagno futuro, anzi lo si disminuisce," i.e., "it is a real invitation to overvalue the capital, besides the fact that, as it is an initial evaluation, the future gain is not imporved but reduced." ("Il Trattato dalla 'Summa' del Paciolo. A cura di Carlo Antinori," in Summit. Gli speciali di Summa. Supplemento al n. 40 di Summa, November 1990, p. 7). Jäger briefly observes in his translation: "Diess ist heut zu Tage nicht mehr erlaubt," i.e., "This is not allowed today." Penndorf also feels the need to remark in a footnote: "Die Praxis befolgte jedoch den richtigen Grundsatz des Niedrigstwertes," i.e., "However, the principle of the lesser value was correctly followed in practice." Cárdenas also makes a remark in a note, besides putting a question mark between brackets in the text. In his note, after suggesting several possible explanations, he concludes: "Por tanto, se estima que Paciolo está sufriendo en este caso una confusión de conceptos, lo cual se atribuye a que, como se sabe, Paciolo no era contador," i.e., "Therefore, it seems that Pacioli was suffering a conceptual confusion in this case due to the fact that, as it is wellknown, he was not an accountant."

to value your goods at a rather high price, you will not yield so easily to the temptation of selling them at a scarcely remunerating price. According to this interpretation, in my translation, the last part of the passage appears as follows: "And in this way it will be easier for you to make a profit." In any case, it is clear that this too is a very subjective interpretation. However, it is necessary to point out that Pacioli's words seem to refer exclusively to goods whose purchase price is not known, when calculating the Inventory, because they were bought before starting to keep the relevant accounts.

The title of Chapter 13 refers to the Index of the Ledger in the following way: "E del suo alfabeto, commo se debia ordinare. ugnolo e dopio," i.e., "And of its index, how it should be ordered, single or double." In the chapter itself, however, only a short reference to this double way of ordering can be found without any clear explanation, when Pacioli says: "Nel qual (the index) porrai tutti debitori e creditori per le lettere che començano con lo numero dele sue carti, cioe quelli che començano per a in a, etc., e del dopio alfabeto," i.e., "In which (the index) you will put down all debitors and creditors, with the number of their folios, by their first letter, that is those that start with an A under A, etc., and of the double alphabet." It is possible that this last sentence is an incomplete one as it also occurs with the last sentence of Chapter twenty-six. In any case, it does not seem to make sense and this is, no doubt, the reason why most translators have omitted the last part of the title and the translation of the mentioned reference.<sup>24</sup> At any rate, the double option indicated by

<sup>&</sup>lt;sup>24</sup>This is, for instance, what Carlo Antinori does. He entitles this chapter: "Del terzo ed ultimo libro principale mercantile detto MASTRO, come deve essere tenuto col suo REPERTORIO," and omits any mention of the reference made in the text. Haulotte and Stevelinck do exactly the same. Jäger maintains the complete title but does not mention the reference in the text. In contrast, Penndorf translates it literally, which is not much help to understand the sense, although he explains correctly in a footnote: "Doppelt, weil auch innerhalb eines jeden Buchstabes die Namen alphabetisch folgen," i.e., "Double because the names appear in alphabetical order also under each letter." Geijsbeek also translates the complete title but omits the reference in the text. Crivelli makes a serious mistake in his translation of the title: "Of the Third and last Principle Mercantile Book called the Ledger, How it is to be kept Single without, or Double with its Alphabet" and again in the text after the mentioned passage: "It will be best to sign the double Alphabet (Ledger) . . . " Brown and Johnston also make the same mistake in their translation of the title, surely induced by Crivelli's translation, but they do not make any reference in the text. Cárdenas translates the complete title and mentions the reference in the text but his explanation does not make

Pacioli answered a fact that was already explained by Karl Peter Kheil in his analysis of Jehan Ympin's text. In the single index, only one page of the book is used for each letter of the alphabet. On this page are recorded the accounts whose heading or holders' Christian name starts with that letter, indicating immediately after the folios where the respective accounts appear in the Ledger. On this page, the headings of the accounts are written without any order as the accounts are opened in the Ledger. In contrast, in the double index, all the letters of the alphabet are listed on the page or double page of the book used for each letter, leaving a blank for each of them, thus forming a kind of alphabetical subdivision under each letter. The accounts are then recorded in the corresponding subdivision according to the first letter of the surname, if it is a personal account, or to the second letter of the heading, in other cases.<sup>25</sup>

In this same Chapter 13, Pacioli explains how to keep the Ledger and uses an expression: faciata, which appears later on several occasions with the same meaning and which does not seem quite clear to me. In modern Italian, apart from the architectural meaning of front, any face of a building, facciata also means page, side (of a sheet). For this reason, almost all translators translate it as "page." Interpreting the word according to the meaning of the sentence in which it is included and taking for granted that Pacioli used two facing pages to keep the Ledger accounts, 26 I gave to the word faciata the meaning of Ledger

much sense: "...comenzando por A, en la A, del propio alfabeto," i.e., "...if it begins by A, under A of the alphabet itself."

<sup>&</sup>lt;sup>25</sup> See Karl Peter Kheil: *Historia de la Contabilidad*, Alicante, 1902, p. 71 f. More recently, Basil S. Yamey has studied the Ledger indexes in his article: "The Index to the Ledger: Some Historical Notes," in *The Accounting Review*, vol. 55, no. 3, July 1980. José María González Ferrando has also referred to this subject in passing, in his usual detailed and meticulous style, in his work: "Bartolomé Salvador de Solórzano, adelantado de la 'Contabilidad Aplicada' en España," in *Revista Española de Financiación y Contabilidad*, vol. XX, no. 68, July-September 1991, p. 727 f. In his book *Nieuwe Instructie Ende bewijs der loofelijcker Consten des Rekenboecks ende Rekeninghete te houdene nae die Italiaensche maniere*, Antwerp, 1543, Jehan Ympym provides an example of double index.

<sup>&</sup>lt;sup>26</sup> However, Pacioli does not specifically write anywhere in his *Treatise* that in the Ledger an account is written on two facing pages. Basil S. Yamey, too, notices this fact in his comments to this paper. In any case, it seems that the traditional form to keep the Ledger in the early Venetian practice was precisely to write the accounts on two facing pages, as we can see for instance from the words of Paliano di Folcho da Firenze used as heading of his Ledger written in

double page or folio in my translation. I shall return to the subject later in another context. Specifically, Pacioli's passage reads as follows: "E in la prima sua carta, dentro, porrai debitrici la cassa: si commo ella e la prima nel giornale, così deve essere prima nel quaderno. E tutta quella faciata si costuma lasarla stare per ditta cassa, e in dar ne in havere non si pone altro, e questo per che la cassa se manegia piu che partita che sia," and my translation is: "In the first folio, on the inside face, that is on the reverse, you will put down the Cash, on the debit side, since as it is the first entry in the Journal it should also be the first one in the Ledger. And these two facing pages are usually reserved to Cash. Thus, nothing more is to be recorded neither on the debit side, nor on the credit side. This is done so because the Cash is used more than any other account."<sup>27</sup>

Also in Chapter 13, Pacioli describes the lines to be drawn in the Ledger and there seems to be a small ambiguity in this respect because it is sometimes not clear whether the word riga is used in the sense of line or column. At any rate, it is explained that two lines must be drawn before the space corresponding to the body of the entries to indicate the date of each of these entries so as to locate them easily: "E dinançe farai 2 righe per potere mettere li di de mano in mano, commo ne li altri quaderni hai visto che piu non mi stendo in questo, etc., per poter trovar presto le partite." In Chapter 15, however, when explaining that in the Ledger the date is not written in the upper part, at the

<sup>1382: &</sup>quot;...e scriverollo alla viniziana, cioè ne l'una carta dare e di rimpetto l'avere...," i.e., "... and I shall write it in the Venetian fashion, that is, the debit on one page and the credit on the other...," or from the words of Americho di Giovanni di Americho Benci, citizen and merchant of Florence, at the beginning of his Ledger of 1459: "...il quale se terra alla viniziana, cioè da una faccia il dare et dall'altra l'avere...," i.e., "... which will be kept according to the Venetian model, that is, the debit on one page and the credit on the other...". Quoted from Fabio Besta: La Ragioneria, quoted work, Vol. III, pp. 328 f.

<sup>&</sup>lt;sup>27</sup> Jäger translates: "Und man pflegt jene ganze Seite für besagte Cassa leer zu lassen," i.e., "And it is customary to leave the whole page empty to the mentioned Cash." Penndorf says exactly the same. Geijsbeek as well: "It is customary to reserve the whole of the first page to cash." Crivelli does not introduce any significant change: "The whole page must be left to cash." Neither do Brown and Johnston: "Reserve the entire first page for Cash." Haulotte and Stevelinck follow the same line: "D'habitude, on réserve toute la page a la Caisse," i.e., "The whole page is usually reserved to Cash." Cárdenas uses the term sheet instead of page: "Y toda la hoja déjala para la Caja," i.e., "And leave the whole sheet to Cash." Antinori follows the general criterion: "Abitualmenta si riserva tutta la pagina alla Cassa."

beginning of the page, as in the Journal, because entries in a Ledger account will usually correspond to different dates, it is specified that the dates will be included in the body of the entry: "Ma dentro dela partita."<sup>28</sup> This is what appears in all the examples of Ledger entries provided in the Treatise, including the ones provided in the appendix which are formulated following the Tuscan and not the Venetian model as the previous entries do. Later on, we shall return to the use in Pacioli's Treatise of two different models of ledger entries, a fact which is well know to scholars.

One of the passages that was more difficult to understand appears in Chapter 14 and refers to the convenience of recording in the Ledger, when posting the Journal entries, the credit accounts immediately after the debit accounts or, at least, as close as possible. Pacioli says, however, that even if it is not done so, it will not matter very much: "E nota che sempre quanto piu presso tu porrai mettere el creditore al suo debitore sera piu liçadro, avenga che posto dove si voglia, tanto monti. Ma per rispetto del milesimo, che ale volte se interpone fra una partita e laltra responde male, con fatiga non poca se ritrovano lor tempi . . . E pero sempre studia dassetar ditto creditore immediate a presso el suo debitore in la medema faciata o vero in la imediate sequente, non interponendovi fra luno e laltro altra partita." Added to the real interpretation difficulties of this passage are those caused by the indiscriminate use made by Pacioli in the first part of his Treatise of the term partita to designate both an entry and an account. No wonder translators and scholars have faced serious interpretation problems. In my Spanish version, I have translated the passage as follows: "And note that the closer you place the account for the credit entry to the account for the debit entry, the better the accounts will be located, although it actually does not matter very much where the credit account is placed. But it could make a bad impression if an account corresponding to a different year is interposed between the debit and the credit account, as it may sometimes occur, apart from the difficulties that would arise in locating the accounts by their date ... For this reason, always try to place the credit account immediately after the debit account, in the

<sup>&</sup>lt;sup>28</sup> It is possible that this apparent contradiction has something to do with a different treatment depending on whether the entry was the first one in the page or not, as Basil S. Yamey thinks. In fact, it seems that this was the practice in Venice in the fifteenth century.

same folio,<sup>29</sup> or in the following one, without interposing any other account between both."<sup>30</sup>

In Chapter 15, Pacioli insists that accounts should be entered in the proper place (suo condecente luoco), without prejudice when two or three accounts may be recorded in the same folio, if there is sufficient place. In Chapter 28, he makes clear what is meant by proper place when explaining how accounts are carried forward to a new folio: "E questo medesimo modo observarai in tutte partite che havesse a reportare avanti, incatinandole al modo ditto e sença intervallo alcuno, pero che sempre le partite si vobliano ponere come nascano de luogo sito di e milesimo, acio nisun te possi caluniare," i.e., "You will do the same with all the accounts you will have to carry forward to a new folio, linking them as explained, without leaving any blank between them and the previous ones, because accounts should always be placed in the proper place, following the same order

<sup>&</sup>lt;sup>29</sup> As can be observed, the term used by Pacioli is *faciata*, which is one more reason for having translated it in a previous passage as double page or folio of the Ledger. This is what we have done in this case, taking for granted that Pacioli kept the debit and credit entries in the Ledger not in a single page, as it would also be possible, but on two facing pages.

<sup>&</sup>lt;sup>30</sup> Jäger does not translate partita as account but as Posten, entry. This leads him to misinterpretations when referring, as in this passage, to Ledger entries. He himself realizes that he is not on firm ground and says in a footnote with respect to Pacioli's remark that it will be better to place the credit account near the debit account: "P. hat, wie aus dem folgendem Satze hervorgeht, hier die Zeitfolge im Auge, welche sowohl im Soll als in Haben möglichst einzuhalten sei, was aber nur hbei Detaileintragung möglich ist," i.e., "As it can be seen in the following sentence, P. refers to the chronological sequence that should be maintained whenever possible both on the debit and the credit sides. However, this is only possible with loose entries." In the second part of the passage, he omits any reference to faciata. Penndorf's version is not very different, although he does not make any remark and translates faciata as page in the second part. Geijsbeek also interprets partita in this context as entry and, for the sake of consistency, translates faciata as line, thus making it even more difficult to understand the passage. In contrast, Crivelli, translates in this case faciata as facing, although this does not improve the understanding of the text. Brown and Johnston increase confusion even more, trying to complete Geijsbeek's version in a logical way and translating the second part of the passage as follows: "Always try in the Journal to place the credit following the debit in the same line or in the line immediately following." However, this text does not refer to the Journal but to the Ledger. Haulotte and Stevelinck also interpret partita as poste, entry, their version being thus substantially similar to the previous ones, but they translate faciata as page. Cárdenas follows the general trend and understands that partita means entry although, in accordance with his previous version, he translates faciata as sheet. Antinori also interprets partita as entry.

in which they were originated, by their day and by their year, so that nobody may calumniate you."

Likewise, in Chapter 15, it is mentioned that Ledger entries referred to accounts that only concern the books' owner requires less explanations than other accounts. On the contrary, in the case of entries on which account is to be rendered, all the required information should be recorded, although it will always be possible to find more details in the Journal. This differentiation of accounts that only concern the books' owner, that is of "quelle che solo a te sapartengano," such as merchandise expenses, household expenses, income and expenditure, unusual expenses, etc., is also found in Chapter 34 when explaining how to close the old Ledger and open the new one. Some authors have found in this differentiation of accounts and in the greater accounting accuracy to be applied in the case of accounts affecting third parties a supporting argument to the theory that the concept of account and even double-entry bookkeeping developed from the need for rendering accounts. Pierre Jouanique, in particular, mentions these passages to draw the attention to the fact that Pacioli distinguished between two types of accounts: those on which account was to be rendered to somebody and those on which account was only to be rendered to oneself. Thus he concludes that "le compte est quelque chose dont on rend compte," i.e., "the account is anything on which account is rendered" [Jouanique, 1987].

At the beginning of Chapter 17, Pacioli provides a few examples of banks or deposit entities which have not always been interpreted well by translators. The first entity mentioned is the Loan House of Venice which was sufficiently known and was correctly interpreted. However, he adds: "in firença, el mote dele dote in genoa li lochi," references which have generally not been well understood.<sup>31</sup> In the first case, Pacioli refers to the Dowry Fund of Florence that has recently been studied in depth by Julius Kirshner and Anthony Molho.<sup>32</sup> In the case of Genoa, our

<sup>&</sup>lt;sup>31</sup> Jäger, for instance, refers to the *Institut für Aussteuer*, Dowry Fund, of Genoa and "sonstige Officien und Bureaux," other offices. However, Penndorf is well informed and explains in a footnote what were the Dowry Fund of Florence and the *loca* of Genoa. Geijsbeek, Crivelli, Brown and Johnston, Haulotte and Stevelinck and Antinori practically say the same as Jäger. On the contrary, Cárdenas refers correctly to the *Monte delle Dote* of Florence and the *Luoghi* of Genoa

<sup>&</sup>lt;sup>32</sup> Julius Kirshner and Anthony Molho: "The Dowry Fund and the Marriage Market in Early Quattrocento Florence," in *The Journal of Modern History*, vol.

author refers to the *Casa* or *Officium Sancti Georgii*, a well-known municipal public bank, created in 1408, that was one of the first in Europe after the *Taula de Canvis i Comun Dipōsits* of Barcelona, established in 1401, and the *Taula de Canvis i Comun Dipōsits* of Valencia, created in 1407. The *luoghi* or *loca* were standard bonds whose face value was 100 liras. These bonds, which all bore the same interest rate, were introduced in 1407 as a result of the drastic reform of the Genoese municipal finance undertaken that year to reconvert and unify public debt and put an end to the countless debts and loans of all types incurred by the town council. The bonds' owners grouped together, forming the aforementioned municipal bank [Felloni, 1991, p. 225-246].

In this same chapter, Pacioli insists on the need, already pointed out in Chapter 3, to carefully keep the evidence of accounts held with banks and public offices due to the fact that these entities maintain business relations with so many people and are, moreover, accustomed to change accountants and clerks quite frequently. He ends up saying, after a short digression: "E pero fa che sia a casa e col capo a botega." This sentence is surely difficult to understand, thus it has often been eluded or wrongly interpreted by translators. In my opinion, as I specified in my translation into Spanish, the sentence refers to the abovementioned evidence. Thus, the Spanish version is as follows: "Therefore, keep very carefully the evidence at home or under the care of the clerk in charge of your business." 33

<sup>50, 1978,</sup> p. 403-438. Later on, the subject was further studied in the work by Anthony Molho: "Investimenti nel Monte delle Doti di Firenze. Un'analisi sociale e geografica," in *Quaderni storici*, vol. 61, 1986, p. 147-170. See also the work by Julius Kirshner and Jacob Klerman on this same fund: "The Seven per Cent Fund of Renaissance Florence," in *Banchi pubblici, banchi privati e monti di pietaì nell'Europa preindustriale. Amministrazione, tecniche operative e ruoli economici. Atti del Convegno, Genova, 1-6 ottobre 1990, nella sede della Società Ligure di Storia Patria, Genoa, 1991, p. 367-396.* 

<sup>&</sup>lt;sup>33</sup> Jäger, who translates scontro, receipt, warrant, as Rechnung, account, calculation, trying to find a meaning to the whole context, translates the last part of the passage as follows: "Sorge deshalb dafür, dass Du die Aufmerksamkeit zu Hause und den Kopf in dem Laden behälst, wenn du mit solchen Leuten zu thun hast," i.e., "Therefore, be careful to keep your attention at home and your head in the store when you have to deal with that kind of people." Penndorf says something similar: "Sorge deshalb dafür, dass Du darin zu Hause bist und mit solchen Leuten mit Bedacht handelst," i.e., "Therefore, be careful to be at home and deal with these people with every caution." Geijsbeek attributes the same meaning to this passage: "Therefore, be very careful when dealing with them,

Chapter 17 also contains a passage with another linguistic difficulty that made translators rack their brains. Referring to accounts kept with public offices. Pacioli says: "E cosi tirrai conto con li gabellari e datiari de robbe che tu vendi e compri. cavi e metti nele terre, etc., come si costuma fare in vinegia, che si tiene per li piu dela terra conto longo con lo officio dela messetaria." The expressions "cavi e metti nele terre," i.e., "bring in or take out of the country" or "unload or load," "import or export" and "per li piu dela terra," i.e., "in most of the country" have raised the greatest difficulties even to such an expert on Pacioli's work as the historian of Italian accounting Carlo Antinori. I have given the following translation to this passage as I believe it may be the most correct: "You will do the same with the accounts you keep with tax collectors on things you sell and buy, or load and unload, as it is customary in Venice where most people hold an extensive account with the office of the Messetaria "34

and be observant at home and keep your head in the store." Crivelli introduces significant changes: "Therefore if you keep an eye over them at home, and having a chief to look after them at the business premises they may perhaps carry out their work in good order." Brown and Johnston give a mixed interpretation: "Therefore, deal as carefully with them as you would with at home, and have a chief watch your employees at the store." Haulotte and Stevelinck provide a somewhat abridged version but always in the same line: "Vous devez avoir l'oeil et garder votre tête dans vos opérations avec eux," i.e., "You have to keep an eye and your head in your operations with them." Cárdena's translation is the freer of all: "Es por esto que, sea en tu casa o en tu bodega, tendrás que hacer las cosas con cuidado," i.e., "For this reason, you will have to do things very carefully both at home and in your store." Antinori gives a similar version to the previous ones: "Per questa ragione tu devi fare molta attenzione e badare alla tua testa nelle tue operazioni con questi tali," i.e., "For this reason, you will have to be very careful and keep your head in operations with these people."

<sup>34</sup> Jäger translates the expression "cavi e mette nele terre" as "Aus dem Keller heraus nimmst oder in denselben hinein legst," i.e., "Take out or put in the cellar." However, he translates correctly "per li piu dela terra" as "die Meisten," most. Penndorf interprets the expression in the same way. Geijsbeek believes the first expression refers to an agricultural activity: "Things that you grow, things that you plant." However, the second expression is correctly translated. Crivelli, Brown and Johnston and Haulotte and Stevelinck follow the same line, which is also adopted by Carlo Antinori: "Nella stessa maniera tu curerai i tuoi conti con i gabellieri e i dazieri per la merci che tu acquisti e vendi, ricavi o semini nella terra como si usa a Venezia, dove si tengono conti importanti per i frutti della terra," i.e., "In the same way, you shall keep your accounts with the gabellieri and dazieri of the merchandise you buy and sell, gather or plant in the ground, as it is customary in Venice, where important accounts are kept in relation to the fruit of the land." Cárdenas simply does a literal translation which is for this same reason more or less correct: "... de lo que sacas y de lo que metes en la

A new difficulty arises also in this chapter in relation to purchases and sales intermediated by *Messetaria* brokers. It is said that the name of the broker who has intervened in the operation must be indicated in the entry and, moreover, "anche la mare in su che fa, cioe el libro dove da in nota li mercati al ditto officio che così lo chiamano in venetia," i.e., "also the master book in which the operation is recorded, as this book is called in Venice." Although the second part of the sentence clarifies rather well the meaning of the expression, the words "e anche la mare in su che fa" have made life difficult for more than one translator.<sup>35</sup>

Another complicated passage appears in Chapter 18 where Pacioli explains as follows how to enter payments or collections of purchases and sales carried out through the Loan House: "E similmente se piu a la giornata ne comprasse, che molti se ne vendano, per te o per altri, come sa chi realto usa, nota ben in chi sono scritti e luoghi." There is a certain confusion among translators with respect to the interpretation of this passage. I have translated it myself in the following way: "Similarly, if you buy one day more than you sell, since much is sold there, to you or to others, as anybody accustomed to doing business on the

tierra, etc., como se acostumbra hacer en Venecia, en donde se tiene que llevar, por la mayoría de la tierra, cuentas extensas...," i.e., "... of what you take out or put in the land, etc., as it is customary in Venice, where extensive accounts are to be kept for most of the land...".

35 Jäger translates la mare as das Meer, the sea. However he perceives the correct meaning of the expression when he translates literally: "Auch das Meer ist zu notieren bezüglich dessen er handelt, nämlich das Buch, mittelst dessen er die Käufe besagtem Bureau vorweist," i.e., "You must also note the sea where business is recorded, that is the book through which purchases are communicated to the mentioned office." As usual, Penndorf is better informed and explains in a footnote: "Mare bedeutet hier nicht Meer, sondern Matrize, Stammverzeichnis oder einfach Buch, wie auch das Hauptbuch der Monteverwaltung in Venedig Mare hiess," i.e., "Mare does not mean here sea but master book, original record or simply book, the same as the Ledger of the Dowry Fund of Venice was also called Mare." Although he correctly interprets the general meaning of the passage. Geijsbeek gets a little mixed up and says that it is also necessary to indicate the special mark - possibly for mare - made by the intermediary in the book in which he records the operations negotiated on behalf of the Messetaria and which is called in Venice "Chiamans." It is not possible to ascertain where Geijsbeek found such a name that can only be a transposition of the verbal form chiamano. Brown and Johnston reproduce these two mistakes in their translation. In contrast, Crivelli only refers to the mark, the same as Haulotte and Stevelinck. Cárdenas uses correctly the term "libro matriz," master book, to translate la mare and, in the same line, Antinori calls it "la madre."

Rialto knows very well, check carefully to whom the monies are credited and where." Therefore, in my opinion, this sentence means that if, one day, you must pay more than you collect, because you have made more purchases than sales, you will credit the balance to the sellers' account through your bank, i.e., the Loan House, in which case you will have to check carefully that the money is credited to the correct account and to the correct office of the Loan House (as this House had offices in the various districts of the town).<sup>36</sup>

<sup>&</sup>lt;sup>36</sup> Jäger translates this passage as follows: "Auf gleiche Weise verfährst Du wenn Du mehr an einem Tag davon kaufst, denn es wird Vieles verkauft sowohl für Dich als für Andere, wie Derjenige weiss, der Rialto oft besucht. Merke Dir daher wohl den Namen, auf welchen die Waare eingeschrieben ist, und den Ort, wo sie liegt," i.e., "You will do the same, if one day you buy more because much is sold, both to you and to others, as anyone who does business on the Rialto knows. And carefully note to whom the merchandise is consigned and the place where it is." This text does not seem to make much sense, the more as these are banking operations with the Loan House. The translation Penndorf's makes even less sense; in the following sentence, where Pacioli refers to the reimbursement of funds deposited in the account, he says: "Beim Abheben der Zinsen ...." i.e., "when collecting interest," whereas this is not the subject at all. Geijbeeks even converts purchases into sales, saving: "Likewise, for the amount of the daily sales for many are the sales made for you or for others, as those people know who are familiar with the Rialto. Be careful to put down the name of the party that buys and his place of business." Crivelli does not understand the text either, although he gets nearer to the correct meaning in some aspects: "And similarly, if the daily purchases are more than your sale or sales for other people, carefully note to whom the goods are sold, and their business addresses. as do those who know, and who are familiar with the customs of the Rialto." Brown and Johnston provide a mixed interpretation based on the two former ones. Haulotte and Stevelinck do not make any progress in their translation into French: "Si vous achetez davantage de marchandises en un jour que vous ne vendez pour vous et pur autres, comme le savent ceux qui sont familiarisés avec le Rialto, vous notez soigneusement à qui les marchandises ont été vendues et d'où ils sont," i.e., "If one day you buy more goods than you sell, for yourself or others, as those who are familiar with the Rialto know, carefully note to whom the goods were sold and where they are." Cárdenas does not cast any light in his translation: "Y similarmente, si en el día tus compras son mayores que tus ventas, por ti mismo o por otro, como sabes que se usa en Rialto; anota bien el nombre de a quien fueron inscritas, los lugares," i.e., "Likewise, if one day your purchases are greater than your sales, for yourself or for others, as you know it is customary on the Rialto, carefully note to whom they were recorded and the place." Antinori follows the same line as the previous translators, although he tries to give a more consistent version: "Se tu acquisti dapprima della merce in un giorno in cui non vendi né per te né per gli altri, come sanno coloro che usano frequentemente il mercato di Rialto, annota bene da chi le merci sono state vendute e dove si trovano," i.e., "If you buy goods one day in which you do not sell, neither for yourself nor for others, as those who are familiar with the Rialto

In this same chapter, the following passage has also given rise to numerous doubts in connection with the permit to take the purchased goods away on payment of duties to the Messetaria: "E pero poi a tal compratori li e concesso di cavare tanto di quella mercantia per quanto a pagato la messetaria fora de la terra in loro bolette a la tavola de luscita o per mare o per terra che la vogliono cavare ala giornata. E pero convengano li mercanti tenere ben conto con lo ditto officio, acio sempre sapino quanto possino cavare, perche non si lassano cavar per piu che si comprino se di novo non paghino la messetaria de contanti." As can be seen, this passage is obscure and has, therefore, originated different interpretations among translators. My own translation is as follows: "Thus, buyers are allowed to take out of the country as many goods as they have paid for to the Messetaria, if they show the corresponding receipt at the exit counter, and they can take them out by land or sea, as many as they want to take out in the day. Therefore, merchants should keep a careful account with this office, so as to know at any moment how much merchandise they can take out, because they are not allowed to take out more than they have bought, unless they pay the corresponding duties to the Messetaria."37

market know, carefully note who sold the goods and where they are." The same as it occurred with Jäger's interpretation, none of these versions takes into account the context in which it appears, that is the recording of the operations carried out through the account held by the merchant with its bank; neither do they interpret correctly the banking term "scritti," i.e., "credited."

<sup>&</sup>lt;sup>37</sup> Jäger's translation of this passage is full of question marks because it did not make any sense even to him. In effect, he says: "Aus diesem Grunde darf der Käufer so viel von dem Waarenpreise abziehen, als die Messetarier ausserhalb der Erde (Venedigs?) bezahlt haben. (?) Der Käufer darf desshalb diejenigen Waaren abführen, für welche die Messetarier nach ihren Frachtbriefen ausserhalb der Erde in ihren Läden am Tische des Ausganges bezahlt haben, sei es zu Wasser oder zu Lande, weil man an diesem Tage es aus den Kellern (Magazinen) ziehen will. Desswegen sollen die Kaufleute ihre Rechnung mit besagtem Bureau gut führen, damit sie immer wissen, wie man Waaren herausziehen kann, denn man lässt nicht mehr abführen, als das (im Verhältnis zu dem Betrage des Erlegten), wenn man die Messetarier nicht wieder mit baarem geld bezahlt, etc. (?)." It is a laborious and obscure text, full of inconsistencies and ambiguities that could be more or less translated as follows: "For this reason, the buyer can deduct from the price of the merchandise the amount paid by Messetaria officials out of the land (Venice?) (?). The buyer can thus withdraw the goods that Messetaria officials, in accordance with their bills of lading, have paid out of the land at their counters of the exit table, both by land and sea, because they want to take them out of the warehouses on that day. For this reason, merchants must keep well their accounts with the mentioned office, so that they may always know how to

The title of Chapter 19 also contains an expression that has caused difficulties to translators: "Commo se debia ordinare el pagamento che havesse a fare per ditta e banco d scritta ne li tuoi libri principali," i.e., "How to record in your main books payments made by draft or by crediting a bank account." In Chapter 9, which describes the various ways of paying the purchase of a merchandise, we already find the term "asegnatione de ditta," that should be translated, in my opinion, as draft or payment order against a bank, as mentioned before. This time, Pacioli makes a difference between payment by ditta and payment by bank transfer from one account to another or scritta di banco. In effect, the concept banco d scritta used by Pacioli means deposit bank and generally refers to banks which took deposits from their clients to whom they provided custody and payment services through cash payments for their account

take goods out, since they are not allowed to take more out (in proportion to the amount paid), unless they pay again to Messetaria officials in cash, etc. (?)." In contrast, Penndorf's translation is totally clear and is generally in agreement with my own, although he calls the tax or brokerage paid to the Messetaria Umsatzsteuer, i.e., turnover or sales tax, which is maybe specifying too much. Geijsbeek gives a somewhat different version in which there are a certain lack of foundation and some inconsistencies: "In accordance with this, the buyer will be allowed to take out of the official warehouses merchandise in proportion to the brokerage paid and according to their books kept at the shipping counter, whether it came by land or sea. Therefore, the merchants should keep a careful account with the said office so that they know how much merchandise they can take out. They are not allowed to take out more than they have bought unless they have paid the extra brokerage." Crivelli gives a similar version in which he also mentions the warehouses which appear in Geijsbeek's translation. Brown and Johnston do the same. Haulotte and Stevelinck provide an interpretation which is basically correct but omit the difficult and controversial parts, saying only that: "L'acheteur est autorisé à disposer de marchandises, en proportion des droits payés et conformément aux livres tenues, venues par terre ou par mer. Partant, les marchands doivent tenir un soigneux compte avec ledit Office afin de savoir de combien de marchandises ils peuvent disposer parce que, comme il est aisé à comprendre, ils ne peuvent disposer de plus de marchandises achetées sans en avoir payé les droits au Messetaria," i.e., "The buyer is allowed to withdraw the goods in proportion to the duties paid and in accordance with the books, whether they have come by land or sea. Therefore, merchants must keep a careful account with the mentioned office in order to know how many goods they can withdraw because, as it is easy to understand, they cannot withdraw more goods than they have bought without paying the corresponding duties to the Messetaria." As can be seen, any references to taking out of the country, exit counter, as many as they wish in the day, etc., have disappeared in this version. Cárdenas does not make any new contribution and also avoids controversial points. Antinori also provides a correct interpretation, without going into complicated details, in line with the translation of Haulotte and Stevelinck.

(ditta) and non-cash payments by transferring the amounts from one current account to another (scritta di banco). In the case under review, the expression banco di scritta used by Pacioli refers not so much to the banks that performed this type of operations as to the operation itself of crediting an account through a transfer from another account. As already mentioned, this operation was actually called, as Pacioli does in other parts of the Treatise, "scritta di banco," since the verb scrivere had, in this context, the meaning of crediting an account. The fact that a number of translators did not exactly know this banking idiom has created some difficulties to them in various parts of the Treatise — among others, the recently mentioned passage on crediting sellers' accounts if daily purchases exceeded sales on the Rialto market. The second service of the recently mentioned passage on crediting sellers' accounts if daily purchases exceeded sales on the Rialto market.

<sup>&</sup>lt;sup>38</sup> Federigo Melis calls this type of crediting by transfer to a bank account *giro-conto* operations. See his works "Note di storia della banca pisana nel Trecento" and "La grande conquista trecentesca del 'credito di esercizio' e la tipologia dei suoi strumenti fino al XVI secolo," both reproduced in Federigo Melis: *La banca pisana e le origini della banca moderna*, Florence, 1987, p. 55-293 and 307-324, respectively. See also Florence Edler: *Glossary of Medieval Terms of Business. Italian Series 1200-1600*, Cambridge, Mass., The Medieval Academy of America, 1934, p. 40 and 265.

<sup>&</sup>lt;sup>39</sup> With respect to the title of Chapter 19, maintaining the line followed in chapter 9, Jäger translates the part under review simply as: "Wie man die Zahlung einzurichten hat, welche man durch eine Firma oder Bank zu machen hat...," i.e., "How payments are to be made through a trading house or through a bank...". Penndorf also translates this part in accordance with Chapter 9 but he corrects the inaccurate use of the word Bürgschaft: "Wie Du die Zahlung, die Du durch Bankschein und Girobank zu machen hast ...," i.e., "How to effect payments by draft or payment order against a bank or through a deposit bank." The only objection that could be made is that he provides a literal translation of Pacioli's words and does not translate the second form of payment as "bank transfer or by crediting a bank account." Geijsbeek also interprets rather well the sentence, though he still considers ditta as a bill of exchange and not as a check against a current account, which is what it would be in modern terms. In effect, he translates: "The payments that we have to make either by draft or through the bank." In the text, he stresses the identity between draft and bill of exchange. Crivelli, Brown and Johnston and Haulotte and Stevelinck adopt the same translation. Cárdenas leaves the terms in Italian, without translating them, although he tries to explain them — rather unsuccessfully - in two notes. To him, ditta is a payment order issued by a trading firm in favor of a similar company. When referring to banco di scritta, though his explanation starts well, at the end it goes wrong. He says: "Refiérese a una práctica reconocida en Venecia, la cual permitía a un Banco privado operar transferencias o pagos por cuenta de sus clientes: un antecedente, al parecer, del 'cheque' bancario," i.e., "This was a customary practice in Venice which allowed a private bank to make transfers or payments on the account of its clients:

There is a passage in this same Chapter 19 whose literal translation does not raise difficulties but whose accounting and financial meaning escapes me. It reads as follows:"Ma quando hai a far pagamento a parte banco e ditta, fa che prima consegni la ditta, e poi per resto scrivi in banco per piu sigurta. Unde ancora questa cautella susa per molti, e bene, quando ben pagassero a contanti de far per resto in bancho." My translation is: "When you have to make a payment part through the bank and part by draft, deliver first the draft and then, for the rest, let the bank credit the payee's account, as a safety measure; when they have to pay part in cash and part through the bank to complete payment, many people take the same precaution, and they do well: so they enter the cash payment first and then the rest through the bank."<sup>40</sup>

apparently an antecedent of the bank check." Antinori also assimilates *ditta* to bill of exchange, as he did in Chapter 9.

<sup>&</sup>lt;sup>40</sup> In his interpretation, Jäger goes beyond the purely accounting context and says in this respect: "Wenn Du aber eine Zahlung theilweise durch die Bank und theilweise durch eine Firma zu machen hast, so sorge, dass die Firma vorher bezahle. dann hast Du nur den Rest durch die Bank umschreiben (scrivi) zu lassen, was zu grösserer Sicherheit dient," i.e., "When you have to make a payment part through the bank and part through a company, make sure that the company pays first because, in this way, you will only have to transfer the rest through the bank, which will be safer." Penndorf also goes beyond the accounting context but he translates Pacioli's words correctly and proves that he has perfectly understood the meaning of the banking instruments used, although he does not say a word on why Pacioli thinks this is the safest procedure. He translates the passage as follows: "Wenn Du aber eine Zahlung teils durch die Bank und teils durch Bankschein zu machen hast, so händige zuerst den Bankschein aus und schreibe dann den Rest durch die Bank zur grösseren Sicherheit um," i.e., "When you have to make a payment part through the bank and part by draft or bank payment order, first deliver the draft and then transfer the rest through the bank, as a safety measure." Geijsbeek's translation is practically the same, except that he replaces the correct term of bank payment order by bill of exchange: "But when you make a payment part through the bank and part by bill of exchange, deliver first the bill of exchange and then settle through the bank, which is safer." Crivelli and Brown and Johnston use practically the same terms, replacing bill of exchange by draft. Haulotte and Stevelinck adopt the same translation as Geijsbeek, also using the expression bill of exchange: "Ouand vous avez à faire un paiement, partie par Banque et partie par traite, délivrez la traite la première et ensuite réglez par Banque, ce qui est le plus sûr." Antinori does the same: "Quando devi fare un pagamento, parte per banca e parte per tratta, regola per prima la tratta e dopo paga per banca, perché è più sicuro," although he does not use the word "deliver" with respect to payment by bill. Cárdenas' translation is somewhat obscure: "Mas cuando tengas que hacer pagos parte por el banco y parte por giro comercial, te conviene primero entregar el giro y después por el resto girar al banco, para más seguridad," i.e., "When you must

The same occurs to me with another expression in the same chapter which explains how to record goods sold to others. "facendoli debitori (to buyers) e creditrici le tue robbe, e debitrici la cassa se ti da contanti, e debitrici le ditte se te le consegna in pagamento, e creditore el banco se tel da." I decided to interpret this passage as follows: "you will debit to them (the buyers) the amount of the goods, crediting the merchandise account, or you will debit the Cash account, if they pay you cash, or the draft account, if they pay you with a draft, and you will subsequently credit the account when the bank settles the draft." This translation has been adopted by several translators, except that they refer to bills of exchange instead of drafts or bank payment orders. However, I am afraid it is not correct, because Pacioli says: "and credit the bank if it gives it to you" - an expression which does not seem to make sense. For this reason, I am inclined to think that Pacioli or the printer made a mistake and put down "creditore el banco," instead of "debitore el banco," i.e., "debit the bank." In this case, the expression would make sense because it would refer to collection through the bank, that is, that the bank would credit our account (i.e., the sellers' account) and would, moreover, complete the various ways of collection considered.41

effect payments part through the bank and part by commercial draft, you should first deliver the draft and then draw the rest on the bank, as a safety measure."

<sup>&</sup>lt;sup>41</sup> Following the idea that ditta means company or trading house, Jäger gives a completely different translation which does not make any sense either: "Indem Du die Käufer zu Schuldnern und Deine Waaren zu Gläubigern machst, ferner die Kasse zur Schuldnerin, wenn man Dir baares Geld gibt, dessgleichen die Firma zu Schuldnerin, wenn sie die Bezahlung leisten soll und die Bank zu Gläubigerin, wenn sie bezahlt," i.e., "Debiting buyers and crediting goods or debiting the Cash if cash money is delivered to you, or in the same way debiting the company if payment is made by same and crediting the bank, if payment by the latter." Penndorf's translation is more correct and tries to be more consistent, although not quite successfully: "Indem Du die Käufer zu Schuldnern und Deine Waren zu Gläubigern machst, ferner die Kasse zum Schuldner, wenn man Dir bares Geld gibt, desgleichen die Bankscheine zu Schuldner, wenn man sie Dir in Zahlung gibt, und die Bank zum Gläubiger, wenn sie Dir solche gibt." The first part of the translation is identical to Jäger's. Differences appear when referring to ditta: "or also debiting drafts if they are given to you in payment, and crediting the bank if they are delivered to you by the latter." Geijsbeek translates the passage the same as Antinori and myself: "And you shall charge bills of exchange if you get a bill of exchange in payment, and credit the latter when the bank pays the exchange," except that I do not use the expression bill of exchange. As usual, Crivelli, Brown and Johnston and Haulotte and Stevelinck follow Geijsbeek's

A similar case appears in Chapter 23. Here again, literal translation does not raise any difficulty but there seems to be an accounting contradiction. Pacioli explains how to record the operations of a shop which has been entrusted to a clerk or that we carry out by ourselves. In the latter case, he assumes that all our business is done through that shop and that we do not carry out any other type of operations: "E metiamo che compri e trafichi tutto per la ditta botega e non havi altro maneggio, alora formarai li libri commo e ditto, e di cio che vendi e compri farai creditori chi te da le robbe per tanto tempo se compri a tempo e creditrici la cassa se compri a contanti, e debitrici la botega." The translation of this passage is clearly: "Let us assume that all you buy and sell is channelled through the shop in question, so that you have no other type of operations. In this case, you will keep the books as I explained in general. You will credit the amount of what you sell and buy to the person who sells you the merchandise on credit, if you buy it on credit, or the Cash account. if you pay cash, debiting the amount to the shop." The contradiction lies in the fact that, if all the business is run through the shop, there is no point in keeping a shop account separating business done through the shop from the rest of our operations. In this example, it seems that it would be reasonable to debit the account of goods purchased. However, no observation in this respect appears in any of the translations consulted.

In Chapter 24, there is an expression that not all translators have translated with the same accuracy. Pacioli says: "E se tu li scrivessi ad altri farai debitore quel tale e creditore detto bancho o patroni di quel tanto noiando el perche." A little below, he provides the example of the entry to be made: "Per martino del tale al ditto ut supra (the banker Girolimo Lipamani) per ducati tanti, etc., li scrissi per parte o per resto o a bon conto o per impresto etc. in questo di." The correct translation of these texts could be: "And if you make a transfer, that is, if you order to credit an amount to somebody's account, you will debit to that person and credit to the bank or its owner the amount in ques-

interpretation. Cárdenas does not really understand the meaning: "Por todo lo que tú vendas a otros, deberás hacerlas deudoras y acreedoras a tus mercancías, y deudora a la Caja, si te dan efectivo; deudoras a las dichas (mercancías) si te las entregan algunos como pago, y acreedor al banco, si él te paga," i.e., "For all you sell to others, you shall debit them and credit your goods, and debit the Cash, if they pay you cash; you shall debit same (the goods) if they are delivered to you in payment, and credit the bank, if the latter pays you." As it is clear, he thought ditta meant ditto in this case.

tion, indicating the reason." And: "From Martino so-and-so to the above-mentioned, for as many ducats as I ordered to credit to his account in part or in balance or on account or as a loan on that day." However, some translators do not mention the fact that payment is made precisely through a bank transfer from one account to another. 42 As a result, the payment procedure used is not specified, when the point in this explanation is just the specification of the accounting employed for this form of payment. As we have already seen before, Pacioli uses a draft account when collections are made through such instruments. Nevertheless, some translators interpret, in my opinion mistakenly, that in this case, payment is made through a cash payment order, surely because they have not understood correctly the meaning of the term scrivessi, you will credit. However, in German there is still an accounting and banking idiom which derives directly from this expression or, at least, has the same root: gutschreiben, i.e., to credit. Another clear example of this type of recording, this time from the standpoint of the bank that effects the transfer between the accounts of two of its clients. appears in the same chapter when the monk of Sansepolcro explains the entries to be made by bankers.

<sup>&</sup>lt;sup>42</sup> Jäger translates the mentioned passage as follows without understanding what it is about: "Wenn Du es für die Rechnung eines Anderen thust, so wirst Du jenen Herrn Zum Schuldner und die Bank zur Gläubigerin machen," i.e., "If you act on behalf of another person, you will debit him and credit the bank." On the contrary, Penndorf perfectly understands the operation and translates it quite accurately: "Wenn Du es anderen überweist, so wirst Du jene anderen zum Schuldner und die Bank oder ihren Inhaber für diesen Betrag zum Gläubiger machen," i.e., "If you transfer it (the money) to others, you will debit them and credit the bank or its owner for this amount." Geijsbeek does not understand the passage very well and believes it is a cash payment order and not the crediting of a transfer to an account, reason for which he says: "And if you should give an order on the bank for somebody else, you shall charge this party and credit the bank or owners of the bank for that much." He translates accordingly the entry given as an example to illustrate this operation: "Per Martino on such and such a day // A ditto for ditto for cash, etc., for so many ducats, for which I gave an order." Both Crivelli and Brown and Johnston follow Geijsbeek's interpretation and mention expressly the payment order without realizing that the operation described by Pacioli is a transfer from a bank account to another. Carlo Antinori seems not to understand the operation either. Haulotte and Stevelinck refer in the text to an order given to the bank to pay to somebody but they translate correctly the example: "Par Martino de tel et tel // A Ditto ci-avant pour tant de ducats que j'ai fait transférer," i.e., "From Martino So-and-so // To ditto above for so many ducats as I ordered to transfer." Cárdenas translates the passage correctly, understanding that it is a transfer.

Another controversial point arises in Chapter 24 from Pacioli's explanation of the intermediation services provided by bankers to the parties to whom they offer their work, effort. time, testimony, premises and even paper and ink: "E vieni in questo atto essere persona meccana e communa, commo testimonio e factore de le parti a tuo inchiostro, carta, fitto, fatiga e tempo." Precisely due to these intermediation services. Pacioli thinks that: "Di qua si cava la honesta provisione nel cambio essere sempre licità quando mai non vi corrisse pericolo de viaggio altre remesse in mano de terce persone." This passage can be interpreted as follows: "It can thus be concluded that the honest commission charged on bills of exchange is always licit, although there are no travel risks such as when money is brought from abroad by third parties." This is the interpretation given by most translators. However, it can also be considered, as do other translators among whom I include myself, that what the sentence really means is: "It can thus be concluded that the honest commission charged on bills of exchange is always ligit. the more as there are no travel risks as when money is brought from abroad by third parties."43 There is not much difference really but the shade of meaning is not quite the same.

<sup>&</sup>lt;sup>43</sup>Carlo Antinori attributes the same meaning to the passage: "Per il tuo inchiostro, carta, fitto, fatica e tempo tu prendi la tua onesta provvigione. Questa è sempre permessa specie quando la tratta non corre il rischio di un viaggio o quando la moneta deve essere trasportata da una terza persona." The other translators consulted opt, more or less extensively or correctly, for the opposite version. For instance, Jäger translates the passage as follows: "Für Deine Tinte, Dein Papier, Deinen Zins, Deine Mühe und Zeit nimmst Du eine bescheidene Provision in Anspruch, welche immer erlaubt ist auch wenn das Geld beim Wechsel nicht die Gefahr der Reise unterworfen ist, welche bei den cambi reali (den wirklichen Tauschen) auftritt," i.e., "For your ink, paper, interest, effort and time you will receive a reasonable commission which is always allowed, although with bills of exchange there are no travel risks as with cambi reali." Penndorf also adopts this version: "Für Deine Tinte, Papier, Miete, Mühe und Zeit ziehst Du eine bescheidene Provision ab, die beim Wechsel immer erlaubt ist, wenn auch keine Gefahr der Reise oder andere Übergabe in die Hand dritter Personen besteht usw.," i.e., "For your ink, paper, rent, effort and time you will receive a reasonable commission which is always allowed on bills of exchange, although there is no travel risk nor the risk to deliver money to third parties." Geijsbeek, Crivelli, Brown and Johnston, as well as Haulotte and Stevelinck follow the same line. In contrast, Cárdenas provides another interpretation: "Puede ser que en estos casos exista una persona intermediaria como testigo y como empleado de una de las dos partes, que saca su comisión, siempre que sea lícito, cuando no hubiera peligro de traslado o de envíos por medio de terceras personas ... como en los cambios de lugar o estado," i.e., "In these cases, there may be an intermediary to act as a

In Chapter 25, Pacioli indicates the name of an account that has caused perplexity to more than a few scholars. This account had already been mentioned, without any explanation, at the beginning of Chapter 22 among expense accounts. The title of Chapter 25 says: "De unaltra partita che a le volte se costuma nel quaderno tenere detta entrata e uscita e a le volte se ne fa libro particulare; e per che," i.e., "Of another account that is sometimes kept in the Ledger and is called income and expenditure, although it is other times kept in a special book, and why." However, the text of the chapter, which is very short, does not answer the expectations raised by the title. The chapter actually begins as follows: "Sonno alcuni che nel lor libri usano tenere una partita detta entrata e uscita in la qual pongano cose straordinarie o altre commo a la fantasia pare," i.e., "Some usually keep in their books an account called income and expenditure in which they record unusual items or whatever they may imagine." The following sentence explains what those items may be: "Altri ne tirra una d spese straordinarie i simili mettano commo in quella dintrata isita presenti che li foser fatti, verbi gratia, e cosi, secondo che ricevano e danno, e tengano conto in dare e havere, e poi a la fine con laltre le saldanno in pro e danno e cavedale, commo intenderai nel bilancio." The translation of this passage can be: "Others keep an unusual expense account in which they record, for instance, any presents received, the same as they do in the income and expenditure account. As they receive and give, they keep the account by recording the debit and credit entries. At the end, they close it, together with the others, by transferring the balance to the profit and loss account and to the capital account, as you shall see when we come to the balance procedure." To specify further the nature of the items recorded in these accounts, Pacioli adds: "Ma in vero quella detta di sopra (in Chapter 22), spese di casa, per tutte e bastante, se non chi volesse per sua curiosita tener conto da per se fin a un portale de strenga che lo porria fare, ma a che fine," i.e., "Although the truth is that, the above mentioned household expense account will be sufficient, except for those who wish to keep a specific account even for a buckle or pin; and if you wish so, you can do it, but for what purpose?"

witness and employee of one of the two parties, who receives a commission, whenever this is licit, when there is no risk of remittances through third parties ... as in changes of place or condition."

The inclusion of the *entrata e uscita* account in the group of expense accounts is clearly confirmed by the fact that it also appears among expense accounts in Chapter 22, as well as in the following passage of Chapter 34 that was already mentioned in another context: "Ma quelle partite che non volesse portare in ditto quaderno A, che porrienno essere quelle che solo a te sapartengano e non se obligato a segnarne conto ad alcuno, come son spesi de mercantia, spesi de casa, intrata isita e tutte spese straordinarie, fitti, pescioni, feudi o livelli, etc.," which means: "The accounts that you do not have to carry to the mentioned Ledger A, as may be those that only concern you and on which you do not have to render account to anybody, as merchandise expenses, household expenses, income and expenditure and all unusual expenses, rents, pensions, bestowals, taxes, etc." On the other hand, this passage of Chapter 34 is the only place in all the Treatise, apart from Chapters 22 and 25, which mentions the account of entrata e uscita or intrata isita, as it is called in this and in a few other occasions, a name which is in any case surprising for an expense account, as it literally means in English entrance and exit. At the end of Chapter 25 in which this account is described, appears an observation which is even stranger considering the nature of this account in Pacioli's mind: "Altri luoghi costuma de lintrata e uscita tenere un livro a sua posta; e poi quello saldano a tempo del bilancio nel ultimo autentico insiemi con le altre facende," i.e., "In other places, they keep a book specifically for the income and expenditure account and they close it at the time of the balance by carrying its balance to the main book, together with that of the other operations." This seems really disproportionate in relation to the little importance of a sundry and atypical expense account.

In view of these apparent inconsistencies, it is not surprising that Pierre Jouanique has recently related this entrata e uscita account to the balance de sortie and balance d'entrée used by Mathieu de La Porte at the end of the financial year to close the old Ledger and open the new one. In fact, these closing and opening balance accounts were used for this purpose with a similar name in many countries, including Spain where, as I explained a few years ago [Hernández-Esteve, 1989, p. 62], Ledger number 67 of the Taula de Canvi of Valencia was opened on 1 June, 1585, with an entry appearing directly in this book, without being recorded first in the Journal, under the heading "Entrada del Present Libre," i.e., "Opening balance of this book,"

as contra-entry of the other accounts. Similarly, it was closed on 31 May, 1586, with the account "Balans y Eixida del Present Libre," i.e., "Closing balance of this book." Therefore, it is quite possible that the account mentioned by Pacioli was used in the same way in some of the places referred to, and that Pacioli himself was aware of it, as assumed by Jouanique, yet the fact is that the monk of Sansepolcro does not seem to relate in any way the entrata e uscita account to the closing and opening procedure. In his Treatise, strange as it may be, he merely attributes to this account the function of recording sundry and atypical entries and expenses. 45

<sup>&</sup>lt;sup>44</sup>This is also the opinion expressed by Yannick Lemarchand in his comment to my paper. On the other hand, he adds that it would not be easy to understand that a closing and opening account would be included among the accounts which are to be closed by transferring their balance to the profit and loss account, since the balance of the latter must also be transferred, in turn, to the capital account. Moreover, if the *entrata e uscita* account were really a closing and opening account, Pacioli would not have included it among the accounts which concern exclusively the book's owner, because the closing and opening account is precisely the one that gathers the balances of all accounts belonging to third parties.

<sup>&</sup>lt;sup>45</sup> Jäger translates the heading of this account as "Einnahme und Ausgabe," i.e., "Income and Expenditure" but he explains in a footnote: "Hiermit ist nicht der Cassa-Conto gemeint, sondern ein Conto für ausserordentliche Spesen, wie diess aus dem Folgendem hervorgeht," i.e., "In this case, it is not the Cash account but a non-recurrent expense account, as it appears from what comes next." When it is mentioned that in other places it is customary to keep a special book for this account, Jäger explains: "Hier deutet P. schon an, dass es besser sei, die Spesen in Hilfsbüchern zu notiren und monatlich, summarisch auf die betreffenden Conti zu übertragen, welche aber nicht in Spesen-, sondern in Waaren-Conti zu bestehen haben, abgesehen von dem Conto für Handlungsunkosten und dem Cassa-Conto," i.e., "P. surely want to mean here that it is better to record expenses in subsidiary books and post them each month in an abridged form to the relevant accounts, which must not be expense accounts but merchandise accounts, leaving aside the overhead expense account and the Cash account." However, as we have seen, Pacioli is very laconic in this respect. It does not seem that he wishes to say all these things and less that the balance of the entrata e uscita account should be posted every month to another account. Penndorf uses the same terms as Jäger to translate the heading of the account but without making any comment. Geijsbeek translates this heading as "Income and Expense" which has the same meaning as the expression used by the German translators. Crivelli calls it "Income and Expenditure" and Brown and Johnson "Income and Expense." All of them are, thus, in the same line, the same as Haulotte and Stevelinck who call the account "Revenus et Dépenses." It should be recalled that Jouanique, in a completely different line, thinks that this expression is to be translated as entrée et sortie, which is equivalent to "Balance d'entrée et de sortie," i.e., "opening and closing balance." Cárdenas leaves the

In saying in Chapter 27 that the profit and loss account need not appear in the Journal because it originated in the Ledger as a result of the closing of accounts that have given some profit or loss and should, therefore, appear only in this book, Pacioli introduces another passage that has raised many doubts. He savs: "E questa partita (the profit and loss account) poi ancora lei si converra saldare in quella del cavedale, la quale e ultima de tutti li quaderni e, per consequente, receptaculo de tutte le altre." These words do not seem too difficult to translate literally. My own version reads as follows: "Then, you will balance this account with the Capital account which is the last one to be closed in the entire Ledger, thus being the receptacle of all the others." This passage has clearly led some translators to think that Pacioli recommended to make closing and opening entries as contra-entries to the Capital account, as explained by some scholars.46 However, in Chapter 34 and also in the summary

term untranslated at the beginning of Chapter 25 but explains in a note: "Término que hemos traducido como: Entradas y salidas, o sus equivalentes," i.e., "Term that we have translated as Income and expenditure, or equivalent." In the last passage of the chapter, referring to what is customary in other places, he precisely says: "En otros lugares se acostumbra tener un libro separado para registrar los ingresos y los gastos a voluntad," i.e., "In other places, it is customary to keep a separate book to record income and expenditure at will." Thus, he expressly and undoubtedly agrees with those who think that this account included, as Pacioli said, atypical income and expenditure. Antinori uses the same words as Pacioli in his translation, i.e., entrata e uscita.

46 With respect to this subject, Carlo Antinori says for instance that "Per aprire o chiudere i conti non si usano i conti Bilancio di Apertura e Bilancio di Chiusura, né si usa contraporre tutti i conti accesi alle attività ai conti accesi alle passività e al capitale netto, ma si usa il conto CAPITALE che serve di contropartita per aprire o chiudere i conti accesi alle attività e alle passività" ("Il Trattato dalla 'Summa' del Paciolo. A cura di Carlo Antinori," in Summit. Gli speciali di Summa. Supplemento al n. 40 di Summa, November 1990, p. 7). Jäger translates this passage as follows: "Welcher (the Capital account) der letzte aller Hefte und daher das receptaculum aller anderen Posten ist," i.e., "Which is the last one of all the books and, thus, the receptacle of all the other entries." Penndorf gives a more accurate translation: "Welches das letzte in allen Hauptbüchern und folglich der Zufluchtsort aller anderen Konten ist," i.e., "Which is the last one of all the Ledgers and, thus, the shelter of all other accounts." Geijsbeek gives a similar translation, though he uses the word receptacle instead of shelter, the same as Crivelli and Brown and Johnston. Haulotte and Stevelinck want to be more accurate and say: "Qui reste toujours le dernier de tous ouvert au Grand Livre, et qui est le réceptacle de tous les autres comptes," i.e., "Which is always the last one to remain open in the Ledger and, thus, the receptacle of all the other accounts." Cárdenas also wishes to provide a more accurate translation and replaces receptacle by summary: "La cual es la última de todos los libros Mayores

offered in Chapter 36, it is clearly specified that the accounts of the old Ledger must be balanced and closed separately, one by one; that is, their balance is to be directly carried forward, as opening entry, to the account of the new Ledger. By the way, we shall remark that, in his Treatise, Pacioli does not make mention of either closing or opening entries in the Journal, as we shall see below. Therefore, it seems that, in spite of what Pacioli says above, we should totally exclude the possibility that he was referring to general closing and opening entries, even if they were only to be made in the Ledger. In effect, with regard to the closing of the accounts in the old Ledger and to their opening in the new one, he expressly says in Chapter 34: "Summarai tutte lor partite in dare e havere, aiutando sempre la menore, comme te dixi sopra del portare avanti, che questo atto de un quaderno in laltro e de ponto simile a quello e fra loro non e altra differentia se non que in quello el resto si porta avanti nel medesimo quaderno. e in questo de un libro in laltro, e dove in quello chiamavi le carti d quel libro proprio in questo si chiama le carti del libro sequente," i.e., "You will add up the debit and the credit side of all their accounts, completing always the lesser part, as I said before with respect to the carry-over of accounts, since this transfer from one Ledger to another is absolutely similar to the above-mentioned one and the only difference between them is that, in the first case, the balance was carried forward to a following folio of the same Ledger whereas, in the second case, it is transferred from one book to another. So, in the former, the reference mentioned was the folio of the same book and, in the latter, it is a folio of the following Ledger."47 In view of all the

y, por consiguiente, el resumen de todas," i.e., "Which is the last one of all the Ledgers and, thus, the summary of all." In accordance with the approach described at the beginning of this note, Antinori translates: "Che resta sempre l'ultimo di tutti, aperto nel Mastro e che è destinato a ricevere il saldo di tutti gli altri conti," i.e., "Which is always the last one that remains open in the Ledger and that will receive the balance of all the other accounts."

<sup>&</sup>lt;sup>47</sup> Jäger translates this passage in a rather complicated way: "Du wirst alle Posten im Geben und im Haben summirer, inden Du die kleineren abziehst, uie ich Dir schon gesagt habe, denn dieser Akt von einem Heft in das andere ist dem anderen ähnlich, und zwischen den Beiden ist kein anderer Unterschied, als dass in diesem der Rest in demselben Heft weiter übertragen wird, und in jenem von einem Buche in das andere; und während Du in jenem Dich aut die Blätter jenes Buches berufst Du in diesem Dich auf die Blätter des folgenden Buches berufst", i.e., "You will add up all the debit entries and credit entries and deduct the smaller, as I told you, since this operation from one book to the other is similar to the other one, and the only difference between them is that, in this case, the

above, we must conclude that Pacioli's words necessarily meant that the Capital account was simply the receptacle of nominal and expense accounts. At the most, in a broader sense, it could be interpreted that these words could refer to the fact that all assets and liabilities accounts were posted to the Capital at the beginning of the operations, when recording the Inventory. In

balance is carried forward in the same book and in the other one, from one book to the other: and while in the former, you refer to the folios of that book. in the latter, you refer to the folios of the following book." Penndorf is much clearer: "Hierauf wirst Du alle Konten im Soll und im Haben addieren und dabei immer die kleinere Seite ergänzen, wie ich Dir oben beim Übertragen nach vorwärts sagte. Denn dieses Übertragen von einem Hauptbuch in das andere ist ienem genau ähnlich und zwischen ihnen ist kein anderer Unterschied als dass in jenem das Saldo in demselben Hauptbuch vorgetragen wird und in diesem von einem Buche in das andere: und während man sich in ienem auf die Blätter desselben Buches beruft, ruft man in diesem die Blätter des folgenden Buches," i.e., "To do this, you will add up the debit entries and the credit entries of all the accounts, always completing the lesser side, as I told you before when explaining how to carry forward accounts to a new folio. This transfer from one Ledger to another is exactly the same as the mentioned one, the only difference being that, in the former, the balance is transferred in the same Ledger and, in the latter, from one book to another and while, in the former, you refer to the folios of the same book, in the latter, you refer to those of the following book." With only a few changes, the translations into English of Geijsbeek, Crivelli and Brown and Johnston do not differ from Penndorf's version. The same occurs with Haulotte and Stevelinck: "Vous totalisez tous les postes du débit et tous ceux du crédit d'un compte, en ajoutant toujours la différence du côté le plus petit, comme je vous l'ai dit précédemment à propos du transfert des comptes, car le transfert dans un autre Grand Livre est identique. Il n'existe entre les deux comme différence, que dans un cas, ils sont transférés plus loin dans le même livre, et dans l'autre, ils sont transférés d'un livre à l'autre. Alors que dans le premier cas on notait la nouvelle page du même livre, dans l'autre, on note la page du livre nouveau," i.e., "You will sum up the debit entries and credit entries of an account, always adding the difference on the smaller side, as I told you with respect to the transfer of accounts, since transfer to another Ledger is performed in the same way. There is a single difference between both: in one case, accounts are transferred to a new folio of the same book and, in the other, they are transferred from one book to another. Therefore, in the first case, you will note the new page of the same book and, in the other, the page of the new book." Cárdenas also provides a similar translation: "Sumarás todas las partidas (cuentas) en el Debe y en el Haber, ayudando (igualando) siempre a la menor, como se dijo antes en los traspasos. Este acto de pasar de un Mayor a otro, es igual al anterior, y entre ellos no hay diferencia alguna, ya que en aquél el saldo se traspasa en el mismo Mayor, y en éste de un libro a otro, y mientras que en aquél indicabas las hojas de aquel libro, en éste debes indicar la hoja del libro siguiente," i.e., "You will add up all the entries (accounts) on the debit side and on the credit side, always helping (making equal) the lesser one, as mentioned before with respect to transfers. This posting operation from one Ledger to another is similar to the previous one and there is no difference between them because, in

this case, however, the remark that this account is a receptacle of all the others as a consequence of the fact that it is the last one to be closed does not seem to make much sense.

The fact that no closing or opening entry is made in the Journal is confirmed, apart from the above passages, in other points of Chapters 33 and 34. In Chapter 33, Pacioli says that new business carried out while accounts are closed and transferred from the old to the new Ledger can be entered in the new books: "in lo memoriale o vero giornale, ma non in quaderno per fin tanto che non li hai portati li resti del primo quaderno," i.e., "in the Memorandum or in the Journal, but not in the Ledger, until you have transferred the balances of the first Ledger." In Chapter 34, he expressly specified: "E quelle (the balances) portarai in libro A, cioe in quaderno nuovo, che non bisogna come fo detto di sopra li resti ponere in giornale," i.e., "Carrying forward the balances to Ledger A, that is, to the new Ledger, then, as we said before, it will not be necessary to enter them in the Journal."

The fact that no general closing or opening entry was directly made in the Ledger, without being recorded in the Journal, is also confirmed in another passage of Chapter 34: "In modo che nel reporto de un libro in laltro, solo una volta per ciascuno quaderno se mette la partita, e questa prerogativa a lultima partita sempre deli quaderni che nullaltra mai po havere," i.e., "Thus, in the transfer from one book to another, the balance is entered only once in each Ledger. And only the last

the former, the balance is transferred in the same Ledger and, in the latter, from one book to another and while, in the former, you noted the sheets of the same book, in the latter, you will note the sheet of the following book." In spite of his idea on the general closing of all accounts as a contra-entry to the Capital account, Antinori interprets this passage as the other translators: "Tu sommerai tutte le partite a debito e a credito di un conto, aggiungendo sempre la differenza nella sezione più piccola, come ho detto in precedenza a proposito del trasferimento dei conti, poiché il trasferimento in un altro libro Mastro è identico. Non esiste tra i due che questa differenza: nel primo caso sono trasferiti più lontano nel medesimo libro, nel secondo, sono trasferiti da un libro all'altro. Come nel primo caso si annota la nuova pagina dello stesso libro, nel secondo, si nota la pagina del libro nuevo," i.e., "You will sum up all the debit entries and credit entries of an account, always adding the difference on the smaller side, as mentioned before with respect to the transfer of accounts, because transfer from one Ledger to another is performed in the same way. There is only one difference between both: in the first case, they are transferred further on in the same book and, in the second, they are transferred from one book to another. Likewise, in the first case, you should note the new page of the same book and, in the second, the page of the new book."

entry, that is, the closing balance has this prerogative in the Ledger."<sup>48</sup> If these words have been well interpreted, they indicate quite clearly by themselves that the account closing and transferring process did not give rise to any general entry because, if it had been so, the balances would have had a contraentry in the same Ledger. On the contrary, this process was done directly by transferring the balances, one by one, to the new accounts in the new Ledger.

In this same chapter, there is a passage that Basil S. Yamey considers as one of the most obscure points of the whole *Treatise* [Yamey, 1978, p. 573]. In this passage, Pacioli refers to the transfer of profit to the Capital account after closing the profit and loss account, saying that the credit balance of the latter will

<sup>&</sup>lt;sup>48</sup> Jäger translates these words as follows: "In dem Uebertrag von einem Buche in das andere der Posten nur ein Mal für jedes Heft eingeschrieben wird. Diesen Vorzug (prerogativa=Vorrecht) hat der letzte Posten der Hefte immer, und kein anderer Posten kann ihn haben," i.e., "In the transfer from one book to another, entries are only recorded once in each book. This prerogative (prerogativa = privilege) is always given to the last entry of the books and to no other." Penndorf translates them practically in the same way: "Beim Übertrag von einem Buche in das andere die Buchung nur ein einziges Mal in jedem Hauptbuch erfolgt. Diesen Vorzug hat immer der letzte Posten der Haupbücher und kein anderer kann ihn haben." Geijsbeek tries to specify more: "Making the transfer from one ledger to another, any account should appear only once in each Ledger. This is a peculiarity of the last entry of the accounts of the Ledgers." The last part of the passage seems somewhat obscure to Crivelli: "In the transfer of one book to the other the accounts are entered only once in each Ledger. As you have noted here preceding, this prerogative of said Ledger accounts, no other accounts can ever have." Brown and Johnston translate the passage in the same line as Geijsbeek. Haulotte and Stevelinck wish to be more specific: "De sorte qu'en transportant d'un livre à l'autre, on inscrit seulement un poste dans chaque Grand Livre. Ce privilège revient uniquement au poste par lequel un compte dans le Grand Livre est clotûré, et à aucun autre," i.e., "So that, when transferring from one book to the other, only one entry is recorded in each Ledger. This privilege is only given to the entry which closes an account in the Ledger and to no other." Cárdenas does a conventional translation: "De manera que los traspasos de un libro a otro, se pone la partida una sola vez en cada cuenta del Mayor; esta prerrogativa la tiene la última partida del Mayor y ninguna otra más podrá tenerla," i.e., "So that in transfers from one book to another, the entry is recorded only once in each Ledger account; this prerogative is given to the last Ledger entry and to no other." Antinori introduces a rather strange variation: "In modo che trasferendo da un libro all'altro, si iscrive solo una posta in ciascun Mastro. Questa prerogativa è caratteristica unicamente dell'ultima partita dei conti o del libro Mastro, perché in nessun altro libro può accadere," i.e., "So that when transferring from one book to the other, only one entry is recorded in each Ledger. This prerogative is an exclusive feature of the last entry of the accounts or of the Ledger because it cannot appear in any other book."

be entered on the debit side and transferred to the Capital account "in havere insiemi con laltre robbe, mobili e stabili," i.e., "on the credit side, together with the other merchandises, personal and real goods."<sup>49</sup> Once again, these words may lead one to think that the amounts of the assets accounts have been credited to the Capital account as a closing entry. However, we have already seen that it was not so. Therefore, we should interpret, this time with even greater certainty than in the previous case, that Pacioli merely referred to the fact that the Inventory entries were posted, one by one, to the credit side of the Capital account when the Inventory was recorded at the beginning of the operations. This is precisely the circumstance mentioned earlier <sup>50</sup>

<sup>50</sup>When explaining how, after transferring the balances of nominal and expense accounts, the profit and loss account will show the profit or loss originated by our business, Pacioli says: "E veduto que harai per questa lutile e danno tuo sequito, alora questa saldarai in la partita del Cavedale, dove nel principio del tuo manegio ponesti lo inventario de tutta la tua faculta," i.e., "And once you have seen the profit or loss incurred, you will balance it in the Capital account to which you posted the inventory of all your wealth at the beginning of your operations."

<sup>&</sup>lt;sup>49</sup> Jäger also attributes this meaning to the passage: "In diesem (dem Kapital-Conto) würdest Du den Posten in's Haben eintragen, wo alle andere Sachen, Mobilien und Immobilien sind," i.e., "You will note the entry on the credit side in the Capital account where are entered all the other things, personal and real property." Penndorf's translation is quite similar with a few minor changes: "Wo Du (in the Capital account) ihn im Haben zusammen mit anderen Waren, Mobilien und Immobilien eintragen wirst," i.e., "Where you will record it on the credit side together with other merchandises, personal and real property." Geijsbeek also translates the passage in the same way: "Making the entry in the credit side (of the Capital account) where all the other goods of yours have been entered, personal or real." Crivelli says practically the same: "You may then enter the balance to the Capital Account where the other goods, furniture, and buildings have been entered." Brown and Johnston introduce a small change: "Credit the same amount to Capital on the same side in which all other personal and real possessions have been entered." There are hardly any differences in the translation provided by Haulotte and Stevelinck: "Le compte Capital auquel il est porté (the balance of the profit and loss account) au crédit, où tous vos autres biens ont été inscrits," i.e., "The Capital account on whose credit side, where are recorded all your other goods, it is transferred." Cárdenas translation is identical: "Abonando a la cuenta del Capital en el Haber, junto con las otras cosas muebles, inmuebles, etc.," i.e., "Entering it in the Capital account on the credit side, together with the other things, personal, real, etc.". Antinori does not make any new contribution: "Il conto Capitale al quale è portata (the balance entry) a credito, ove tutti i tuoi altri beni sono stati scritti," i.e., "The Capital account in which it is entered on the credit side where all your other goods have been recorded."

In this same paragraph, Pacioli insists again that the Capital account must be the last account in the entire Ledger ("in questo cavedal quale conviene essere sempre lultima partita d tutti li quaderni"). This statement should be understood in the sense that it must be the last account to be closed.<sup>51</sup> The continuation of this sentence, which clarifies its full meaning, has also created some headaches. In fact, it says: "in questo cavedal ... porrai sempre cognoscere tutta tua faculta giongnendo li debiti e crediti che in libro A portasti," i.e., "from this capital ... you can always know what your net worth is, since it contains the debit and credit balances that you have carried to ledger A." However, the meaning of the gerund giongnendo, with its causative connotation, has not always been correctly understood.<sup>52</sup>

Another passage in Chapter 34 that has also raised difficulties and created some confusion refers to the transfer of the Capital account to the new Ledger. Pacioli says in this respect:

<sup>&</sup>lt;sup>51</sup> Jäger skips this sentence in his translation. Penndorf translates it literally: "In diesem Kapitalkonto, das immer das letzte von allen Konten der Hauptbücher sein muss," i.e., "In this Capital account which must always be the last of all Ledger accounts." Geijsbeek does the same: "Which must always be the last account in the entire Ledger." Crivelli and Brown and Johnston provide a similar translation. Haulotte and Stevelinck interpret that it must be the last account to remain open in the Ledger: "Le compte de Capital, qui doit toujours rester le dernier compte ouvert dans le Grand Livre," the same as Antinori: "Che deve sempre restare l'ultimo conto aperto nel Mastro," i.e., "Which must always be the last account to remain open in the Ledger." Cárdenas follows the letter of the text: "Que siempre conviene que sea la última cuenta de todos los libros Mayores," i.e., "Which should always be the last account of all the Ledgers."

<sup>52</sup> For instance, Jäger translates this passage as follows: "Du wirst folglich im Kapital stets von Deinem ganzen Vermögen Kenntnis nehmen können, wenn Du die Schulden mit dem Guthaben (crediti pl.) vergleichst, wie Du diess in das Buch A etc. übertragen hast," i.e., "Therefore, from the capital you will always know your fortune, if you compare the debits with the credits that you have transferred to ledger A." Penndorf translates the sentence in a completely different and original way: "In diesem Kapitalkonto...wirst Du immer von neuem Dein ganzes Vermögen erkennen können, wenn Du die Schulden und Aussenstände, die Du in das Buch A eingetragen hast, hinzuzufügst," i.e., "From this capital account you can always know your fortune, if you add the debts and the accounts receivable that you have carried to ledger A." Geijsbeek translates: "Therefore, from the capital account, ... you may always learn what your fortune is, by adding together all the debits and all the credits, which you have transferred in Ledger A." The translation of Crivelli is similar: "Said Capital Account ... will always enable you to know the value of the whole of your property, providing you add the debits and credits which you have transferred to Ledger A." The interpretation of Brown and Johnston is freer and more correct, although it goes far beyond Pacioli's words: "From the Capital account, therefore, ... you may learn

"E portarala (the Capital account) come laltre nel quaderno A in resto e summa, o voi a partita per partita che lo poi anche fare, ma si costuma farla in summa perche una volta tutto tuo inventario apare." There is no unanimity on this point,<sup>53</sup> but I have interpreted this passage as follows: "And you will carry it forward, the same as the other accounts, to Ledger A, and you

the entire value of your property. The value of your business appears in the Capital account as the net of all debits and credits transferred to Ledger A as well as the other accounts closed into Profit and Loss and then into Capital." Haulotte and Stevelinck keep closer to Pacioli's words and transmit correctly their meaning: "Ainsi, par le compte Capital ... vous pouvez toujours connaître l'etat de votre fortune, puisqu'il vous donne les totaux des débits et des crédits que vous avez transportés au Gran Livre A," i.e., "In this way, from the capital account ... you can always know the amount of your property, because it shows the total of the debits and credits that you have carried to ledger A." Carlo Antinori offers a completely similar translation: "Così dal conto Capitale . . . tu puoi sempre conoscere lo stato del tuo patrimonio, poiché ti dà i totali delle attività e delle passività che hai trasportato nel Mastro A," i.e., "So, from the capital account . . . you can always know the amount of your property, because it shows the total of the assets and liabilities that you have carried to ledger A." On the contrary, Cárdenas turns back to an interpretation similar to that offered by the first translators into English: "Y de nuevo, en la de Capital ... podrás siempre conocer todo tu patrimonio (facoltà), añadiendo las deudas y los créditos que pasaste en el libro A," i.e., "And once again, from the capital . . . you will always be able to know all your property, by adding together all the debts and credits that you have carried to ledger A."

<sup>53</sup> Jäger translates this passage as follows: "Und denselben wie die andern in das Heft A in Rest und Summe, oder Posten per Posten übertragen. Man pflegt aber den Posten in Summe zu übertragen (fare) weil alsdann Dein ganzes Inventar," i.e., "You will transfer it, as the other ones, to Ledger A, in balance and total or entry by entry. It is, however, customary to carry forward the total amount of the entry so that all your inventory may appear at once." In this respect, Jäger points out in a footnote that in this context "inventory" should be interpreted as "Schlussinventar," i.e., "closing inventory" or "final inventory," although he explains that Pacioli did not make that explicit but that he identified it with the results of the Capital account. Penndorf interprets this passage in a similar way: "Es wie die anderen in das Hauptbuch A in Saldo und Summe oder, wenn Du willst, Posten für Posten übertragen, was Du auch tun kannst. Aber man plegt es in einer Summer zu tun, weil sodann Dein ganzes Inventar mit einem Male erscheint," i.e., "As the other ones, you shall transfer it to Ledger A in balance and total or, if you wish, entry by entry, since you can also do it this way. However, it is customary to transfer the total amount, since this allows to see your entire inventory at once." Geijsbeek remains in the same line: "Then this capital account should be closed and carried forward with the other accounts to Ledger A, either in total or entry by entry. You can do either way, but it is customary to transfer only the total amount, so that the entire value of your inventory (inventario) is shown at a glance." Neither Crivelli, nor Brown and Johnston introduce any change in their translations, whereas Haulotte and Stevelinck introduce an ingenious one in theirs: "Ensuite ce compte Capital du may transfer the balance or the total amount of debit and credit sides, or even, if you wish, entry by entry. But it is customary to transfer the total amounts of the account since they show the whole Inventory at a time." With respect to the possibility, which seems quite odd to us, of transferring the Capital account entry by entry, it should be pointed out that Pacioli does not mention whether the Inventory should be made each time the Ledger is closed. It seems rather the opposite. In Pacioli's opinion, the closing of the Ledger should be made every year, without awaiting the completion of the book.

In Chapter 36, another expression has raised some doubts, which says: "El bilancio del libro debbe essere pari, cioe che tanto debbe esser la summa non dico de creditori ne debitori, ma dico la summa del credito quanto la summa del debito," i.e., "The Ledger balance must be reconciled, that is, the total amount, I do not mean of creditors and debitors but of credit, must be equal to the total amount of debit." It seems that Pacioli wants to make it clear that what are to be reconciled in this bilancio are not the Ledger credit and debit balances but the total amounts of debit and credit entries. Practically all translators agree on this point.<sup>54</sup> On the other hand, he already mentioned in Chapter 34 that all the total amounts of debit entries and all the total amounts of credit entries of the accounts in the Ledger had to be recorded separately in a folio. Then, the total amounts of debit entries, on one hand, and those of credit entries, on the other, were to be added up, the totals being called summa summarum of debit entries and summa summarum of credit entries, respectively. These two summe summarum had to be

Grand Livre Croix sera clôturé et transporté au Grand Livre A, soit pour son solde, ou si vous le préférez, porté poste par poste; quoiqu'on ait l'habitude de le faire en une somme, parce qu'alors votre fortune est inscrite en une fois," i.e., "Then, the Capital account of the Ledger of the Cross will be closed and carried forward to Ledger A, either in balance or, if you prefer, entry by entry, although it is customary to transfer the total amount since in this way your wealth is recorded all at one time." Cárdenas does not make any new contribution. Carlo Antinori translates this passage as follows: "In seguito, questo Conto Capitale del Mastro Croce sarà chiuso e trasportato nel Mastro A, sia per il suo saldo, o se lo preferisci, portando partita per partita. Qualcuno ha l'abitudine di fare una somma, ed in questo caso il tuo patrimonio è rappresentato in una sola volta, dal suo ammontare."

<sup>&</sup>lt;sup>54</sup> However, Carlo Antinori's interpretation of this passage has nothing to do with total amounts and balances but with the number of debit and credit accounts: "Il bilancio del Libro deve essere pari, cioè pari devono essere le somme, non del numero dei creditori e dei debitori, ma le somme dei crediti e dei debiti."

equal if the Ledger was well kept and balanced.<sup>55</sup> Pacioli points out that he had anticipated this conclusion in Chapter 14, where he also explained its reasons. In fact, in this chapter it is explained that each Journal's entry originates two entries in the Ledger, one on the debit side and another on the credit side. In the same way, he indicates: "di qua nasci poi al bilancio che del libro si fa nel suo saldo tanto convien che sia el dare quanto lavere," i.e., "this is the reason why, afterwards, in the balance that is stroken at the moment of the closing the book, the debit must come to the same amount as the credit." We shall return at once to the mentioned passage of Chapter 34 in relation to another serious and interesting problem. For the moment, let us just say that, in both cases, the total amounts in question do not seem to always reflect the total movement of the accounts because Pacioli does not say anywhere that total amounts should also be transferred when carrying forward the balance of an account to a new folio because the current one is full. It seems rather that the opposite practice was in use at that time. Therefore, the total amounts of debit and credit entries appearing in the summa summarum of Chapter 34 and the bilancio of Chapter 36 should, in any case, be the total amounts of the last folio of the account.56

<sup>55&</sup>quot;E acio sia piu chiaro de ditto saldo, farai questo altro scontro. Cioe summarai in un foglio tutto el dare del quaderno croci, e ponlo a man sinistra. E summarai tutto suo havere, e ponlo a man dextra. E poi queste ultime summe ressummarai e farane de tutte quelle del dar una summa che si chiamara summa summarum. E cosi farai una summa de tutte quelle dal avere che si chiamara ancora lei una summa summarum, ma la prima sira summa summarum del dare e la seconda si chiama summa summarum de lo havere. Or se queste doi summe summarum siran pare, cioe che tanto sia luna quanto laltra, videlizet quella del dare e quella delo havere, arguirai el tuo quaderno essere ben guidato, tenuto e saldato."

<sup>&</sup>lt;sup>56</sup>However, in the example of *summa summarum* inserted by Manzoni in his book *Quaderno doppio col suo giornale*, at the end of the Ledger assumption, and although under the name of *Summa delle Summe*, the names of all the Ledger accounts are written in an *ad hoc* page after closing the accounts. Both outstanding and carried forward accounts appear by strict order of folio followed in the relevant line, first, by the sum of the debit entries of each account, and then, on the right hand side, by the sum of the credit entries, which is obviously equal. At the end of the page appears the *Summa delle Summe* with the reconciled totals of the debit and credit sums. This list occupies almost four complete pages of Manzoni's work at the end of which he totals the *Summa delle Summe* of each of them, obtaining in effect the total of all entries, i.e., of all the Ledger movements, since this total also includes the sums of the accounts carried forward to a new folio.

# DOUBTS ON THE TREATISE AS A SINGLE UNIT

Regardless of any possible accusation of plagiarism, the truth is that a thorough reading of Luca Pacioli's *Summa de Arithmetica*, *Geometria*, *Proportioni et Proportionalita* gives the clear impression that it is not a single work written from start to finish but a collage of heterogeneous elements written in different occasions and for different purposes which have been juxtaposed.

In the same way, a careful study of the Particular Treatise De Computis et Scripturis, included as "Title Nine, Treatise Eleven" of Pacioli's Summa, gives grounds for believing that neither is this Treatise a single work written at the same time and for the same purpose. On the contrary, the *Treatise* seems to be made up of at least two separate parts showing a number of clear differences: on one hand, the first thirty-five chapters constitute a single unit and, on the other, Chapter 36 which is introduced as a summary, as well as the two following sections that have a heading but no number, together with an example, provided at the end, consisting of ten related Ledger entries. Some authors believe that all of it could be considered as part of Chapter 36.57 An additional reason, not argued so far, to link Chapter 36 proper to the final parts of the *Treatise* could be that, both in the examples with money amounts provided in that chapter and in all the Ledger entries presented at the end, the monetary unit is not the one expressly adopted throughout the first thirty-five chapters, i.e., the gold lira de grossi divided into soldi, grossi and piccioli but the lira divided into soldi and denari which was the monetary unit used by Florence accountants. It should also be pointed out that the entries recorded in the Cash account in this final example do not include any explanation as it was recommended in Chapter 36. Likewise, in the first unnumbered section headed Casi che apartieni a mettere al libro de mercanti of this final part, a direct and express reference is made to a passage of Chapter 36.58 Some believe, however, that Chapter 36 is independent of the two unnumbered sections that

<sup>&</sup>lt;sup>57</sup>This is what Carlo Antinori does in his version of Luca Pacioli's *Treatise* into modern Italian.

<sup>58</sup> This reference reads as follows: "e come nelle regole to ditto tutte le partite vogliono havere in loro tre cose, cioe il giorno e la quantita de la pecunia e la cagione." The expression regole refers to the title of Chapter 36, "Summario de regole e modi sopra il tenere uno libro di mercanti," in whose first paragraph these three requirements are indeed specified.

follow it, which in their opinion seem to be afterthoughts that Pacioli adds to the text to complement it.<sup>59</sup> Anyway, the question is still whether these after-thoughts referred to the first thirty-five chapters or to Chapter 36. One thing seems to be clear: these four sections or elements do not seem to be integrated in the main body of the *Treatise* but juxtaposed afterwards, even if Pacioli mentions their existence in previous parts of his text, as we shall see. For this reason, they can be considered a sort of appendix to the *Treatise*, whether or not they form a separate unit *per se*, since they present some clear differences with regard to the first thirty-five chapters which make up the main body of the *Treatise*.

Many years ago, it was observed that the group of ten entries was formulated, as already pointed out, following the Tuscan model and, therefore, differed from the examples provided in the text of the first thirty-five chapters, which were written according to the Venetian practice [Besta, 1916, p. 361]. Yet until now, not much attention has been paid to the fact that the differences arise not only in this group of entries but in the entire appendix. Only Basil S. Yamey noticed and pointed out some of these differences, even observing in passing in a half-joking tone — that those who consider Pacioli a plagiarist could find reason to say that when the Franciscan friar wrote his *Treatise*, he not only plagiarized one work but two [Yamey, 1978, p. 577].

The division of the *Treatise* into two or more differentiated parts does not necessarily lead to the conclusion that they were written by different authors. Rather, it could simply be concluded that the parts of the appendix had a different origin than the main body of the text and that they were written at a different time and for a different purpose. Specifically with regard to Chapter 36 (to which the author refers in Chapter 12 and 34 explaining that it contains a summary of the preceding chapters), it is possible that Pacioli wrote it on another occasion, before or after writing the body of the text, in order to give to specific, possibly Tuscan, readers an abridged explanation of the rules that had to be followed by a merchant to apply double-entry bookkeeping to his accounts. Later, when he wanted to publish the *Summa* and gave it to his printer, he would decide

<sup>&</sup>lt;sup>59</sup>This is the opinion expressed by Basil S. Yamey in his kind comments to this paper.

to use the text to complete his *Treatise*. At any rate, he mentions the existence of this summary in Chapters 12 and 34, as well as in the *sumario dela terça* parte principale which appears at the beginning of the *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* (unnumbered folios 4 v<sup>a</sup> and 5 r<sup>a</sup>). In the opinion of Basil S. Yamey, the ten related Ledger entries were also referred to by Pacioli, though somewhat cryptically in Chapter 15 saying: "e anco in fin di questo harai exemplo," i.e., "and at the end of this you will also find an example."

Let us now see what are the main differences observed. In the first lines of Chapter 36, it is said that "lultimo nome dela partita del debito debbe essere il primo della partita del credito." i.e., that "the last name of the debit entry must be the first of the credit entry." This condition is met, in effect, in the Ledger entries provided at the end. These entries, formulated according to the Tuscan style, are written, for instance, as follows: "Ludovico di Piero Forestani owes on 14 November 1493, L. 44, S. 1, D. 8. for an amount in cash borrowed by him, and I enter it on the credit side of the Cash account, in folio 2." However, in the examples provided in the text of the first thirty-five chapters written in the Venetian fashion, this rule is not so obvious, as we can see when considering one of these entries: "Cash account owes on 8 November to Capital account, for various types of cash, in gold and coins, custodied in same, today, in total, folio 2." As can be seen in the Ledger entry, according to the Tuscan model, the heading of the contra-entry account is placed at the end of the explanation, just before specifying the number of the relevant folio. On the contrary, in the Venetian style, the Ledger entry in the debit account is practically the same as the Journal entry. The contra-entry account is placed immediately after the holder's account or, at most, after the date.

A little further, it is explained that: "Lo bilancio del libro sintende un folio piegato per lo longo," i.e., "By Ledger balance we understand a folio folded lengthwise." In the previous chapters, it is not mentioned that this folio should be folded. On the other hand, neither in Chapter 36, nor in the following sections, is it mentioned that this balance is called *summa summarum*, as opposed to Chapter 34 where this name is strongly emphasized. It was shown above that the total amounts of debit entries and

 $<sup>^{60}</sup>$  This opinion has also been expressed by Yamey in his comments to this paper.

credit entries were recorded both in the *summa summarum* of Chapter 34 and in this *bilancio* of Chapter 36, with the remark that these total amounts do not seem to reflect the total movement of the accounts but only that of the last folio. On the other hand, it seems that balances had to appear also in the *bilancio*, in addition to total amounts.

When explaining in Chapter 36 how to write the balance in a folded folio, Pacioli specifies: "sul quale dala mano destra si copiano li creditori del libro, e dala sinistra li debitori. E veda se la summa del dare e quanto quella de lavere. E allora il libro sta bene," i.e., "in which you will put down the credit balances of the Ledger on the right hand side and the debit balances on the left hand side. And check if the total amount of debit is equal to that of credit. If it is so, the Ledger is correct." As mentioned before on another passage in this same chapter, Pacioli strongly insisted that the expressions creditori and debitori referred to balances, whereas the total amounts of debit entries and credit entries were called summa del debito and summa del credito. These were precisely the total amounts of the bilancio that had to be reconciled and not simply those of the balances. Therefore, it seems that it can be concluded that both the total amounts and the balances of the accounts had to appear in the bilancio of the Ledger analyzed in Chapter 36. This conclusion is obviously based on the assumption that Pacioli used these terms accurately and in a systematic way, but we cannot always be sure of that.

In support of the theory that account balances had to appear also in the bilancio explained in Chapter 36, we shall recall that in Chapter 34 it was said that accounts were to be transferred directly from the old Ledger to the new one, from book to book, without any other contra-entry or Journal entry. This procedure is not basically contradicted in Chapter 36 but an intermediate step is introduced when it is explained that the accounts of the old Ledger must be closed and those of the new one opened taking off the balances recorded in the bilancio. The passage says: "E di poi levare el bilancio del libro vechio, che sia giusto e pari come debba essere, e da quello bilancio copiare tutti li creditori e debitori in sul libro nuovo, tutti per ordine, come elli stanno in sul bilancio," i.e., "You will then strike the balance of the old Ledger and duly reconcile it. Afterwards, you will take off all the creditors and debtors from this balance and will post them to the new Ledger, in the same order in which they appear

in the balance sheet." Pacioli says further on: "E in ciascuna partita del debitore hai a dire per tanti resta a dare al libro vechio segnato A," i.e., "In every entry transferring a debtor's account you must say: for so much that remains to owe according to the old Ledger marked with an A." Similar instructions are given to close the accounts of the old Ledger, always after opening the new ones in the new Ledger.

On the other hand, this indicates that, while the *summa summarum* was the ultimate check to make sure that the accounts of the old book had been closed and those of the new one opened correctly and that it was, therefore, established after this process was completed (as pointed out by Edward Peragallo) [1938, p. 59], the *bilancio* described in Chapter 36 was drawn before transferring the balances to the new Ledger. The *summa summarum* and *bilancio* were not the same document, had different names and were presented, if the hypothesis suggested in this paper is true, in two different texts that were juxtaposed later on.<sup>62</sup> All of this gives reason to believe that the *summa summarum* mentioned by Pacioli in Chapter 34 and the

<sup>&</sup>lt;sup>61</sup> However, in his mentioned work: "La clôture des comptes dans la Summa de Arithmetica," Pierre Jouanique considers that the bilancio of Chapter 36 did not show the balances but only the total amounts. Balances would be transferred to open the new Ledger and to close the old one on the basis of the total amounts recorded in same but directly from the accounts of the old Ledger, in a sui generis interpretation of Pacioli's words.

<sup>62</sup> It seems that this fact had not been observed so far by scholars although, in a very recent article, Pierre Jouanique expresses his conviction that these two balances were completely different, saying that: "Il ne faut pas confondre le bilancio du chapitre 36 avec la summa summarum du chapitre 34. Cette dernière se place à la fin des opérations de clôture, et a pour objet de vérifier qu'elles ont été correctement effectuées," i.e., "The bilancio of Chapter 36 should not be mixed up with the summa summarum of Chapter 34. The latter is drawn at the end of the closing operations and its purpose is to check that they have been carried out correctly." (See his work: "La clôture des comptes dans la Summa de Arithmetica," quoted work). However, Jouanique develops his reasoning as if Chapters 34 and 36 were part of a consistent and coordinated whole, since he does not realize that, as explained, they possibly belong to two different bodies written separately. This is precisely the explanation of many of the inconsistencies and difficulties met by scholars. Jouanique believes the two balances were part of the same process: first, the bilancio of Chapter 36 was drawn, then accounts were closed and opened and, at the end of the process, the summa summarum was established as a final check. According to Jouanique's approach, closing operations, as described by Pacioli, could be divided into six steps: 1. To cross-check Journal and Ledger entries; 2. To close Ledger accounts and point out balance entries by means of the abbreviation Ro in the margin; 3. To establish a balance to check total amounts (the bilancio); 4. To carry forward

bilancio described in Chapter 36 were conceived in a different way and had a different purpose.

At this point, it is important to remember that, as observed by others (e.g. Basil S. Yamey [1978] and Edward Peragallo [1941, p. 448]), Pacioli used the word bilancio to mean not only the statement of total amounts or balances recorded in the mentioned folio, folded or not, but also used it in the broad sense to designate all the Ledger closing operations as a whole, whether the book was closed because it was already full or at the end of the financial year, as it was customary in some places. Pacioli says in Chapter 32: "Bisogna hora dar modo al reporto de un libro in laltro quando volesse mutar libro, per cagione che fosse pieno o vero per ordine annuale de milesimo, come el piu si costuma fare per luochi famosi che ogni anno, maxime a milesimi nuovi, li gran mercatanti sempre lo observano. E questo atto insiemi con li sequenti e detto el bilancio del libro," i.e., "It is necessary to talk now about the way to post entries from an old Ledger to a new one when you have to change book, either because the previous one is full, or because of the annual closing of accounts, as it is customary in important places where big merchants always change books once a year at the beginning of the new year. And this operation, together with those that will be explained below, is called to make the balance of the Ledger." On the other hand, this passage led Mathieu de la Port and Pierre Jouanique more than two hundred years later, to observe that Pacioli distinguished two different reasons to close the books. As pointed out by Mathieu de la Porte, this gave rise to different processes [Jouanique].

In this sense, going beyond the mentioned differences between the *summa summarum* of Chapter 34 and the *bilancio* of Chapter 36, it seems as if, as a whole, the closing process discussed in the first part of the *Treatise* was different from that described in the summary. While it seems that a true closing of the financial year is considered in the body of the *Treatise*, with the results being settled and incorporated into the Capital account, by contrast, the summary seems to describe a simple transfer of accounts from an old Ledger to a new one after having checked, of course, if the entries are correct. In any case, it must be pointed out that the accounts of merchandise entries

balances to the new Ledger; 5. To regularize expense, commission and, if required, Cash accounts and to adjust profit and loss and Capital accounts; 6. To strike a final trial balance, the *summa summarum*.

totally sold are settled and their results transferred to the profit and loss account, when the last lot is sold, without awaiting the closing of the financial year. At any rate, the steps to be identified in the closing process discussed in the body of the *Treatise* would be the following, described in order:

- Cross-checking and ticking all entries of the Memorandum and any subsidiary books, of the Journal and Memorandum entries and, finally, of the Ledger and Journal entries;
- Closing of Ledger accounts, except the Capital, expense and nominal accounts, calculating the balances and adding the debit entries and the credit entries of each folio, already equalled, so that it can appear at first sight that they are reconciled;
- 3. Transfer of the balances of these accounts directly to their respective folio in the new Ledger;
- 4. Closing of expense and nominal accounts following the same procedure;
- 5. Transfer of the balances of these accounts to the profit and loss account;
- Closing of the profit and loss account following the same procedure and transfer of its balance to the Capital account:
- Closing of the Capital account in the same way and transfer of this account, carrying forward its balance or total amounts or each single entry to the respective folio in the new Ledger;
- 8. Striking of the *summa summarum*, as final balance of total amounts for checking purposes, posting the final total amounts of each account, that is to say, the amount of debit entries and the amount of credit entries after having equalled them in order to close the account, as interpreted by Edward Peragallo, or the amounts before recording the balance on the opposite side.

These would be the steps required to close the accounts and to strike the balance, as explained in the first part of the *Treatise*, i.e., in the first thirty-five chapters.

In the closing process considered in the "Summary," many of these steps are omitted, besides referring to a different balance. Thus, nothing is said about the closing of nominal and expense accounts by transferring their balance to the profit and loss account or about the closing of the latter by transferring its balance to the Capital account. According to the summary, the closing of the Ledger "quando el libro fusse pieno o vechio e tu volessi ridullo a un altro libro," i.e., " when the book is full or old, and you wish to transfer it to a new book," would consist of the following steps, in this order:

- 1. Striking of the balance of the old book, recording the debit amounts on the left and the credit amounts on the right;
- 2. Reconciliation of the balance, that is, "che sia giusto e pari come debba essere," i.e., the total amounts of debit entries must be equal to those of the credit entries, as expressly stated by Pacioli: "La summa, non dico de creditori ne debitori; ma dico la summa del credito quanto la summa del debito;"
- 3. Transfer of balances of credit and debit accounts from the balance sheet to the new book, in order, as they appear in the balance sheet or *bilancio*, posting the respective balance as opening entry of each new account;
- 4. Closing of the accounts of the old Ledger by posting the respective balances taken off from the balance sheet to the relevant accounts, as closing entry, on the opposite side in order to equal both sides and to cancel the account.

This is all the "Summary" says with respect to the closing of accounts or, rather, to the transfer of accounts from an old to a new Ledger.

Without realizing that Pacioli possibly refers not only to one balance but to two different balances, scholars have expressed different opinions with respect to the nature of the balance presented in the Particular Treatise De Computis et Scripturis. Given the circumstances, it is not surprising that there have been opinions to suit every taste. To most of these scholars, the balance referred to by Pacioli is a mere trial balance. To others, it is more than that, because they believe it shows some typical traits of a year-end balance. Finally, in the opinion of a few, it is not even a true trial balance. All depends, obviously, on which features their opinion is based: those of the bilancio explained in Chapter 36 or those of the summa summarum of Chapter 34. It should be stressed once again that all the analyses are largely based on the reliability to be attributed to the expressions used by Pacioli in terms of accuracy, uniformity of the incorporated concept, etc. If these conditions are not met, the analyses become a simple play on words. At any rate, if the analysis is based on the summa summarum that Pacioli himself considers as the ultimate check, it seems in principle clear that, as it is a balance of total amounts, without account balances, it should be considered just a trial balance. However, as already mentioned, the summa summarum was established after having made all the adjustments required to settle the results obtained in the financial year, both from purchases and sales of merchandise, carried out as the lots were completely sold, and from expenses incurred. If one did not perform all the adjustments that would be carried out today in relation to the evaluation of stocks, the amortization of personal and real property, the requalification of debtors, etc., this is by no means attributable to the balance procedure but to the general accounting approach. For this reason, Carlo Antinori says that the balance mentioned by Pacioli is something more than a trial balance [Antinori, 1990, p. 7]. It should be mentioned in passing that among the specific adjustments omitted by Pacioli in his Treatise, are those related to cash funds retired at one stroke to pay small expenses little by little, as well as to the lots of merchandise not yet totally sold.

To Edward Peragallo, on the contrary, the balance explained by Pacioli is not quite a true trial balance. Peragallo refers only to the summa summarum and does not seem to see the differences between the latter and the bilancio of Chapter 36, which he does not mention. He says that the summa summarum cannot be a trial balance, since it is established after closing the accounts of the old Ledger and opening those of the new one and, therefore, after having balanced the accounts and entered their balance on the opposite side. He argues that, in these conditions, if the total amounts of each account are reconciled and equalled, the general total amounts must also be reconciled and equalled, this last step representing no check at all. For this reason, in his opinion, the summa summarum is established for the exclusive purpose of checking the correctness of the closing of the ledger, i.e., that no account has remained unbalanced.63 Peragallo is right. We should admit the possibil-

<sup>&</sup>lt;sup>63</sup> "Obviously, a trial balance of a closed ledger is no trial balance at all. It is bound to balance in all cases, even if the ledger were full of errors, because both sides of the accounts were made equal by transferring their balance to the new ledger. It is clear that Paciolo did not know the true function of the trial balance nor its proper construction. This leaves only one possible alternative, that

ity, however, that although the *summa summarum* is certainly established as the final step of the whole closing process of the Ledger and the financial year, the total amounts considered in same could be not the final ones of the accounts, already made equal, but those established before recording the balancing entry. Nevertheless, this possibility seems to be highly improbable, taking into account the example of *Summa delle Summe* inserted by Manzoni in his book discussed earlier.

If the *bilancio* mentioned in Chapter 36 is taken as a basis, we must admit that, although both total amounts and balances apparently appeared in it, taking into account that it is not said that nominal and expense accounts were previously adjusted and that the profit and loss account was balanced with a contraentry in the capital account, the *bilancio* can hardly be considered as anything more than a trial balance. According to what Pacioli says in this context, this *bilancio* was strictly used, first, to check that the old ledger had been kept correctly and, then, to post the opening entries to the new Ledger as well as the closing entries to the old Ledger.

It should also be pointed out that Chapter 36 does not mention at all that the date should appear either in these balancing, closing entries, or in the opening ones. In the examples provided, the date is not indicated in any of these entries. In Chapter 34, however, it is specified that these entries should mention the date on which the balance is drawn.

We turn now to another question. In Chapter 36, it is also stated that the entries carried to the Cash account can be written in an abbreviated form, "cioe sença dire la cagione, solamente dire da tale di tale, o a tale di tale," i.e., "without specifying the reason, saying only from So-and-so on such day, or to So-and-so on such day." This is new with respect to previous chapters.

It is also mentioned that any new account should be opened "in carta nova, sença tornare a dietro, ancora che a drietro vi trovassi spacio da metterla. Non si die scrivere in drietro, ma sempre avanti, per ordine, come vanno li giorni del tempo che mai non ritornano in drietro," i.e., "in a new folio, without going back, even if there is space for it. When opening account, you shall not go back but always move forward, in order, the same

Paciolo was using his 'summa summarium' for exactly the purpose he describes — to prove the correctness of the closing of the ledger, and not for the purpose of a trial balance in the modern sense." [Edward Peragallo: "Origin of the Trial Balance," quoted work, p. 449].

as days never move back." Although the same idea is expressed in previous chapters, and especially in Chapter 28, it is perhaps not stated in such an explicit and categorical way. These words obviously do not mean that two or three accounts cannot be maintained in the same folio if their movement does not require more space, as it is confirmed later in this same Chapter 36 when Pacioli says: "E lascia a ciascuno tanto spatio quanto tu arbitri havere a travagliare con seco," i.e., "And leave for each of them as much space as you think you will need for the operations you intend to carry out with them."

In relation to the contra-entries made to cancel and correct errors, it is specified that they shall be distinguished with a cross or an H. In Chapter 31, when discussing this subject, Pacioli only recommended to put a cross, although he added "o altro segno," i.e., "or another sign." Therefore, the H is mentioned here for the first time.

With respect to balancing entries made to carry forward an account to a new folio, it is expressly indicated that these entries are written "sença mettere giorno," i.e., "without recording the day" and this is how they appear in the example provided. The same is said for the entry through which the balance is carried forward and the account is opened in the new folio, although in this occasion the example says: "Tale di tale d tali de havere." Considering the above, this sentence should be translated as follows: "So-and-so has to have" and not as "On such day So-and-so has to have." In contrast, in the examples given by Pacioli in relation to the same subject in Chapter 28, the day is mentioned in both cases.

On the other had, these types of entries "si debe segnare in margine davanti cosi cioe  $R^o$ , che significa resto," i.e., "must be distinguished in the preceding margin in this way:  $R^o$  which means resto (balance)." No mention whatsoever to this sign appears in the previous chapters.

When using the letters of the alphabet to designate the successive books in order to distinguish them one from the other, the summary does not mention the denomination Ledger of the Cross which, according to the former chapters, was currently used among Catholics to designate the first book. In Chapter 36, the first book is directly called Ledger A.

I should also mention in passing that the fact that the closing entries in the old Ledger and the opening entries in the new one, as well as other entries, were not entered in the Journal shows very clearly the operational and probative character of this book in which the main items to be recorded were transactions related to third parties. Examples of other entries include the closing of merchandise accounts, kept according to the periodic inventory system with a single account, the closing of nominal accounts by transferring them directly to the profit and loss account in the Ledger and the closing of this profit and loss account by transferring its balance to the Capital account. All of these are made without any entry in the Journal.

As mentioned before, the two examples with money amounts provided in Chapter 36 referring, on the other hand, to the correction of an error and, on the other, to a balance carried forward, to do not use the monetary unit expressly adopted "al modo nostro venitiano" throughout the first thirty-five chapters, i.e., the gold lira divided into soldi, grossi and piccioli, but the lira divided into soldi and denari used by Florentine merchants in their accounts. We have already seen that the same occurs in the ten interrelated Ledger entries provided as an illustrative example at the end of the Treatise.

A basic difference between this part of the *Treatise* and the previous one appears in relation to the Capital account. In the body of the *Treatise*, the first thirty-five chapters, the Capital account is always and consistently used under this name — "Cavedale." In the first unnumbered section after Chapter 36, which is entitled "Casi que apartiene amettere al libro de mercanti," i.e., "Cases that must be recorded in the merchants' book," instead of the Capital account, the expression used every time is "Tuo conto, cioe tu medesimo," i.e., "Your account, that is yourself," etc. The denomination Capital account is never used, neither in this section, nor in any other one in the appendix, which starts in Chapter 36.64

Another novelty which appears in the appendix with respect to the previous part of the *Treatise* is the recommendation made in this first unnumbered section that no entry is to be made for inventory goods whose value is less than ten ducats, since such goods are not to be included in the Ledger: "Ma nota che queste partite sintende che non sienno manco di dieci ducati luna, pero che le cose minute di poco valore non si mettano al libro."

This section also mentions for the first time ship insurance operations whose premiums received in cash are credited to an

<sup>&</sup>lt;sup>64</sup> In the opinion of Fabio Besta, the expression "conto cavedal" was almost exclusively used in Venice. [La Ragioneria, quoted work, Vol. III, p. 365].

account bearing a proper name, "sicurta di navilij," and debited to the Cash account. The same occurs with merchandise received on consignment to be sold against a commission, an operation that had never been mentioned in the first thirty-five chapters. There is not any mention either in these first chapters to conditional operations such as purchases or barters made on the condition of receiving the merchandise in good state, of which an example is provided in the second and last section, unnumbered, included in the appendix under the title "Casi che acade mettere ale recordançe del mercante," i.e., "Cases that must be recorded in the merchant's Agenda."

On the other hand, and from a formal point of view, perhaps it should also be added that, in the first unnumbered section, the full stop is used much more than in the previous text.

Even disregarding the ten examples of ledger entries at the end of the *Treatise* (Tuscan vs. Venetian style) and the differences between Chapter 36 (and the following unnumbered sections) and the first part of Luca Pacioli's accounting treatise, one other such difference must be added. While in these last parts Pacioli uses correctly the word "conto" for "account" and the word "partita" for "entry," in the former thirty-five chaptes, he uses the expression "partita" indistinctly to designate an account or an entry, as we have already mentioned.

Likewise, it must also be stated that the denomination "quaderno" is never used in the appendix to designate the Ledger, as it was habitually used in the previous chapters. Instead, Pacioli uses the expression "libro de mercanti" or, simply, "libro," words that were also used in several occasions in the former chapters. 65

In view of all the above, there seems to be indeed good reasons to believe that Chapter 36 of the *Treatise* is not really a summary of the first thirty-five chapters, as Pacioli says, but that it is a separate, though certainly very condensed, text that was not meant to be a summary of the preceding chapters but was written for a different purpose. In the same way, it can also be said that neither the ten related Ledger entries provided at the end of the *Treatise*, nor the two unnumbered sections after Chapter 36 seem to have been written originally for the purpose of being a part of the *Treatise*. This is the case irrespective of

<sup>&</sup>lt;sup>65</sup> According to Fabio Besta, the term "quaderno" with the meaning of Ledger was also characteristic of the Venetian merchants. [La Ragioneria, quoted work, Vol. III, p. 365].

whether all these sections are considered as a unit *per se* together with Chapter 36 or, on the contrary, as separate elements.

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# EARLY ACCOUNTING IN NORTHERN ITALY: THE ROLE OF COMMERCIAL DEVELOPMENT AND THE PRINTING PRESS IN THE EXPANSION OF DOUBLE-ENTRY FROM GENOA, FLORENCE AND VENICE<sup>1</sup>

Abstract: This paper offers an explanation of why double-entry book-keeping developed in the city-states of Northern Italy in the years 1200-1350, and then how it then spread from there to the rest of Europe. Increased economic activity initiated soon after the start of the Crusades, but then growing into an explosion of Italian trade by 1350, provided Genoa, Florence, and Venice with enormous trading opportunities. This expansion of trade created, in turn, the need for a much improved accounting technique. The spread of double entry was greatly abetted by the advent of cheap business arithmetics and grammars made possible by the invention of the moveable type printing. Venice was especially advanced in her printing industry during the years after 1500.

Thus, it was that the double entry system was created in Northern Italy between 1200-1350 primarily due to the development of the regional economy, and from there spread to the rest of Europe helped immeasurably by access to cheaply printed books.

¹A preliminary version of this paper was presented at the International Congress on Banchi Pubblici, Banchi Privati e Monti di Pieta nell'Europa Pre industriale, in Genoa, Italy, Oct. 1-6, 1990. This article is speculative, exploratory, unsettled and controversial. There is much research still to be done on these topics especially the relationship between privity, literacy and the precise mechanism by which double entry spread from Italy. I want to express my heartfelt and sincere gratitude to the Societa Ligure di Storia Patria for making the Congress possible. The conference was made excellent by the careful and diligent work of Giuseppe Felloni and Dino Punuh. I want to personally thank Professor Felloni, Ugo Tucci and Reinhold Muller of the University of Venice, and Richard Marshall, then a graduate student of Johns Hopkins, for their insightful and useful comments. They helped to make this paper much better than it would have been otherwise. I am especially in debt to Professor Felloni for time spent with me on this research. The comments of two anonymous

# INTRODUCTION

The results of research on the origins and history of accounting techniques appear to have settled the issues of where and when the double entry accounting system was developed. Relatively little has been done to shed light on why this system of accounting practices emerged in Italy in the early thirteenth century or how it spread from there to the rest of Europe. These two issues are explored in this paper and preliminary results are provided to indicate that regional economic development and the technology of moveable type printing were primarily responsible for the rise and spread of double entry.

Historians of accounting agree that one of the two or three great advances in accounting technique was the development and subsequent implementation of the "double-entry" (hereafter DE) system. Furthermore, most accounting historians will agree that the initial successful presentation of DE in published form was Pacioli's 1494 manuscript. So overwhelming is Pacioli's book that he is celebrated as the "father" of modern accounting. and the conventional wisdom is such that accounting as a profession is typically dated from 1494. So great is this legacy that in the 1990s a group of accountants have formed a society to celebrate the 500th Anniversary of Pacioli's book. Named after the master himself, this organization is complete with a newsletter, research notes and trips to Italy. The ironic feature of this celebration is that Pacioli denied any creative originality for the DE system; he was merely memorializing a system which he thought had existed for some two centuries or more in Northern Italy [Taylor, 1956, pp. 179-181].

The literature on the specific origins of DE has gone through cycles over the past century, at first crediting Pacioli and Venice with its discovery. Later research by Fabio Besta and Edward Peragallo has demonstrated that Florence, Genoa and other commercial centers had developed DE either independently of the Venetians, or through a process of intellectual cross fertilization and simultaneous improvement and development. A. C. Littleton, in his seminal book, described the neces-

referees were most valuable in clarifying my thinking and the character of the paper. I am most grateful to these two individuals, as well as editor Dale Flesher, for the time, trouble and care they spent in reviewing and developing this manuscript. The errors, of course, are mine, but readers should know that much of this paper's contribution is due to these people.

sary preconditions for the invention of DE, and offers an explanation of the relationship between these factors, which determined the invention of this most useful piece of social technology [Littleton, 1966, pp. 13-21]. Academics have also focused their research on other accounting elements, such as the widespread use of the Hindu-Arabic number system, to shed light on the appeal for DE [Williams, 1978, pp. 29-39].

It is not the purpose of this paper to reopen any of the old debates. There is an abundance of research on the alleged locus of invention, and the current state of research on this issue is inconclusive as to specifics [Yamey, 1949, pp. 99-113; Yamey, 1975, pp. 117-136; Yamey, 1927, pp. 260-292; Sombart, 1933, pp. 116-127; Schumpeter, 1942, pp. 119-126; Lane, 1973, pp. 140-141]. The literature is relatively silent however on a related question, i.e., why did DE emerge where it did and why did its use spread so rapidly? To propose answers to these questions this paper focuses on two phenomena which have heretofore been overlooked in the historiography of DE, namely: (1) the rise of relatively high speed moveable type printing, and the subsequent gradual spread of this print culture from Northern Italy to the commercial centers of Northern Europe and (2) the economic development of the area between the three great Italian city states — Genoa, Venice and Florence — which gave rise to a business climate and level of commercial sophistication that demanded a new and better form of accounting. It is the theses of this paper that the second element mentioned above, the economic development of Northern Italy, created the necessary business environment for the DE technique and that it was then spread to the rest of Europe via business and arithmetic grammars, written in local vernacular, by the new technology of moveable type printing. To be sure the new printing technology was not at all necessary for the creation of DE (recall that when Pacioli published his Summa, DE was already generally recognized as a superior accounting scheme), but it did greatly facilitate the spread of the new accounting after 1500. As Elizabeth Eisenstein, the notable historian of printing as an agent of change, has so aptly pointed out, religion was not the only area of human activity revolutionized by the printing press, there were others as well [Eisenstein, 1979, Chapters 3 and 4].

This article maintains that the origins of DE are rooted in its relationship to broad economic, technological and intellectual factors. While historians are not sure in exactly which Italian city-state double entry was initially used, they are positive the technique originated in the Genoa-Venice-Florence triangle in the years from 1200-1350. Using this as a point of departure, an explanation is offered of why DE both originated in and spread from this area and to place these events in the context of the regional economy and printing technology of Northern Italy.

Double entry is defined as any bookkeeping system in which there was a debit and credit entry for each transaction, or for which the majority of transactions were intended to be of this form. The proviso is needed to cover situations where the corresponding debit or credit item is missing, for whatever reason, but was intended to be present. This definition covers the systems of Medieval bookkeeping which most experts agree were in the double entry format. Initially, these were in paragraph form. The money values were most often kept in Roman numerals and in the local monetary unit. Paragraphs were sometimes kept vertically, one below the other, but the lateral method (debit on the left side, credit on the right) was also in wide use and eventually became universal. It was not unusual to find entries recorded in separate books or folios, which can make the identification of a double entry system more difficult. Merchants often recorded only that information which they regarded as most important or was specifically related to a credit item. Because profit, and hence retained earnings, were not yet fully recognized and defined; and because, in any case, they were often small, credit, usually short-term, was a critical element in many businesses and hence accorded a special place in a merchant's books.

The development, spread, and near universal adoption of double entry accounting helps bridge the late Medieval period with that of early modern Europe and forms a base upon which commercial development and modern management were built. The economic development of the regional economy of Northern Italy and the invention of the printing press influenced learning, the development of vernacular languages and enhanced business education, especially accounting practices [Eisenstein, 1979, Chapters 3 and 4]. The development of Renaissance thought, along with its economy, gave birth to a business ethos in which the accumulation of wealth and material objects was both important and encouraged. The implications of this for business, and accounting practices, are obvious.

# COMMERCIAL EXPANSION

In explaining where and when modern bookkeeping arose, it is necessary to differentiate between the two economic spheres of Medieval Italy. The first sphere is comprised of small artisans and businesses conducting operations within a single village or town. Dealing almost exclusively with a fixed number of repeat customers, these businesses had little use for new and sophisticated accounting devices. The second sphere is made up of larger merchants mainly from growing urban centers. It was this group which built the large trading, commercial and financial firms where the need for modern accounting practices proved greater. Double entry bookkeeping was invented and implemented by large merchants for reasons specific to the economy and culture of Northern Italy. From there, it spread over the trading routes of Europe to become standard business practice.

Three related events conspired to cause the economy of Northern Italy to expand rapidly after 1100. One was a generalized and rapid (for the era) increase in population. This remained true until the plague years of the mid-fourteenth century reduced European population by a third. The second was the economic opportunities provided by the Crusades. After the Turks captured Jerusalem in 1075 and for two hundred years thereafter, wave after wave of European armies, and their camp followers, traveled to and from the Middle East. This interaction introduced the Crusaders to the delights of the Middle East and created a permanent demand for these products. Venice, Florence and Genoa all had a long history of trading contacts with the Middle East and their role and importance in this trade increased many fold. All three city states grew and prospered accordingly. Later, there was a derivative flow of trade and commerce in all of Northern Europe which, in turn, increased the demand for specialized commercial services, one of which was a superior accounting methodology.

That bookkeeping and accounting are inherently pragmatic affairs hardly needs elaboration, but is underscored by the fact that a systematic body of accounting theory was not developed until well into the nineteenth century. Before then, accounting was in the hands of practitioners who were concerned with practical business problems. Bookkeeping developed in response to, was dependent upon, and adaptable from the nature of the firm in question. To some extent this is, of course, still

true. It has only been in the last century or so that academic theorists have caught up with professional business people in the application of, and writing about, accounting practices.

Werner Sombart indicates that medieval businessmen only infrequently balanced their books. This assertion may not be true in a technical sense, but it is more important to point out that businessmen of the period had a clear idea of capital and profit, and were able to manage large, diverse and international operations with available accounting principles. The lack of a uniform tax system, the church's ban on usury, thin and underdeveloped capital markets, and an uncertain idea regarding the nature of long-term capital, all mitigated against an annual balancing of a firm's books as is understood today. But as Lane points out in his famous article, partnerships did close their books on various projects and reconcile profits to the various principles [Lane, 1945, pp. 164-172]. However, as accounting practices developed in this environment, they became useful for immediate problems and laws and business conditions did not yet require a generalized, uniform system of books. The most typical forms of Medieval books were two: a simple cash account and a form of venture accounting. The cash account was merely a listing of cash items, inflows and outflows, which were conducted with little or no consideration to the nature of the transaction. Conversely, venture accounting was different and grew from a customary method of financing international trade to be perfected by the Venetians and Genoese [Lane, 1977, pp. 177-191; Lane, 1945, pp. 164-172]. Most venture accounting schemes were often made in paragraph form with long, flowing narratives describing the transaction. Medieval books can also be found in a number of different forms. For example, merchants used single entry systems for cash receipts and disbursements. Some small merchants could simply keep their books in their heads, so regular and ordinary were their operations. As business expanded in complexity beyond the capability of an individual memory, simple receivable and payable ledgers became more common. This was particularly needed by those who traveled to the fairs of the late Medieval period. As these fairs grew, trade ledgers came to include assets, liabilities, plus other accounts besides cash. Such transactions required more sophisticated accounting devices. Journals appeared and were used to record entries from many ledgers and to consolidate certain types of information. The need for double entry was gradually increasing, and by 1200 a critical mass had formed.

Fabio Besta, his students and a few others generally are recognized for creating the idea about the origin of modern accounting. This wisdom holds that double entry was invented or developed in Northern Italy perhaps as early as the first decades of the thirteenth century. The extant sources and current scholarship does not support a more precise dating. What is clear is that by 1340, the Masari of the Commune of Genoa had a well developed double entry system whose origins are unclear. The Masari, elected officials and managers, who had legal responsibility over certain Treasury business. The Masari were officials of the Commune for a period of one year. At the end of their tenure, they had to pass control over cash, and other accounts, to their successors. This meant they had to justify cash balances at least once per year, which created a fundamental need for responsibility and control over the public trust. This annual political and accounting cycle undoubtedly helped explain why accounting methods in Genoa were so advanced.

Scholarly attention has shifted in the last 70 years to two other Italian city-states, Venice and Florence, as possible origins of the double entry method. However, nothing so unique or tidy has risen to replace Besta's thesis, and researchers are left with a confused and complicated picture. Both Venice and Florence have advocates extolling their claims for fathering DE, but no one is (yet) able to make an irrefutable case for uniqueness. What emerges is the view that DE was developed in several locations, simultaneously, in response to similar pressures from regional economic, social, and cultural conditions. For example, Florentine economic growth dates from around 1100 and succeeded in transforming the city from a provincial agricultural and feudal town to a cosmopolitan banking and mercantile center [Goldthaite, 1981, pp. 107-115; Miskimin, 1969, pp. 68-75; Polonio, 1977, pp. 1-91]. Origins of the modern business, enterprise can be traced to the large commercial partnerships which were established in Tuscany in the late Middle Ages. In 1252, Florence coined the first gold piece of Europe. This has traditionally marked the Florentine rise to the pinnacle of European business and commercial success, especially in banking, and was aided by the unique Florentine system of raising capital. Large associations, based on family ties, accumulated hitherto unheard-of sums of money. These funds helped to foster the flowering of industry and banking in Tuscany. As Florence became a major European commercial center, its need for a modern system of bookkeeping arose.

The prevailing mode of partnership finance gave rise to bookkeeping practices which meticulously recorded each partner's contribution and responsibilities. Books of account were opened, and early fourteenth century manuscripts reveal debits and credits in vertically placed paragraphs. There is some evidence in the Peruzzi ledgers of a double entry system as early as 1335 [Pelagallo, 1938, pp. 18-22; Ceccherelli, 1910, Chapter 3]. One also notes the use of a cross indexing system akin to Genoa's but not as detailed. Thus, the available manuscript evidence indicates that Florence by 1330 or 1340 had independently developed a relatively sophisticated system of DE bookkeeping. The available evidence does not allow scholars to determine the antecedents of the Florentine system. However, its sophistication and widespread use both are indicative of a long developmental process of perhaps a century or more.

Florentine businesses were also the first to use a type of branch accounting to keep touch with their overseas operations, and the silk and woolen manufacturers pioneered a type of cost accounting unique in Medieval Europe. These firms had, by 1350, two sets of books, one for the production or purely industrial side of the business and the other for its commercial operation. Before the discovery of the Florentine industrial accounting practices in textile houses, cost accounting was thought to have originated in England with the Industrial Revolution about 1785. This is an important finding because it indicates that accounting practices were more advance in Medieval Italy than had previously been suspected [Elder, 1937, pp. 228-231].

Before the locus of international trade shifted to the Atlantic. Venice was the uncontested trading center of Mediterranean Europe. As a maritime city, it was able to reap huge profits from its trading and carrying activities and consequently developed a large commercial population. It was natural that Venice would develop a system of accounting to record the financial condition of her businessmen. Furthermore, it was the Venetian trading network, coupled with her intellectuals and the printing industry, which was in large part responsible for spreading the DE system over Europe. Although the earliest extant records of Venetian DE are from a later period, it should be noted that by 1494 the DE system was sophisticated, well known and widely applied. As Pacioli was primarily an academic on these matters, its safe to conclude that his writing followed the best practice of the day, it did not show the way. As such, its then logical to assume that Venice, despite its lack of archival evidence, was

utilizing a DE system on about the same time table as other important commercial and traveling centers in Italy.

Modern accounting was, therefore, the end result of a long and arduous problem-solving effort, itself related to the increasing complexities of trade in early modern Italy. Three cities — Venice. Florence, and Genoa — provided the seed bed for modern accounting practices, and became the centers from which the new discipline spread. The years from 1200 to 1350 saw a burst of economic activity, a sharp break from the past, which the historian Robert Lopez called "the Commercial Revolution" [Lopez. 1976. chapters 1 and 2 ]. The larger merchants of this region were subject to a common set of commercial pressures which forced them to seek an accounting system superior to that of the Middle Ages. By approximately 1200, conditions were ripe for the invention of DE. Merchants, especially those in the active trading centers, began experimenting with a variety of expense, capital and equity account whereby all that remained (essentially) was to never debit without crediting.

The economic revolution of the twelfth and thirteenth centuries greatly retarded feudalism and transformed its wealth into resources for a world economy. This economic expansion fueled the progressive development of business and industry and created the wealth of the Renaissance. Production for profit and an expanding market made possible the national economic systems which underlie the growth of the modern state. In short, this great burst of economic activity helped to push Europe from feudalism toward capitalism. With this increase in trade and other commercial activity went a demand for more advanced accounting system. Capital began to accumulate in Northern Italy, and this necessitated institutions to safeguard and invest it. These funds were funneled into the expanding commercial sector as productive investments or used to finance working capital. The economic development of the thirteenth and fourteenth centuries was an "explosion of Italian trade," which stretched from Greenland to Peking [Lopez, 1976, Chapter 3-51.

This explosion drew additional energy from technological developments in navigation and transportation which greatly reduced transportation and insurance costs. Thus did this great movement of people and commodities encourage the invention of the Italian system of venture accounting, and in turn the spread of Italian multinational enterprise (to use modern terminology), especially of banks, motivated the development of more

elaborate accounting systems [Lane, 1945, pp. 164-172]. The banking and textile industries required meticulous attention to detail, and found it profitable to use double entry early. This superiority as a management tool was quickly recognized, and entrepreneurs were eager to adopt it.

# **PRINTING**

The other crucial element of this analysis was the invention in Germany of movable type printing in 1454. While printing did not aid the invention of modern accounting, it certainly abetted its spread. Printing affected all of Northern Italy, but its primary impact, for our purposes, was on Venice. The relationship between accounting and printing is understandably obscured by the profound effect printing had upon religion. Martin Luther ingeniously used the printing press as a tool to spread his crusade against the prevailing Catholic dogma. However, printing presses were also used to help educate merchants on the details of double entry. While prosaic in comparison to theological issues, the new business arithmetics and bookkeeping manuals certainly helped to educate and convert many businessmen to double entry [Eisenstein, 1979, chapters 1-2 and 6-8; Davis, 1960, pp. 18-48]. Printing greatly increased the availability of instruction in the double entry technique, thus giving Northern Europeans a practical guide to the new accounting. To be sure there were some sources of information on DE before the printing press, but they were few in number and relatively expensive.

Italy also sponsored a revival of secular learning which, Fernand Braudel suggests, grew out of the need to train merchants' apprentices [Braudel, 1983, chapters 11-13]. He mentions that Florence had as many as 10,000 children learning to read in primary school at a time when the cities population was not larger the 100,000. Braudel continues to make the point that as many as 1,200 boys went on to study accounting and arithmetic until they were fifteen years old [Braudel, 1983, chapters 11-13]. Given the available resources and population base these are very large numbers of students. It is clear from this research that Northern Italian city-states were leaders in education and that this education typically took the form of reading, writing, and arithmetic. All of these mental endeavors were crucially aided by the spread of grammars and arithmetics made possible by the printing press. The specific intellectual linkages are com-

plicated in this instance and any scholar of this period must constantly remind himself or herself there is no simple cause and effect relationship among these variables. The demand for output of printers was dependent upon the educational level of the population. However, to a certain extent the literacy rate was related to supply of affordable books. Both, variables were dependent upon the great increase in the desire for knowledge, fostered by the Renaissance. Further complicating these relationships is the fact that secular humanism itself rested upon the ability of interested individuals to read the texts they wished. Thus, it is not an easy problem to sort out.

One method which could be used to document this claim regarding the spread of double entry would be to count and note the locations of printing various business arithmetics and grammars. Estimates could, in theory, be made of the number of students who were schooled in the commercial arts and this data could in turn be compared with business records of the day to link the two events. While its certainly true that early printed books were expensive, they were cheaper and more accessible than materials of a comparable nature before the printed book.

Such a research design is not available due to a lack of extant records, especially on literacy rates and enrollments in business education curriculum. However, drawing on the research of Elizabeth Eisenstein, it is possible to construct a pattern for the rest of the continent. This data is summarized in the table below.

# **Establishment of Printing Centers**

	Before 1471	1471- 1480	Total to 1480	1481- 1490	1491- 1500	Total at 1500
Northern Italy	2	33	35	9	5	49
Rest of Italy	2	3	5	4	0	9
Germany*	7	28	35	20	11	66
Switzerland	2	3	5	8	2	15
Iberia	1	6	7	14	9	30
France	1	8	9	11	12	32
England	0	4	4	0	0	4
Scandinavia	0	0	0	4	2	6
Eastern Europe	0	4	4	3	3	_10
Total	15	89	104	73	44	221

<sup>\*</sup> Includes present day Austria and Benelux

Table constructed from E. Eisenstein, *The Printing Revolution in Early Modern Europe*, Cambridge University Press, 1983, pp 14-15.

This data represents the spread of printing in the years immediately preceding 1500. Printing centers is a term used to indicate the location of printing presses, and associated services, such a translation, editing and book selling, which were carried with printing during this era. This table is primarily descriptive, not inferential, and is used here to indicate a general pattern of development.

Printing per se, spread from two areas, Northern Italy and Germany, (mainly present day Central Germany), North and then West. Before 1480, the majority of growth of printing centers was primarily in Northern Italy and Germany which accounted for fully 70 of the 104, or 67%, of all the printing centers in Europe. In the case of Northern Italy, these centers were concentrated in Venice, Genoa and Florence, including their suburban networks of towns and villages. These were also the urban areas where DE was being developed, refined and implemented, and represented and opportunity for business people to put down in book form their methods of accounting.

Furthermore, each printing center could support a number of separate printing houses. Indeed, the economic phenomenon of agglomeration economics coupled with external efficiencies explain the rapid growth and low cost of printing in Venice. Venetian printers were able to learn from each other, and to learn by doing which allowed them to rapidly capture a sizeable share of the printing market via superior quality at a lower cost. The political climate in Venice was generally tolerant, and this, plus the city's role as a commercial and intellectual center, attracted a wide range of scholars who could be employed as translators and advisors to the printers.

From Northern Italy, after 1480, printing spread to other commercial centers mainly in France and Iberia. The majority of the growth in printing came from only four countries: France, Spain, Italy, and Germany, which accounted for 185 of the 202 printing centers, fully 91% of the total, by 1500. Since printing was a quintessentially urban activity, during these years all centers were simultaneously associated with business and commercial growth.

The spread of printing was associated with two crucial elements which abetted the wide adoption of DE. In all cases, new printing centers were established and operated in urban areas. In order for this new technology to survive, a critical mass of population, literacy and the demand for printed works in local

vernacular all had to be present. These could only be found together in urban areas. Secondly, and more importantly for DE, these urban areas had to be commercially active and involved in trade in order for there to be a subsequent demand for the new accounting technique.

Throughout the thirteenth and fourteenth centuries, the economies of the great Northern Italian city-states developed rapidly. Population and urban growth were both high as was the advancement of trade and manufacturing. This process was temporarily interrupted by the Black Death Plague, but by the early years of the fifteenth century, Venice became the trading capital of Europe with factors and subsidiary operations stretching from London to the Levant. In conjunction with economic growth, the Renaissance helped to foster free thinking and broader education. The end result of this process was increased literacy and specialized educational institutions, especially in urban areas [Sarton, 1930, Chapter 5].

Venice became the printing center of Southern Europe and was more urbane and cosmopolitan than either Genoa or Florence, or even Rome, all of which still retained a certain Italian provincialism. The Church had less influence in Venetian affairs, and, in conjunction with a liberal government, large skilled labor force and vibrant intellectual community, provided the conditions in which a vigorous printing industry could thrive. A large percentage of the titles in business, commerce and accounting books were first published in Venice; and then Venetian merchants carried them to all of Europe. Such printers as Aldo Manuzio quickly took advantage of this comparative advantage in printing and translation. The city had acquired an impressive array of ancient and contemporary scholars eager to assist fledgling printers. These unique advantages allowed Venice to become the premier printing center of Europe. To illustrate Venetian dominance of printing south of the Alps, consider the following: by 1500, 2,835 books had been printed in Venice, while Rome could claim 925, Milan 629 and Florence 300 [Symonds, 1933, p. 369; Grendler, 1977, Chapters 2 and 3].

# CONCLUSION

This article was written to achieve two purposes: first to locate the region — Italy's Golden Triangle — where DE was originally developed and to explain why it initially occurred in Northern Italy. Second to develop a plausible theory of the

mechanism by which DE was spread from Northern Italy to the major trading centers of Europe.

Simply put, double entry developed in three Northern Italian city-states between approximately 1200 and 1350. The need for a new accounting system stemmed in large part from the economic forces of the Commercial Revolution. From Northern Italy, double entry spread along European trading routes to other commercial centers first by way of example and then through the use of new business manuals from the printing industry. The increase in economic activity was fueled by commercial contacts from the Crusades, advancements in agriculture and trade, population growth and the rise of urban areas. While Luca Pacioli and his followers were behind practitioners in commerce, they did provide an educational medium from which others could learn the new art of double entry. This method of keeping books allowed for a more precise definition and calculation of profit, and, at the same time, it gave managers better financial tools with which to make decisions.

There is more to the story of Italian dominance of accounting's early years than can be told here. However, the main character of the play and the essentials of the plot and setting have been established. Two events — the Commercial Revolution and printing — came together in Northern Italy to create the conditions whereby the region could invent, perfect and disseminate double entry. Raymond de Roover, the distinguished Belgian historian of accounting, sums up these events best: "Under the spur of necessity, accounting developed spontaneously and reached a remarkable degree of perfection in the Italian communes of the Middle Ages. . . . and the invention of printing and the publication of manuals helped the diffusion of double entry bookkeeping outside Italy" [de Roover, 1955, p. 417].

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# THE DOUBLE-ENTRY BOOKKEEPING METHOD APPLIED IN SPAIN TO ACCOUNT FOR TRANSACTIONS RELATED TO THE MINTING PROCESS OF GOLD AND SILVER IN THE SIXTEENTH CENTURY

Abstract: This paper represents a summary of broad research undertaken in the Archivo General de Indias of Seville. Gold and silver were shipped from America, received in the Treasury Room, minted, and sold in public auctions to merchants. Because single-entry was the usual accounting method applied by the Casa de la Contratación de las Indias, it was surprising to find several books which provide evidence of the application of the double-entry accounting method to account for those transactions related to the minting process. The purpose of this paper is to demonstrate that the documents related to the accounting procedures of the Casa treasury represent the earliest evidence found of the utilization of the double-entry method by a public institution.

The study concludes that the treasury utilized the double-entry bookkeeping procedure as early as 1555 to account for the transactions involved in the minting process of gold and silver. Although the focus of this research is on the period 1555-1600, this method was utilized until the middle of the 17th century. This paper examines the accounting procedures used to account for the sale of gold and silver during 1560.

# INTRODUCTION

Under the auspices of the Bank of Spain, during 1991 this study analyzed the accounting documentation located in the Archive of the Indies. These documents pertained to the sales of the gold and silver brought from America that entered into the Casa de la Contratación of Sevilla (Casa hereafter). The goal of the Casa was to control and organize trade with America. Within this trade, gold and silver occupied a preferential position, playing a role whose relevance depended upon the frequently over-extended treasury and general economy of Spain.

The first discovery of this interesting documentation was made by Hernández-Esteve [1986] in his book dedicated to Pedro Luis de Torregrosa, who was an important figure in the sixteenth century and is considered to be the chief expert on the double-entry method of accounting in Spain during this period. Moreover, he was an important buyer of gold and silver in the second half of the sixteenth century. Esteve mentions the ledger books (*Libros de Caxa*) and the diary books (*Libros Manuales*) that correspond to the years 1555, 1557, 1558, and 1560, that the Casa used to account for the sales of the precious metals belonging to the crown.

It is possible that these books have passed through the hands of many other researchers, primarily those who have dedicated their work and efforts to discerning the quantity of gold and silver that Spain imported from the Indies during this time frame. Possibly Hamilton [1975], as Hernández-Esteve [1986, p. 59] notes, has used these books as well, but without realizing their significance in the history of accounting. Because they were not familiar with the double-entry method, other researchers of the history of economics may have committed the same error. The analysis of this documentation, as will become apparent, reveals the establishment of the double-entry book-keeping in the public sector forty years before its utilization by the central accounts of the Royal Treasury of Castilla in 1592.

# A BRIEF DESCRIPTION OF THE LOCALIZED DOCUMENTATION

After reviewing the documented sources for all of the second half of the sixteenth century, the general index of the Archives of the Indies was investigated particularly the discovered separate part which was dedicated to the buyers of gold and silver. This included two subparts that, for the period of interest, contained the following files, all of which pertain to the section labeled *Contratación*.

First part: Under the general heading of Libros de Cargo y Data of the treasurership, the following files were found:

Years	-	File
1553-1567		4678
1554-1588		4679
1554-1579		4680
1557-1580		4681
1562-1588		4682
1576-1593		4683

1580-1599	4684
1585-1609	4685

The books about this part of the cargo had data files that were kept primarily using a single-entry form of bookkeeping. However, it was discovered that there existed an important quantity of diary books and ledger books which were kept in the pure style of the double-entry method practiced at this time.

Second part: In the general index of the archives, files were located under the generic name of "Buyers of gold and silver." These files outline the obligations and surety that the buyers had to fulfill. The gold and silver that they bought in the rough form from the treasury room was to be taken from and returned to the mint (Real Casa de la Moneda). Among these files, the following have been analyzed:

Years	File
1506-1609	4951
1507-1575	4955
1574-1592	4956
1557-1580	4681
1580-1600	4957

In this part, as well as in the previous one, the generic name does not correspond to the contents of all the files, but rather only to the first ones (4951). The rest of the files carry the title of "Books of the receipt and sale of gold, silver, and pearls that came from the Indies", and the contents of which include some ledger and diary books. Table 1 contains a summary of the information contained in these files.

As an example of the analyzed documentation, I have selected one of the clearest accounting processes found. Specifically, I chose the process corresponding to the sale of gold and silver that came for the King by way of Captain General Pedro de las Roelas in 1560. I have chosen this process for the following reasons:

**First:** As one can verify in Table 1 (file 4955), I have the complete documentation which includes: the books of sales, the diary or "manual", and the ledger or major book. The examination of these books is confined to the year 1560 and to the fleet that came that year under the command of Captain General Pedro de las Roelas.

**Second:** In this process, only the entries of gold, silver and *reales* (a type of coin) that came for the monarch were recorded. This made the selected process seem simple and more easily

**FABLE 1** 

Documentation Analyzed from the General Archives of the Indies in Seville

Other books			Book of the confiscation of gold and		1588					Gook of the receipt and sale of the	silver of his majesty (1558 to 1559)							
Diary and ledger books			Diary and ledger book of the sale of	silver from the Guadalcanal and	Aracena mines (1557 to 1588)	Diary from 1555 to 1561				Diary of 1557	Diary of 1558 to 1571	Ledger book from 1558 to 1563	Ledger book from 1565 to 1579	Ledger book from 1563 to 1588	Diary from 1566 to 1577	Ledger book of 1567	Diary from 1577 to 1593	Ledger book from 1577 to 1593
"Cargo" and "data" books	"Cargo" and "data" books of the	treasurer of the Casa de la	"Cargo" and "data" book of the	treasurer of the Casa de la	Contratación (1557 to 1562)	"Cargo" and "data" book (1557 to	1559) Debit book of the sales of	silver from Guadalcanal and	Aracena (1562 to 1579)				"Cargo" and "data" book	(1568 to 1569)		"Data" book (1578 to 1583)		
YEARS	1553	to 1567	1554	t		1554	to	1579		1557	to	1580	1562	to	1588	1576	to	1593
File (legajo)	4678		4679			4680				4681			4682			4683		

Other books	Entries of gold and silver that the maestres of nao declared. Entries of gold and silver that were sold by auction.		Book of obligations and surety of the buyers of gold and silver (1506 to 1629)	Book of the sales of gold and silver in 1560 Book of the sales of gold and silver from 1563 to 1575	Book of the receipt and sale of gold, silver, and pearls (1574 to 1592)	Book of the receipt and sale of gold, silver, and pearls (1580 to 1600)
Diary and ledger books		Ledger book from 1585 to 1602 Ledger book from 1595 to 1609 Diary from 1593 to 1605		Diary of 1560 Ledger book of 1560 Diary book of 1563 Ledger book of 1566		
"Cargo" and "data" books	"Cargo" and "data" book					
YEARS	1580 to 1599	1585 to 1609	1506 to 1629	1507 to 1579	1579 to 1592	1580 to 1600
File (legajo)	4684	4685	4951	4955	4956	4957

interpretable. This simplification does not occur in other processes. For example, in those that concern the treasures headed toward diverse destinations and in those sequestrated by the monarch, a considerable number of accounts are necessary and the process is enormously complicated (e.g., the complete representation of the origin and destination of the treasures and the treatment of the debts of the monarch with the owners of the confiscated treasures).

**Third:** A set of identifiable and coordinated accounts are utilized in this process. This permits a simple and complete schematic representation of the accounting process appearing next to the personal accounts and the accounts of differential values or of results. This trait represents one of the essential characteristics of the double-entry accounting method.

#### CHARACTERISTICS OF THE ACCOUNTING METHOD USED

After the examination of the files, I concluded that the method used was, primarily, the double-entry accounting method commonly found in the practice of private business accounting at that time. It is interesting to note, however, that together with the principal books used in that method (diary and major), others such as the "cargo" and "data" books corresponding to the single-entry method were still kept. The reason is that these books served as auxiliaries to the treasurership: they contained exclusively numerary income and outcome, and were under control of the treasurer of the Casa.

#### PRINCIPAL BOOKS UTILIZED IN THE METHOD

There are four main books that I have identified in relation to the activity of the sale of precious metals:

- \* "Cargo" and "data" book of the treasurer of the Casa de la Contratación: The "cargo" book registered the numerary input (principally for the sales of gold and silver). It was completed by a book of "data" or numerary output, whose titulary belonged to the treasurer of the Casa.
- \* Silver and gold receipt and sales book: The content of this book was similar to the previous one. One exception was that in the silver and gold receipt and sales book, no debits were annotated and only the receipt and sales of the gold and silver were presented. It also contained, like the "cargo" book, all of the characteristics of the sales that were realized.

- \* Diary book or "manual": This was a book of the sale of gold and silver, but whose content for the most part goes beyond the exclusive representation of the transactions and the related operations. It usually represented, in a complete form, the last destination given to the treasures that were sold or not sold in public auction.
- \* Ledger (major) book or *Libro de Caxa*: in this book, they opened all of the accounts that appeared in the diary book, which permitted the control of its balances.

Next, I will briefly analyze the content of these books and observe the adapation of the final two books to the double-entry accounting method.

### "Cargo" and "Data" Book of the Treasurer of the Casa de la Contratación

This book was dedicated to annotating every numerary inflow and outflow. The treasurer, as his name indicates, was in charge of these entries, which originated from activities related to the sale of the gold and silver of the Royal Treasury.

For the purpose of this research, this book represents an "auxiliary of cash." In a very detailed form, the book contained all the sales transactions for gold and silver that entered into the Casa. The treasurer was the only person in charge of registering the precious metals as they were received and, thus, the importance of this book lies in its being an instrument of essential control over the resources managed by the treasurer. When the book of Cargo was combined with the book of Data, the resulting balance was normally positive. This balance was obtained by taking the difference between all of the transactions recorded in the Cargo from all those annotated in the Data book. Whenever it was positive, the amount was transferred as a debit (cargo) to the following book of Cargo and Data. If it was negative, the treasure would have to clarify it.

### Silver and Gold Receipt and Sales Book

It is similar to the "cargo" book of the treasurer of the Casa. The precious metals delivered to the Casa by the *maestres de naos* were subsequently sold to the merchants. The major difference between this book and the previous ones is that only the receipts and subsequent sales of the gold and silver were recorded in it, making no reference to the treasurer of the Casa.

Therefore, this book can be considered as only an auxiliary to the diary book, since all of the operations registered in the former were subsequently transferred to the latter.

### Diary or Manual Book

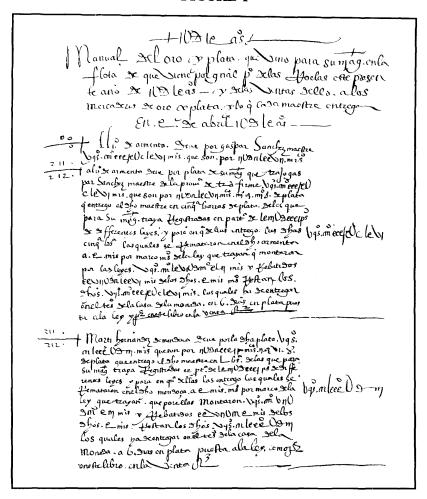
It was in this book where the transactions derived from the sale of gold and silver were recorded chronologically until these metals were transformed into coin and again reverted back to the treasurer of the Casa. In order to clarify this, we have to point out that the goal of the buyers of gold and silver was to acquire these metals in public auction in accordance with the law established in the Indies, to be able to smelt the metals according to guidelines imposed by the crown for the coinage (11 dineros y 4 granos for silver and 22 carats for gold). The merchants were obliged to deliver the value of the acquired silver or gold to the treasurer of the mint, who then returned the coined money to the treasurer of the Casa.

The structure of the diary book, which is characteristic of the double-entry bookkeeping practiced in Spain during the sixteenth century, is shown in Figure 1. It represents a page of a diary book corresponding to the year 1560.

Each page of the diary was divided into three columns. In the first and narrowest column located on the far left, a type of fraction was recorded that indicated the pages of the ledger book where one could find the accounts that pertained to the transaction. The numerator of the fraction represented the page of the ledger book where one found the account that had been debited, and the denominator designated the page of the ledger where one could find the account that had been credited. These numbers did not represent, as they do in the present, a code indicative of a definitive account, but only the page of the ledger where one could find that account. In the example, we present in figures 1 and 2, the accounts correspond to the gold and silver merchants, Alvaro de Armenta and Martin Hernández de Mendoza. Both of these accounts can be found on page 211 in the ledger.

<sup>&</sup>lt;sup>1</sup>Several references are provided at the end of this paper, which will allow the interested reader to learn more about the double-entry bookkeeping method as it was utilized in Spain. Detailed explanations of the accounting practices as well as comparisons among several European countries, will be found among the contributions referred.

#### FIGURE 1



The second and widest column provided the detail. This constitutes what we call "the central body of the entry." With the passage of time, this part became more concise in its content. As one can see, the first thing represented in this central body was the date, centered at the top, with all the corresponding transactions being recorded immediately after it. Then, the following date was recorded in the same manner, i.e., at the center of this column. All entries began with the name of the account that was debited (i.e., Alvaro de Armenta) which could be found on the page of the ledger indicated by the numerator of the fraction in the first column (page 211). Next, the expres-

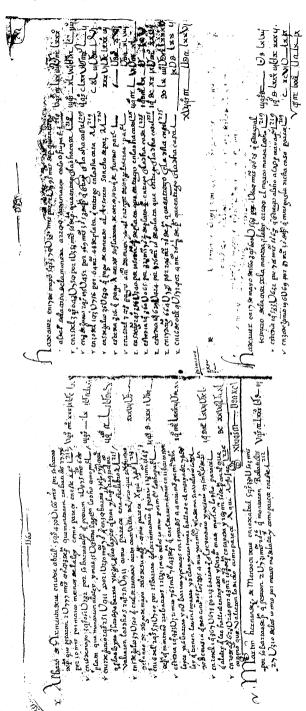
sion "owed for" was written, followed by the name of the account that was being credited (i.e., His Majesty's silver brought by Gaspar Sánchez, maestre of the province of Tierra Firme). This account could be found on the page of the ledger indicated by the denominator of the fraction (page 212). At the end of the entry, once all the characteristics of the transaction were described, the page of the book of sales (where the registered transaction was located) was indicated (page 2).

In the right column, the quantity of the transaction (in maravedís) was represented using the system of "Castilian Account." On the other hand, a quantity had been repeated in the central body using the same form of Roman and Arabic numeration, because a general norm of representation did not exist. The symbols corresponding to the Castilian Account were always included ("qo", or "qos", the symbol of the "quento/s" (million) and the "calderon", "U", symbol of a thousand). When a reference to pages of other books were made, it was always written in Arabic numerals.

### Ledger Book or Libro de Caxa

This book adopts the form of the Venetian accounting system which is characterized by opposing sections. In it, each account is represented by two facing pages, the left one dedicated to debits and the right one to the credits. In Figure 2, two pages of a ledger book are presented as an example that corresponds to the accounts that appeared in the diary book reproduced above. Specifically, the example contains the accounts of Alvaro de Armenta and Martin Hernández de Mendoza, gold and silver merchants, which can be found in the double folio number 211 in the ledger book.

The operations entered into the diary were transferred to the major book or ledger maintaining the chronological order of the entries. No reference to the corresponding entry in the diary was found in the entries of the ledger, since the transactions entered into it were not numbered. This fact made the diary seem, perhaps, of greater importance than the ledger. If, for any reason, the ledger were destroyed, it could be reconstructed by returning to the diary. If the situation were reversed, however, a reconstruction of the diary would entail much greater difficulty. If one made reference to the diary each time an entry was made, it was to the folio of this same book where one found the balancing entry.



This was mentioned at the end of each registry. Thus, as seen in Figure 2, the purchase of silver made by Alvara de Armenta mentioned earlier is annotated in his account (folio 211) on the left or debit side, where it is represented in the following terms:

#### -1560 -

211// Alvaro de Armenta debe en 10 de Abril 5 qos 439 U 166 mrs. por 50 barras de plata que pesaron 2.777 mcos. 4 onz. 4 och. de plata que montaron rebatidos 27.776 mrs. por 10 mrs. por marco menos de la ley como aparece en este a folio 212

V qosCCCCXXXIXUCLXVI

#### **— 1560 —**

211/ Alvaro de Armenta owes on the 10th of April 5 qos 439 U 166 mrs. for 50 silver slabs weighing 2 U 777 mark, 4 oz., 4 och. of silver sold to him. As you can see in this book on page 212

V qosCCCCXXXIXUCLXVI

Each page of the ledger begins with a reference to the year in which the entry was made, located in the top center part of the page. The structure of this book is in accordance with the double-entry accounting method. One finds each page divided into three columns:

The first column represents a simple margin where some symbols indicative of the control of its entries were recorded as well as the years, which were entered consecutively.

The second column constitutes the central body of the entry where the transactions corresponding to the diary were recorded. The entry indicated the day and month of their realization in a way such that if more than one entry occurred on the same date, it was replaced by the expression "on this day". If only the month coincided, the day was noted and then followed by the words "of it." When a different year passed, this was indicated, as we have already said, in the left margin. Here, the explanation of each operation was shorter than in the diary, and, normally, the quantities stated in the central body were written in the Castilian ac-

count method but using the Arabic numerations. At the end of the diary and in a type of right angle, the folio of this book was presented indicating where to find the balancing entry.

The third column was divided, as that in the diary, into subcolumns because it facilitated its summation. It was reserved for the quantities which were always expressed in the Castilian style of accounts with Roman numbers, using the Calderon sign (U) located in the center in order to divide that column. If the account occupied more than half of a page, partial sums were normally made: a first sum approximately on half of the page, and a second, considering the result of the first, on the other half. This, however, did not represent a general norm. The total was situated under a horizontal line.

Only on the debit side of the account (left hand side of the page) was the name of the account written, followed by the word *debe* (owes). The name and this word were written only in the first entry and were not repeated in any others. On the credit side of the account, the first entry began with the expression *Ha de aver* followed by the date and the rest of its contents. The rest of the entries were identical to those recorded on the debit side. Let us now examine the example that appears in Figure 2 corresponding to the first annotation in the credit side of the account of Alvaro de Armenta:

#### -1560 -

*Ha de aver* en 17 de Mayo 5 qos 374 U 380 mrs. por 2 u 395 marc. de plata que entregó al tesorero de la Casa de la Moneda a 2244 mrs cada marco es lo dicho como parece a folio 219

VqosCCCLXXiiiijUCCCLXX

#### -1560-

*Ha de aver* on the 17<sup>th</sup> of May 5 qos 374 U 380 mrs. for 2 U 395 mark of silver delivered to the treasurer of the mint at 2244 mrs. per mark as appears written on folio 219

VqosCCCLXXiiiijUCCCLXX

Normally, the books were not closed at the end of the accounting process or from one period to the next. On many occasions, even the accounts that should be closed remained open with a small residual balance which was regulated by the inclusion of a differential account entitled "surpluses and shortages of this book". Given the characteristics of the accounts that were intervening, the majority of them were closed at the end and only a few remained open.

These findings, which represent only a summary of this study from the aforementioned books, provide evidence that the method applied is in conformity with the double-entry book-keeping procedure. In the following sections, I will analyze the most relevant characteristics of the accounting method applied by the Casa. Questions about the structure of these books, the control of the operations and the corrections of errors, are beyond the scope of this paper.

### ANALYSIS OF THE ACCOUNTING PROCESS CORRESPONDING TO THE SALE OF GOLD AND SILVER THAT CAME FOR HIS MAJESTY ON THE FLEET OF PEDRO DE LAS ROELAS IN 1560

#### Accounts Used

In the development of this accounting process, five groups of accounts were used. These will be included in the following discussion and examples.

### Silver, gold, and reales of his majesty

This group represents the different amounts of gold and silver sold in public auctions to the buyers of these metals, as well as the coins (reales) that the *maestres de nao* delivered to the treasurer of the Casa. These coins belonged equally to the treasury of his majesty. The Royal Treasury obtained income from the sales of gold and silver as well as from the reales.

### Buyers of gold and silver

These accounts represented the debts of the buyers to the Royal Treasury for the purchase of treasures. These debts had to be satisfied according to what had been stipulated in the contract of sale. This was normally through the delivery of silver or gold to the treasurer of the mint. Then, after three to six days, the metals were smelted according to the law and made into coined money. Consequently, these are the asset accounts that give rights to the Royal Treasury over the buyers of gold and silver for a sale realized on credit.

#### The treasurer of the mint

The debt of buyers, at the delivery of the gold and silver to the treasurer of the mint, was transformed into the debt of this treasurer now owed to the Royal Treasury. Consequently, this account is likewise an asset.

#### The treasurer of the Casa de la Contratación

This account functions like the current treasurership, which is in charge of the receipt of cash, coming either from the treasurer of the mint, from the *reales* that were handed over the treasure of the Casa by the maestres, or from the cash payments received by the treasurer from the buyers of gold and silver in order to balance their accounts. Consequently, it is treated by an asset account. Because the asset does not appear as cashoutflow for the expenses he was ordered to pay, this process seems peculiar.

### Feble y fuerte

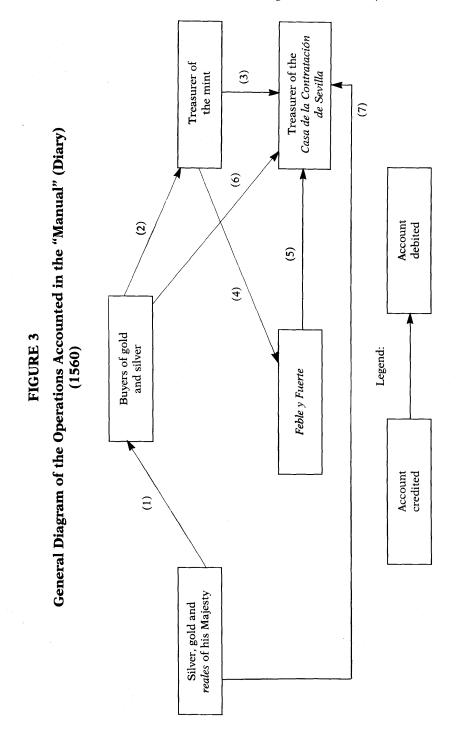
These accounts represented differential accounts that could be profit (feble) or losses (fuerte). The feble represented the profit or excess that was obtained in the process of coining, more money than was legally stipulated according to the fixed amount which was 67 reales per mark of silver and 68 escudos per mark of gold. The fuerte represented the loss that was produced when fewer coins than anticipated, in accordance with the legally fixed amount, were produced. Therefore, their functioning is characteristic of a differential account.

### Representation of Transactions in a General Diagram

This accounting process, the simplest of those that we have analyzed, consisted of only seven general transactions. In truth, these seven transactions result in 345 entries in the diary (manual). Thus, when we speak of general transactions, we are really referring to groupings of entries of the same nature.

In Figure 3, I present a general diagram of these transactions using the coordination credit/debit with an arrow (whose point indicates the account that is being debited, and whose tail indicates the account that is being credited). Also included in the center of the arrow is a number, in parenthesis, indicative of the transaction whose meaning corresponds to the following:

(1) Sales of gold and silver: This transaction reflects the sales of gold and silver, whose accounting representa-



- tion is identical to that which we use today in order to account for the sale of merchandise on credit.
- (2) Gold and silver required by law in order to coin that which is delivered to the treasure of the mint: Accounting entries reflect the payment of the debt of the buyers through the delivery of the silver required by law, to the treasurer of the mint.
- (3) Gold and silver transformed into coin that the treasure of the mint then handed over to the treasurer of the Casa de la Contratación: Having coined the metals, the treasure of the mint handed over to the treasurer of the Casa the obtained reales of silver or escudos of gold.
- (4) What resulted from fuerte during the coinage process: This, along with the following, represents transactions complementary to the previous one. The fuerte, as we have said, reflected the loss accumulated during the process of coining gold or silver.
- (5) What resulted from feble during the coinage process: The feble reflected the profit obtained during the coining process. Feble was charged to the treasurer of the Casa as he received it under his power and credited to the account of feble y fuerte. The balance for feble was, therefore, a credit-balance, and for fuerte a debit-balance. As both were accounted for in the same account, its balance indicated a loss or a profit in the process of coinage. At the end, the balance was dependent on whether the fuerte was either higher or lower than the feble.
- (6) Cash payment from the buyers of gold and silver made in order to liquidate their debts: The delivery of gold and silver required by law in order to mint coins from the buyers to the treasurer of the mint was not the only mechanism that the buyers used in order to settle their debts. On occasion, principally to liquidate the remainder of their debts at the end, they made delivery directly to the treasurer of the Casa from the corresponding coin.
- (7) The delivery of reales on behalf of the maestres de nao: In the naos, not only were metals brought in paste, but the maestres on occasion brought coined reales made in the Indies. These reales were delivered to the treasurer of the Casa as property of the King. Thus, treasures

(coins) belonging to the King that came from the other side of the Atlantic were included in the *Casa*'s inventory.

At the end of this entire process, only three general accounts remained open: "Silver, gold, and reales of his majesty" (income through sales), "the treasurer of the Casa de la Contratación" (account of the treasurership or cash account) and "feble y fuerte" (account of the profit and loss resulting from the coining process). The three accounts formed a relationship such that the balance of the first is equal to that of the second, plus or minus, depending on whether it be debit or credit, the balance of feble y fuerte. Which is to say:

Silver, gold and reales of his Majesty

The treasurer of the Casa de la Contratación +/-Feble y fuerte

Having arrived at this point, the process could be balanced perfectly with a closing by making only a transfer of balances. But evidently, these transactions are not made here, since they were not made even by merchants in their accounting during this period. Furthermore, it should be remembered that this having been done, the objective of control the Royal Treasury was pursuing was completely satisfied with the utilization of the double-entry accounting method herein analyzed.

#### **CONCLUDING REMARKS**

The present study has analyzed an important number of documents whose existence was first announced by Hernández-Esteve [1986, p. 58]. According to his prediction, the outcomes of such an analysis provide interesting insights on the relationships and transactions associated with the minting process of gold and silver by the *Casa de la Contratación*.

After the examination of the documents found in the Archives of the Indies, we can conclude that the double-entry bookkeeping method was the accounting procedure applied by the treasurer of the Casa in order to record the transactions related to the sale of gold and silver to the merchants, and the subsequent delivery of the coined metals.

The importance of these findings pertains to the fact that a public institution utilized an accounting method which previously had only been applied by merchants. Consequently, Spain was not only the first country to issue a law compelling the merchants to follow the double-entry method, but was also the first one in which the method was implemented by a public institution. The single-entry bookkeeping method, however, continued to be used, being the official procedure to control the activity of the treasurer of the Casa.

I did not find any document justifying the reasons that led the Casa to implement the double-entry method when accounting for the transactions related to the precious metals. Therefore, the reason for its adoption is not known.

I believe, however, that there are certain factors which could have made this method appear to be the most suitable one to account for such important transactions. First, it was generally known and understood by private merchants and proved to be useful in the realm of private businesses. In fact, Spain was the first country to issue laws (the *Reales Pragmáticas* of 1549 and 1552) which compelled the merchants to apply the double-entry method.

Second, the information provided by the so-called *Cargo y Data* method (single-entry), commonly used by public institutions, was only useful to control the activity carried out by the treasurer. Given the complexity of the minting process, in which a wide number of subjects took part, there was a need for a strict control of the balance of a great number of accounts. Therefore, the single-entry method was not enough, and it had to be complemented with the double-entry method — a method much more suitable to establishing strict control.

Thus, the implementation of the double-entry method and the use of the ledger enabled the treasurer to know exactly the credit or debit balance corresponding to each account, those representing the stocks of each metal and those which represent the debtors (merchants). This allowed the treasurer to determine the residual balances resulting from the sale and re-purchase of the metals and the deliveries to be made by every merchant.

Little is known about the origins of the double-entry method in the practice of accounting in Spain, because of the scarcity of pre-sixteenth century documents. The earliest theoretical contribution was provided in the book *Libro de Caxa y* 

Manual de Cuentas de Mercaderes y Otras Personas con la Declaración Dellos published in 1590 by Bartolomé Salvador de Solórzano, almost a century after the appearance of Pacioli's work. It includes examples which illustrate the application of the method to account for business transactions, according to the laws issued by the Crown in 1549 and 1552, without recognizing any foreign influence on the Spanish practices. In view of the preceding examples, the research affirms that the method used by the Casa coincides with that explained by Solórzano.

Given the close relationship existing between Spain and Italy after the Middle Ages (when the Castilian Crown conquested vast territories in Italy and the trade with Italian merchants, many of which settled in Spain, increased remarkably), it is likely that the Italian accounting practices influenced the development of the Spanish ones. However, no document reflecting the influence of the Italian tradition on the practice of accounting in Spain was discovered. Since no evidence in that respect was found, future research should attempt to elucidate such relationships.

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## THE ACCOUNTING SYSTEM PRACTICED IN THE NEAR EAST DURING THE PERIOD 1220-1350 BASED ON THE BOOK RISALE-I FELEKIYYE

Abstract: This study examines the governmental accounting practice in the Near East during the Il-Khan Dynasty period (1120-1350 A.D.). The survey is based on a handwritten manuscript, Risale-i Felekiyye. The accounting system introduced in the Risale-i Felekiyye is an elaborate governmental accounting system. The system was based on seven major books and a number of special journals. Documents used in the system formed the basis for recording events in the books. Furthermore, the system included concepts and rules for accounting and resulted in a final report.

This accounting system emerged primarily from social and economic necessities caused by agricultural and fiscal reforms introduced by Ghazan Khan in 1295-1304. As a result of these reforms, budgeting practices and accounting regulation by the state were introduced to control state tax revenues and expenditures and to prevent fraud. These regulations introduced the use of a single monetary unit for recording, the use of an accounting fiscal period, duality, classification, substance, procedural rules which introduced a bilateral journal entry form, agency account rules, and correction and control rules. Also the rule of "revenues have to be equal to expenditures" presented itself as a balance sheet identity equation. These regulations, however, were not based on the accrual principle; instead, a cash basis of accounting was the recognized practice.

The study concludes that the rudiments of double-entry accounting were practiced in the Near East and were developed independently from the accounting practices used in the West.

#### INTRODUCTION

The objectives of this study were to examine the accounting system practiced in Iran and the Near East, from 1220 to 1350 A.D., during the Mongol Dynasty of the Il-Khans, and to appraise accounting practice and its regulation which were introduced through fiscal reforms. The study is based on a handwrit-

ten manuscript, *Risale-i Felekiyye*, written by Abdollah Ibn Mohammed Ibn Kiya al-Mazandarani, 765 H/1363 A.D.<sup>1</sup>

Risale-i Felekiyye is a public finance book, but a substantial portion of it covers the principles and procedures to be followed in governmental accounting. The book provides factual examples related to that period. Thus, it is plausible to assert that the content of the book is also representative of the actual accounting practices in the domain of the Il-Khans. Furthermore, extant manuscripts on public finance which were written during this period confirm this practice by their references and content.<sup>2</sup>

The study is arranged in four sections. The first section portrays the socio-economic situation and the fiscal reforms, then explains the Il-Khan state organization and the structure of the governmental accounting system which regulated bookkeeping practices in the Il-Khan Dynasty. The second section gives a detailed explanation of the major source documents, accounting books, and procedures which were used to govern the accounting system as well as the financial reporting process. The third section gives a critical evaluation of the accounting concepts and rules. The final section presents concluding remarks.

#### THE IL-KHAN DYNASTY

The Il-Khans ruled Iran and neighboring territories from 1220 to 1350 [Manz, 1988]. The Il-Khan, who was head of state, had a number of *vezirs*, the approximate equivalent of ministers. The *Diwan* or Chancery of State, which was independent of the Khan, kept the accounts of the state and administered the state's financial affairs, postal service, public construction, and the financial affairs of the army. The First *Vezir* served as head of the *Diwan*. Each of the 16 regions was administered by a regional governor appointed together with an army commander and a tax administrator who were subordinate to the governor.

After 1220 when the Il-Khans had taken over Iran from the Seljuk Turks, heavy taxes were levied on the settled population comprised of urban people, landlords, and peasants, including

<sup>&</sup>lt;sup>1</sup> Mazandarani, Abdollah B. Mohammed, Kiya, *Risale-i Felekiyye*, St. Sofia Library, No. 2756, Istanbul, Turkey, 1363. Transcribed in 1433.

<sup>&</sup>lt;sup>2</sup>Felek, Ala-i Tebrizi, "Saadetname", Yusuf Aga Library No. 516, Konya, Turkey, 1307. Imad, as-Seravi, "Camiu'l Hesab", Yusuf Aga Library, Konya, Turkey, 1340.

many non-Muslims. The resulting massive social and economic upheaval forced much of the settled population either to leave the country or go into hiding. As a result, the country's tax revenue, which had been 2,871,200 dinar in the Fars period and 2,335,000 dinar in the Seljuk period, fell to 350,000 dinar [Boyle, 1968]. The country was administered so corruptly that little revenue reached the central Il-Khan government. Out of concern about this decline in revenue, an effective reform package consisting of agriculture and fiscal policy was introduced by Ghazan Khan (1295-1304) [Spuler, 1987; Skyes, 1969].

Some of the measures of this fiscal reform which had an impact on accounting practices are as follows:

- —Prohibition of indiscriminate writing of drafts by officials of the central government and prohibition of all draft writing by provincial provinces.
- —Establishment of a stable rate of currency by introducing silver *dinar* as the monetary unit.
- -Introduction of fiscal year.
- —Appointment of a treasurer to every province and an auditor to some provinces to determine the tax rate for the province.
- —The requirement of a detailed list of liabilities of each taxpayer to the *Diwan*.

#### THE ACCOUNTING SYSTEM

The Il-Khan governmental accounting system was designed to function parallel to the decentralized governmental system. Some of the books were kept centrally, others by regional authorities. The recording of the major revenue items was categorized regionally. Regions were treated as principal responsibility centers for recording expenditures, and within regions, additional responsibility centers were identified. Thus the recording of all revenues and expenditures was done first on the basis of principal centers and then recorded again within regions, under subclassifications [Mazandarani, para., 63b, 66b, 67b]. The starting point of the accounting system was state budgets. Each region had a state operational budget (*Mukarrariye*), and a discretionary budget (*Itlakiye*) [Spuler, 1987]. The Khan had authority only over the discretionary budget, while the operational budget was under the control of the Diwan. The regions oper-

ated within the limits of the state budget. The regional agency of the state had the authority to collect taxes and renumerate all the regional expenditures from these taxes. The tax administrator was accountable to the central authority and his accounts were subject to an external audit whenever it was deemed necessary [Spuler, 1939]. This accounting system was based on seven major accounting books and some special journals. Recording was done according to bookkeeping rules that were regulated during the fiscal reform period (c. 1300 A.D.). Examples in Exhibit I show how the accounting system functioned.

#### THE SOURCE DOCUMENTS

The accounting system used two kinds of major source documents for recording financial transactions [Mazandarani, para. 43b, 44b, 51a]. The first document called *receipt* was used to record the amount of tax collected by the regional administrator. The second document called *acquittal* was used to show the transfer of tax funds from the region to the state. As soon as the tax collection orders were issued by the *Diwan*, the regional administrator became accountable for the designated amount of tax collection. The document called *acquittal*, therefore, was used to release the administrator from his accountability and financial responsibility to the *Diwan*. The following items of information were required in preparation of a document:

- 1. date of the transaction,
- 2. place of the transaction,
- 3. name of the payer,
- 4. name of the payee,
- 5. exact budget allocation for the item,
- 6. specification of the payment,
- 7. amount of money or equivalent in kind,
- 8. half of the amount, to verify the whole amount received,
- 9. the official seal.

The requirements for documents clearly reflect the extent of the awareness on providing objective and verifiable data for recording. These documents also contained a built-in control mechanism, as seen in requirement number 8. It would be fair to infer that other kinds of external and internal documents were utilized which the author of the *Risale-i Felekiyye* did not regard as directly related to public finance. It is plausible to

### **EXHIBIT I**

### **General Journal Book**

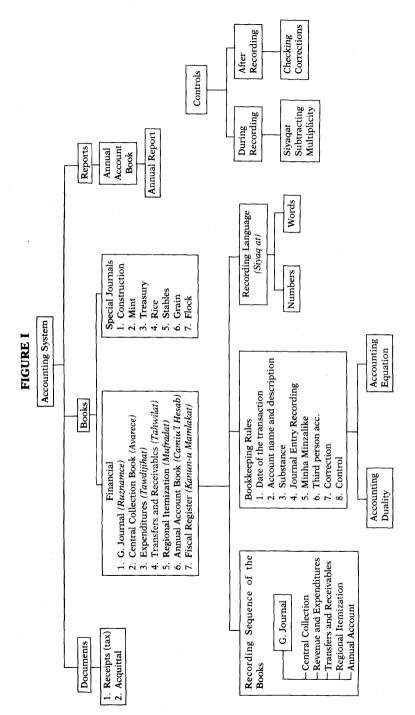
(Risale-i Felekiyye Para. 55b)

	<u>DEBIT</u> (Silver	<u>CREDIT</u> (Silver
	Dinar)	Dinar)
Material expense	300,000	
Revenue		300,000
From Siraz rev. 100,000		
From Tebriz rev. 50,000		
From Isfahan rev. 50,000		
From Bagdat rev. 70,000		
From Diyarbeker rev. 30,000		
Expenses incurred for Bagdat region		
and paid from the sources shown above.		

### **Central Collection Book**

(Risale-i Felekiyye, Para. 66a, 66b)

(Risa	іе-і геіекіуу	e, Para. oba	ι, σου <i>)</i>	
			DEBIT	<b>CREDIT</b>
*			(Silver	(Silver
			Dinar)	Dinar)
Bagdat Account, Governo	r Tebrizi			
Tax revenue		2,000,000		
Expenditures from operat	ional budget		400,000	
Grants	110,000			
Postal service	90,000			
Travel exp	100,000			
Construction exp	<u>100,000</u>			
Payment				400,000
from that balance		1,600,000		
Expenditures			540,000	
•	Allocation	Collection		
Material	100,000	30,000		
Material	300,000	70,000		
Construction	500,000	200,000		
Material	100,000	50,000		
Material	185,700	40,000		
Postal service	_	30,000		
Wages	40,000	30,000		
Salaries		90,000		
payment				540,000
(based on acquittals)				
from that . , balance		1,060,000		



argue, however, that without such verifiable documents, it would not have been possible, for example, to calculate the labor cost of a building which was recorded in the construction journal.

#### THE BOOKS

According to the *Risale-i Felekiyye*, accounting books are to be categorized into two groups in terms of information: financial accounting books and special journals. Some of the latter recorded only physical information rather than financial and some others recorded both.

A special language, *Siyaqat*, was practiced for recording. *Siyaqat Signs* were special short-hand signs that were used by the *Il-Khan* public finance authorities and accountants to record amounts of money and numbers of people, animals and goods.<sup>3</sup>

#### The Financial Books

### 1. General Journal (Ruznamce)

All documents and decisions that came through the *Diwan* concerning revenue and expenditure were recorded chronologically in the General Journal [Mazandarani, Para. 52a, 52b].<sup>4</sup> The first page was reserved for the dates of the beginning and end of each financial year. A statement of the objective of the book followed:

This is the journal which recorded all revenues and expenditures incurred as arising from the decisions of the *Diwan*.

The General Journal functioned as general ledger in terms of posting the transactions to other books and classifications. All posting was made from this journal to the other related books. Ledger accounts in the contemporary sense did not exist. The General Journal was the major source of financial information and included every detail of the information.

<sup>&</sup>lt;sup>3</sup> Solas, C., and Otar, I., "Bookkeeping Rules and Accounting Signs During the Il-Khan Dynasty, 1220-1350", paper presented at the AAA Convention 1992, Washington, D.C.

<sup>&</sup>lt;sup>4</sup> Risale-i Felekiyye did not have page numbers but showed paragraph numbers; (para.) indicates the paragraph number of the book.

### 2. Central Collection Book (Awaradje)

The central authorities kept a collection book, the Awaradie. to record both general revenue collections for the regions and the overall and general expenditures incurred regionally for the whole country. Information posted to this book from the General Journal was classified as to responsibility centers — that is, the principal regional administrative centers of the country. Although the revenue collection was itemized by its kind, it was not classified but rather summarized. So itemized revenue collection figures were not easily available to the users. It was not possible to know the detail of a particular account for the region. However, revenues and expenditures were related to their budget allocations. All the regional expenditures incurred in the region were deducted from the above-mentioned revenues. Then the residual was clearly shown in the book to provide prompt and precise information when it was needed [Mazandarani, para., 63b, 64a, 64b, 65a, 65b].

### 3. Expenditure Book (Tawdjihat)

Also kept by the central authorities was the Expenditure Book, or *Tawdjihat*, whose purpose was to record expenditures items classified by activity. Each expenditure was linked with its respective items classified by activity. Each expenditure was linked with its respective revenue budget allocation. This revenue allocation was made either from the operational budget (*Mukarrariye*) or from the discretionary budget (*Itlakiyye*). This book facilitated the administrative authorities' control over state expenditures [Mazandarani, para., 67a, 67b].

An explanation of the style of recording in this book gives more insight into the accounting practices. First, incurred expenditures were recorded in detail by primary account and then by auxiliary account for region.<sup>5</sup> Immediately under that the corresponding revenue budget allocations were recorded including how they were paid (See Exhibit I). In other words, the debit side of the entry showed the expenditures and the revenues created the credit side of the entry. Also, this book showed the residual balance of the revenue after reduction of expenditures.

<sup>&</sup>lt;sup>5</sup>Since this system did not define ledger accounts, it is preferred to identify those accounts which were recorded by using (*from that*) rule as "primary" accounts and others which were recorded by using (*from this*) rule as "auxiliary" accounts.

Under the recording rule of this book, it was not possible to make an expenditure if there was not allocation for that particular expense item. Recording an expenditure and its respective revenue together provided the administrators an effective means of control over the expenditures and their related budget allocations.

### 4. Transfers and Receivables (Tahwilat)

This book was first designed to establish accountability of regional administrators for fiscal transactions (effective collection of revenues and the efficient control of expenditures). One book was kept by each regional authority. Authorization of budgeted revenues and expenditures of the region was sent to the public administrators by the *Diwan*. This authority enabled the administrator to act as a government agency and collect taxes and remunerate the expenditures. [Mazandarani, para. 72b, 73a]. This book primarily showed tax collections, budget transfers to and from the region, and payments made to the individuals by the administrator.

The written budget authority given by the Diwan entitled the administrator to make all necessary payments for his region from the tax revenue which he collected from his region. The balances were displayed periodically. At the end of the fiscal year, the balance remaining in credit, indicating unutilized revenue, had to be paid out to the government of the *Il-Khan*. Any balance in the debit of the regional receivables account either had to be deferred to the following year or had to be cancelled by transfers from other regions' budget allocations or the government.

### 5. Regional Itemization Book (Mutradat)

Details of the regional revenue and expenditure transactions were incorporated in this book. For each region, a separate book was maintained for recording the collected revenues that had been assessed for the region. The realization of the assessed revenues by their types, e.g., poll-tax, income tax or sales tax, was shown. All expenditures incurred in the region were similarly recorded, being classified as wages, construction, mail services, etc. The residual amount was displayed [Mazandarani, para., 75b]. Revenues were classified first as primary types of taxes. Then, every primary tax was classified by the sub-type of tax. In addition, each region was sub-classified.

Expenses were classified similarly, the residual amount of the account again being displayed. This book provided information for the General Journal and the Expenditure and Receivables books [Mazandarani, para. 84b, 85b, 85a, 86a, 86b]. Tables were prepared for receivables or expenditures based on the *Regional Itemization Book*.

It may be inferred that the control mechanism of the responsibility centers, in terms of recording and reporting, functioned satisfactorily through *Regional Itemization Book* records. This book enabled the authorities to calculate the total amount of state revenues and expenditures for both the region and the entire country. A summary of regional revenues was presented as a table in *Risale-i Felekiyye* [Mazandarani, para. 96a, 96b, 97a. 97b].

### 6. Final Annual Account or Trial Balance (Camiu'l Hesab)

This book was similar to a trial balance. It contained a regional summary of all revenues and the expenditures for the entire country. For each region, aggregated sums for the various classifications of such revenues and expenditures were reported. A final report based on this information was submitted to the Khan at year-end. Thus the Khan was able to keep track of the total revenue collected from various provinces and regions and to monitor the different provincial expenditures [Mazandarani, para. 87a, 87b].

For presentation purpose, this account was prepared on a long sheet that was rolled and presented to the Khan, usually semi-annually. For this reason, we interpreted this account as an annual report whereas its Arabic meaning is "aggregated accounts."

### 7. Tax Register Book (Kanunu Mamlakat)

The Arabic meaning of this book is "The Law of the Country." In this context, however, it functioned as a regional tax rate book. This was a book of tax laws which showed tax assessments for those people subject to taxes and tax rates. Thus it should be considered to be more than an accounting book.

The Tax Register Book listed the regional tax levies according to the kinds of taxes and the tax rates, which differed from region to region. Further, this register prevented taxpayers from being taxed more than once or at varied rates. This book was prepared by the regional treasurer.

### Special Journals

Section nine of the *Risale-i Felekiyye* gives us information about the second group of accounting books which were used for special activities: the Construction Journal, Mint Journal, Treasury Journal, Warehouse Journal, Cracked Rice Journal, Flock Journal and Stabler Journal.

#### 1. Construction Journal

The Construction Journal was used to determine the actual cost of construction and to control the materials in terms of physical units as well as material and labor cost, which were recorded in the narrative section. Also, *Risale-i Felekiyye* showed hourly, daily and weekly wage rates for each labor type and the total amount of the labor cost [Mazandarani, para. 117b, 118b, 120b]. In the financial accounting books, construction accounts were also established according to expenditure assessment and tax revenue allocation [Mazandarani, 56a, 56b]. It is plausible to argue that there existed an awareness of cost concept, but that cost accounting was limited to labor and material costs.

#### 2. Mint Journal

The Mint Journal showed the inventory of the gold and silver at the beginning of the period in terms of both physical units and monetary units. This was followed by transactions of units started in the minting process [Mazandarani, 126a-128a]. Physical units were recorded in the narrative section of the journal. Both physical units (gold unit, or *miskal*) and monetary units (silver *dinar*) were recorded together, but in the monetary unit section, only money was shown.

In the Il-Khan state, the mint was a separate entity managed by a private company or an independent state agency under the direct control of the Khan. This entity was accountable for the amount of gold and silver transferred to it at the beginning of the period.

For the mint operations, one *miskal* of gold was a service charge for every 100 *miskal* units of gold minted. Private companies also paid this amount to the authorities at the end of the period [Mazandarani, 129a, 129b, 130a].

### 3. Treasury Journal

The purpose of this journal was two-fold: to determine the inventory of the treasury and to trace the treasury transactions.

According to the general rules of this journal, given in the *Risale-i Felekiyye* [Mazandarani, 132a-138b], all the treasury inflows had to be recorded first, then all treasury outflows of the day had to be recorded. Two methods of recording were recommended for the treasury transactions. The first method, referred to as the "Arabic Method," recommended a single journal. The second, referred to as the "Persian Method," recommended keeping separate journals for inflows and outflows. This journal showed transactions in terms of money values of the treasury and their physical units and amounts concurrently.

#### 4. Warehouse Journal

The purpose of this journal was to control the person who was accountable for storing the grain. Also, this journal showed every movement of the grain as to the inflows from different regions and outflows to regions and persons. Recording in this journal was done in terms of physical units only. Recording, however, followed the general bookkeeping rules.

#### 5. Flock Journal

The existing flocks of the state were entrusted to shepherds, who were made accountable for the animals. All sheep were classified as male or female and recorded in this journal by debiting each shepherd's account in terms of physical units. Following increases and decreases, due to birth and death or outflows for other reasons, the accounts were debited or credited to provide an inventory of the sheep in the state.

#### 6. Cracked Rice Journal

This journal showed the yield of cracked rice from fields that were entrusted to individual farmers. The journal was kept in terms of physical units by the names of the individuals so that the production of the cracked rice both before and after the process could be seen clearly.

#### 7. Stabler Journal

This journal served a purpose similar to the flock journal. It showed the physical inventory of horses as to the inflows and outflows. It also listed the locations separately.

# ANALYSIS OF THE ACCOUNTING CONCEPTS AND RULES

Bookkeeping rules were introduced to regulate and facilitate acceptable recording as one of the necessary measures to control revenues and expenditures. *Risale-i Felekiyye* presented these rules under eight categories. Some of these rules were extremely detailed procedural rules which were the rhetoric of the bookkeeping practiced during that period [Aho, 1985]. However, the others introduced accounting concepts that were quite contemporary but somehow not identified as such.

The Il-Khans' accounting rules and concepts are summarized as follows:

### Accounting System

The Il-Khan governmental accounting was designed as a system of accounts which rendered the material into a language. However, the accounts did not involve real and nominal accounts. It could be argued that, as a governmental accounting system, there was no need for having profit and loss accounts, as revenue and expense accounts were sufficient for the purpose. Risale-i Felekiyye did not mention any kind of depreciation accounting practice. The Cash account did not exist among the accounts. It seems there was no such concept even though cash basis accounting was a recognized practice.

### Accounting Equation

The accounting equation indicated that revenues had to be equal to expenditures [Mazandarani, para. 32a, 105a, 111b]. Since there was no need for income determination, this equation served their governmental accounting purposes. It also provided means for duality. Probably, this equation was sufficient for governmental accounting practice.

### Duality

Duality was also created through the "revenues-should-be-equal-to-expenditures" rule. Although the objective of this rule was primarily to keep the expenditures within the revenues, it also provided necessary means for double entry. However, "debit" and "credit" as accounting terms were not used. Serving the purpose instead was the from that, from this rule (meaning

"deduct"). However, in a bookkeeping context, those words served the purpose of creating a journal entry and were used like *Per* and *A*, though not exactly in the same way it was used in Paciolo's book. The use of *from that* and *from this* determined either the debit side or the credit side of the entry. The "primary accounts" of the entry were also determined by *from that* rule, while *from this* determined the "auxiliary accounts" of the entry in the narrative section. On the amounts section of the entry, these words served as a built-in control mechanism. In that case, numbers were deducted from each other. In this system, duality existed in entry and in the books but not among the account [Littleton, 1956]. An overall view of the system showed a duality itself as indicated below (also see Figure II):

	<u>Debit</u>	<u>Credit</u>
—The total of the Central Collection Book	3,288,000	
The total of the Regional Itemization Book		3,288,000
—The total of the Rev. and Expenditures Book	2,270,000	3,200,000
The total of the Transfers	2,270,000	
and Receivables		2,270,000

In addition to this duality, the journal entries in these books showed the double-entry system also, as can be seen in Exhibit I and II.

### Classification

We did not discover the use of any classification in the contemporary sense, but classification was provided by the journals. The journals were maintained to keep account of state revenues and expenditures as major categories according to region. Entries were made by using the actual transactions as classification, such as "purchase of sheep" or "payment from Mint." But these transactions were classified among themselves by using the *from that* and *from this* rule in the entry.

### Monetary Unit

As mentioned earlier, the fiscal reform introduced a stable rate of coin, maintained in silver *dinar*, which was then established and required to be used as a recording unit. When other units like gold, grain, etc., were used for actual transactions,

their silver *dinar* equivalent was calculated for recording purposes. This rate was shown at the bottom of the entry. In some of the special journals, recording was kept in kind. However, those journals were for control purposes and were independent from major journals.

#### **EXHIBIT II**

### **Revenues and Expenditures Book**

(Risale-i Felekiyye, Para. 69b)

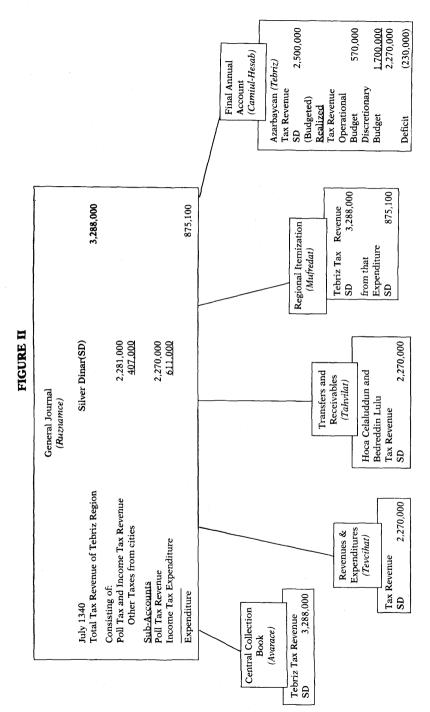
		<u>DEBIT</u> (Dinar)	<u>CREDIT</u> (Dinar)
Expenditure		300,000	(Billul)
Armour wear	100,00	300,000	
Arrows & bows	50,000		
Swords & shields	50,000		
Camel and camel caretaker	70,000		
Wages	<u>30,000</u>		
Paid from			
Siraz Region old and new re-	v.		100,000
Tebriz Region new revenue			50,000
Isfahan Region new revenue			50,000
Bagdat Region old revenue			70,000
Diyarbekir Region new rever	nue		30,000
Transfers from other regions reve	enues		

#### **Transfers and Receivables Book**

(Risale-i Felekiyye, para. 73a)

		<u>DEBIT</u> (Sil. Dinar)	<u>CREDIT</u> (Sil. Dinar)
Emir Seyh Ali Account		300,000	
Armour wear	100,000		
Arrow & bows	50,000		
Sword & shields	50,000		
Camel and camel caretaker	70,000		
Wages	<u>30,000</u>		
Paid from			
Siraz revenue			100,000
Tebriz revenue			50,000
Isfahan revenue			50,000
Bagdat revenue			70,000
Diyarbekir revenue			30,000
Expenses incurred in the region			

In para. 79b, Regional Itemization Book showed 300,000 Silver *Dinar* expense among other expenses.



### **Periodicity**

Fiscal reform introduced a strict fiscal period, starting on March 21. This implied that fiscal period had to be observed as an accounting period as well as stated at the beginning of the General Journal

### Year-end Closing

Books were closed at the end of the period. However, a year-end closing rule was not introduced as a general rule except for the Transfers and Receivables book. The credit balance shown in this book had to be paid to the central authority and debit balance either deferred to the following year or a budget transfer made to close the adverse balance.

### Year-end Report

Regional revenues and expenditures were calculated indicating budget surplus or deficit and presented as a report to the Khan. As seen in Figure II, the year-end report was really a budget realization table. It showed budgeted revenue, realized revenues, incurred expenses and the budget deficit. the *Risale-i Felekiyye* provided a table showing these regionally as a whole. It could be considered a trial balance which included budgeted figures as well as realized figures, surpluses and deficits [Mazandarani, para. 96a, 96b, 97a, 97b].

#### Accrual

Cash basis was used for recording. All revenue collections were recorded as cash inflows and all expenditure remittances were recorded as cash outflows.

#### Procedural Rules

In addition to the above concepts, some very detailed procedural or bookkeeping rules (shown in Figure I) were introduced and practiced. One quite important procedural rule which regulated double-entry bookkeeping was a bilateral form of journalizing. According to this rule, the sheet had to be divided vertically into two columns. One side was used for narratives, the other side for amounts. However, it seems this rule was not followed strictly.

#### CONCLUSION

A rudimentary double-entry accounting was practiced in the Near East during the 1220-1350 period by the Il-Khan state, quite independently from the West. The version of double-entry bookkeeping used did not carry all the requirements of the double-entry system, lacking, for example, a cash account [Roover, 1956] as well as proper classification rules.

It is quite significant that accounting principles and rules were regulated during this period. Although the intention was to increase the state tax revenue and to control the state expenditures, the fiscal reform also led to the regulation of accounting practice.

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## MEDIEVAL TRADERS AS INTERNATIONAL CHANGE AGENTS: A COMMENT

Abstract: The objective of this comment is to qualify a contention published in this journal that "the actual nature of accounting in Islamic lands seems to be a mystery" [Parker, 1989: 112]. The qualification is based on answers to the following research questions concerning fragments of business records kept by Medieval traders and bankers which were deposited in the Geniza[h] (storeroom) of the Ben Ezra Synagogue at Fustat (Old Cairo). First, do extant translations of Old Cairo Genizah fragments reveal sufficient details of the form and content of accounting used in the Medieval Muslim Empire in order to sustain a claim that the mystery has been solved? Second, is there a need for additional research and translations of Genizah fragments by scholars versed in accounting history?

#### INTRODUCTION

Parker [1989: 107-18] presented a case which showed that Medieval Jewish traders located in the Muslim Empire influenced the development of accounting in Italy because they had previously established the conditions which Littleton [1966: 12-21] identified as the antecedents of double-entry bookkeeping. The existence of Littleton's [1966] antecedents in important trading centers of the Muslim Empire was confirmed by the works of a distinguished scholar of Medieval Judaeo-Arabic philology, society and culture. Goitein [1955: 7] found that:

the civilization of the Middle East during early medieval times was characterized by its commerce, industry and bureaucratic organization, at a time when western Europe was mainly agricultural and was dominated by knights and feudal lords.

Goitein [1955] indirectly addressed the antecedents of double-entry in his analysis of the relationships between Jews and Arabs in the Muslim Empire. He described the talmudic and Arabic law related to property [Goitein, 1955: 40]; the accumulation of capital [Goitein, 1955: 101]; the distribution of trade and commerce [Goitein, 1955: 100-107]; and the role of

Jewish bankers in the provision of credit [Goitein, 1955: 116]. Given our knowledge about the emergence of double-entry in Italy, it is of interest to note Goitein [1966b: 288] found that "Arabic speaking Jews regularly travelled on Genoese or Pisan ships."

In contrast to his received knowledge of the existence of the antecedents, Parker [1989: 112] made clear that he could not present a case "that accounting methods in the Moslem Empire were directly influential in the development of accounting in Italy ... because the actual nature of accounting in Islamic lands seems to be a mystery." In the case of Old Cairo, an important and far-reaching Judaeo-Arabic trade center, this contention must be qualified in the light of direct evidence provided by Goitein [1966a, 1973] and Gil [1970, 1976]. This evidence was not cited by Parker [1989: 112] who stated that he had "been able to find only conjectures about accounting in the Moslem Empire." Given this statement there can be no doubt that Parker [1989] believed that further research was needed.

Goitein [1966a, 1973] and Gil [1970, 1976] devoted many productive years to studies of thousands of fragments from the Medieval period which were deposited in the Genizah at Old Cairo. However they made no claim to be accounting experts. nor did they profess a detailed knowledge of the history of accounting, other than the major steps on the road to the development of the double-entry system. As a consequence, they did not produce a definitive study of the nature of accounting used by Jewish traders and bankers who occupied prominent positions in Medieval Mediterranean trade and commerce. A comparison of their works and perceived accounting skills to that of de Roover [1956, 1963], who translated and analyzed Medieval Italian business records, suggests that they might not have recognized significant early uses of important accounting techniques. If this suggestion is correct, then further research is needed for three reasons. First, to verify the findings of Goitein [1966a, 1973] and Gil [1970, 1976]; second, to solve Parker's [1989] mystery; and third, to illuminate fully the history of Medieval accounting. This new research, for which Parker [1989] made an implicit call, must be conducted by scholars with the skills required to present complete and verifiable descriptions and analyzes of the form and content of the Genizah fragments. The skills required include a thorough understanding of accounting techniques and their early development, and the ability to translate Hebrew and Arabic words and business abbreviations written in Hebrew script.

#### GENIZAH COLLECTIONS

The existence of a store of letters and documents at the Ben Ezra Synagogue was suspected by scholars throughout the nineteenth century. However, as Gil [1970: 12] recounted they were unable to access the fragments until Solomon Schechter made his decisive visit to Cairo in 1896-7 and the fragments were collected and distributed to different university libraries. Schechter, a lecturer in talmudic literature at the University of Cambridge, supported by Dr. Charles Taylor, Master of St. John's College, ensured that the bulk of the collection found its way to the Cambridge University Library [Goitein, 1967; 4]. At present, the Taylor-Schechter Genizah Collection at the Cambridge University Library comprises more than 150,000 fragments which reveal details of social, cultural and commercial life in the Mediterranean lands that were under Arab rule. Other major collections are held at the Bodleian Library at Oxford, the British Library, Dropsie College at Philadelphia and the Jewish Theological Seminary of America at New York, After Schechter relinquished his position at Cambridge, he became president of the Seminary at New York [Goitein, 1955: 94].

# EVIDENCE PRESENTED BY SOLOMON DOB FRITZ GOITEIN

Parker [1989: 113] cited Goitein's [1967] opinion on the relative development of bookkeeping by the Jewish merchants and he noted that "the Geniza accounts, kept by Jewish merchants, were not as detailed as those kept by Italians in the late Middle Ages." Goitein [1966b: 281] stated that he "has worked through all the known collections of Geniza material," he translated and analyzed thousands of fragments held in nineteen libraries around the world. He described how the original collection had been dispersed "page 1 of a book or letter may be found in Cambridge, page 2 in New York, and page 3 in Leningrad" [Goitein, 1955: 95].

Goitein's magnum opus, based on the Genizah fragments, was a five volume set entitled A Mediterranean Society. The first volume, Economic Foundations dealt with "more than six thousand passages" from fragments related to the world of com-

merce and finance [Goitein, 1967: xi]. Many of the fragments were difficult to read and Goitein acknowledged that his translations and analysis contained inaccuracies. He sought advice from experts in fields, such as accounting, in which he had no prior knowledge or experience. Yet his works showed that he had an inadequate understanding of accounting concepts and terminology and that his translations and analysis were not verified by someone who possessed these skills. For example, his description of cash receipts and payments related to the management of a house by a collector and paymaster of a charitable organization stated "His balance sheet showed the revenue on the right side, and the expenditure on the left" [Goitein, 1971: 116]. Goitein [1967: viii] regarded his work as being "that of an historian and philologist, not that of expounder of socioeconomic or political theories." Consistent with this statement, Goitein, in general, avoided making comments on the form of accounts; he preferred to leave it to others more expert than himself to describe the historical significance of the techniques revealed by the Genizah fragments. He suggested that a description of the form of the accounts ought not to accompany a translation of accounting fragments, rather that "a discussion of such details is better left to an edition of the originals" [Goitein, 1973: 273]. Such an edition has not been published.

Goitein [1966a: 28-66] described a selected set of eleventh and twelfth century accounting fragments which he attributed to bankers. Goitein's [1966a] translations and illustrations of the accounts showed that the Jewish bankers and merchants recorded cash receipts in one column and cash payments in another. From time to time the columns were footed and a balance struck, I compared Goitein's [1966a] illustrations of accounts against the original fragments held in the Taylor-Schechter Genizah Collection and there is no doubt that they have a bilateral form akin to a modern T account. Goitein [1966a: 30], in the presentation of the bankers' accounts, rendered one Arabic word frequently used at the beginning of an entry as debit and another word used similarly as credit. The rendering of alayhi as debit and lahu as credit is confirmed in a work produced at Cambridge by Khan [1992: 96]. He found the same Arabic words used on eighth and ninth century papyrus documents.

Given the above, then an important element of Parker's [1989] mystery has been revealed. That is, Goitein [1966a] pro-

vided direct evidence that in the eleventh and twelfth centuries Jewish bankers in Old Cairo used a bilateral form of accounts which predated the known usage of such a form in Italy. This evidence compels accounting historians to answer a research question which Parker [1989: 112] posed implicitly by declining to make a positive assertation. From Parker's [1989] words, I take the liberty to frame what might be called *Parker's Question*: Is it possible to assert that accounting methods in the Moslem Empire were directly influential in the development of accounting in Italy? Given the works of de Roover [1956] and others such as Lee [1973] who examined, translated, analyzed and described Medieval Italian business records held in Italian archives and the availability of Genizah fragments, it appears that sufficient evidence is available from which to build a case which answers *Parker's Question* one way or the other.

Not all accounts deposited in the Genizah had a bilateral form. Goitein [1971: 116] in regard to the accounts kept by a collector and paymaster of a charitable organization stated "Sometime the revenue is written above the expenditure." This form of account is known as the *paragraph form* and in Italy and other parts of Europe it was the precursor of the *bilateral form* which was not generally adopted there until the fourteenth century or later [de Roover, 1963: 91-2].

In the 1960s, Goitein made available his copies of Genizah fragments to his students at the University of Pennsylvania. One PhD candidate, Moshe Gil, concentrated his attention on Genizah fragments related to the operations of charitable organizations.

### EVIDENCE PRESENTED BY MOSHE GIL

In order to describe fully the features of charitable organizations revealed by fragments from the Genizah, Gil studied, translated and analyzed copies of numerous fragments collected by Goitein from the period 1000-1250 [Gil, 1970: 11]. Among the fragments selected by Goitein and Gil were 82 statements or accounts of cash receipts and payments for houses owned and administered by charitable organizations in Old Cairo [Gil, 1976: 54]. Gil [1976: 54] stated that 22 accountings consisted of lists of both revenues and expenses. Gil [1976: 55] found that "accounting was not very advanced as compared with the development of this skill in other places." He cited a classification scheme proposed by Leyerer [1902] who examined early fif-

teenth century account books kept at Dubrovnik [de Roover, 1956: 157] and declared that the accounts which he examined were "two generations earlier than the next big revolutionary advance in bookkeeping, the double-entry system" [Gil, 1976: 56]. He suggested that "an intermediary form of credit-debit account can be observed in a document dating from around 1100" [Gil, 1976: 56]. From Gil's [1976: 56] description it is clear that this document is in paragraph form: on each of three days amounts paid out for materials and labor were listed first, followed by amounts received from various person, totals of debits and credits were calculated and a net amount was determined. On the first day the net amount was a deficit (or *dayn*) of 54 *dirhems*.

Gil's [1976] findings are consistent with those of his PhD supervisor. He found that the nature of accounting in Muslim Empire indicated by the Genizah fragments had reached the stage where debits and credits were shown separately. However, there was no evidence that the records were based on a double-entry system.

#### CONCLUSION

In answer to the questions posed at the outset of this paper, it is reasonable to conclude that while Goitein's [1966a] translations of fragments stored in the Genizah of the Ben Ezra Synagogue showed significant details of "the actual nature of accounting in Islamic lands", there remains a need for scholars versed in accounting history to carry out additional research. The evidence presented by Goitein [1966a] revealed that Medieval Jewish merchants and bankers in Old Cairo made up accounts which had a bilateral form and that their use of this form predated that of the Italians and other Europeans. The evidence also revealed that they used words which had meanings similar to those used by the Italians to denote debit and credit. However the evidence accumulated to date does not permit a case to be made which answers Parker's Question, i.e., is it possible to assert that accounting methods in the Moslem Empire were directly influential in the development of accounting in Italy?

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## THE NATURE AND INFLUENCE OF MANAGERIAL ACCOUNTING DURING THE NEW SOUTH MOVEMENT: THE CASE OF A CHARLESTON PRINTER\*

Abstract: This paper investigated the accounting system of Walker Evans & Cogswell, a printing company in Charleston, South Carolina, in order to ascertain the nature and influence of management accounting during the New South Movement. Through archival analysis, the accounting techniques used by the Company were found to be effective management tools for planning and control during the period in which the Southern economy was transformed from agrarian to manufacturing. The findings raise new questions about existing studies on nineteenth century managerial accounting, especially for the printing industry.

There is a New South, not through protest against the old, but because of new conditions, new adjustments, and ... new ideas and aspirations.

Henry W. Grady 1886

Several accounting historians have analyzed the nature and influence of managerial accounting during the nineteenth century. Garner [1954] provided foundational insights into the development of managerial accounting in *Evolution of Cost Accounting to 1925*. Johnson [1981, 1972] examined the importance of cost accounting during the Industrial Revolution. Recent works by Tyson [1992, 1988] focused on managerial accounting during the nineteenth century.

<sup>\*</sup>The authors appreciate the assistance provided by Peter Wilkerson of the South Carolina Historical Society in the cataloguing of the Walker Evans & Cogswell Collection and to the College of Charleston for providing financial support for this study. We are grateful for the invaluable input of two anonymous reviewers.

Despite such impressive research, no studies have specifically addressed the nature and influence of management accounting during the New South Movement. Consequently, little is known about the role management accounting played in the transformation of the post-Civil War Southern economy from agrarian to manufacturing. Therefore, the purpose of this paper is to examine the character of management accounting in the post-Civil War Southern economy.¹ The investigation is predicated on the practices of a printing company in Charleston, South Carolina — Walker Evans & Cogswell (WEC) — commonly known as "Printers of the Confederacy."²

#### HISTORICAL CONTEXT

Review of Nineteenth Century Management Accounting

The roots of contemporary management accounting can be traced to the nineteenth century. During this time, a period known as "the Cost Renaissance," modern cost accounting evolved as business and capital became more sophisticated. The writings of Garke and Fells [1887] and Metcalfe [1885] are widely considered the most influential works on management accounting during the Cost Renaissance.

The introduction of Metcalfe's *Cost of Manufacturing*, in 1885, prompted a distinction between fixed and variable for the "manufacturing burden" (overhead) [Garner, 1954].<sup>3</sup> Metcalfe

<sup>&</sup>lt;sup>1</sup>This paper focuses on the management accounting system. According to Kaplan [1982], management accounting is a broad concept defined as "a system that collects, classifies, summarizes, analyzes, and reports information that will assist managers in their decision-making and control activities" [page 1].

<sup>&</sup>lt;sup>2</sup>The financial records of Walker Evans & Cogswell were made available to the authors by the South Carolina Historical Society. The collection was donated to the Society in 1987 and includes a comprehensive record of the business transactions of the Company from its inception in 1821 until its liquidation in 1985. The authors, in conjunction with the Society, identified, organized, and catalogued the journals, ledgers, job-order records, memorandum books, tax records, and financial statements, among other documents. Each record was organized by its specific function and time period in an attempt to piece together the accounting system of the firm. Once the collection was organized, an archival investigation was made of the accounting system of the Company during the historical era known as the *New South*. The paper focuses on the overall managerial accounting system as a facilitator of decision making within the firm from 1859 to 1913.

<sup>&</sup>lt;sup>3</sup> Garner [1954] contended that prior to Metcalfe's work in 1885, American manufacturers did not concern themselves with allocation of overhead to factory production.

also provided the foundation for the modern job-order system. This "shop order" system was perhaps the earliest substantive attempt at formalizing a system of documents that included tickets and cards aimed at accumulating the costs of raw materials, labor, and overhead. Ultimately, these documents allowed the construction of a "cost-sheet" that facilitated tracking of costs and jobs through the factory.

In 1887, Garke and Fells published *Factory Accounts*, which is regarded as the pioneering effort to bring together the concepts of scientific management and accounting [Chatfield, 1977]. The work was the first to introduce the concept of prime costs and the manner in which they pass through a series of ledger accounts. Church [1901] refined the techniques by describing a method of allocating "shop charges" to particular jobs or production.

More recently, Johnson [1981] explained the rise of nine-teenth century accounting among capital-intensive American industries. His findings suggested that the evolution of cost accounting was driven by the way firms organized economic activity and by information needs of decision makers. This conclusion contradicted earlier beliefs that cost accounting developed as a result of increased use of long-term assets during the nine-teenth century.

It is suggested that management accounting techniques of the late 1800s had not evolved sufficiently to account for depreciation on fixed assets or to facilitate the use of forecasts or return-on-investment calculations [Johnson, 1981]. Further, Chatfield [1977] argued that typical costing methods of the period had not advanced to support full-absorption costing. The findings of our study suggest that the preceding explanations may not be complete.

Johnson and Kaplan [1987] contended that industrialization of the United States may have been fueled by management accounting. Their premise that "... management accounting itself may have facilitated the growth of large-scale firms" [page 20] provided the impetus for other studies on the importance of management accounting during nineteenth century industrialization.

Tyson [1992] suggested that early nineteenth century costing methods were influenced by the social and economic environment of the day. His study examined textile industry costing and found that reports were both comprehensive and math-

ematically exact, thereby supporting a variety of managerial decisions. It appears that relatively sophisticated costing methods existed in the United States prior to 1840. Earlier work of Tyson [1988] indicated that detailed cost reports may have been produced during the latter part of the nineteenth century by firms faced with increased competition and economic depression.

According to Garner [1954], despite management accounting advances in the nineteenth century, printing industries in America and Great Britain did not adopt formal systems of cost accounting until about 1914. Notably, Garner argued that the printing industry ignored depreciation on productive assets. He pointed out that the technological state of the day supported the position that "the equipment used was not very expensive. and there was no danger of its becoming obsolete, or even wearing out within a foreseeable time" [page 23]. Although fairly complex accounting techniques were developed and used in the nineteenth century by manufacturing entities, the printing industry was believed to have lagged behind in developing sophisticated managerial accounting techniques [Jackson, 1919].4 However, the research findings in this paper provide evidence to the contrary. In fact, Walker Evans & Cogswell depreciated long-term assets and allocated these and other overhead amounts to production as early as 1874.

#### The New South Movement

Concurrent with "the Cost Renaissance" that occurred in the last three decades of the nineteenth century was the incidence of the New South Movement. Woodward [1951] noted the phrase "New South" is not a place, as is "New England," nor does it precisely designate a period, as does "the Confederacy." The phrase was more a "rallying cry" [page xi] for those whose faith lay in the future, distinctly apart from those whose heart was with the past. For purposes of this paper, however, the "New South Movement" will be used to describe the changes in the Southern economy that occurred from approximately 1870 to 1913.

The period marked the end of an era of social, economic, and political revolution and the beginning of the Industrial

<sup>&</sup>lt;sup>4</sup>Interestingly, the *Journal of Accountancy* did not specifically address practice standards within the printing industry until May 1919 when it featured "Standardization of Printer's Accounts" [Jackson]. This was followed by the 1922 feature "Accounting for a Printing and Bookbinding Business" [Beaujon].

Revolution in the South. The business revival brought the rise of Southern factories, especially the cotton mills. The slogan, "bring the factories to the fields" was symbolic of the economic reconstruction of the former Confederate states. In his report on the cotton-textile industry in the Census of 1890, Edward Standwood wrote that the extraordinary rate of growth in the South during the 1880s was the most important aspect of the period [Woodward, 1951]. With the proliferation of Southern cotton mills came successful competition with New England.

In addition to the rapid growth of new mills, Southern empires of timber, coal, and iron attracted Northern and foreign investors. Agricultural production was revitalized, and railroads and bridges were constructed in response to the expanding economy. The South, rich in natural resources but poor in capital, represented an appealing economic frontier for investors toward the end of the nineteenth century.

Prosperity of the period was illusionary for Charlestonians, whose economy was in decline compared with other New South urban centers. Although Charleston remained the largest port south of Baltimore and South Carolina's major rail and trade center, the last two decades of the nineteenth century saw a soft economy in Charleston. Part of the city's economic problems were situational, such as unfavorable rail rates. Many of Charleston's woes, however, were attributed to cultural elitism and a disdain for trade. Although commercial activity was on the rise by 1900, Charleston's economy was described as "moribund" [Fraser, 1989]. Nonetheless, many Charleston businesses, including Walker Evans & Cogswell, were prosperous during the era.

## Profile of Walker Evans & Cogswell

Walker Evans & Cogswell (WEC) was founded in 1821 in Charleston, South Carolina. In the early years, the business depended primarily on local printing orders. WEC had expanded to other regions of the South by 1850. At its pinnacle around 1920, WEC had printing contracts with businesses and governmental entities throughout the country. The extensive accounting records chronicle its intriguing history and its role in the American Civil War, Reconstruction, and the New South Movement.

The influence of WEC prior to the Civil War was primarily limited to South Carolina, although occasional orders were re-

ceived from nearby North Carolina, Georgia, and Florida. The major source of revenue during this period was from orders for stationery and bookbinding, including journals and ledgers. As a designer, manufacturer, and supplier of account books and forms for businesses throughout the South, the firm may well have helped spread the concepts of double-entry accounting.

Rapid expansion began in 1885 with the purchase of a large printing facility equipped with modern printing presses and binding machinery. Following the expansion, the firm was fully able to mix and store inks of all grades and colors to meet increasing customer demands. The direction of the flourishing printer, however, changed dramatically in the 1860s.

The American Civil War began in Spring 1861 with the first shots fired in Charleston approximately two blocks from the WEC facilities. Soon after, Confederate government officials approached Benjamin Evans, company president, to negotiate printing contracts for the production of currency and bonds. He traveled to England and Scotland to purchase equipment and enlist corps of lithographers. Upon his return to Charleston, production of currency and bond certificates began.<sup>5</sup> Illustration 1 provides examples of \$5 and \$10 Confederate notes printed by WEC.<sup>6</sup>

The printing facility was moved to Columbia, South Carolina in 1862 to avoid the shelling and mortar fire in Charleston. The firm remained in Columbia during the War and was reestablished in Charleston in 1865. The devastation of war brought a virtual end to commerce in Charleston until around 1867 when the city began to resurrect slowly. However, WEC enjoyed a quick economic recovery and prospered during the Reconstruction period.<sup>7</sup>

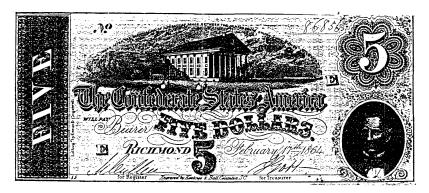
<sup>&</sup>lt;sup>5</sup>Due to the death of John C. Walker, general partner, in 1861, the printing firm assumed the name of "Evans & Cogswell" during the war years. The name Walker Evans & Cogswell was restored in 1865 when Walker's son, C. Irvine Walker, returned to the firm after serving in the Confederate army.

<sup>&</sup>lt;sup>6</sup>According to Criswell [1964], Walker Evans & Cogswell (then officially known as "Evans & Cogswell" was one of several printing firms involved in the production of Confederate currency, bond certificates, and postage stamps. Other printing establishments included Keating and Ball (Richmond and Columbia), Hoyer and Ludwig (Richmond), Southern Bank Note Company (New Orleans), and B. Duncan (Columbia).

<sup>&</sup>lt;sup>7</sup>Unlike most businesses, WEC emerged from the Civil War with its equipment and management intact. The equipment was hidden during Sherman's destructive "March to the Sea" in 1865 by the Cogswell family.

#### **ILLUSTRATION 1**

## \$5 and \$10 Confederate Currency Lithographed by Walker Evans & Cogswell 1864





### MANAGERIAL ACCOUNTING AT WEC

The accounting records of WEC had evolved into an interconnected system for managerial decision making by the commencement of the New South Movement. By 1870, a system of journals, ledgers, and memorandum books was clearly established to facilitate the preparation of comparative financial statements, cash flow analysis, job order costing, pricing, and periodic assessment of financial position. In contrast to the findings of Garner [1954] and Johnson [1981], the firm depreciated plant assets and allocated this and other fixed overhead to production as early as 1874. This characteristic of WEC's managerial accounting system is intriguing in light of the fact that the work of Garke and Fells did not appear until 1887 in England.

In 1870, the managerial accounting system was comprised of the president's memo book, general journal, general ledger, customer ledger and index, and work order books. After diversification, separate sales records were kept for the retail business. Beginning around 1890, customer ledgers were maintained geographically. A cash book was added in 1901 as a means of monitoring and controlling cash flow. An employee payroll book was introduced in 1909 to account for the growing labor force.

#### President's Memo Book

The president's memo book, maintained from 1859-1913, provides insights into managerial accounting practices. It contains information used for major decisions concerning diversification, transfer pricing, cost allocation including fixed overhead to production, cash flow and liquidity analysis, and extensions of credit to major customers.

The memo book provides evidence that WEC directly affected the momentum of the New South Movement by influencing the rebuilding and establishment of many Southern newspapers. Risky credit extensions were sometimes made to promote the growth of these enterprises. Of special significance is the role that the firm played in financing Henry W. Grady, famed journalist, editor of the *Atlanta Constitution*, and acknowledged spokesman of the New South. Reflecting on the decision to assist Grady, WEC president William H. Cogswell later wrote [Walker Evans and Cogswell, 1921]:

...[the firm] equipped marthem the first newspape guished Southern journalis was unknown to fame and usual credit inquiries were a minor, without legal rest of the highest personal chat character and justified in him [page 61].

The memo book contains rused in the daily decisions. Anothe capability of producing coand resulting "Comparative Stacal years 1860 and 1870 are repairs, prepared in 1870, demonst for comparative data.

newspaper offices, among enterprise of the distin-Henry W. Grady. Then he tranger to the firm, so the ade. It was learned he was isibility, but a young man acter. He was trusted on he confidence of the firm

nerous schedules and analyses ample of one analysis indicates parative reports. The analysis ments of Business" for the fisduced in Exhibit 1. This analyes management's appreciation

#### **EXHIBIT 1**

## Walker Evans & Cogswell Comparative Statements of Business For the Fiscal Years 1860 and 1870\*

ans and Cogswell	
1859 July 1, to 1860 July 1	\$49,983
1858 July 1, to 1859 July 1	43,727
1859 July 1, to 1860 July 1	\$24,948
er Evans & Cogswell	
1869 July 1, to 1870 July 1	\$65,057
1869 July 1, to 1870 July 1	\$81,885
60 E&C	30 pr. ct.
60 E&C	228 pr. ct.
	1859 July 1, to 1860 July 1 1858 July 1, to 1859 July 1 1859 July 1, to 1860 July 1 er Evans & Cogswell 1869 July 1, to 1870 July 1

<sup>\*</sup>The fiscal year end was changed to March 31 when the business incorporated in 1887.

The analysis was likely done as part of the decision process aimed at expanding into the retail market in 1870. The schedule indicates that ordered work (contractual printing jobs) had increased by 30 percent in 10 years, while sales had multiplied by 228 percent. The evaluation perhaps reinforced the decision to diversify and illustrates management's income statement focus.

## Job Order System and Logistical Effects

The efficiency and scale of WEC's operations were primary factors in its selection as a Confederate contract printer. Scarce resources and need for effective internal control during the war years likely improved efficiency and sophistication of the job order system. These qualities enabled WEC to recover rapidly during the critical years of Reconstruction and to prosper during the New South Movement.

The job order cost system was capable of producing detailed cost data. In contrast to earlier findings [Johnson (1981); Garner [1954)], WEC depreciated plant assets and allocated these and other fixed overhead amounts to production. Depreciation was calculated at a 10% rate on the investment in plant assets. Subsequently, depreciation was allocated to production

EXHIBIT 2 Cost of Work July 1, 1874

	Engine	General	Press Room	Composing Room	Bindery	Ruling Room
Engineer	624					
Fuel	490					
Oils	34		97			
Repairs	100		277			1
10% Depreciation	170		1,300	700	230	250
Inks			261			232
Foreman's Wages			1,716	1,716	858	728
<b>Proof Reading</b>				1,014		
Sundries				253	342	
Taxes		669				
Rent	·	1,568				
Insurance		390				<b>\</b>
[Foreman's] Time		1,716				
Frederick Parker	ĺ	300				
Bookkeeping & Collecting		750				
Office Wages 10%		200				
Boxes Used		864				
Cost of Engine	\$1,418	]	850	50	300	218
General Expenses		\$6,457	1,800	1,800	1,600	1,257
Total	<u></u>		\$6,301	\$5,533	\$3,330	\$2,685

departments which served as cost centers. Each department, in turn, allocated depreciation to units produced. Exhibit 2 illustrates the step allocation of depreciation and other costs of production to departments.

Located in the port of Charleston, WEC was able to take advantage of logistical benefits to minimize inventory costs. Its seaport location provided a distinct competitive advantage over many of the inland printing firms which were forced to bear the cost of overland transportation, primarily rail. WEC did not need to warehouse large volumes of inventory, whereas inland

printing establishments had to maintain abundant volumes of "safety stock." This was necessary because the South's inland transportation infrastructure was not reliable to ensure necessary supply. To avoid "stockouts," firms with no easy port access could minimize risk only by keeping large amounts of inventory on hand. Thus, WEC enjoyed a distinct cost advantage, providing the means to diversify the printing business into retail sales.

## Diversification and Transfer Pricing

Diversification took place in 1870 when the printing business expanded into retail sales of supplies, ink, and stationery. While WEC maintained the retail outlet in Charleston, the bulk of sales were made to other printing establishments and individuals throughout the South.

The accounting records provide insights into the decision to diversify, which resulted in cost advantages of increased scale and scope. Entering the retail printing supplies market required a relatively small initial capital investment since existing facilities were used. In addition, incremental costs of operating the retail business were minimal.

The management accounting system facilitated transfer pricing. For each major printing job, an "Estimation of Profit" was prepared. The estimate included an assessment of total labor and materials cost for each job, which was added together in "Cost of Printing Operations and Bindery" ("PO&B").8 The cost of raw materials was marked up to retail in deriving estimated profit.9 The May 23, 1871 estimate on the printing job involving the *South Carolina Supreme Court Rules*, illustrated in Exhibit 3, provides an example of the technique.

The estimate of profit had a dual purpose. First, the estimated profit figure (or target profit) allowed the firm to bid on particular jobs. Second, the estimate was a benchmark, or rough measure, of subsequent performance. In the latter sense, the profit estimation acted as a crude type of "manufacturing budget."

<sup>&</sup>lt;sup>8</sup>The "Cost of Printing Operations and Bindery" (PO&B) was comprised of both variable and fixed overhead including depreciation on equipment.

<sup>&</sup>lt;sup>9</sup>Printing supplies that were sold in the retail division were marked up and transferred from the PO&B to the retail business. This mark up was identical to the mark up on the materials used for production in the PO&B.

#### **EXHIBIT 3**

## Estimated Profit Calculations Rules of Supreme Court May 23, 1871

Cost in Printing Operations and B	indery (PO&B)	\$110.00	
Advertising Circular			
Printing	\$ 3.00		
Envelopes	.50		
Postage	6.00	9.50	
Cost of Printing Extras		5.50	\$125.00
Sales			
164 copies @ \$1 less \$.02 postage		160.72	
43 copies @ \$2 less \$.12 postage		80.84	241.56
Estimated Profit			\$116.56

## Management Information Requirements: A Liquidity Emphasis

Management's emphasis on liquidity is evident in the perpetual tracking of sales and cash collections. The chaotic economic and political environment of the period likely dictated the liquidity focus, which was driven by management's need for assessment of going concern.

The liquidity issue was also a principal concern in accounting for receivables for government printing contracts. Around 1890, an aggressive sales campaign was undertaken aimed at attracting printing contracts of state, county, and municipal governments. The endeavor resulted in printing contracts with a substantial portion of the governmental units in South Carolina, North Carolina, Florida, Georgia, Alabama, Mississippi, and Tennessee. In 1894 and 1895, nearly 50% of all revenue from the printing operations and bindery (PO&B) was generated from government printing contracts.

The increase in government printing contracts caused special liquidity concerns. A statement by William H. Cogswell, WEC president in 1901, provides evidence that liquidity was, in fact, a primary consideration [Walker Evans and Cogswell, 1921]:

There have been marked changes in the manner of credits. Previous to 1860 the business of the South was done on long credits and this business had to conform to this system. After 1865 mercantile credits were only

30 days, but a large part of the business of the concern was with counties which settled only once a year, when taxes were collected. This required a large capital sleeping in such accounts [page 65].

Methods used to track sales and receivables during the New South period demonstrate that the management accounting system was capable of producing detailed liquidity reports. Comparative statements were management's primary decision-making tool during the period. Exhibit 4 presents the 1894-1895 comparative statement of sales which differentiates between printing contract revenues and retail sales. Sales within each of these categories are further divided between cash sales and sales on account to "City" and "Country" customers. City customer accounts represented sales made in Charleston, while country customer accounts represented sales made outside the metropolitan area. The practice of accounting for sales by geographic area was begun in 1875.

The 1894-1895 comparative statements were likely prepared in response to the need to analyze the effects of a serious economic recession. The comparative data indicate total sales of \$112,452 for 1894 and \$99,305 for 1895. The decrease in 1895 sales was apparently attributable to the economic downturn.

During the later years of the New South period, WEC enjoyed economic growth and prosperity. The first decade of the new century saw a steady increase in sales. Significant inroads into the Northeast and Midwest were made as a national advertising campaign was undertaken. The sales area expanded to include virtually every region of the United States with annual sales averaging \$200,000 by 1913.

The management accounting system during the early 1900s continued to focus on providing detailed liquidity data. Extensive tracking of sales and cash collections continued to provide management a perpetual assessment of cash flow. Exhibit 5 illustrates comparative information concerning sales and cash collections for the period 1901-1913.

This comparative information permitted management to monitor fluctuations in sales and assess the effectiveness of credit policies. Although evidence in the memo book suggests aggressive collection efforts, bad debts were significant throughout the New South period, often exceeding ten percent of total sales. No provision for bad debts, however, was recorded in the balance sheet nor was such expense recognized in earnings.

The Accounting Historians Journal, June 1994

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Comparative Statements of Sales

Fiscal Years Ended March 31, 1894 and

					(Actu	Actual Dollars	lars)						
	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
Sales (FYE March 31, Retail Sales	1894)												
Cash	285	317	276	249	256	265	720	337	376	401	517	529	4,528
City	1,048	1,119	626	1,079	268	1,363	1,456	1,023	1,126	1,492	875	1,226	13,634
Country	844	990	717	1,246	2,771	1,945	1,199	1,489	2,228	2,475	1,774	1,849	19,527
TOTAL (Retail)	2,177	2,506	1,972	2,574	3,795	3,573	3,375	2,849	3,730	4,368	3,166	3,604	37,689
Printing Operations & 1	Bindery												
Cash	27	27	m	12	13	10	9	23	6	46	6	23	208
City	3,033	3,036	1,747	2,482	1,735	2,547	3,974	2,028	2,937	3,002	2,087	3,332	31,940
Country TOTAL (BO&B)	5,748	2,588	2,829	2,008	3,131	3,550	2,941	2,930	4,266	4,039	3,926	4,659	42,615
IOIAL (FORB)	0,000	100,0	<b>t</b> 'C' <b>t</b>	<b>4</b> ,302	4,0,4	0,107	0,921	4,701	717'	/90'/	0,022	8,014	/4,/03
TOTAL SALES	10,985	8,157	6,551	7,076	8,674	6,680	10,296	7,830	10,942	11,455	9,188	11,618	112,452
Sales (FYE March 31,	1895)												
Retail Sales													
Cash	309	320	228	230	225	334	695	422	449	540	291	386	4,429
City	927	691	529	876	763	1,167	1,664	1,044	1,325	1,362	813	1,230	12,391
Country	1,118	839	787	1,185	1,942	3,648	1,057	1,307	1,355	2,545	1,162	744	17,689
TOTAL (Retail)	2,354	1,850	1,544	2,291	2,930	5,149	3,416	2,773	3,129	4,447	2,266	2,360	34,509
Printing Operations & I	Bindery	Ā	,	7	,,	7	Ş	ų.	i.	į	ć	;	ţ
Cash	1	CI	07	10	67	67	20	CI	33	77	70	35	C/7
City	2,200	2,773	2,428	1,997	2,248	3,653	2,439	2,154	2,483	2,816	1,325	2,327	28,843
Country	3,669	2,238	1,985	1,780	3,284	2,650	4,270	2,710	2,814	3,870	3,083	3,325	35,678
TOTAL (PO&B)	5,883	5,026	4,439	3,793	5,555	6,328	6,739	4,879	5,332	6,707	4,428	2,687	64,796
TOTAL SALES	8,237	6,876	5,983	6,084	8,485	11,477	10,155	7,652	8,461	11,154	6,694	8,047	99,305

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	Walker Evans & Cogswell	Fiscal Years Ending March 31, 1901-1913
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	1913	16.751	15,187	12,104	12,337	13,126	11,898	11,902	13,407	17,617	18,353	13,149	17,044	172,874	,	1913	20,603	17,965	14,018	12,095	11,805	14,063	16,705	13,901	15,784	16,914	16,911	15,220	185,984
	1912	15 530	18.041	13,312	14,675	16,264	16,746	18,098	16,495	15,892	20,350	18,902	27,078	211,482		1912	22,540	18,042	15,006	14,246	13,154	12,757	18,580	16,865	16,740	16,895	17,167	19,228	201,220
	1911	14 251	16.360	17,759	12,881	13,854	15,992	17,870	18,171	22,739	21,341	18,523	18,065	207,806	9	1911	20,486	17,561	14,933	13,954	12,676	15,780	13,140	14,141	15,037	20,126	16,769	21,838	196,441
	1910	13.613	19.627	15,857	15,537	13,586	17,639	17,619	19,557	20,419	26,657	23,636	21,316	225,063		1910	17,529	16,337	15,668	13,437	15,004	15,608	16,842	15,986	16,893	20,509	19,499	17,004	200,316
1913	1909	13.238	12,295	16,078	15,286	15,108	15,089	15,723	17,173	18,337	19,571	16,856	21,313	196,067	0	1909	17,298	15,269	12,098	13,293	13,594	15,421	14,491	14,941	17,771	19,279	15,649	18,632	187,736
, 1901-	1908	12.729	13,385	14,561	12,177	11,188	13,293	14,326	13,795	19,087	16,306	15,306	29,490	185,643		1908	14,329	13,679	10,775	15,344	11,271	13,951	13,937	13,394	14,199	19,332	16,319	17,099	173,629
arch 31	1907	17.515	16.562	14,024	15,180	14,700	14,183	14,086	16,262	19,285	20,704	13,035	18,066	193,602		1907	17,165	18,460	17,105	13,076	14,031	11,571	13,097	15,974	17,108	18,126	22,988	17,789	196,490
Years Ending March 31	1906	12 733	13.184	13,987	13,943	17,008	14,767	16,542	17,791	18,749	20,960	17,171	18,740	195,575		1906	16,675	14,506	12,986	11,568	12,259	12,897	14,583	16,186	16,191	19,692	15,428	17,281	180,252
ears En	1905	13 478	15.745	12,635	10,580	14,572	15,633	14,700	16,426	19,167	19,332	17,204	20,281	189,743		1905	14,895	16,802	12,285	13,522	13,620	11,237	15,078	15,306	15,535	18,235	17,579	16,889	180,983
Fiscal Y	1904	10 990	12.544	11,130	12,787	14,428	14,721	13,051	14,683	18,161	17,904	14,791	18,095	173,285		1904	12,050	13,349	11,013	13,123	11,822	12,236	12,536	13,102	14,871	18,345	14,741	14,537	161,725
_	1903	11 918	12.273	14,965	11,740	12,079	12,122	11,359	10,636	13,322	15,947	12,405	16,504	155,270	9	1903	11,810	11,171	10,745	8,437	11,039	9,884	11,810	12,597	11,322	13,192	14,321	13,504	139,832
	1902	10 943	12,609	11,146	10,158	10,858	10,773	13,182	10,457	16,303	15,398	13,307	14,592	149,726		1902	11,722	11,173	11,086	11,579	11,030	11,243	11,997	15,023	14,978	17,242	10,601	12,318	149,992
	1901	\$ 9.218	9.928	9,627	12,064	13,657	11,366	15,778	12,534	16,619	16,162	14,583	14,139	\$155,675	CASH COLLECTIONS	1901	\$11,723	9,464	8,586	9,364	10,088	8,981	10,856	13,150	12,719	13,666	13,337	14,741	\$136,675
	SALES	APR	MAY	NOI	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOT	CASH C		APR	MAY	NOI	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOT

Management periodically compiled delinquent account schedules and assigned collection probabilities.

#### **SUMMARY**

The accounting records of Walker Evans & Cogswell are important for two reasons. First, they provide a glimpse into the management accounting practices of a firm significant to the transformation of the Southern economy during the New South movement. Second, new insights are provided into nineteenth century managerial accounting, particularly practices of the printing industry.

The study suggests that managerial accounting practices aided in the economic transformation inherent in the New South. The turbulent economic and political environment of the period placed unique demands on the management decision process. The accounting system of WEC provided critical information for management concerning liquidity and cash flow, sales, product costs, and profitability estimates. The management decision process relied heavily on the comparative reports to evaluate going-concern. Diversification into retail sales allowed the firm to maximize profit and reduce risk.

Further, the findings suggest that earlier work on the nature of management accounting during the nineteenth century may not be complete. Specifically, this study provides evidence that fixed overhead, including depreciation on equipment, was recognized and allocated to production. While earlier work suggested that these allocations were not standard practice, particularly in the printing industry until 1914, the results of this investigation indicate that such allocations were routinely made by WEC as early as 1874. These allocations were an integral part of the determination of product costs for the firm. Furthermore, the management accounting system was capable of providing highly detailed comparative reports and facilitating transfer pricing in a diversified business.

In conclusion, future research is needed to explore the relative sophistication of management accounting practices and cost allocation techniques in the late nineteenth and early twentieth century. Since the results of this study were based on a particular firm, additional studies should determine whether the practices of Walker Evans & Cogswell were typical. Perhaps the current understanding of the development of managerial ac-

counting methods and techniques which were so vital to America's industrialization is not yet complete.

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## A HISTORICAL ANALYSIS OF THE "MARRIAGE TAX PENALTY"

Abstract: The marriage tax penalty resurfaces as a topic of interest when tax policy makers consider the economic consequences of increasing marginal tax rates on declining "family values". Alm and Whittington [1993] found that marriage taxes influence the incidence of marriage. A historical perspective of the marriage tax penalty and its counterpart, the marriage tax bonus or "subsidy", merit consideration and re-evaluation in light of current tax policy trends toward higher marginal tax rates.

This paper develops a historical framework for the study of the federal income tax and conducts a detailed analysis of the marriage tax for first quartile, weighted average, and third quartile taxpayers over the entire history of the United States personal income tax. It demonstrates that potential bonuses have historically been consistently more significant than penalties. In fact, penalties do not gain prominence until 1964.

The current trend toward increasing marginal rates will increase both the penalty and the bonus. Therefore, analysts interested in this area of policy should consider means of reducing both. The most successful method of mitigating the marriage penalty has been the "two-earner deduction".

#### INTRODUCTION

Increased individual marginal federal income tax rates have recently been adopted for "high income" taxpayers. As tax rate schedules become more progressive, the "marriage tax penalty" (MTP) is again becoming a topic of interest (i.e., Alm & Whittington [1993], and Schultz [1993]).

This paper explores the historical development of components of basic individual federal income taxation leading to MTPs and the less frequently addressed "marriage tax bonuses" (MTBs) or "subsidies". Insight is provided to correct for confusion in contemporary research efforts, with respect to the historical incidence (or lack thereof) of "marriage neutrality". A

historical framework is developed which will be useful to future researchers as a means of examining the development of the entire federal income tax system. Within this general framework, a detailed discussion of MTPs and MTBs is presented. In addition, historical methods found to mitigate MTPs and MTBs are identified and their potential for application (and limitations) in future policy decisions is examined.

Basic historical tax law was reviewed to generate tax liabilities for married (filing jointly and with no dependents) and single, non-itemizer taxpayers. The "adjusted gross income" (AGI) levels used were developed from *Statistics Of Income*<sup>1</sup> (SOI) data provided by the Internal Revenue Service (IRS). The first such IRS publication (June 1918) emphasized descriptive statistics of 1916 tax returns, providing lesser information for the 1914 and 1915 tax years. Detailed data for 1913 individual federal income tax returns was omitted from analysis, due to the inconsistency of this ten month period (i.e., March 1 through December 31, 1913) with future tax years.

Analyses of MTPs and MTBs are based on the calculation of approximately 727 "short form" (i.e., non-itemized) tax returns for first (low income<sup>2</sup>) quartile, third (high income<sup>2</sup>) quartile, and weighted average-based taxpayer AGI levels.<sup>3</sup> (Appendix A provides a detailed list of these income levels for any tax researcher who is interested in a historical analysis of the tax law and its effect on a broad base of taxpayers.) All analyses presumed wages to be the only source of income.

The potential for marriage tax bonuses have exceeded that for marriage tax penalties in both frequency and amount, for

<sup>&</sup>lt;sup>1</sup>The SOI data is also compared with contemporary tax publications to check for any discrepancies in tax rules. See KixMiller, W. and, Baar, A., Eds. (1918-1927), *United States Income and War Tax Guide* (Commerce Clearing House); Pechman, Joseph A. (1987), *Federal Tax Policy*, 5th edition (The Brookings Institution; Washington, D.C.); and *United States Master Tax Guide*, (1937-1993; Commerce Clearing House).

<sup>&</sup>lt;sup>2</sup>The terms "low income" and "high income" refer to the relative economic status of taxpayers required to file individual federal income tax returns. In fact, most taxpayers required to file returns for years prior to the mid-1940s would have generally been considered "high income".

<sup>&</sup>lt;sup>3</sup>The first and third quartile, as well as the weighted average, was used to provide a broad based picture of the effect of the marriage tax on the average taxpayer. The weighted average is generated from the SOI data which is provided only by income class. This is calculated by taking the class midpoint and weighting it by the number of tax returns filed for that class.

first through third quartile-based taxpayer AGI levels throughout the history of our current system of federal individual income taxation. Such historical findings suggest that solutions to present and future MTPs must simultaneously address the exposure to revenue losses attributable to MTBs.

MTPs were effectively mitigated, throughout this range of taxpayer AGI levels via the variable standard deduction (1944 through 1963) and its predecessor, a revised "earned income credit" (1934 through 1943). The "two-earner deduction" (1982 through 1986) and its predecessor, a (\$500 maximum) "earned income" deduction (1944 and 1945), were also successful in reducing MTPs.

## **DEFINITION OF THE MARRIAGE TAX PENALTY**

Definitions of the "marriage tax penalty" have varied. Fox [1988] defined and analyzed the two separate components of the MTP as the "rate factor" and the "base factor". Rosen [1987] did not distinguish between the (relatively recent) more significant "rate" and less vital "base" effects, but included the impact of the current "earned income credit" (EIC) in his calculations of MTPs and MTBs. McIntyre [1988] suggested that disaggregation of the EIC would have been more useful in Rosen's analysis, distinguishing between "spending" (EIC) and "tax" (combined "rate" and "base" effects) policy issues. Jagolinzer and Strefeler [1986] and Tilt and Spencer [1983] used a more fully developed definition of the MTP in an effort to identify (but not to model the relative impacts of) all tax provisions resulting in different tax liabilities based solely on marital status.

This paper makes use of SOI-based AGI data and the standard deduction to quantify combined "base" and "rate" effects for non-itemizer taxpayers with no dependents. It, therefore, employs a definition consistent with those of Fox [1988] and McIntyre [1988] and the no dependent scenario included in studies conducted by Rosen [1987] and Alm and Whittington [1993].

The marriage tax penalty, then, refers to that situation where a legally married couple using married, filing joint (MFJ) or married, filing separate (MFS) tax rate schedules pays higher federal income taxes than what would be paid by two single taxpayers without dependents and with the same level of income.

#### "RATE" AND "BASE" EFFECTS

Two primary factors causing the generation of the MTP are the "rate" effect and the "base" effect [Fox, 1988]. The base effect results from the current (and historical) "inequities" between married and single taxpayer's personal exemption (1913 through 1943) and standard deduction (1944 through 1993) amounts. For example, in 1993 two single people could take a standard deduction of \$3,700 each for a total of \$7,400; married couples, however, were limited to a standard deduction of \$6,200. The base effect (generally) is the result of the base differential combined with the marginal tax rate of the taxpayer(s) for all tax years prior to 1971.

For post-1970 tax years, a "rate" effect, independent of and in addition to the base effect, came into existence when substantively separate tax rate schedules were first produced in 1971 for single and married taxpayers. Currently, the primary generator of the MTP is the rate effect caused by separately developed progressive tax rates, though the base effect continues to exist for non-itemizer taxpayers. The MTP is maximized for "non-traditional" two-earner households or when spousal earnings occur at 50%/50% allocation levels. A MTB occurs and is maximized for the historically more "traditional" one-earner households or when spousal earnings occur at 0%/100% allocation levels. As tax rates become "flat" or less progressive, MTPs and MTBs decline. As tax rates become more progressive, MTPs and MTBs rise.

### MISCONCEPTIONS REGARDING "MARRIAGE NEUTRALITY"

Many contemporary researchers have focused on the rate effect and have ignored the base effect, in concluding that pre-1948 Revenue Act tax law provided for "marriage neutrality". Alm and Whittington [1993, p. 201] note the following:

The individual income tax was established in 1913, and originally used the individual as the unit of taxation, so that all individuals were taxed using a single progressive tax schedule not linked to marital status. Such a tax system was marriage neutral because an individual's tax burden did not change upon marriage (emphasis ours). . . . Departure from marriage neutrality developed with the adoption in 1948 of income splitting for married couples.

While there were no significant marriage tax penalties during this era, the income tax law was not marriage neutral. Tax law consistently provided marriage tax bonuses.

Strefeler [1982] qualifies his reference to pre-1948 Revenue Act conditions, as follows:

Until 1948, marital status was *relatively* (emphasis ours) unimportant...

Fraser [1986, p. 831] and Mitchell [1989, p. 113] point to the "impossibility" of a tax system that "simultaneously (1) is marriage neutral, (2) provides for joint filing for married couples, and (3) has marginal, nonlinear tax rates that increase with income." Though Mitchell [1989, p. 116] erred in his statement regarding the complete absence of a marriage tax penalty during the 1948 through 1969 tax years:

From 1948 to 1969 there did not exist the so-called marriage penalty...

Similarly, Neff [1990, p. 420] says:

The introduction (emphasis ours) of the marriage penalty in 1969...

While the average taxpayer may not have suffered from marriage tax penalties, MTBs did exist. (Appendix B provides a historical listing of the potential bonus or penalty at each income level studied.) Penalties existed at the first quartile taxpayer AGI level during the 1964 through 1969 tax years and at the third quartile taxpayer AGI level for the 1968 and 1969 tax years.

#### HISTORICAL FRAMEWORK

The history of federal income taxation can be divided into four base effect periods: Period I — the thirty-one year period of personal exemption-based deductions (1913 through 1943), Period II — the twenty year period of variable standard deductions (1944 through 1963), Period III — the thirteen year period of semi-variable standard deductions (1964 through 1976), and Period IV — the seventeen year (and current) period of fixed standard deductions (1977 through 1993).

The history of personal exemption/standard deductionbased penalties and bonuses (the base effect) is summarized using this framework (see Exhibit I). Since the base effect is the combination of the standard deduction and the tax rate, the

#### **EXHIBIT I**

## The History of Personal Exemption/Standard Deduction-Based Amounts Available to Single and Married Taxpayers

I. Personal Exemption-Based (1913 through 1943):

	Personal	Exemption	Deduction	Deduction
Year(s)	Single	Married	Bonus	Penalty
1913-1916	\$ 3,000	\$ 4,000		\$ 2,000
1917-1920	\$ 1,000	\$ 2,000	\$ -0-	\$ -0-
1921-1924	\$ 1,000	\$ 2,500	\$ 500	
1925-1931	\$ 1,500	\$ 3,500	\$ 500	
1932-1939	\$ 1,000	\$ 2,500	\$ 500	
1940	\$ 800	\$ 2,000	\$ 400	
1941	\$ 750	\$ 1,500	\$ -0-	
1942-1943	\$ 500	\$ 1,200	\$ 200	

#### II. Variable Standard Deduction-Based (1944 through 1963):

10% of AGI with a \$1,000 maximum per tax return. Minimum/Maximum deduction penalty at \$-0-/\$1,000.

#### III. Semi-Variable Standard Deduction-Based (1964 through 1976):

			Component			
	Filing	Fixed	Variable	Fixed	Deduction	n Penalty
Year(s)	Status	Minimum	Percent of AGI	Maximum	Minimum	Maximum
1964-1970	Both	\$ 200	10%	\$ 1,000	\$ 200	\$ 1,000
1971	Both	\$ 1,050	13%	\$ 1,500	\$ 1,050	\$ 1,500
1972-1974	Both	\$ 1,300	15%	\$ 2,000	\$ 1,300	\$ 2,000
1975	Single	\$ 1,600	16%	\$ 2,300	\$ 1,300	\$ 2,000
	Married	\$ 1,900	16%	\$ 2,600		
1976	Single	\$ 1,700	16%	\$ 2,400	\$ 1,300	\$ 2,000
	Married	\$ 2,100	16%	\$ 2,800		

#### IV. Fixed Standard Deduction-Based (1977 through 1993):

	Standard I	Deduction	Deduction
Year(s)	Single	Married	Penalty
1977-1978	\$ 2,200	\$ 3,200	\$ 1,200
1979-1984	\$ 2,300	\$ 3,400	\$ 1,200
1985	\$ 2,390	\$ 3,540	\$ 1,240
1986	\$ 2,480	\$ 3,670	\$ 1,290
1987	\$ 2,540	\$ 3,760	\$ 1,320
1988	\$ 3,000	\$ 5,000	\$ 1,000
1989	\$ 3,100	\$ 5,200	\$ 1,000
1990	\$ 3,250	\$ 5,450	\$ 1,050
1991	\$ 3,400	\$ 5,700	\$ 1,100
1992	\$ 3,600	\$ 6,000	\$ 1,200
1993	\$ 3,700	\$ 6,200	\$ 1,200

#### EXHIBIT II

## The History of Federal Individual Income Tax Rates

	Marginal Ta	x Brackets
Year	Minimum Rate	Maximum Rate
I. Personal Exemption-Based	Deductions (1913 thro	ıgh 1943):
1913-1915	1%	7%
1916	2%	15%
1917	2%	67%
1918	6%	77%
1919-1921	4%	73%
1922	4%	58%
1923	2.25%	43.5%
1924	1.5%	46%
1925-1931	1.125%	25%
1932-1933	4%	63%
1934-1935	4% (A)	63%
1936-1939	4% (A)	79%
1940	4.4% (A)	81.1%
1941	10% (A)	81%
1942-1943	19% (A)	88%
II. Variable Standard Deduct	ion-Based (1944 throug	h 1963):
1944-1945	23%	94%
1946-1947	19%	86.45%
1948-1949	16.6%	82.1275%
1950	17.4%	84.357%
1951	20.4%	91%
1952-1953	22.2%	92%
1954-1963	20%	91%
III. Semi-Variable Standard	Deduction-Based (1964	through 1976):
1964	16%	77%
1965-1967	14%	70%
1968	14%	75.15%
1969	14%	77%
1970	14%	71.75%
1971-1976	14%	70%
IV. Fixed Standard Deductio	n-Based (1977 through	1993):
1977-1981	14%	70%
1982	12%	50%
1983-1986	11%	50%
1987	11%	38.5%

(A) Before adjustment for 10% "net income"-based earned income credit.

15%

15%

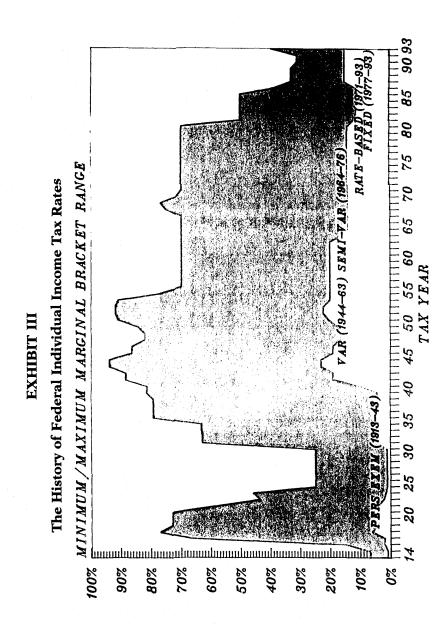
15%

33%

31% 39.6%

1988-1990 1991-1992

1993



ranges of the marginal tax rates are shown in Exhibit II. Exhibit III then provides a broad overview of the history of tax rates in the United States.

# Period I: Personal Exemption-Based Deductions (1914 Through 1943).

The period began with the establishment of a "flat" or proportional "normal" tax and a progressive surtax (1913 through 1916). Only a few, high income taxpayers were subject to the tax. A progressive feature was later introduced to the "normal" tax in the form of two- and three-tiered brackets, and a greater portion of taxpayers became subject to the surtax as surtax thresholds (generally) declined (1917 through 1935). The period concluded with the return to a proportional "normal" tax (1936 through 1943), the complete elimination of the progressive surtax thresholds (1941 through 1943), and the establishment of a revised "earned income credit" (1934 through 1943) that would later take the form of a variable standard deduction during Period II.

The Revenue Act of 1913 provided for a "flat" or proportional "normal" tax, applying only to amounts in excess of the newly established personal exemption "credit". The proportional "normal" tax rate was 1% for the 1913 through 1915 tax years, increasing to 2% for the 1916 tax year. The personal exemption "credit", as it was called, was comparable to what would today be referred to as the personal exemption "deduction". Separate personal exemption amounts were established for single and married taxpayers, and were the primary source of MTP- (1913 through 1916) and MTB-based (1921 through 1940, 1942, and 1943) "deductions", reflected in Exhibit I. During this period the individual, rather than the family, was considered the taxpayer, (Groves [1963] provides a discussion of the historical evolution of the taxpaying unit).

Maximum marginal tax rates of 7% (1913 through 1915) and 15% (1916), as indicated in Exhibit II, resulted from the combination of the proportional "normal" tax and the progressive surtax.<sup>4</sup> The surtax applied only to taxpayers with "net in-

<sup>&</sup>lt;sup>4</sup>This progressive surtax (prior to any adjustments in the later years of this period) ranged from 1% through 6% (1913 through 1915), 1% through 13% (1916), 1% through 63% (1917), 1% through 65% (1918 through 1921), 1% through 50% (1922 and 1923), 1% through 40% (1924), 1% through 20% (1925)

comes" in excess of \$20,000,5 and was calculated prior to any reduction for appropriate personal exemption amounts. Therefore, "normal" tax and surtax "net incomes" were provided for through separate, differing calculations. However, the term "net income" is roughly comparable to what is today referred to as "adjusted gross income" (AGI).

Through the 1916 tax year, the maximum possible MTP for taxpayer's below the \$20,000 surtax threshold was \$40 (\$20 for the 1913 through 1915 tax years). These "base" effect MTPs resulted entirely from the taxpayer's marginal tax rate multiplied by the differing filing status-based personal exemption amounts for married and single taxpayers. Related "base" effect maximum MTBs for the same period was \$20 (\$10 for the 1913 through 1915 tax years).

Beginning with the 1917 tax year, a supplementary, proportional "War Tax" of 2% was added. This resulted in the imposition of federal income tax on incomes previously too low to be taxed (the number of tax returns filed increased from 437,036 to 3,472,890). This was the first use of a progressive "normal" income tax. The more progressive nature of the now two-tiered "normal" tax generally provided only MTBs (at the income levels reviewed for the 1917 through 1920 tax years).

The Revenue Act of 1918, made permanent this progressive, two-tiered feature of the "normal" tax. The first \$4,000 of income in excess of the personal exemption deduction was taxed at a flat rate of 6%. Any additional excess was taxed at 12%.6

through 1931), 1% through 55% (1932 and 1933), 1% through 59% (1934 and 1935), 1% through 75% (1936 through 1940), 6% through 77% (1941), and 13% through 82% (1942 and 1943).

<sup>&</sup>lt;sup>5</sup>The surtax threshold was decreased from \$20,000 (1913 through 1916) to \$5,000 (1917 through 1921), increased to \$6,000 (1922 and 1923), further increased to \$10,000 (1924 through 1931), then decreased to \$6,000 (1932 and 1933), and decreased further to \$4,000 (1934 through 1940) until the threshold was eliminated and all "surtax net income" became subject to the progressive surtax (1941 through 1943). Surtax thresholds were not exceeded at the third quartile or weighted average AGI levels for any tax years through 1940.

<sup>&</sup>lt;sup>6</sup>The \$4,000 first bracket amount was maintained through the 1940 tax year, when it was reduced to \$2,000 (1941 through 1963), and further reduced to \$500 (1964 through 1976).

The unadjusted first bracket rates went through a series of reductions from 6% to 4% (1919 through 1922). "Blended" rates of 3% were developed for the 1923 (transitional) tax year. Three brackets were available for the 1924 through 1931 tax years. First bracket rates fell to 2% (1924), and 1.5% (1925 through 1931), before being restored to 4% (1932 through 1940) and increased to 6%

The Revenue Act of 1921 altered the temporary nature of many of the so-called "War Taxes". For the 1921 through 1923 tax years, married taxpayers with combined "net income" of \$5,000 or less, received a personal exemption of \$2,500. A reduced personal exemption of \$2,000 was available to married taxpayers with "net income" in excess of \$5,000. For the 1924 tax year, this reduced standard deduction provision was repealed and all married taxpayers received a \$2,500 standard deduction.

This reduced personal exemption amount for relatively high income, married taxpayers was the predecessor to the current "phase-out" of the personal exemption (and itemized deduction) amounts, which became effective during the 1991 tax year. Taxpayers affected by the \$500 reduction in their personal exemption deduction merely lost the marriage deduction-based bonus.

The minimum rate of 2.25%<sup>7</sup> for the 1923 tax year was the result of a "blending" of 1922 and 1924 tax rates, after adjustment for a 25% "earned income credit" (EIC). Effective for the 1923 through 1931 tax years, this EIC was limited to 25% of the "normal" tax and provided that the first \$5,000, but not more than \$10,000, of the "net income" of every individual was to be considered "earned income".

Beginning with the 1934 tax year, the personal exemption (and exemption for dependents) amount(s) was made deductible in arriving at "net income" for surtax purposes. (Previously, personal exemptions had been deductible for "normal" tax computation only.) A new, revised "earned income credit" (EIC) was made available through the 1943 tax year. Unlike the preceding EIC, this "credit" was comparable to what is today referred to as

<sup>(1941</sup> through 1943). Second bracket rates were reduced from 12% to 8% (1919 through 1922), decreased to a "blended" rate of 6% (1923), decreased further to 4% (1924), and 3% (1925 through 1931). Third bracket rates were in effect for the 1924 through 1931 tax years at rates of 5%.

<sup>&</sup>lt;sup>7</sup>The calculations in arriving at the 2.25% rate follows:

<sup>1922</sup> minimum rate of  $4\% \times 50\% = 2\%$ 

<sup>1924</sup> minimum rate of  $2\% \times 50\% = 1\%$ 

<sup>1923</sup> minimum "blended" rate of  $3\% \times [100\%-25\%] = 2.25\%$ .

The maximum bracket of 43.5% was the result of a transitional reduction/adjustment of the 1922 maximum bracket of 58% by 25% (i.e., 58% x [100%-25%] = 43.5%).

A more recent example of "blended" rates occurred for the 1987 tax year. Maximum marginal tax rates of 50% (1986) and 28% (1988, excluding the 5% surtax) were (approximately) "blended" to achieve the 38.5% maximum for the 1987 tax year.

a "deduction". It resulted in a reduction of the amount subject to the "normal" tax, but not the surtax. This "credit" on earned income was restricted in amount to 10% of the first \$14,000 of "net income" for a maximum deduction of \$1,400 for single or married taxpayers. This was the predecessor of the variable standard deduction available during Period II.

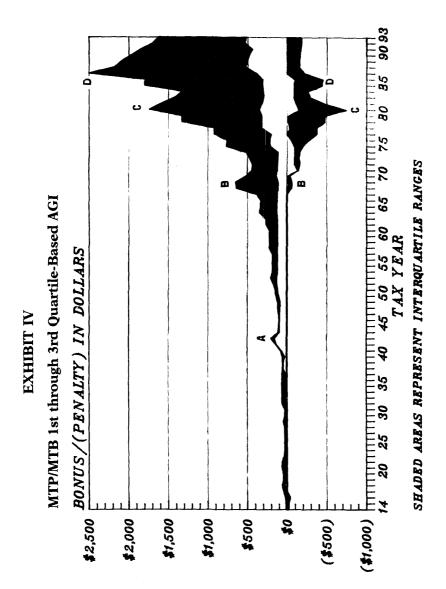
Married taxpayers filing separate tax returns were limited to one-half of this amount and if one spouse itemized deductions (or took the alternative EIC), the other was also required to itemize (or take the EIC). This provision prevented any "planning opportunities" or "loopholes" that may have otherwise been available through the use of the separate filing status for married taxpayers. This policy has been used consistently through the present (i.e., both itemize or both take the standard deduction when selecting the married filing separately (MFS) filing status).

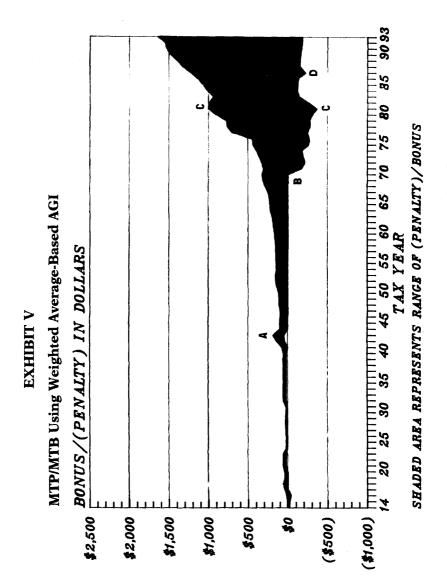
Generally, the more progressive the tax rate schedules and the lower the ceiling for the elimination of the first bracket and initiation of the second bracket, the greater the dollar amount of any "base" effect-based MTB/MTP. Taxpayers through the third quartile AGI levels failed to exceed the first bracket established for any tax year from 1918 through 1943.

Without exception, MTPs failed to materialize for first and third quartile AGI taxpayers for the 1917 through 1943 tax years. MTBs did, however, occur (see Exhibits IV and V and Appendix B). In small amounts, and due entirely to personal exemption deduction bonuses (the base effect), annual MTBs ranged from \$0 to \$60 from 1917 to 1940. MTBs increased significantly during the 1941 through 1943 tax years where they reached a third quartile and weighted average AGI high of \$198 (see Exhibits IV and V, point A).

# Period II: Variable Standard Deduction-Based (1944 Through 1963)

The period began with a provision that alleviated any MTP for married filing jointly (MFJ) two-earner households (1944 and 1945). The "normal" and surtax rates schedules were merged, providing for a single calculation of "net income". The EIC was retained, taking the form of a variable standard deduction. These changes provided for a continuation of a "marriage subsidy" from Period I through Period II (1917 through 1963) for taxpayers through the third quartile AGI levels.





The 1944 and 1945 tax years were the first for which a standard deduction was available for non-itemizer taxpayers in lieu of itemized deductions. The term "adjusted gross income" (AGI) was first used for the 1944 tax year, and the term "net income" was altered to represent AGI less itemized (or the new "standard") deduction(s).

The standard deduction was variable (i.e., 10% of "total income") with a fixed ceiling of \$1,000 for both married and single taxpayers, and was deducted for the purpose of both the 3% "normal" tax and surtax computations. The 1944 and 1945 tax years' personal exemptions were deducted only for the purpose of calculating the normal tax.

All taxpayers were provided with a \$500 deduction for the 3% normal tax rate. Two-earner married taxpayers were effectively provided with an additional \$500 deduction, through a tax reduction of 3% of the smaller of the two incomes to a maximum of \$15. Unlike the "two-earner" deduction available during the 1982 through 1986 tax years, this provision completely eliminated any MTP for married taxpayers with minimum earnings of \$500 each. This "adjustment" eliminated base effect MTPs, whereas the 1982 through 1986 "two-earner deduction" attempted to mitigate "rate" effect MTPs. This additional deduction/tax reduction was the first direct example of a tax provision designed to alleviate a MTP.

Beginning with the 1946 tax year, normal tax and surtax rates schedules were combined and the move toward a completely progressive tax structure was completed. "Income-splitting" provisions were introduced to counter a growing movement toward adoption of community property laws. Eight (excluding California) of the nine (i.e., California, Louisiana, Texas, Idaho, Washington, Arizona, Colorado, Nevada, and New Mexico) community property states' married taxpayers had previously benefited from "income splitting" provisions [Groves, 1963, p. 60-65]. This enabled married taxpayers to go through the lower brackets twice. The tax benefits granted to taxpayers of states under which community property laws were in effect led to a movement toward the adoption of such laws by other states (i.e., Hawaii, Michigan, Nebraska, Oklahoma, Oregon). Effective for the 1949 tax year, the family became (and remains) the basic taxpaying unit.

The 1944 through 1950 tax years used the same basic tables (with varying regressive reductions to scheduled rates) in arriv-

ing at minimum and maximum tax rates.<sup>8</sup> For the 1951 through 1963 tax years, minor alterations were made to rates schedules. Beginning with the 1952 tax year, a separate, less progressive rate schedule became available for taxpayers with dependents and able to meet requirements for use of the head of household filing status. Beginning with the 1955 tax year, an additional rate schedule became available for married taxpayers.

With one exception (third quartile taxpayers in 1947, see Appendix B), the variable standard deduction resulted only in MTBs for the 1944 through 1963 tax years. The absence of MTPs was due to the variable nature of the 10% standard deduction amount and the fact that the fixed ceiling was, without exception, not achieved at either the weighted average or the third quartile AGI levels.

First quartile AGIs generated MTBs ranging from a low of \$87 to a high of \$133. Third quartile AGIs resulted in MTBs and provided for a broader range, from a low of \$95 to a high of \$264. And weighted average-based AGI levels produced MTBs ranging from a low of \$95 to a high of \$199. Therefore, this period concluded with a continuation of the "marriage subsidy" which dominated Period I.

# Period III: Semi-Variable Standard Deduction-Based (1964 Through 1976)

This period began with minimum and maximum marginal tax rate reductions and the establishment of identical fixed minimum and maximum standard deduction amounts for married and single taxpayers (1964 through 1970). The semi-variable nature of these standard deductions resulted in the reappearance of base effect MTPs for "low income", first quartile (1964 through 1967) taxpayers. Both first and third quartile taxpayers had rate MTPs, as "tax-based" surtaxes (1968 through 1970) increased the progressive nature of tax rates schedules. The period concluded with both base and rate effect-based

<sup>&</sup>lt;sup>8</sup> Minimum and maximum marginal tax rates were calculated (see Exhibit II), as follows:

		Minimum			Maximum	
Ū.	nadjuste	d	Adjusted	Unadjusted		Adjusted
Year	Rate	Reduction	Rate	Rate	Reduction	Rate
1946-1947	20%	5%	19%	91%	5%	86.45%
1948-1949	20%	17%	16.6%	91%	9.75%	82.1275%
1950	20%	13%	17.4%	91%	7.3%	84.357%

MTPs, as substantively separate tax rates schedules were introduced (1971 through 1976).

The Revenue Act of 1964, in an effort to stimulate a sagging economy, provided for individual (and corporate) tax rate reductions. The 1964 tax year was the first for which a "minimum" fixed standard deduction amount became available. Those taxpayers at the lowest AGI levels were now provided with what came to be known as a \$200 "low income allowance". This "low income allowance" did not alter the variable nature or fixed ceiling of the standard deduction.

The "low income allowance", disproportionately benefiting low income singles, generated MTPs for first quartile taxpayers during the first four years (1964 through 1967) of this period. All taxpayers felt the impact of MTPs as the progressive nature of the basic tax rate schedules (1965 through 1970) was increased. Fixed tax-based surcharges, applied to progressive tax rate schedules in effect during the 1968 through 1970 tax years (see Exhibits IV and V, point **B**), effectively magnified the progressive character of the tax rates schedules.

Fixed minimum and maximum "allowances" and variable percentages available throughout the range were periodically increased (see Exhibit I) throughout Period III. The 1971 tax year was the first year for which MTPs were independently reflected in the tax rate schedules and resulted in the first purely rate effect-based MTP (see Table I) at a maximum of \$4,800. Separate, independent "allowances" were developed for married and single taxpayers beginning with the 1974 and 1975 tax years.

Prior to the 1971 tax year, few MTPs were generated. During the 1971 through 1976 tax years, increases in the semi-variable "low income allowances" combined with the newly implemented and more significant rate effect-based MTP contributed to the generation of larger MTPs. Maximum MTPs of \$148 (1971), \$274 (1976), and \$271 (1976) occurred for taxpayers at the first quartile, third quartile, and weighted-average AGI levels, respectively. MTBs also increased, approximately doubling during Period III.

# Period IV: Fixed Standard Deduction-Based (1977 Through 1993)

The Tax Reduction and Simplification Act of 1977 attempted tax system simplification, in part, through the establishment of fixed, filing status-based, "zero-bracket" amounts (i.e., standard (exemption) deductions). Standard deduction

TABLE I
The First Rate-Based Marriage Tax Penalty
(1971-1976)

	Taxable 1	Inco	me Above	N	<b>I</b> arginal	Bracket			Cur	nulative
5	Single		Married	SGL	MFJ	Difference	Pε	enalty	P	enalty
\$	-0-	\$	-0-	14%	14%	-0-%	\$	-0-	\$	-0-
\$	500	\$	1,000	15%	15%	-0-%	\$	-0-	\$	-0-
\$	1,000	\$	2,000	16%	16%	-0-%	\$	-0-	\$	-0-
\$	1,500	\$	3,000	17%	17%	-0-%	\$	-0-	\$	-0-
\$	2,000	\$	4,000	19%	19%	-0-%	\$	-0-	\$	-0-
MTP at Taxable Incomes Above \$4,000 (SGL)/\$8,000 (MFJ)										
\$	4,000	\$	8,000	21%	22%	1%	\$	40	\$	40
\$	6,000	\$	12,000	24%	25%	1%	\$	40	\$	80
\$	8,000	\$	16,000	25%	28%	3%	\$	120	\$	200
\$	10,000	\$	20,000	27%	32%	5%	\$	200	\$	400
\$	12,000	\$	24,000	29%	36%	7%	\$	280	\$	680
\$	14,000	\$	28,000	31%	39%	8%	\$	320	\$	1,000
\$	16,000	\$	32,000	34%	42%	8%	\$	320	\$	1,320
\$	18,000	\$	36,000	36%	45%	9%	\$	360	\$	1,680
\$	20,000	\$	40,000	38%	48%	10%	\$	400	\$	2,080
\$	22,000	\$	44,000	40%	50%	10%	\$	800	\$	2,880
\$	26,000	\$	52,000	45%	53%	8%	\$	960	\$	3,840
\$.	32,000	\$	64,000	50%	55%	5%	\$	600	\$	4,440
\$	38,000	\$	76,000	55%	58%	3%	\$	360	\$	4,800
M	MTP Fixed at Taxable Incomes Above \$44,000 (SGL)/\$88,000 (MFJ)									
\$	44,000	\$	88,000	60%	60%	-0-%	\$	-0-	\$	4,800
\$	50,000	\$	100,000	62%	62%	-0-%	\$	-0-	\$	4,800
\$	60,000	\$	120,000	64%	64%	-0-%	\$	-0-	\$	4,800
\$	70,000	\$	140,000	66%	66%	-0-%	\$	-0-	\$	4,800
\$	80,000	\$	160,000	68%	68%	-0-%	\$	-0-	\$	4,800
\$	90,000	\$	180,000	69%	69%	-0-%	\$	-0-	\$	4,800
\$	100,000	\$	200,000	70%	70%	-0-%	\$	-0-	\$	4,800

amounts remained constant with only one change from the 1977 through 1984 tax years, but were independently inflation-indexed (and rounded to \$10 increments) beginning with the 1985 through 1987 tax years. Inflation-indexing of the standard deduction was introduced following double-digit inflation and heightened concerns over "tax bracket creep". Standard deduction bases were revised for the 1988 tax year and independent inflation-indexing (rounded to \$50 increments) continued.

The maximum possible rate effect-based MTP for the 1977 and 1978 tax years increased to \$6,480 and peaked at \$7,790 (see Exhibits IV and V, point C) during the 1979 through 1981 tax years (see Table II).

The Economic Recovery Tax Act of 1981 (ERTA81) reduced top individual rates from 70% to 50% and provided "non-traditional" households with an "adjustment to income" (i.e., "above the line" deduction), intended to partially alleviate this growing potential MTP. The "two-earner deduction" of 10% (5% for 1982) of the lesser of the two spouses' earned income to a maximum of \$30, 000, was available for the 1982 through 1986 tax years and resulted in a maximum deduction of \$3,000 with maximum MTP reductions of \$1,500 (\$750 for 1982) per year. It was repealed with the passage of the Tax Reform Act of 1986 (TRA86), under the expectation that marginal tax rate reductions (i.e., a move toward "flatter" tax rate schedules) would reduce the MTP (see Table II and Exhibits IV and V, point **D**).

TABLE II

The History of the Rate-Based Marriage Tax Penalty
(1971-1993)

Year III. Semi-Varia	MTP	ERTA81 - MTP =		Base Effect =				
				_				
1971-1976	\$4,800	N/A	\$4,800	\$1,400	\$ 6,200			
IV. Fixed Stand	IV. Fixed Standard Deduction-Based (1977 through 1993):							
1977-1978	\$5,640	N/A	\$5,640	\$ 840	\$ 6,480			
1979-1981	\$6,950	N/A	\$6,950	\$ 840	\$ 7,790			
Maximum "Two-Earner Deduction" (1982 through 1986)								
1982	\$4,813	\$ 750	\$ 4,063	\$ 600	\$ 4,663			
1983	\$5,056	\$ 1,500	\$ 3,556	\$ 600	\$ 4,156			
1984	\$5,530	\$ 1,500	\$ 4,030	\$ 600	\$ 4,630			
1985	\$5,754	\$ 1,500	\$ 4,254	\$ 620	\$ 4,874			
1986	\$5,976	\$ 1,500	\$ 4,467	\$ 645	\$ 5,112			
	"Two-Earner Deduction" Eliminated (Post-1986)							
1987	\$2,012	N/A	\$ 2,012	\$ 508	\$ 2,520			
1988	\$1,493	N/A	\$ 1,493	\$ 330	\$ 1,823			
1989	\$1,547	N/A	\$ 1,547	\$ 330	\$ 1,877			
1990	\$1,624	N/A	\$ 1,624	\$ 347	\$ 1,971			
1991	\$1,365	N/A	\$ 1,365	\$ 341	\$ 1,706			
1992	\$1,442	N/A	\$ 1,442	\$ 372	\$ 1,814			
1993 (A)	\$1,485	N/A	\$14,985	\$ 535	\$15,430			

<sup>(</sup>A) The 1993 Tax Act increased the potential MTP for very high income taxpayers. The maximum penalty is reached at a joint income of approximately \$.5 million

NOTE: "'Base' Effects" were calculated by multiplying the "Deduction Penalty" (see Exhibit I) by the "Maximum Rate" (see Exhibit II).

As maximum tax rates remained constant at 50% (1982 through 1986), greater rate effect-based MTPs were built into the annually revised tables, gradually offsetting the tax savings resulting from the "two-earner deduction". Further declines in maximum rates to their pre-1993 Tax Act levels of 31%, and the introduction of inflation-indexing of tax rate/bracket thresholds, have seen modest, constant increases in MTPs coupled with the more significant, constant increases in MTBs for taxpayers at the weighted average AGI level.

For the average taxpayer, MTPs have declined from their Period IV high of \$365 (1981) to their current level of \$180 (1993). MTBs have consistently risen from their beginning of Period IV low of \$702 (1977) to their current Period IV high of \$1,648 (1993).

First quartile taxpayer MTPs have held constant at \$0 (1987 through 1993) and related MTBs have risen gradually to their current level of \$518 (1993). Third quartile taxpayer MTPs have risen gradually, but remain below 1977 through 1986 levels of \$180 (1992 and 1993). Related MTBs have declined and current levels have fallen from a 1987 high of \$2,554 to \$1,618 (1993).

A "phase-out" (beginning with the 1991 tax year) of (1) deductions for exemptions and (2) itemized deductions was established for "high income" taxpayers. However, neither of these changes affect the calculations through third quartile AGI levels.

The Revenue Reconciliation Act of 1993, with its increased marginal rates, significantly increases the maximum potential rate and base effect-based MTPs to \$15,430 (Table II). However, this increased potential MTP does not affect taxpayers at the income levels reviewed here. The Revenue Reconciliation Act of 1993 also increases the MTP for low income taxpayers starting in 1994 with the expansion of the earned income credit (EIC) and its extension to childless people. Childless married taxpayers at the first quartile AGI of approximately \$10,000 will not receive any EIC while two single people with AGI of \$5,000 each (a joint AGI of \$10,000) would each receive a credit of \$306 (or a combined total of \$612).

#### LIMITATIONS

This paper is primarily descriptive and intended to provide a historical insight on a topic that resurfaces during periods of rising (or in anticipation of rising) marginal federal individual income tax rates. As is the case in some of the recent literature [Alm and Whittington, 1993], calculations were based on the assumption that taxpayers did not itemize at any income level. Wages were presumed to be the sole source of income, and first quartile, third quartile, and weighted average AGI levels were developed from data available from SOI publications. Furthermore, though descriptively valid, calculations are not combined with any relative weighting of the MTBs and MTPs experienced for any tax year. Finally, those MTPs/MTBs falling outside of the rate and base categories [Jagolinzer and Strefeler, 1986, and Tilt and Spencer, 1983] have not been isolated or independently addressed.

#### **SUMMARY**

Recent literature has focused on the MTP. References to post-1948 through 1970 marriage tax subsidies are often cited (i.e., Rosen, [1987]), though historical findings (for the first and third quartile taxpayer) presented in this paper would suggest that the "subsidy" period began with the 1917 tax year. The broad-based "potential" for MTBs, throughout the history of the United States individual federal income tax, has consistently far exceeded the "potential" for MTPs, and remains so.

Historically, the MTP has most effectively been mitigated through use of the (purely) variable standard deduction represented during Period II (1944 through 1963). It was also successfully mitigated during Period I (i.e., 1934 through 1943 tax years) when the form of the variable standard deduction was that of a revised "earned income credit". However, neither of these periods had the independently developed tax rate schedules for married and single taxpayers that exist during the current post-1970 period. The variable standard deduction only mitigated the "base" effect and not the "rate" effect-based MTP for nonitemizers.

In order to effectively mitigate the rate effect a different mechanism is needed. A reconstruction of some form of the "two-earner deduction", with some provision or ceiling on applicable earned income levels, appears to possess the greatest historical merit toward mitigating tax "rate" effect-based MTPs. Since the rate effect-based MTP is becoming the dominant factor, this more recent mechanism holds the greatest promise for future mitigation. This is particularly so when one considers the likelihood of further increases in marginal tax rates.

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APPENDIX A

Measures of AGI used for MTP/MTB Calculations/Graphics 1914 through 1989 and 1990 through 1993 (Estimated) (in thousands of dollars)

	Qua	rtile	Weighted		Qı	ıartile	Weighted
Year	First	Third	Mean	Year	First	Third	Mean
1914	\$4.50	\$ 7.5	\$10.826	1954	\$1.75	\$ 5.5	\$ 4.107
1915	\$4.50	\$12.5	\$12.993	1955	\$1.75	\$ 5.5	\$ 4.334
1916	\$4.50	\$12.5	\$14.733	1956	\$1.75	\$ 5.5	\$ 4.612
1917	\$1.50	\$ 4.0	\$ 4.150	1957	\$1.75	\$ 5.5	\$ 4.786
1918	\$1.50	\$ 4.0	\$ 3.840	1958	\$1.75	\$ 6.5	\$ 4.865
1919	\$1.50	\$ 4.0	\$ 3.983	1959	\$2.25	\$ 6.5	\$ 5.189
1920	\$1.50	\$ 4.0	\$ 3.483	1960	\$2.25	\$ 6.5	\$ 5.293
1921	\$1.50	\$ 2.5	\$ 3.134	1961	\$2.25	\$ 6.5	\$ 5.451
1922	\$1.50	\$ 4.0	\$ 3.343	1962	\$2.25	\$ 7.5	\$ 5.653
1923	\$1.50	\$ 4.0	\$ 3.419	1963	\$2.25	\$ 7.5	\$ 5.870
1924	\$1.50	\$ 4.0	\$ 3.677	1964	\$2.50	\$ 8.5	\$ 6.385
1925	\$1.50	\$ 4.0	\$ 5.526	1965	\$2.50	\$ 8.5	\$ 6.699
1926	\$1.50	\$ 4.0	\$ 5.598	1966	\$2.50	\$ 8.5	\$ 6.995
1927	\$1.50	\$ 4.0	\$ 5.813	1967	\$2.50	\$ 9.5	\$ 7.405
1928	\$1.50	\$ 4.0	\$ 6.499	1968	\$2.50	\$12.5	\$ 7.729
1929	\$1.50	\$ 7.5	\$ 6.406	1969	\$2.50	\$12.5	\$ 8.176
1930	\$1.50	\$ 4.0	\$ 5.197	1970	\$3.50	\$11.5	\$ 8.685
1931	\$1.50	\$ 4.0	\$ 4.496	1971	\$3.50	\$12.5	\$ 9.234
1932	\$1.50	\$ 4.0	\$ 3.211	1972	\$3.50	\$12.5	\$ 9.845
1933	\$1.50	\$ 4.0	\$ 3.156	1973	\$3.50	\$13.5	\$10.528
1934	\$1.50	\$ 4.0	\$ 3.351	1974	\$3.50	\$14.5	\$11.192
1935	\$1.50	\$ 4.0	\$ 3.495	1975	\$4.50	\$17.5	\$11.912
1936	\$1.50	\$ 4.0	\$ 3.820	1976	\$4.50	\$17.5	\$12.893
1937	\$1.50	\$ 4.0	\$ 3.590	1977	\$4.50	\$17.5	\$13.892
1938	\$2.50	\$ 2.5	\$ 3.293	1978	\$5.50	\$17.5	\$15.127
1939	\$2.50	\$ 2.5	\$ 3.276	1979	\$5.50	\$22.5	\$16.178
1940	\$1.50	\$ 2.5	\$ 2.603	1980	\$5.50	\$22.5	\$17.628
1941	\$1.50	\$ 2.5	\$ 2.747	1981	\$6.50	\$27.5	\$19.145
1942	\$1.50	\$ 2.5	\$ 2.712	1982	\$6.50	\$27.5	\$20.036
1943	\$1.50	\$ 4.0	\$ 3.056	1983	\$6.50	\$27.5	\$20.806
1944	\$1.25	\$ 3.5	\$ 2.551	1984	\$7.50	\$27.5	\$22.210
1945	\$1.25	\$ 2.8	\$ 2.479	1985	\$7.50	\$35.0	\$23.481
1946	\$1.25	\$ 2.8	\$ 2.622	1986	\$7.50	\$35.0	\$24.838
1947	\$1.25	\$ 3.5	\$ 2.817	1987	\$7.50	\$35.0	\$26.703
1948	\$1.25	\$ 3.5	\$ 3.293	1988	\$8.50	\$35.0	\$28.466
1949	\$1.25	\$ 3.5	\$ 3.254	1989	\$8.50	\$35.0	\$29.656
1950	\$1.63	\$ 4.3	\$ 3.402	1990	\$8.50	\$35.0	\$31.257*
1951	\$1.63	\$ 4.3	\$ 3.676	1991	\$8.50	\$35.0	\$32.570*
1952	\$1.75	\$ 4.8	\$ 3.867	1992	\$9.50	\$35.0	\$33.873*
1953	\$1.75	\$ 5.5	\$ 4.022	1993	\$9.50	\$35.0	\$35.228*

<sup>\*</sup> Weighted means were "projected" using Consumer Price Index estimates for 1990 and 1991 (5.4% and 4.2%, respectively) and 4% for 1992 and 1993 tax years.

#### APPENDIX B

# Summary of MTP/MTB by Category 1914 through 1989 and 1990 through 1993 (estimated)

1st Quartile 3rd Quartile Weighted Averag											
Year	МП		MTB	N/	SIU Q ITP		итв		veignie MTP		verage MTB
								ľ	VIIF		MID
			n-Based (191								
1914-1915	\$	5	\$ 10		20	\$	10		20	\$	10 (a)
1916		10	\$ 20	- 7	40	\$	20		40	\$	20 (a)
1917	\$	0	\$ 10 (b)	\$	0	\$	40	\$	3 (c)	\$	40 (a)
1918	\$	0	\$ 30 (b)	\$	0	\$	60	\$	0	\$	60
1919-1920	\$	0	\$ 20 (b)	\$	0	\$	40	\$	0	\$	40
1921	\$	0	\$ 20 (b)	\$	0	\$	60 (b)	\$	0	\$	60 (a)
1922	\$	0	\$ 20 (b)	\$	0	\$	60	\$	0	\$	60
1923	\$	0	\$ 11 (b)	\$	0	\$	34	\$	0	\$	60
1924	\$	0	\$ 8 (b)	\$	0	\$	23	\$	0	\$	23
1925	\$	0	\$ 0 (b)	\$	0	\$	23	\$	0	\$	23 (a)
1926	\$	0	\$ 0 (b)	\$	0	\$	23	\$	0	\$	24 (a)
1927	\$	0	\$ 0 (b)	\$	0	\$	23	\$	0	\$	26 (a)
1928	\$	0	\$ 0 (b)	\$	0	\$	23	\$	0	\$	34 (a)
1929	\$	9	\$ 9 (b)	\$	0	\$	45	\$	0	\$	33
1930-1931	\$	0	\$ 0 (b)	\$	0	\$	23	\$	0	\$	23 (a)
1932-1933	\$	0	\$ 20 (b)	\$	0	\$	60	\$	0	\$	60
1934-1937	\$	0	\$ 14 (b)	\$	0	\$	60	\$	0	\$	60
1938-1939	\$	0	\$ 50 (b)	\$	0	\$	50 (b)	\$	0	\$	60 (a)
1940	\$	0	\$ 24 (b)	\$	0	\$	53	\$	0	\$	53 (a)
1941	\$	0	\$ 69 (b)	\$	0	\$	75	\$	0	\$	75 (a)
1942	\$	0	\$133	\$	0	•	133	\$	0	\$	139 (a)
1943	\$	0	\$158	\$	0	\$	198	\$	0	\$	187
	0.	,	lb 1 dest	1	(1044	41		<2).			
			l Deduction-I						^	æ	100
1944	\$	0	\$100	\$	0		113	\$	0	\$	100
1945	\$	0	\$100	\$	0	7	100	\$	0	\$	100 95
1946	\$	0	\$ 95	\$	0	\$	95	\$	0	\$	95 96
1947	\$	0	\$ 95	\$	3(c)		105	\$	0	\$	
1948	\$	0	\$ 87 (b)	\$	0	-	115	\$	0	\$	110
1949	\$	0	\$ 87 (b)	\$	0		115	\$	0	\$	109
1950	\$	0	\$104	\$	0		136	\$	0	\$	116
1951	\$	0	\$122	\$	0		147	\$	0	\$	137
1952	\$	0	\$133	\$	0		173	\$	0	\$	154
1953	\$	0	\$133	\$	0		205	\$	0	\$	158
1954	\$	0	\$120	\$	0		181	\$	0	\$	142
1955	\$	0	\$120	\$	0	•	181	\$ \$	0	\$	146
1956	\$	0	\$120	\$	0		181		0	\$	151
1957	\$	0	\$120	\$	0		181	\$	0	\$	154
1958	\$	0	\$120	\$	0		222	\$	0	\$	156
1959	\$	0	\$120	\$	0		222	\$	0	\$	164
1960	\$	0	\$120	\$	0		222	\$	0	\$	170
1961	\$	0	\$120	\$	0		222	\$	0	\$	178
1962	\$	0	\$120	\$	0		264	\$	0	\$	189
1963	\$	0	\$120	\$	0	\$	264	\$	0	\$	199

#### **APPENDIX B (continued)**

	1st (	Quartile	3rd (	Quartile	Weight	ed Average
Year	MTP	MTB	MTP	MTB	MTP	мтв
III. Somi V	omioblo Cto	andard Dedu	ation Dass	J (1064 4b	l- 107()	
1964	\$ 24	\$109		4 (1964 tilira \$ 324	_	¢ 220
		,	,	•	\$ 0	\$ 220
1965		\$103	\$ 0	\$ 307	\$ 0	\$ 227
1966	\$ 22	\$103	\$ 0	\$ 307	\$ 0 \$ 0 \$ 0	\$ 235
1967	\$ 22	\$103	\$ 0	\$ 361	\$ 0	\$ 248
1968	\$ 24	\$111	\$ 59	\$ 636	\$ 0	\$ 285
1969	\$ 24	\$113	\$ 61	\$ 651	\$ 0	\$ 318
1970	\$ 8	\$138	\$ 34	\$ 513	\$ 0	\$ 328
1971	\$148	\$117	\$143	\$ 435	\$171	\$ 306
1972	\$ 98	\$119	\$164	\$ 431	\$213	\$ 333
1973	\$ 98	\$119	\$146	\$ 473	\$194	\$ 364
1974	\$ 98	\$119	\$156	\$ 523	\$175	\$ 398
1975	\$ 95	\$214	\$198	\$ 770	\$261	\$ 443
1976	\$ 54	\$222	\$274	\$ 757	\$271	\$ 449
IV. Fixed S	tandard D	eduction-Bas	sed (1977 t	hrough 199	3):	
1977	\$ 0	\$199 (b)	\$376	\$ 921	\$244	\$ 702
1978	\$ 42	\$322	\$376	\$ 921	\$280	\$ 767
1979	\$ 14	\$318	\$478	\$1,330	\$275	\$ 776
1980	\$ 14	\$318	\$478	\$1,330	\$304	\$ 907
1981	\$154	\$358	\$747	\$1,744	\$365	\$1,009
1982	\$113	\$316	\$471	\$1,589	\$258	\$ 992
1983	\$ 85	\$295	\$292	\$1,419	\$142	\$ 936
1984	\$ 91	\$304	\$253	\$1,325	\$115	\$1,020
1985	\$ 95	\$308	\$443	\$1,804	\$123	\$1,077
1986	\$101	\$311	\$448	\$1,793	\$133	\$1,137
1987	\$ 0	\$387 (b)	\$222	\$2,554	\$222	\$1,226
1988	\$ 0	\$533 (b)	\$150	\$2,179	\$150	\$1,329
1989	\$ 0	\$510 (b)	\$150	\$2,091	\$150	\$1,396
1990	\$ 0	\$480 (b)	\$158	\$1,970	\$158	\$1,483
1991	\$ 0	\$443 (b)	\$165	\$1,851	\$165	\$1,535
1992	\$ 0	\$540 (b)	\$180	\$1,700	\$180	\$1,553
1993	\$ 0	\$540 (b) \$518 (b)	\$180	\$1,700	\$180	\$1,648 (a)
1773	φU	$\phi_{DTO}(\Omega)$	\$100	φ1,010	φιου	$\varphi_{I,UTU}(a)$

- (a) Weighted mean-based AGI exceeds third quartile-based AGI.
- (b) First and third quartile-based AGI years where MFJ calculations resulted in \$0 tax liability. The weighted mean-based AGI calculations yielded tax liabilities for the MFJ status for all tax years.
- (c) Penalty attributable to "rate" effect (i.e., MTP results from MFJ amount above first bracket and SGL amount below first bracket thresholds).

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# THE DEVELOPMENT OF ACCOUNTING AND INTERNAL CONTROL FOR THE NATIONAL LAND SYSTEM OF THE USA

Abstract: This paper examines the early accounting practices that were used to administer the United States' national land system. These practices are of significance because they provide insights on early governmental accounting and they facilitated an orderly settlement of the western territories.

The analysis focuses on the record-keeping and control practices that were developed to meet the provisions of the Land Act of 1800 and to account for land office transactions. These accounting procedures were extracted from the correspondence between the Department of the Treasury and the various land officers.

With the signing of the Treaty of Paris in 1783, the United States acquired a vast domain. In order to manage this new territory, it was necessary for the new government to create an administrative system which would allow for a distribution of the land as well as a record-keeping system that would monitor and control this system.

This administrative mechanism had to serve three basic needs: 1) to provide a major source of revenue to help pay off the staggering national debt, 2) to provide for an orderly settlement of the west, and 3) to facilitate the distribution of land to veterans who had been promised it for their services in the Revolutionary War [Hibbard, 1965, p. 32-35].

Unfortunately, the development of an effective land policy to reach these goals was slow in coming. Over the course of the next thirteen years, two acts were passed by Congress to regulate the sale of the public domain (The Land Ordinance of 1785¹ and the Land Act of 1796²). However, the provisions of these

<sup>&</sup>lt;sup>1</sup>The statutory title of this ordinance was An Ordinance for Ascertaining the Mode of Distribution of Lands in the Western Territory [Journals of the Continental Congress, Vol. XXVIII, pp. 375-381, (May 20, 1785)]. Reprinted in Treat [1910, Appendix II, pp. 395-400].

<sup>&</sup>lt;sup>2</sup>The statutory title of this act was An Act providing for the Sale of the Lands of the United States, in the territory northwest of the river Ohio, and above

acts did not satisfy either the public or the Congress, and few lands were sold under them (see Table 1). Criticism of the government's land statutes typically focused on issues such as minimum lot size, price per acre, credit terms, and the manner in which the land would be surveyed [Rohrbough, 1968, p. 22]. The greatest benefit derived from this period of public land sales may be that it provided trial and error experience for future public land policy.<sup>3</sup>

TABLE 1
Public Land Sales
1785-1799

	Acres Sold	Revenues
Ordinance of 1785 <sup>a</sup>	108,431	\$205,872
Land Act of 1796	48,566	\$105,040
Total	156,997	\$310,912

Source: U.S. Congress American State Papers — Public Lands, Vol. 3, Schedule in relation to the sales of public lands before the Land Offices were opened, Nov. 8, 1820, p. 406. Application for the Remission of a Forfeiture, Jan. 28, 1823, p. 535.

By 1800, Congress was ready to write a refined act based upon these experiences. On May 10, 1800, Congress passed An Act to amend the act entitled An Act providing for the sale of the lands of the United States, in the territory northwest of the Ohio, and above the mouth of the Kentucky river [2 Stat., Ch. LV, pp. 73-78, (May 10, 1800)], hereafter referred to as "the Land Act of 1800." This Act would govern land sales for the next two decades, a period in which sales of the public domain would ex-

<sup>&</sup>lt;sup>a</sup> These sales under the Ordinance of 1785 included the sale of 35,457 acres at a price of \$88,764, which was later forfeited to the United States for failure of payment.

the mouth of the Kentucky river [1 Stat., Ch. XXIX, pp. 464-469, (May 18, 1796].

<sup>&</sup>lt;sup>3</sup> In addition to the provisions for these two prior land laws, there were other factors that hampered public land sales during the period. These factors included Indian unrest, a shortage of surveyors, and "squatters" that settled on the land in defiance of the law [Hibbard, 1965, pp. 41-42].

<sup>&</sup>lt;sup>4</sup>This act was amended on April 24, 1820, when Congress passed An Act making further provisions for the sale of the public lands [3 Stat., Ch. LI, pp. 566-567, (April 24, 1820)].

pand and reach fulfillment [Rohrbough, 1968, Ch. 6]. Within the provisions of this new act were the accounting practices that would guide its administrative procedures and monitor its success.

This paper deals with these accounting practices that governed early land sales. The next section provides an outline of the provisions of the Land Act of 1800. Those provisions that relate to accounting and control are emphasized. This is followed by a description of the record-keeping procedures that were developed by the Treasury Department in order to provide control over the monies received and the various land documents issued. The paper then examines some of the problems that were encountered by the land officers in carrying out their instructions during early land office transactions. The paper concludes with a summary section.

#### THE LAND ACT OF 18005

For disposal of the public lands in the Northwest Territory, the Land Act of 1800 established four land districts, each with an office, located in Cincinnati, Chillicothe, Marietta, and Steubenville, Ohio. For each of these land offices, the President of the United States was to appoint two officers: a "Register of the Land Office," who would direct the office, and a "Receiver of Public Monies." These two officers were in charge of the record-keeping procedures at their respective land offices, and their duties are discussed in the following sections.

Tracts of land were to be offered for sale in the four towns in either sections (640 acres) or half sections (320 acres). Prior to sale, the land was to be surveyed "by running parallel lines ... from east to west, and from north to south, at the distance of one mile from each other, and marking corners, at the distance of each half mile ... " (e.g., 1 square mile = 640 acres). The Surveyor General was to submit plats of the surveyed districts to the registers of the local land offices, and also forward a copy of these plats to the Secretary of Treasury. The land was to be sold at public auction on the dates prescribed by the Act, and sales were to remain open for three weeks. However, "All lands, remaining unsold, at the closing of either of the public sales,

<sup>&</sup>lt;sup>5</sup>The provisions of this act that are outlined in the sections below are contained in the body of the Act of 1800. Thus, additional citations or references to the act are omitted unless direct quotes from the Act are used.

may be disposed of at private sale by the registers of those respective land offices" [2 Stat., Ch. LV, Sec. 4, p. 74].

## Terms of Payment

The minimum price for which lands could be sold under the Act was two dollars an acre, and payments could be made either in specie form or in evidence of the public debt of the United States. On the date of sale, the purchaser was required to make a deposit of one-twentieth of the purchase price and pay a surveying fee of six (three) dollars for a section (half-section). Credit terms were as follows:

One fourth of part of the purchase money shall be paid within forty days after the sale as aforesaid; another fourth part shall be paid within two years; another fourth part within three years; and another fourth part within four years after the date of sale [2 Stat., Ch. LV, Sec. 5.2, p. 74].

According to Section 5.3 of the Act, interest at six percent would be charged on each of the last three payments, payable as they become due. In addition, a discount of eight percent would be allowed on any of the last three payments, "which shall be paid before the same shall become due, reckoning this discount always upon the sum, which would have been demandable by the United States, on the day appointed for such payment."

However, if the purchaser failed to make his first payment of one-fourth within the forty-day payment period, then his deposit of one-twentieth and his surveying fees were forfeited to the government, and the land would be resold at private sale.<sup>6</sup>

## Duties of the Receiver of Monies

The receiver of the land office was responsible for issuing receipts for all deposits, fees, and payments received by him. He was also required:

<sup>&</sup>lt;sup>6</sup>If the purchaser did not pay the entire sum within one year of the last scheduled payment date, then the land would revert back to the government and be sold at public vendue "for a price not less than the whole arrears due thereon." Any surplus of the sum bidden over the amount of the arrears (including interest) would be returned to the original buyer [2 Stat., Ch. LV, Sec. 5.5, p. 75].

... to transmit within thirty days in case of public sale, and quarterly, in case of private sale, an account of all the public monies by them received, specifying the amount received from each person, and distinguishing the sums received for surveying expenses, and those received for purchase money, to the Secretary of the Treasury [Sec. 6, p. 75].

The receiver was also required to transmit this money to the Treasury every three months. However, transferring this money to the nearest bank posed for the receiver several difficulties which are explored later in this paper.

The sixth section of the Act also specified that the receiver was entitled to one percent of all monies received "as compensation for clerk hire, receiving, safekeeping, and transmitting to the Treasury of the United States."

## Duties of the Register

The duties of the register began when a purchaser of land presented him with a receipt of purchase issued by the receiver. He would then fill out an entry of application for the purchase of a tract of land in:

... books kept for that purpose only ... stating carefully ... the date of the application, the date of the receipt to him produced, the amount of monies specified in the said receipt, [and] the number of the section or half section, township, and range applied for [Sec. 7, p. 76].

The receipt would be filed by the register, and the buyer would receive a copy of the entry of application. If, within three months, the purchaser produced a receipt for one-fourth of the purchase price, the register was to file the receipt and make a note:

... in the said book of entries .. opposite to the original entry, and give to the party a certificate, describing the land sold, the sum paid on account, the balance remaining due [and] the time and times when such balance becomes due [p. 76].

When the purchaser produced a receipt for the second installment payment, the Act directed the register to open an account

<sup>&</sup>lt;sup>7</sup>For the "faithful discharge of his trust," the receiver was also obligated to submit a bond of \$10,000 before he entered office [2 Stat., Ch. LV, Sec. 6, p. 75].

in the name of the purchaser for each section or half section purchased. This account was to be recorded:

... in a book kept for that purpose ... and in which he shall charge the party for the whole purchase money, and give him credit for all his payments; making the proper charges and allowances for interest or discount, as the case may be.8

All subsequent payments were to be entered in this book, and when the last payment has been received and the account settled:

...he shall give a certificate of the same to the party; and producing to the Secretary, the same final certificate, the President of the United States is hereby authorized to grant a patent for the lands to the said purchaser, his heirs or assigns [p. 76].

However, if the Register is not tendered the receipt for the first payment of one-fourth, he was directed to:

... enter under its proper date, in the said book of entries, that the payment has not been made, and that the land has reverted to the United States, and he shall make a note of the same in the margin of the book opposite to the original entry [p. 76].

Under the eighth section of the Act, the register was to note on the general plat:

... every tract which may be sold, by inserting the letter A on the day when the same is applied for, and the letter P on the day when a receipt for one-fourth part of the purchase money is produced to them [Sec. 8, p. 76].

If the land should ever revert back to the United States due to a failure of payment, the letter *A* was to be crossed out, signifying that the tract may be purchased again.

According to section nine, the register was to transmit quarterly to the Secretary of the Treasury and the Surveyor General an account of: (1) all tracts applied for, (2) all tracts of which

<sup>&</sup>lt;sup>8</sup>For the second and third payments of one fourth (see *Terms of Payment*), the register was also required to issue a receipt to the purchaser. This receipt provided documentation that the purchaser had presented his receipt issued by the receiver to the register, and the register had duly filed it [2 Stat., Ch. LV, Sec. 7, p. 76].

one-fourth of the purchase money has been received, and (3) all tracts which have reverted to the United States. The Secretary of the Treasury was also to receive quarterly:

... an account of all the payments by them entered, according to the receipts produced to them, specifying the sums of money, the names of the persons paying the same, the names of the officers who have received the same, and the tracts for which the same have been paid [Sec. 9, p. 77].

As compensation for their duties, the registers were entitled to receive from the Treasury of the United States, "one half percent on all the monies expressed in the receipts by them filed and entered."9

#### Analysis of the Land Act

Most of the provisions in the Land Act of 1800 were a culmination of earlier legislation and debates [Treat, 1910, pp. 94-98]. Multiple land offices, different size tracts, and credit terms were all by then established features of the land system. The new act modified these particulars to help facilitate sales to the western settlers.

The distinguishing feature of the new land system was the addition of the register and the resulting implications for record-keeping procedures. The Land Act of 1796 did not provide for a register, so the Receiver of Monies had assumed the responsibilities of record-keeping and the collection of payments. The new Act separated these duties to provide an internal check for errors as well as serving as a deterrent to fraud. Both the receiver's record of "public monies received" and the

<sup>&</sup>lt;sup>9</sup>In addition, the registers were entitled to receive fees from the purchasers for "services rendered." These fees included the following: (1) for every original application of land, three (two) dollars for a section (half-section), (2) for every certificate issued upon the receipt of the first (last) installment payment of one fourth, twenty-five cents (one dollar), and (3) twenty-five cents for providing a receipt for the second and third installment payments [2 Stat., Ch. LV, Sec. 12, p. 77].

<sup>&</sup>lt;sup>10</sup>The Land Act of 1796 provided for a "... person, to be appointed to receive the money on sales in the western territory," but did not specify that the receiver handle record-keeping responsibilities [1 Stat., Ch. XXIX, Sec. 12, p. 468]. These responsibilities were later assigned to the receiver by the Secretary of the Treasury [Wolcott, Oct. 5, 1796].

register's account of "payments entered" were subject to the scrutiny of the Department of the Treasury.

In addition, the Act went much further in establishing the records to be kept by the land officers. Based on the provisions of the Act, the register was to keep two books. The first book, or the "book of entries," was to contain the details of the purchase (the entry of application), and provide a record of the receipt of the deposit of one-twentieth and the first installment payment of one-fourth of the purchase price. Upon the receipt of the second installment payment, the register was to transfer the purchase price of the tract of land and the payment history related to that tract into an account in the name of the purchaser in a second book. All subsequent payment would then be entered in this second book.

The duties of the receiver would prove to be exacting chores [Rohrbough, 1968, p. 31]. Under the terms of the Act, a purchaser could receive a discount on one installment payment and be required to pay interest on the next. Purchasers of public lands were also allowed to make payments using "evidence of the public debt of the United States" (see *Terms of Payment*), in lieu of cash. The procedures to be followed for these noncash transactions caused problems for the receivers, as did the calculation of discounts. Both of these problems are investigated later in this paper.

While the Act provided an outline of the records to be kept and the documents to be issued, it was up to the Secretary of the Treasury, Oliver Wolcott, to fill in the details and implement a record-keeping system for the disposal of the public lands. <sup>12</sup> The Secretary's record keeping system is outlined in the next section.

#### WOLCOTT'S RECORD-KEEPING SYSTEM

For purposes of implementing the record-keeping procedures required under the Act, a more qualified man could not

<sup>&</sup>lt;sup>11</sup>The deposit of one-twentieth was to be deducted from the first installment payment, so the first payment was actually for less than one-fourth [2 Stat., Ch. LV, Sec. 5.1, p. 74].

<sup>&</sup>lt;sup>12</sup>According to section eleven of the Act, "... the Secretary of the Treasury shall... prescribe such further regulations, in the manner of keeping books and accounts, by the several officers... in order [to] fully carry into effect the provisions of this act" [2 Stat., Ch. LV, Sec. 11, p. 77].

have been found than Oliver Wolcott.<sup>13</sup> Wolcott had a distinguished background in federal administration, having previously served as Auditor of the Treasury Department and Comptroller of Public Accounts [White, 1948, p. 124]. Prior to joining the federal government, Wolcott worked in the office of the Pay-Table and served as Comptroller of Public Accounts in his native state of Connecticut [Gibbs, 1846, pp. 15-17]. He was appointed to the Secretary's position in 1795 upon the resignation of Alexander Hamilton.

Wolcott began his work by sending his newly appointed registers and receivers instructions and forms to be used in the land office business [Wolcott, Sept. 26a, 1800 and Sept. 26b, 1800]. The purpose of these forms was to assist the officers in maintaining their books, preparing statements for the Treasury, and in issuing certificates. The content of these forms are outlined below.<sup>14</sup>

#### Instructions to Registers

There were ten forms to be used by the registers for issuing certificates and preparing records. Form I contained instructions to be used in filling out the book of applications (the book of entries) referred to in the Land Act. According to Wolcott [Sept. 26a, 1800], notes of all "transactions connected with the acquisition of a complete title" were to be recorded in the margins of this book. Form II was to be used in filling out a certificate to be issued to the purchaser upon receiving evidence of the first installment payment of one-fourth of the purchase price. When receipts for the second and third installment pay-

<sup>&</sup>lt;sup>13</sup> Wolcott's father, General Oliver Wolcott, was also a public servant, and had a distinguished military career. The senior Wolcott led several campaigns in the Revolutionary War, and was elected to the Congress of 1776. It was in this capacity that he earned his lasting place in history as a signer of the Declaration of Independence. He served in Congress until the end of the war, and in 1796 was elected governor of his home state of Connecticut. He died one year later in December 1797 [Gibbs, 1846, pp. 11-12].

<sup>&</sup>lt;sup>14</sup>The actual forms drawn up by Wolcott and sent to the land officers are not among the records on file at the National Archives. The content of these forms as described in this manuscript are based on the instructions from Wolcott contained in his letters.

<sup>&</sup>lt;sup>15</sup>Wolcott's instructions regarding the book of entries appear to go farther than required under the Act. Based on the author's interpretation of the Act, the only payments to be recorded in the book of entries were the deposit of one-twentieth and the first installment payment of one-fourth.

ments were tendered to the register, he was to issue an "endorsement" to the purchaser according to *Form III*. <sup>16</sup> *Form IV* was to be used in issuing the final certificate upon receipt of the last installment payment of one-fourth. According to Wolcott [Sept. 26a, 1800], "These Certificates are to be numbered progressively, beginning at 1 and preceding in regular succession." As an additional precaution, Wolcott ordered his registers to issue this final certificate "... only upon the surrender of the Certificate before described No II duly endorsed."

Form V "is the form of a Register to be kept of all certificates which may be issued according to the forms II and IV" [Wolcott, Sept. 26a, 1800]. Those certificates issued according to Form II were to be recorded in columns one through 17 of the register, and those certificates issued according to Form IV were to be recorded in columns 18 through 21. Note that this register was not referenced in the Land Act of 1800, but was prescribed by Wolcott to maintain control over the certificates.

According to Wolcott [Sept. 26a, 1800]:

No. VI and VII are forms of a journal and ledger containing examples of the entries to be made in congruence of the different transactions expected to occur in your office — the principles upon which the books are to be kept are explained in the paper marked VIII.

The instructions of Wolcott cited above do not provide guidance on the details of this journal and ledger. However, section 7 of the Land Act provided for two different books: (1) the indentured book of applications, which was used to record the deposit of one-twentieth and the first installment payment of one fourth, and (2) a book to record the second payment of one-fourth and all subsequent transactions. It is the author's contention that Forms VI and VII relate to this second book prescribed by the Act. Upon the receipt of the second installment, an account was to be opened for the purchaser in this book, possibly by debiting the account for the purchase price of the tract and interest accrued on the outstanding balance, and crediting the account for all payments received and discounts taken (see Duties of the Register).

Forms IX and X were to be used by the registers to prepare their quarterly statements for the Department of the Treasury,

<sup>&</sup>lt;sup>16</sup>This "endorsement" given to the purchaser is in all likelihood the receipt provided by the register that is discussed in footnote 8.

which were required under the ninth section of the Act. Form number IX was an account containing "all lands applied for," and number X was to be used in preparing an account of all "monies entered" [Wolcott, Sept. 26a, 1800]. This account of monies entered could then be reconciled by the Treasury Department with the statements prepared by the receivers, which are discussed next.

#### Instructions to Receivers

To distinguish the forms to be used by the receivers from those used by the registers, Wolcott marked the receivers' forms in alphabetical order from A to G. According to Wolcott [Sept. 26b, 1800], "The papers marked A & B contain specifications of entries to be made in a Journal and Ledger in which all receipts and payments must be recorded." The principles upon which the Journal and Ledger were to be kept were contained in *Form C*. This Journal and Ledger would serve as the linchpin of the record-keeping system for the receivers, and was used to prepare the quarterly statements for the Treasury. The form of the receipts issued to the land purchasers was contained in the paper marked D.

Those purchasers who wished to submit certificates of indebtedness (stock) in lieu of specie for their payments were to be issued a certificate (as well as receipts) according to Form E. However, the receiver was not supposed to accept these stock certificates. This stock had been created pursuant to An Act making provision for the [payment of the] debt of the United States [1 Stat., Ch. XXXIV, pp. 138-144, (Aug. 4, 1790)]. Under section seven of this Act, this stock:

... shall be transferable only on the books of the treasury, or of the said commissioners respectively, upon which the credit for the same shall exist at the time of transfer, by the proprietors of such stock [Sec. 7, pp. 140-141].

The purchaser was to deliver certificate *E* to the Treasury or the Commissioner of Loans who would make the transfer and necessary entries on its books.

According to Wolcott [Sept. 26b, 1800], "The paper marked F is the form of an account of monies received, which is to be dated and rendered at the end of each calendar month to the Secretary of the Treasury." A duplicate of this account was to be

remitted to the register of the land office. This duplicate account may have been used by the register to insure that the receipts presented to them were authentic, and that the payment had been made. The last form, (G), was to be used by the receiver to prepare a record of all receipts and repayments.<sup>17</sup>

In addition to the account of monies received, Wolcott directed his receivers to submit seven statements to the Treasury at the end of each quarter. Statement one was an Account of Deposits including surveying expenses. This statement was to be extracted from the Journal and Ledger "showing the particulars of all the debit and credit entries and the balance of the account" [Wolcott, Sept. 26b, 1800]. The second statement, Sales of Public Lands, included the tracts of land purchased and the sum paid on them. The third and fourth statements, Accounts of all Forfeitures and Account of Interest, were to be "exact extracts from the accounts in your books."

A Cash and Stock Account was to be prepared "distinguishing receipts in money from transfers in stock and exhibiting in distinct columns, the amount of each stock and its value in money" [Wolcott, Sept. 26b, 1800]. Finally, an Account of Discounts was to be submitted along with the receiver's Commission Account.

## Notes on the Record-Keeping System

Unlike the office of the register, the text of the Land Act of 1800 did not provide a reference for specific accounting books to be kept by the receiver (see *Duties of the Receiver of Monies*). Rather, the Act called for statements of accounts that were to be transmitted to the Department of the Treasury on a monthly (or quarterly) basis. Thus, Wolcott designed a record keeping system that facilitated the preparation of these statements.

As outlined above, the statements submitted by the receivers were detailed and numerous. While these statements were necessary to provide the Treasury Department with current revenue projections, they also provided checks over the two land officers and land claims. Note that the register was required to submit an account of "all lands applied for," while the receiver had to prepare a statement listing all tracts purchased (i.e., Sales of Public Lands].

<sup>&</sup>lt;sup>17</sup>The nature of these repayments are discussed later in this manuscript under *The Receiver's Account of the United States*.

Wolcott's record-keeping procedures would soon be tested, as the first public sales of land were scarcely six months away. Believe, circumstances would soon prevent him from supervising his system. Wolcott resigned from the Treasurer's position upon Thomas Jefferson's victory over John Adams in the Presidential election of November, 1800 [White, 1948, p. 125]. While Wolcott's responsibilities for directing land office affairs were completed, his record-keeping system would survive to be a lasting contribution to the administration of the national land system. The balance of this study will explore some of the problems encountered in the operation of this system in its initial stages.

### ADMINISTRATION UNDER ALBERT GALLATIN

On March 4, 1801, the new administration assumed direction of the nation's affairs [Rohrbough, 1968, p. 26]. To serve in his cabinet as Secretary of Treasury, Jefferson appointed Albert Gallatin of Pennsylvania on May 14, 1801.<sup>19</sup> Gallatin, formerly the leader of the opposition of the house, had emerged as an authority on public land policy and displayed a keen interest on its issues. As an astute financier, he clearly foresaw the potential of sales of the public domain as a means to reduce the federal debt [Balinky, 1958, p. 126]. However, in pursuing this objective, Gallatin could not have anticipated the administrative duties which lav ahead. In his first year in office, the Secretary would spend a substantial portion of his time conducting land office affairs. He found himself constantly interpreting the provisions of the Act of 1800 and clarifying Wolcott's record-keeping system for his land officers. This first year of public land sales would, in fact, serve as a trial-and-error period for the national land system.

## First Sale of Public Lands of Chillicothe

As directed by the Act of 1800, the first public auction in Chillicothe commenced on the first Monday of May, 1801, although it was under very interesting circumstances. The register

<sup>&</sup>lt;sup>18</sup> Under section four of the Act, the first public sales of land were to be held in Cincinnati on the first Monday in April, 1801, and in Chillicothe on the first Monday in May, 1801 [2 Stat., Ch. LV, Sec. 4, p. 74].

<sup>&</sup>lt;sup>19</sup>During the interim, Jefferson had appointed Samuel Dexter as the acting head of the Treasury [Balinky, 1958, p. 15].

of the land office, Thomas Worthington, had failed to receive his proper books and certificates to be used in the land office business [Worthington, May 11, 1801]. In addition, neither the Governor nor the Secretary of the Western Territory had arrived. Under the Act of 1800, at least one of these officials was to attend as Superintendent of the sales.

While the register clearly did not want to proceed with the sales, the large crowd which had been gathering for several days may have influenced his decision. Worthington [May 11, 1801] wrote:

In this case I felt much undetermined as to my duty, not less than two hundred people were in town from different parts of the country waiting for the commencement of the sale ... the Surveyor General being here, I called on him for his opinion and on three Gentlemen of the Bar all of whom agreed it was my duty to commence the sale.

So reluctantly following this advice, the register signaled the crier to announce the location of the first tract to be offered for sale [Rohrbough, 1968, p. 43]. Lacking record books and certificates, Worthington followed the directions issued to him by the former Secretary to record the purchases of land. According to Worthington [May 11, 1801], "In conformity to my instructions from Mr. Wolcott I prepared a book for entries and have regularly had the Application entered and signed by the purchasers."

Despite the chaotic beginning, the land sales at Chillicothe were a great success. The office sold 99,058 acres of land for \$229,918 in the three weeks of public sale. In the next five months, Worthington sold an additional 64,205 acres for \$128,410 at private sale [Reports of the Secretary of the Treasury of the United States, Vol. 1, Report on the Finances for 1801, Schedule O, p. 246]. These figures were a sharp contrast to the sales under the Land Act of 1796, and were a welcome addition to the government's income [Rohrbough, 1968, p. 44].

# Controversy Over the Book of Entries and Register's Fees

During these initial land sales at Chillicothe, a dispute arose between Worthington and Governor St. Clair (who arrived three days late) over the record-keeping procedures of the register. This controversy was related to a point of law embodied in the Act of 1800. According to the twelfth section of the Act:

They [the registers] shall be further entitled to receive ... the following fees for services rendered ... for every original application of land, and a copy of the same, for a section three dollars, for a half section two dollars [2 Stat, Ch. LV, Sec. 12, p. 77].

The Governor maintained that purchasers at public sales were not required to pay this application fee since their "original application" was by becoming the highest bidder; that is, giving a receipt to the register cannot be considered as "applying for the purchase" [Gallatin, June 10a, 1801]. Based on his own interpretation of the law, St. Clair also thought it unnecessary to make an entry of application for sales at public auction in the book of entries [Worthington, May 11, 1801, and July 2, 1801]. The real issue at hand was whether the record-keeping procedures to follow at a public sale were the same as those of a private sale. From Worthington's point of view, this issue had already been settled. In response to one of the register's prior letters, 20 the former Secretary, Oliver Wolcott [Nov. 21, 1800], had remarked:

You are right in your ideas that lands sold at public sales are to be entered in the same manner as those privately applied for — after they are struck off to the highest bidder, the mode of proceeding is to be precisely the same.

Following these directions, Worthington had charged all purchasers at the public sale an application fee and filled out an entry of application in the book of entries.

St. Clair pointed out that Oliver Wolcott was no longer the Secretary of the Treasury. For guidance on the matter both Worthington and the Governor sought the advice of the new Secretary, Albert Gallatin. For months, the Secretary side-stepped the issue without rendering an opinion. Gallatin [July, 16, 1801] finally concluded, "I think this is one of those cases, where I should resort to the opinion of the Attorney General; it would have been done at once, had he not been absent." During this time, a suit was brought against Worthington in the Court of the Common Pleas in Fairfield County for the return of those fees previously charged. The outcome of this suit is described by Worthington [July 28, 1801]:

<sup>&</sup>lt;sup>20</sup>This letter from Worthington to Wolcott was not found, but is referenced in Wolcott [Nov. 21, 1800] and Worthington [May 11, 1801].

After a fair investigation of the subject by arguments for and against the Question it was given unanimously in my favour [sic], not withstanding 3 out of 4 of the judges were Interested in the question having purchased a considerable quantity of Lands at the sales.

However, this ruling was not the end of the matter. A few days after this proceeding, the Attorney General, Levi Lincoln, rendered his opinion [July 29, 1801]:

I see no necessity from the law making the entry of a public sale on the book of entries, in the same manner as in the case of an application for a purchase at private sales ... It is more clear, that the purchasers at public sales are not obliged to make application at the Land office, ... or to pay any fee therefor.

Now that the Attorney General had issued his opinion, the Secretary took a stand on the issue. Gallatin [Aug. 15a, 1801] advised Worthington:

By last mail I sent you the opinion of the Attorney General on the quantum of fees, for the land sold at public sale — it does not accord precisely with mine — it is perhaps superfluous to add, that it is only an opinion, and, that, in that case, it is not to be considered as binding, but merely as advice.

Gallatin further noted that "a decision by the court . . . would be preferable as it would settle the matter." This issue was now in fact before the General Court of the Territory. In October, 1801, the General Court ruled in Worthington's favor, settling the issue and making it law [Worthington, Oct. 29, 1801]. While the Governor expressed intentions of appealing the decision to the Federal District Court of the Territory, there is no evidence that he ever did so.<sup>21</sup>

<sup>&</sup>lt;sup>21</sup>This dispute brought about by St. Clair was not untypical of the Governor's character; he often attempted to rewrite laws he did not agree with, and he was constantly using his veto power over the territorial legislature [Goforth, Jan. 15, 1802 and Symmes, Jan. 23, 1802]. In addition, the Governor was the chief obstacle to the legislature's bid for statehood, and his political appointments were often despised by the western inhabitants [Sears, 1958, pp. 54-55]. As a result, St. Clair was not a popular man in the western territory, and this dispute over land office affairs only hastened his downfall. Shortly after St. Clair raised this controversy over the book of entries, his enemies drafted up a memorandum to effect his ouster [Worthington, Jan. 30, 1802]. The memorandum contained ten charges against the Governor, and was personally delivered

### Gallatin's Instructions for Payments and Receipts

The text of the Act of 1800 was the origin of another problem that affected the record-keeping procedures of the land officers. Recall that under the fifth section of the Act, the first installment of one-fourth of the purchase was to be paid to the receiver within 40 days (see Terms of Payment); and according to the seventh section the receipt for this payment was to be delivered to the register within three months (see Duties of the Register). Apparently, a number of purchasers had paid their first installment of one-fourth to the receiver, but had neglected to remit their receipt to the register within three months [Gallatin, Aug. 5a, 1801]. Following a rigorous construction of the law, this could cause a reversion of the lands to the United States, According to Gallatin [Aug. 15a, 1801], a forfeiture under these circumstances was "contrary to the intent and spirit of the law." In order to prevent this reversion from happening. Gallatin ordered his receivers to issue duplicate receipts for all payments received. In cases where the purchaser failed to convev his receipt to the register within three months, the register was to:

... consider the Receiver ... as an Agent for the parties, and to act upon such duplicate receipts, precisely as if the original had been produced to you within the limited time, by the purchasers [Gallatin, April 5, 1802].

In those cases when the receiver acted as the agent for the purchaser, the duplicate receipt was to be transmitted to the Treasury and the certificate of payment was to be prepared. When the purchaser finally produced his receipt, he would receive his certificate.

## Mode Used in Calculating Discounts

Prior to the first sales of the public lands, the Secretary of the Treasury realized the potential problems that his land officers might have in calculating the discount of eight percent allowed on payments received before their due date. Under the advice of the President, he consulted the Attorney General for

to Congress by Thomas Worthington [Smith, ed., v. 1, p. 240]. After an investigation of the Governor's affairs, St. Clair was notified by the Secretary of State, James Madison [Nov. 22, 1802], that his commission as Governor of the Northwestern Territory had ended.

his opinion on the matter [Dexter, March 12, 1801]. The Attorney General responded:

I... am clearly of the opinion that in case any payment shall be made before the same shall become due, the mode of Casting the 8 per cent discount provided by the act, is to add the interest of the 6 percent from the day of sale to the time appointed for the payment & then from the aggregate sum deduct at the rate of 8 per cent per annum making in reality a discount of about 2 percent on the principle [Lincoln, March 10, 1801].

After receiving these instructions, the Secretary transmitted a copy of them to his land officers. In spite of these detailed instructions, problems in computing discounts still existed.

In June of 1801, David Hoge, the register at Steubenville, got into a dispute with an astute purchaser, Charles Long, over the correct mode to be pursued in calculating discounts [Gallatin, Aug. 17, 1801]. Hoge had determined the discount on Long's payment by multiplying the discount rate of 8 percent by the principal sum due. According to Long this was incorrect; and when Hoge refused to issue him his final certificate because of it, he presented the case to Albert Gallatin. After examining Hoge's calculations, the Secretary quickly concluded that Long was correct. Gallatin [Aug. 17, 1801] wrote to Hoge:

The mode of calculation which it is understood you have adopted, though it is strictly conformable to the Arithmetical rule of discount, differs from the mode pursued by the Banks ... it is explained at large in the forms originally sent you.

Gallatin further instructed the register that the correct method to be used in the future for calculating discounts was to multiply the rate of discount by the gross amount due (i. e. principle plus interest). "Calculating in this way the payments of Mr. Long will be found sufficient to pay in full for the Section which he has purchased," Gallatin added, and Hoge was ordered to issue Long his final certificate.

## Transfers of Stock

Many purchasers of lands presented stock (debt) of the United States as an alternative form of payment. This stock was interest bearing and typically circulated below par. There were several types of stock, and the rates at which they could be

transferred for payment was governed by An Act to authorize the receipt of evidences of the Public Debt, in payment for the Lands of the United States [1 Stat., Ch. XIV, p. 507, (March 3, 1797)]. Under this act, stock which had a stated interest of 6 percent would be received at its par value. All other species of stock would be received at its market value at the time of payment. As mentioned previously, all transfers of stock were to be made at the Treasury Department or by the Commissioner of Loans. These instructions, however, apparently were not clear to all.

In June, 1801, Zaccheus Biggs, the receiver in Steubenville, accepted two six percent certificates of stock, one for \$503.35 and another for \$1,546.22 in full payment of a tract of land. When Gallatin learned of this, he ordered Biggs to transmit these stock certificates to his office, so the necessary entries could be made on the books of the Treasury [Gallatin, June 11, 1801].

To prevent against similar occurrences in the future, Gallatin issued a circular to all receivers which contained detailed instructions to be followed when purchasers wished to tender stock for payments.<sup>22</sup> In these cases, Gallatin [June 27, 1801] ordered his receivers to inform the purchaser that:

... public stock is by the laws of the United States, transferrable and therefore payable only at the Treasury of the United States or at one of the loan offices.

The receivers were then directed to:

... grant him a certificate similar in substance to the enclosed form H, and stating the value of the stock which if paid on the ensuing quarter day would discharge all or any of the said installments.

The *purchaser* was then to deliver certificate H to the Department of the Treasury or the Commissioner of Loans, who would make the transfer on the books of the Treasury. The Treasurer or loan officer would then issue a certificate (marked *A*) to the purchaser, which was to be delivered to the receiver. Certificate A would serve as evidence of the transfer of stock, and upon its receipt, the receiver would issue the purchaser a receipt for his payment. The receiver was then instructed to endorse and can-

<sup>&</sup>lt;sup>22</sup>The principles outlined in these instructions are consistent with those provided by Wolcott [Sept. 26b, 1800], but contain some slight modifications concerning the letter of the certificate granted by the receiver.

cel certificate A "by cutting a hole through the name of the Register of the Treasury or of the Commissioner of loans" [Gallatin, June 27, 1801]. The receiver would then transmit these canceled certificates to the Treasury along with his quarterly returns.

## The Receiver's Account of the United States

In order to provide control over the public monies received by the district land offices, Gallatin's predecessor, Oliver Wolcott, had requested his receivers to submit seven summary statements to the Treasury on a quarterly (or monthly) basis (see *Instructions to Receivers*). Shortly after the first sales of public lands, Gallatin requested that his receivers submit an additional document, their "account current", on a monthly basis [Gallatin, June 10b, 1801]. The purpose of this *T-account* was to facilitate the reconciliation of the receiver's books with his ending balance of monies. This account is presented below.

# United States in acc<sup>t</sup> curr<sup>t</sup> with AB Receiver of Public Monies

Repayments to purchasers Cash paid the Treasurer's bill Commissions Balance remaining in hand to the credit of the U.S. Balance on hand per last return Cash received for lands sold Cash received for surveying expenses

The *T-account* above operates under the same principles as a statement of cash flows. The credit side of the account represents cash received on behalf of the United States, and the debit side represents cash payments made by the receiver. The final balance at the end of the month represents cash due to the United States. While the credit entries to the account are fairly straight forward, the debit entries are not, and are discussed below.

The first entry, Repayments to purchasers, represents cash reimbursements to purchasers of land. The receivers were required to make repayments for at least two reasons,<sup>23</sup> the first of

<sup>&</sup>lt;sup>23</sup>A third possible case in which a purchaser might receive a refund was if a forfeiture occurred and the purchaser had already paid one or more of the installment payments of one-fourth (see footnote 6). However, it is not clear whether this refund would be paid by the district land officer or by the Treasury Department.

which involved transfers of stock. Upon the purchase of a tract of land the purchaser was required to submit the deposit of one-twentieth of the purchase money in specie. However, if the purchaser later elected to transfer stock for his first installment payment of one-fourth, he was entitled to a repayment in cash for his previous deposit [Gallatin, June 26, 1801]. The second case in which a purchaser was allowed a repayment was when an error in calculation had been made by the receiver, resulting in an overpayment [Worthington, July 2, 1801].

The second debit entry, Cash paid the Treasurer's bill, includes: (1) cash remitted to the Treasury during the period, and (2) cash drawn on the receiver to fulfill financial obligations of the United States. The second of these components is examined further in the next section.

Finally, the *Commissions* account was the amount of the receiver's commissions of one percent of all monies received during the month.

### Transfer of Specie

The responsibility involved in handling the public funds placed a large burden on the receivers. For safekeeping, the monies collected were stored in an iron chest until it could be transmitted to the Treasury Department. While the Act of 1800 directed that these monies were to be transmitted quarterly, this rule was rarely followed because of the difficulty involved. The distance to the nearest bank was far and the roads in between hazardous. During March of 1805, James Findlay, the receiver at Cincinnati, was asked to ship \$150,000 in specie to the Bank of Pennsylvania in Pittsburgh [Gallatin, March 8, 1805]. The sum, made up mostly of silver, weighed four tons and required four wagons and several armed guards.

To help prevent the accumulation of public monies, Gallatin had earlier adopted the practice of drawing on the receivers to make payments for the Treasury Department [Gallatin, Aug. 28, 1801]. The Department of War, the Surveyor General, and the Postmaster General all drew regularly on the receiver's accounts. The compensation of the registers (see *Duties of the Register*) was also paid out of the receiver's funds [Gallatin, May 5, 1802]. This required the receiver to have his "account current" and monthly record of monies received updated so the Treasurer would not draw on him for more than the money he had in his possession [Gallatin, Aug. 15b, 1801].

When the Treasury needed to draw on the receiver's account, the payee was to present the receiver with a bill. The receiver was then instructed to "make out a fair copy of the bill and to take a formal receipt from the holder" [Gallatin, May 16, 1801]. The receiver would then transmit a duplicate of the receipt and the bill to the Treasury.

To further alleviate the problems encountered in transporting specie, purchasers were allowed to submit bank notes in payment of their lands [Gallatin, Nov. 6, 1802]. This created additional headaches for the receivers. They had to reject notes that would not be accepted at par at the bank of deposit, a condition requiring them to know the fifty or so banks whose notes might currently be received [Rohrbough, 1968, p. 32].

#### SUMMARY AND CONCLUSIONS

As evidenced by the experiences recounted above, the years 1801 and 1802 served as a period of trial and error for the Land Act of 1800 and Oliver Wolcott's record-keeping system. The provisions of the Act had to be interpreted and the record-keeping procedures clarified, or in some cases changed. Had Wolcott remained in office to implement this record-keeping system, it is doubtful whether things would have gone much smoother. In general, the inhabitants of the western territory were not very learned, [St. Clair, Dec. [nd], 1799], and few of the land officers had prior training in record-keeping [White, 1951, p. 522]. Fortunately, Wolcott's record-keeping system included the checks and balances to detect errors made by the land officers. While the two offices provided their own internal control, the oversight provided by the Treasury Department over the register and receiver was also critical. When the inevitable mistakes were found, the land officers were required to track the buyers down and make the correcting entries on their books.24

As sales of the public lands increased, these administrative and record-keeping procedures matured. The sales of land from

<sup>&</sup>lt;sup>24</sup>For example, the register at Cincinnati, Israel Ludlow, sold two tracts of land during the month of April, 1801, which he had included in his June statement "land forfeited to the United States." When this error was uncovered by the Treasury Department, Gallatin [Aug. 5b, 1801] informed Ludlow, "This is incorrect. It was impossible for you to know on 30th June whether land applied for since 1st April was forfeited . . . they were not obliged to produce receipts to you before the expiration of three months." Ludlow was then required to make the necessary correcting entries on his books.

650,369

\$1,514,908

TABLE 2
Public Land Sales
April 7, 1801 - November 1, 1802

April 7, 1801 - November 1, 1802				
	Acres Sold	Revenues		
Cincinnati	214,622	\$ 432,787		
Chillicothe	193,029	\$ 417,861		
Marietta	5,821	\$ 13,891		

325,185

Source: Reports of the Secretary of the Treasury of the United States, Vol. 1, Report on the Finances for 1801, pp. 216-251, Report on the Finances for 1802, pp. 252-261.

1801-1802 were substantial (see Table 2). However, they were just a sample of what was to follow. During the twelve years Gallatin served as Secretary of the Treasury, there was a tremendous growth in the land business. By 1812, Gallatin had established eight more district land offices in the Northwest [Rohrbough, 1968, p. 30]. These administrative provisions for the disposal of the public land sales were also expanded to the south after the purchase of the Louisiana Territory in 1803. To accommodate these new inhabitants, six land offices were opened in the Mississippi and Louisiana Territories as well [Rohrbough, 1968, p. 29]. During this expansion period of the west, these record-keeping procedures served the internal control needs of the public and provided the accounting information needed by the Department of the Treasury to carry on the nation's affairs.

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Steubenville

Total

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# THE CHANGING FORM OF THE CORPORATE ANNUAL REPORT

Abstract: The purpose of this paper is to observe and explain signs of a historical change in the form of annual reporting of very large British industrial corporations. It is based on an argument by Sikes [1986], supported by Ewen [1988], that contemporary business management uses the annual report to reflect corporate style by means of visual metaphors of corporate character. Using data extracted from the annual reports of a small sample of British industrial corporations, the paper reports results consistent with the argument. The data indicate the annual reports of these corporations have increasingly been used as stylistic means of establishing corporate identity in a consumer-oriented world. This raises concern about the effectiveness of such reports as mechanisms of corporate governance.

This paper reports on observations of measurable changes in the form of annual reporting by very large British industrial corporations. It provides a commentary on how their annual reports have increasingly appeared to be used for purposes other than financial stewardship. More specifically, the purpose of the paper is to document and discuss a distinct change in annual reporting emphasis — i.e. from predominantly accounting communications of corporate financial performance to nonaccounting projections of corporate identity in a consumer-orientated world. The researched data are consistent with Ewen's [1988] reported argument of Sikes [1986] that corporate executives use annual reports as part of an image management function to influence external stakeholders. This switch from an accounting to a non-accounting focus in annual reporting raises questions concerning the effectiveness of annual reports in the governance of corporations.

Helpful comments on this paper were received from colleagues at the Universities of Alabama and Edinburgh, Southern Methodist University, and this journal's anonymous reviewers. Alistair Preston of the University of New Mexico provided invaluable advice on the literature to which this paper relates, and Trevor Jenkins ably assisted in the data gathering. However, the usual caveat applies.

#### THE CORPORATE ANNUAL REPORT

The study observes developments between 1965 and 1988 in the form of the annual financial report of twenty-five of the largest British industrial corporations. The annual report is a long-lived mechanism of corporate accountability and governance. Evidence of change in this focus is observed and discussed in the context of Ewen's general thesis of corporate image management, and Sikes' specific argument regarding annual reports. The analyzed empirical data suggest that, at least for these very large corporations, annual reports have ceased to be merely vehicles for communicating messages about corporate financial performance. Instead, they appear to have become mechanisms to communicate stylized images of corporate identity. The data suggest the annual reports of these British corporations have evolved beyond their intended regulatory mission, and now serve a managerial purpose of a non-accounting nature

The paper is constructed to, first, provide a review of Ewen's analysis of the politics of style, and how it relates to corporate annual reporting. Second, it presents qualitative data relating to the annual reports of a sample of twenty-five British industrial corporations for a period between 1965 and 1988. Third, it discusses the data observations in the context of Ewen's arguments. Fourth, it expresses a concern based on this discussion about the future of corporate annual reporting.

#### UNDERLYING THEORY

The theory on which this study is based describes an observed and persistent twentieth century practice of using stylized images to provide perceivable impressions of rationality in the corporate enterprise. The author of this theory is Ewen [1988]. Other writers, however, have presented consistent arguments, and the interested reader is recommended to study Featherstone [1991], Harvey [1989], and Morgan [1986]. Ewen's arguments are complex, but are supported by empirical observations from business history. The following is a condensation of his thesis. Citations refer to specific pages in his 1988 text.

Ewen's initial premise is that there is an observable phenomenon called *style* which aesthetically reflects societal assumptions, values, and structures [p. 3]. He reveals the phenomenon to be historically linked to consumption and, in modern times, to the power of mass media to manipulate and influence

consumers [p. 10]. More specifically, the politics of style go back to the Middle Ages, and the formation of market economies and the circulation of wealth within communities. It relates to the emergence of conspicuous consumption — from luxury goods as a form of social currency in the Renaissance onwards; to the establishment of a consumer democracy by the nineteenth century [pp. 26-32]; and, finally, to the "throw-away" society of the late twentieth century [p. 233]. In the politics of style, according to Ewen, it is the surface rather than the substance of goods and services in the market which dominates [pp. 33 and 96]. In effect, style becomes a compensation for substance [p. 103], and value is based on aesthetic appeal rather than intrinsic worth [p. 37].

Ewen writes of images being constructed as artifacts to identify and signal existence [p. 64]. He particularly emphasizes the importance of design in an image manufacturing process [pp. 33 and 42], with a marriage between art and commerce in the context of market advertising [p. 41]. Such design activity is described as *consumer engineering* [p. 43] — in which design becomes a business tool [p. 45] with a bottom line of sales [p. 46]. Designs or symbols are deliberately formed to impress the memory of consumers, even in a fast-changing World [p. 246].

Ewen demonstrates the form of style has changed over time [p. 4], and represents "an incongruous cacophony of images" [p. 14]. In recent historical times, the rate of change in business style has quickened [p. 243], particularly because of the concept of dynamic obsolescence of goods and services [p. 239]. Style therefore reflects a need for the business to survive, and its continuing search for a surviving identity [p. 20]. In a corporate context, this can be seen in advertising and packaging, in which the idea is to use designed images to provide identity both to the producer and the consumer (e. g. as with the Card of American Express) [p. 57].

If successful, these images become part of the fabric of everyday life [p. 23] and, historically, have the effect of transcended social classes [p. 59]. According to Ewen, they were particularly at work in the creation of a Victorian middle class [p. 61]. Thus, stylized images are historically part of a social process of "becoming" [p. 74], and of social mobility [p. 75] and gradual democratization [p. 78]. Ewen describes this process as "constructing the person by style" [p. 79]. In this sense, construction also applies to the business enterprise.

Ewen's thesis also reveals the part played by technology in

the politics of style. He provides the nineteenth century example of photography — where the photographic image became more important than the photographed object, bringing into question the meaning of reality [p. 24-25]. This visual process of stylized images continues to the present day — particularly with the use of photographed or televised personalities with whom consumers can identify and pursue ideals [pp. 85-87]. Television has proved to be a particularly powerful vehicle to manipulate and control consumers [pp. 201-202] in a dispersed community [p. 231].

Ewen takes these ideas further. For example, he describes in detail the use of designed logos to identify corporate personality, operational efficiency, and organizational dignity [p. 112]. In this respect, the main point of his thesis is revealed when he links style to power [pp. 114, 171 and 216]. He particularly uses architecture as an example of this phenomenon in business [p. 118] (i.e. ornamental facades in the late 1800s, skyscrapers in the early 1900s, and glass-framed buildings in the 1970s). The progression has been to produce unifying corporate images of rationality [p. 211]. He illustrates this perceptible rationality with the early example of the AEG company, and the unifying script in its publicity materials [p. 212].

Ewen's overall description is of the deliberate creation by corporate management of images formed by technologies of representation [p. 213]. During the twentieth century, corporate enterprises outgrew images of ornamentation, and moved to those of organizational functionality [p. 128] — with the machine-based factory process as the main focus [p. 134]. The idea was to provide images of economic efficiency and institutional rationality [p. 143]; and give a utopian view of transcendent perfection, encompassing the full range of technological possibility [p. 215].

Historically, the specific style change in business has been from hard goods to abstract value — i.e. to the ephemeral, with idea divorced from matter [pp. 157 and 161]. Ewen argues this creates a new reality because of the freeing of form from substance [p. 174]. Thus, style causes tangible reality to disappear below the less tangible surface of image [p. 262]. Under these circumstances, access to coherent information reduces as stylistic information increases. Truth is that which sells to the consumer [pp. 264-265].

What Ewen is therefore saying about the history of style in corporate business is that there is a link between modern aesthetics and social management [p. 200]. In this respect, he identifies three principles of image related to style — a separation of images from their source; a need to economically mass produce images; and the production of images as merchandise. [p. 247]. Ewen specifically uses the annual financial report as a practical example of these principles in operation. He describes annual reports as the domain of designers who slip fantasy between facts and figures [pp. 259-260]. He provides an example of the detail of image management in the form of the paper on which the annual report is printed. More generally, he describes the creation of corporate personality by means of image in annual reports [p. 260]. Finally, he sums up these characteristics by quoting from Sikes [1986, pp. 31-32]:

The audience for annual reports extends beyond stock-holders and employees. Executives use them as calling cards, salesmen as credentials, personnel departments as recruiting tools, and financial analysts as a means of evaluating a company's performance. Thus, there's no limit to the kinds of visual metaphors used to express corporate character.

In annual reports it's what's up front that counts. The opening pages can be visual corporate propaganda in its purest form. The reality you see is the reality the firm wants you to see, often by showing rather than by telling. Chief executives officers (CEO) are primped for portraits as lovingly as pet poodles, and oil rigs are lit as theatrically as the set of *Miami Vice* next to breezy, easily scanned prose. The real story lies in the back pages' financial figures, a territory frequently neglected by designers — perhaps in the hope that shareholders will do the same.

The empirical analysis of this paper is directed to the arguments of writers such as Ewen and Sikes. Ewen's view of the history of the business world centers on consumerism, and a related need for business managers to manufacture designed images to establish the identity of the corporate personality in the minds of consumers — i.e. for managers to be actively involved in the function of image management. Sikes suggests that these images become business commodities designed to reflect power and authority, and influence or manipulate corporate stakeholders in a consumer culture. The process of image management has been subject to change over time, and has used available technologies of representation. The images repre-

sented have created a surface reality separate from the underlying realities of the corporation and its goods and services. Information about these matters is accessed at this surface level. Corporate annual reports are an important example of this surface information.

There is a need to research this issue in greater depth — i.e. to discover if the surface form of corporate annual reports has changed over time and, if so, whether the change is consistent with Sikes' and Ewen's thesis of the annual report as part of the style of modern consumerism and business. The significance of this research is to determine if corporate annual reporting's long-standing regulatory focus on financial stewardship has been affected by changes connected with Ewen's politics of style. If the focus of the annual report has changed, there is an obvious concern that its traditional function of reporting financial results may have been corrupted by activities which distract report users from their main task of assessing managerial performance (as suggested by Sikes).

#### IMAGE MAKING IN HISTORY

Before proceeding to the empirical analysis, it is important for the reader to know that what is described in this study is not unusual in the generalized context of the history of image management by organizations. For example, pre-corporatism, one of the most familiar uses of manufactured public images was those images organized by or on behalf of monarchy. According to Thurley [1991, p. 14], the construction by Henry VIII of magnificent palaces was no more than a means of impressing his subjects with his dominant position as their ruler:

Henry VIII was not particularly interested in Renaissance architecture for its own sake. There was no merit in faithfully reproducing classical orders and proportions as in Italy. What Henry was concerned with was magnificence. He wanted his palaces to reflect his power and status as a leading ruler in Christendom.

Burke [1992] also looks at the monarch as an institution which required image management. In a study entitled *The Fabrication of Louis XIV*, he reveals the French government's primary emphasis on the creation of images of Louis. As with Henry VIII, architecture was chosen as the primary mechanism for this purpose. So too were portraits, statues, medals, texts, and poems [pp. 25-26] (a situation similar to annual reports).

Extensive use was made of architects and artists [p. 28], thus involving the latter in social and, indeed, political roles. The same conclusion has been reached by Harvey [1989, p. 62] in relation to corporate sponsorship of the arts in recent times. Indeed, more generally, Featherstone [1991, p. 64] writes of "the interdependencies between various groups of specialists in symbolic production and economic specialists."

#### ENVIRONMENTAL FACTORS AND SAMPLE SELECTION

This study is presented in the context of a number of environmental factors affecting the production of corporate annual reports in Britain between the mid 1960s and the late 1980s First, the technologies of representation (e.g. printing and color) improved due to innovations over the period examined [Harvey, 1989, p. 289], and relevant unit production costs were reduced simultaneously. Thus, for those corporate enterprises involved in image management by means of annual reporting, the medium became much more efficient, economic, and effective for use as an external communication device.

Second, as Ewen demonstrates throughout his text, those corporations most committed to image management in recent times, and arguably best able to afford to do so, were the largest entities with a wide constituency of external stakeholders seeking the accountability of management. This study therefore observes a small sample of the largest British industrial corporations, all of which had a multinational focus throughout the period of analysis. The companies are listed in the appendix at the end of this paper.

Third, the data studied are presented in the context of persistent legislative and other regulatory changes to increase corporate financial disclosure in Britain — i.e. the Companies Acts of 1967, 1976, 1981 and 1985; and the standards of the Accounting Standards Committee. Each of these prescriptions expanded the required disclosure of financial information, and imposed change both on the form and the substance of the overall reporting package. The volume of disclosure significantly increased.

The corporations selected for this study were and remain part of a relatively small subset of corporate enterprises in Britain. They are among the very largest industrial organizations, and are believed to be representative of that group. Because of their very public position in the corporate world throughout the period of analysis, they were deemed to be suitable candidates to study for purposes of observing change in the form of annual reporting.

The corporations were selected on a random basis from a publicly-available list of the largest British industrial organizations (*The Times 1000*). Their size was defined in terms of reported capital employed. Within the context of the 1,000 largest industrial corporations in each of the years 1965, 1978, and 1988, the highest ranking for the selected corporations was 1 (in 1965, 1978, and 1988), and the lowest 179 (in 1988). The mean ranking of the sample ranged from 45 in 1965 to 73 in 1988, indicating a gradual diminution in its relative size over the period, while consistently remaining very large in the context of all British industrial corporations. The 25 organizations covered 19 different standard industrial classifications.

The sample is small because of the defined corporate focus of the study, and the amount of time required to extract the required data for analysis. Results consequently cannot be interpreted other than in the context of the largest British industrial corporations. The years examined are 1965 (a period in the mid-1960s prior to a significant increase in regulated accounting disclosure); 1978 (a period towards the end of continuous accounting standardization); and 1988 (a period towards the end of the 1980s and representative of most recent times).

#### **METHODOLOGY**

The reader is reminded that this is a study of reporting form rather than substance, consistent with McCluhen's 1964 cliche that the medium is the message. Consequently, it is concerned with data which describe the shape and structure of annual reports rather than their specific content. Such data were derived from physical inspections of the annual reports of the selected companies. Page counts were made to discover changes in the reporting volume devoted to general categories of disclosure (i.e. regulated versus voluntary); narrative versus pictorial; and operational versus non-operational). In all cases, these counts were estimated, allowing for page and print size, and line spacing.

Other raw data were more easily observed. These include the use of image management techniques such as design consultants, corporate logos, color presentations, and picture and narrative mergers or fusions. Second order data were derived from raw data — i.e. with respect to the order of reported information; voluntary disclosures forming the majority of total report volume; pictorial disclosures exceeding narrative disclosures; and product-related disclosures constituting the majority of available report volume.

#### **ANALYSES**

A useful starting point for the analytical part of this paper is the recent professional accounting literature. It reveals signs of a relatively new dimension to discussions of corporate annual reporting. This concerns the packaging of the annual report by professional designers to create, manage and report images intended by corporate management. For example, Pettersen [1990, p. 16] presents the idea of using the annual report as a means of communicating corporate objectives in the following terms:

...today, annual reports are widely recognized as highly credible, multipurpose documents with the power to communicate important corporate messages. Every element covers the message, from the figures it presents to the paper on which it is printed.

Pettersen is a representative of an industry which exists with the primary purpose of assisting corporate organizations to communicate their managerial messages to an external world. The corporate annual report is an important element of such communication, and a significant product of the design industry manufacturing it. Several British design and art journals (e.g. *Print*) devote space to issues relating to the form of annual reporting.

The analysis begins with an examination of change in the volume of the annual report. The use of a measure of reporting volume is justified on the basis of its potential to signal changes in managerial intention to disclose. The analysis focuses on whether there was a disproportionate increase in report volume devoted to voluntary disclosure between 1965 and 1988 (i.e. allowing for accounting disclosure changes imposed by regulators). If there was such an increase, this is indicative of corporate managers using the annual report to signal messages other than those required by regulators. More specifically, the data were examined to discover whether any voluntary increase in disclosure between 1965 and 1988 (a) took a narrative or pictorial form (pictures being consistent with Ewen's descriptions of

twentieth century image management); and (b) emphasized product-related matters designed to influence stakeholders (consistent with Ewen's consumerism argument in image management).

The initial analysis focuses on the general shape of reporting form, and thus observes for possible image management in the annual report of the companies surveyed. The second phase of analysis searches for signs of image management techniques of the type suggested by Ewen — i.e. the employment of design consultants as image managers; the creation of explicit images in the form of corporate logos; and the use of contemporary reproduction technologies in image management, including high resolution color and merging or fusing of pictures and narrative messages. The third stage of analysis outlines certain of the consequences of image management as indicated by measurable changes in the form of the annual report — i.e. (a) the order used to disclose voluntary messages and required accounting information (particularly looking for any change in positioning in the report as a signal of relative importance); (b) the balance between required and voluntary disclosures (with specific attention to the relative proportions of total reporting volume devoted to voluntary disclosures); (c) the use made of pictorial and narrative content in the report (especially searching for significant use of pictorial messages); and (d) the emphasis on operational activity (particularly product-related data). Explanations of each of these analyses are provided in each appropriate section.

#### RESULTS

The most simplistic view of change in the form of the observed annual reports is contained in Table 1.

The initial analytical focus on report form is the absolute volume of the annual report. Use of this variable is justified because, as Ewen [1988, pp. 259-60] argues, the annual report is a significant vehicle for management to construct an image of the industrial corporation. Report volume is a crude proxy for the extent to which the annual report is used for this purpose—i.e. the greater the volume, the higher the probability of its use for purposes other than regulatory compliance. The annual report is therefore viewed in this study in much the same way as Thurley and Burke perceive a royal palace as a deliberately constructed signal of a monarch's power and authority.

TABLE I
Annual Report Structure

	1965	1978	1988
(A) TOTAL PAGE COUNT			
Mean total	26	36	54
Standard deviation	8	8	10
(B) REGULATORY PAGE COUNT			
Mean total	15	23	25
Standard deviation	3	4	4
(C) VOLUNTARY PAGE COUNT			
Mean total	11	14	29
Standard deviation	7	7	8
(D) NARRATIVE PAGE COUNT			
Mean total	8	. 6	19
Standard deviation	4	3	8
(E) PICTORIAL PAGE COUNT			
Mean total	3	7	10
Standard deviation	4	5	4
(F) OPERATIONAL PAGE COUNT	Γ		
Mean total	8	7	16
Standard deviation	5	4	9
(G) PRODUCT PAGE COUNT			
Mean total	1	2	12
Standard deviation	1	3	5

On the basis of total page count described in Table 1(A), the annual reports of the 25 companies appear to have been significant vehicles for management to communicate corporate presence throughout the period of analysis. In 1965, the mean total count for the sample was 26 pages. This datum grew continuously over the period and, by 1988, reached 54 pages — an increase of nearly 108%. This difference is significant at a level of less than 1% using a two-sample *t* test. The change can be expressed in an alternative form. In 1965, 23 of the 25 corporations had reports of less than 40 pages. By 1988, not one of these organizations fell into this category. The smallest and largest changes between 1965 and 1988 were, respectively, 5 and 58 pages.

These figures suggest something substantial was taking place in the annual reporting of the 25 companies between 1965 and 1988. However, the data are relatively uninterpretible until they are decomposed into relevant elements which help explain

where the increase in report volume occurred. Looking first at report content in terms of regulatory and voluntary disclosures. Tables 1(B) and (C) show that, between 1965 and 1988, the regulatory mean page count increased by 67% (presumably as a result of the requirements of the Companies Act 1967), while the voluntary mean count expanded by approximately 164%. Thus, for these industrial corporations, the mean total reporting volume dedicated to voluntary disclosure increased by 18 pages. compared to a 10-page mean increase for regulatory disclosure. Put differently, 84% of the 25-company sample in 1965 had less than 20 voluntary pages. By 1988, this figure dropped to 8%. This suggests there was a significant use of the annual report by management for purposes other than to satisfy regulatory requirements for financial disclosure. Differences in mean between 1965 and 1988 are significant at a level of less than 1% in the case of both required and voluntary disclosure page counts (again using a two-sample t test).

The data for voluntary disclosure were decomposed to narrative reporting and pictorial presentation. The purpose of doing this was to identify if there had been a change during the period between reporting volume devoted to traditional narrative explanation of corporate business activity, and that concerned with picture messages — which, according to Ewen [1988, p. 85] had become an important part of corporate imagemaking.

The data in Tables 1(D) and (E) reveal a relatively steady disclosure of narrative messages between 1965 and 1982. The mean page count was 8 in 1965, and increased to 19 pages by 1988. The overall change in mean count between 1965 and 1988 was 138%, a difference significant at a level of less than 1% using a two-sample t test. The position with respect to pictorial presentation was just as persistent — a mean count of 3 pages in 1965 gradually increasing to 10 in 1988. The overall change in mean for the complete period was 233%, indicating a differential rate of growth in pictorial presentation compared with narrative disclosure. The difference is significant at a level of less than 1% using a two-sample t test. Indeed, 92% of the 25 corporations had less than 10 pictorial pages in their 1965 reports. The comparable proportion in 1988 was 36%. These results appear consistent with Ewen's view that large corporations use visual techniques to project images of their position in the economic world [see also Harvey, 1989, p. 289].

Sections F and G of Table 1 relate to report volume dedi-

cated to operational and product-related messages. A general review of voluntary disclosures in annual reports suggests they can include a variety of topics (e.g. operating and financial performance, personnel, and external economic issues). Much of the voluntary disclosure surveyed in this study consistently related to operational activity and personnel. For example, in 1965, nearly 73% of the mean voluntary page count described operational details (8 of 11). In 1988, the equivalent figure was 55% (16 of 29). The overall mean increase in operations-related pages between 1965 and 1988 was 100%, with the biggest movement in the mid 1980s. The difference between 1965 and 1988 is significant at a level of less than 1% using a two-sample t test.

With respect to the more specific product-related disclosure volume, a change similar to that of operations is evident from the analyzed data. In 1965, the mean product page count was one page. In 1988, the figure was 12 pages. The overall difference between 1965 and 1988 of 1100% is significant at a level of less than 1% using a two-sample *t* test.

The mean product content of total voluntary disclosure for the 25 companies was 9% in 1965. By 1988, the equivalent datum was 41%. These analyses suggest that not only were the surveyed corporations increasing their voluntary disclosures at a rate faster than regulatory-based changes, they were also doing so more by use of pictures than narrative, and were specifically focusing on corporate operations generally, and corporate products particularly. This is consistent with Ewen's [1988] general thesis of consumer engineering using image management techniques.

The above analyses reveal that a communication device which was mainly informing investors and others about corporate financial performance in 1965 was, by 1988, primarily promoting images of the corporate enterprise's operational performance and products. Nearly 64% of the 1965 to 1988 change in mean total page count is accounted for by an increase in voluntary disclosure. Of the latter, 61% relates to each of the narrative and product-based disclosure changes. Put differently, of the change in mean total page count between 1965 and 1988, 39% is attributable to space devoted to product disclosures.

## Detailed analysis

The previous analysis indicates a considerable change in the form of annual reporting by the 25 corporations observed between 1965 and 1988. This section further examines the process of producing the annual report to detect significant changes in reporting method. The data concerned are contained in Table 2.

TABLE 2
Production of the Annual Report

FEATURES		1965	1978	1988
		%	%	%
Design consultants	*	12	24	80
Corporate logos	*	28	68	96
Paper colors	*	4	24	64
High resolution color	*	0	28	100
Fusion of pictures and narrative	*	20	44	96

<sup>\*</sup> Fisher exact probability test: differences between 1965 and 1988 significant at <1%

The explicit use by the 25 corporations of design consultants to manage the production of the annual report is a significant feature of change in reporting emphasis. The proportion of the sample following this practice increased from 12% in 1965 to 80% in 1988. Most of this change occurred in the 1980s. Thus, by the end of the 1980s, most of these corporations were acknowledging in their annual report that it was produced by professional designers.

The influence of such designers in annual report production can be observed in a number of ways. First, there was a significant increase in the use of prominent logos in annual reports to assist in corporate identification and association (28% of corporations in 1965; and 96% by 1988). Second, improved reproduction methodology is evidenced in the significant increase in use of different paper types and colors in the annual report (4% in 1965; and 64% in 1988); and, particularly, high resolution colors for presentation purposes (none in 1965; 100% in 1988). Third, the graphic design technique of fusing or overlaying narrative descriptions with pictorial presentations became a significant feature of reporting (20% in 1965; and 96% in 1988). Each of these differences is significant at a level of less than 1% using the Fisher exact probability test.

#### Final analysis

The previous analyses point to an increasing emphasis on voluntary disclosures concerning corporate operations and products, and that these developments took place in the context of professional design management using contemporary design methodologies. Table 3 presents an overview of the effects of professionalizing the annual reporting process.

TABLE 3
Annual Report Emphases

FEATURES		1965	1978	1988
		%	%	%
Financial report order	*	36	80	100
Voluntary majority	*	16	12	72
Pictorial majority		12	44	20
Products majority	*	0	8	32

<sup>\*</sup> Fisher exact probability test: differences between 1965 and 1988 significant at <1%

The first part of Table 3 suggests there was a deliberate switch in emphasis in the ordering of annual report material by the 25 companies during the period of analysis. In 1965, 36% of the corporations preceded their regulatory accounting material with voluntary disclosures. By 1988, the equivalent datum was 100%. This is consistent with Sikes' observation concerning the relative importance of the two types of disclosed material in the minds of reporting managers.

The relative volume of the voluntary segment of the annual report also changed significantly over the period. Always a minority part of the total report until the late 1980s, it was a majority segment for 72% of the 25 corporations in 1988. The significant pictorial presence in annual reports described earlier is also evident in Table 3. In 1965, 12% of the corporations had a majority of their annual report volume in pictorial form. Although this datum rose to a peak of 68% by 1986 (a difference significant at a level of less than 1% using the Fisher exact probability test), it fell to 20% by 1988. There is no obvious reason to explain the bell-shaped nature of this change. But the 1988 position does suggest a move back to the traditional narrative emphasis of the late 1960s and early 1970s

The recent emphasis in product-related disclosures is highlighted in the last data line in Table 3. It reveals that none of the 25 corporations in 1965 had a majority of annual report volume dedicated to product disclosure. However, by 1988, nearly one third of the sample (32%) exhibited that characteristic. Again, this emphasizes not merely the change to a *consumer* focus, but also the size of this change for several of the companies surveyed.

#### SUMMARY AND CONCLUSIONS

The above analyses suggest significant changes were taking place between 1965 and 1988 in the annual reports of 25 very large British corporations. Nothing in the analyses is inconsistent with the general proposition that these entities were increasingly using their annual reports for purposes other than compliance with regulatory provisions of a financial nature. The substantial rate of increase in report volume devoted to voluntary disclosures (particularly of corporate operations and products), and the explicit and increasing use of professional designers and design methodologies to produce annual reports, each support such a general conclusion. As suggested by Sikes and Ewen, the form of annual reporting of these corporations was significantly changed between 1965 and 1988, and in a way consistent with the idea of the annual report as a means of creating and managing images of the reporting corporation's position in the economic community. The reasons for such changes in each corporate case are unknown in this study, and should form the basis for further research. However, the general emphasis captured by the data suggests a desire to participate in consumer engineering via the annual report.

Of course, such conclusions are subject to limitations. First, the sample surveyed was small and restricted to very large industrial corporations with the resources necessary to operationalize change in reporting form as described in this paper. Second, the analysis was made primarily on the basis of page counts as a means of measuring the relative disclosures by companies. As such, the justification is in observing the broad picture. Further content analysis is necessary to examine the detail of the disclosures to, first, determine the specifics of how management attempted to create images. From the broad-brush data, it would appear the predominant emphasis was on corporate operations and products. This is not dissimilar to the previ-

ously described impression management of royalty in terms of artistic descriptions of the heroic actions and deeds of kings and queens.

The implications of these changes in corporate reporting emphasis are not difficult to identify. First, financial reporting for stewardship and decision purposes appears to have been overtaken by the voluntary part of the annual report (at least in terms of disclosure volume). Whether the latter has submerged the former in terms of content and quality is arguable and needs researching. However, at least for very large British industrial corporations, it is reasonably clear that financial data constitute a minority of space in the total reporting package. Second, following the previous point, if financial data take a secondary position in the annual report of large and complex corporate organizations, this creates concerns about the quality of accountability and governance. More specifically, if the annual report during the last three decades has gradually become part of the public relations arm of the very large corporation, there is a danger that its financial reporting may not receive the attention it deserves from its readers (particularly, those with little or no accounting competence). If this is found to be the case following further research, attention must be paid to the issue of the annual report apparently existing for financial accountability purposes whilst, in reality, being part of corporate image management.

#### CONTRIBUTIONS

This is not a typical accounting history paper. It looks at very recent historical change, and provides only general insights into the nature and explanation of such change. Nevertheless, it makes a contribution in three related ways. First, it attempts to monitor change in the area of accounting as it is happening. Too often in historical study, the historian arrives too late to acquire the historical materials needed to provide accurate descriptions and plausible explanations. Second, the study introduces the reader to Ewen's study of the politics of change which could be applied to a variety of communication tasks in accounting. And, third, the results of the study are sufficient to justify further research in a number of areas mentioned in this concluding section.

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#### APPENDIX: CORPORATIONS OBSERVED

BAT;

Beecham;

Blue Circle; BP;

Burton;

Cadbury Schweppes; Coats Vivella:

Courtaulds;

English China:

GKN; Glaxo; Guinness:

ICI;

Johnson Matthey;

Lucas:

Marks and Spencer; Reckitt and Colman;

Plessey; RTZ; Sears;

Scottish and Newcastle:

STC; TI; Unigate; Whitbread

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## INITIAL EFFORTS OF KENNETH W. STRINGER TO DEVELOP A STATISTICAL SAMPLING PLAN\*

Abstract: In 1981, the Auditing Section of the American Accounting Association selected Kenneth W. Stringer to become the first recipient of the Distinguished Service in Auditing Award. Stringer was a pioneer in the auditing research efforts of Haskins and Sells for nearly 25 years. One of Stringer's many contributions was the development of a statistical sampling plan which was adopted by Haskins & Sells in 1962. The plan developed by Stringer is referred to in the literature as *Probability-Proportional-to-Size sampling*. This study provides insight into facets of Stringer's research efforts which include his evaluation of prior sampling plans, a behavioral laboratory experiment, the interdisciplinary process through which the plan was constructed, and the influence of Oscar Gellein, whom Stringer viewed as his mentor during his early career.

In 1981, Kenneth W. Stringer became the first recipient of the Distinguished Service in Auditing Award; this prestigious award is sponsored by the Auditing Section of the American Accounting Association. The award to Stringer was for his pioneering efforts in the auditing research at Haskins & Sells (H&S) for nearly 25 years (Haskins & Sells became Deloitte & Touche after a merger.) One of the many contributions made by Stringer to the theory and practice of auditing is the development of a statistical sampling plan which was adopted by H&S in 1962. This plan was originally referred to as the Haskins & Sells Sampling Plan (hereafter referred to as the Plan). The Plan developed by Stringer is frequently referred to in the literature as Probability-Proportional-to-Size sampling (PPS). Certain features of the Plan are still the subject of much auditing research

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[Grimlund, 1988a and 1988b; Hall *et al.*, 1989; Hansen, 1993; Ko *et al.*, 1988; Plantel *et al.*, 1985]. This study documents Stringer's efforts to develop the Plan from the initial research phases to the submission of his proposed Plan to the firm. A brief summary of Stringer's personal background and early career is also presented.

Other professional contributions of Stringer include the Statistical Technique for Analytical Review (STAR), which is an application of regression analysis to the analytical review process [Stringer, 1975; Stringer and Stewart, 1986], one of the first generalized audit software packages — "AUDITAPE" — and the audit risk model which provides a systematic means of managing audit risk by structuring an orderly synthesis of the component parts.

### RESEARCH OBJECTIVES AND IMPORTANCE OF THE STUDY

This study attempts to achieve five major objectives. First, the research seeks a greater understanding of the inherent benefits and limitations of the Plan by a) examining the issues and problems associated with prior sampling techniques which were instrumental in catalyzing Stringer's effort to develop the Plan and b) describing the process through which the Plan was developed.

Second, the study examines research conducted by Stringer to gain insight into the extent of divergence in various auditors' judgements regarding their choice of sample size and the extent of testing, in similar or identical audit situations. The study also examines the impact of his research results upon the firm's policy regarding the need for the Plan.

Third, the research attempts to provide insight into the interdisciplinary process through which Stringer harnessed "outside" technology to improve the practice of auditing. Specifically, the study examines the circumstances which forced Stringer to form an interdisciplinary collaborative effort, the problems he experienced in forming the collaboration, and the achievements that resulted. Insights provided by his interdisciplinary efforts appear particularly useful to the accounting profession's effort to adapt to the current ongoing fusion of traditional accounting, information systems, and computer science.

Fourth, the study examines the policies and attitude of top

management regarding encouragement and funding of technological innovation and its impact upon Stringer's success. Today, this issue is particularly important given the effect of competition and litigation upon the financial resources of many firms

Lastly, the study also examines how Stringer was influenced by the protegé-mentor relationship that developed between him and Oscar Gellein. The potential value of mentoring is an issue of current interest to the accounting profession and is the subject of recent studies [Dennis, 1993; Alter, 1991; Viator and Scandura, 1991; Pillsbury *et al.*, 1989]. Insights provided by Stringer's experience should contribute to an increased understanding of the potential value of these professional relationships.

#### RESEARCH METHODOLOGY

Research methods employed include a series of interviews with Stringer which were taped and transcribed resulting in 226 pages of conversation as noted in the reference section [Stringer, 1993]. The narrative portion of this study, including all direct quotes of Stringer, are taken from these transcriptions. The author also was permitted to examine the surviving written documents generated by Stringer. These include numerous memos, correspondence, reports, and manuals.

#### STRINGER'S BACKGROUND

Born in the small rural town of Birmingham, Kentucky (population, approximately 300) on February 23, 1918, Stringer was the only child of Amos and Elizabeth Allison Stringer. Amos was a barber who operated a local shop.

Advertisements for accounting courses offered by college correspondence schools such as La Salle Extension and International Business School provoked Stringer's first curiosities and interest in the possibility of pursuing a degree in business. As to his decision to major in business he notes:

I suppose it was sort of the sense that business was exciting and a little bit different than the usual career choices. A degree in accounting was within the parameters of my horizons back then. It seemed somewhat challenging. As I look back, I never regretted the decision. I'm sure I made the right one.

### Education and Early Career

In 1934, Stringer entered Bowling Green College of Commerce located in Bowling Green, Kentucky which was about 100 miles from his home. (This college later merged with Western Kentucky University.) While an undergraduate, Stringer served as president of a social fraternity and was a charter member of the local chapter of Beta Alpha Psi. He also was recipient of the Betty Austin Cup which was the school's annual award for the most outstanding student.

Upon graduation in May, 1938, with a B.S. in Commerce (major in Accounting, minor in Business Administration), Stringer assumed the position of staff accountant at the Kentucky Public Service Commission, a state regulatory agency. He soon grew disenchanted with his assignments at the Public Service Commission due to what he describes as a lack of creative challenge.

While reading the employment section of the local newspaper, he read that Haskins & Sells (H&S) was sending someone from their Cincinnati office to open an office in Louisville, Kentucky. "I simply walked into the office and asked for an interview. That's all there was to the recruitment process", he recalls. In December, 1939, he joined the Louisville office of Haskins & Sells as a junior staff accountant.

As the country became engulfed in World War II, Stringer left H&S to serve in the war effort and was discharged in August 1946. During the war years, Stringer developed the notion that he would like to start his own practice for the independence and managerial discretion that is usually associated with self-employment. Returning to civilian life, he decided to join Robert Killebrew who was the sole proprietor of a public accounting firm in Danville, Kentucky.

The first three years proved to be very challenging and provided many opportunities for creative activity as Stringer began building his clientele. He derived much satisfaction from managing the entire operation. However, during the fourth year, it was becoming clear that the challenge and excitement were beginning to wane. Though financially successful, he began to consider career alternatives.

## Rejoining H&S

The diversity of assignments and professional challenge he had enjoyed earlier with H&S were still appealing. However,

based on his prior experience with the firm and through subsequent discussions with H&S representatives, he knew that if he were to return to H&S, he initially would have to take a substantial cut in salary. He also was aware that if he eventually were admitted to the partnership, the financial rewards would be substantial.

After much thought and encouragement from his wife Catherine, he decided to return to H&S; as Stringer recounts, "I decided that I really should just go ahead and make the break and go for the brass ring." Given the initial financial disincentives for his return to H&S, the accounting profession has been the beneficiary of the high value that Stringer placed upon professional challenge, intellectual stimulation, and a creative environment.

In January, 1952, Stringer resumed his career with H&S in the Cincinnati office. In 1954, he was promoted to manager. While working in the office of a client early in the summer of 1957, Stringer received a call from H&S's Executive Office (EO) in Manhattan requesting that he accept a two year assignment in EO.

When EO requested that he accept a two year assignment, he replied that he first would like to meet in New York to discuss the assignment. He remembers, "I had some hesitancy in making the transfer to be very honest; I didn't know how I'd like New York and I just didn't know what to expect." After a reassuring meeting with Oscar Gellein, Larry Walsh, Weldon Powell and John Queenan, Stringer decided to accept the assignment. These discussions indicated to him that he would be given relatively broad latitude to explore any ideas for possible improvement in the firm's auditing policies and procedures. Stringer remembers being both excited and awed by the challenge of the assignment. Equally important, he felt comfortable with the people and the environment.

Since flying was not yet the most frequent mode of long distance transportation, the Stringers took a train to their new residence in New Jersey in October, 1957; as Stringer recalls, "I remember the day well since the Russians launched their first Sputnik the same day I launched my new career in EO."

## STRINGER'S INITIAL EFFORTS TO CONSTRUCT THE PLAN

Oscar Gellein was hired by H&S in 1953 to direct the re-

search efforts of the firm. It became apparent to Gellein that there was a need for a broad review of current developments in auditing. He expanded the firm's efforts to provide guidance to those in the field with an emphasis upon increased internal communications. Gellein began to make inquiries to various practice offices concerning the identification of those who had a special talent for development and application of auditing procedures. He became aware of Stringer (who was then a manager) and met with him at the firm's 1956 meeting of managers. When Stringer arrived at the EO, John Queenan was the managing partner of H&S and Weldon Powell was the senior technical partner and the second highest ranking partner in the firm.

Upon arrival in New York, Stringer spent a month outlining and gathering information on what he viewed as the "totality" of his assignment. The assignment, broad in its scope, was to conduct a review of H&S's overall approach to the audit and to examine a number of technical procedures. While in practice at the Cincinnati office, Stringer had become convinced that two aspects of the audit process warranted immediate attention, even though he believed that his firm was already more sophisticated than most firms in these practice areas.

His first concern was the overall approach of evaluating a system of internal control. Second, he was dissatisfied with the process of determining the extent of testing based on the initial evaluation of internal control. He then decided that of all the auditing issues and problems identified, "the most pervasive was the process used to determine the extent of testing and the selection process of items to be tested." Stringer pursued his interests in these two areas since he believed these issues to be generally compatible with his assignment as noted above.

## **EXISTING SAMPLING TECHNIQUES**

After making a preliminary evaluation of the system of internal control, the auditor is faced with the task of determining the extent of testing. Typically, the auditor selects a sample of a population for examination rather than examining 100% of a population. When Stringer arrived at the EO, there were few, if any, authoritative guidelines concerning the extent of testing and the selection process. Since his early years as an auditor, he had been dissatisfied with the lack of authoritative guidelines. He believed that in similar audit situations there existed an unjustifiably wide variation in the extent of testing prescribed by various auditors.

One frequently encountered method of testing during this era was block testing. Using this approach, a period of time is selected and audit procedures are applied extensively to that specific period rather than applied to transactions through the year. Stringer perceived the process of selecting the time periods to be somewhat arbitrary and felt that there must be a more objective method to "link what you were trying to accomplish with the amount of work that needed to be done."

An article by Howard F. Stettler that appeared in the *Journal of Accountancy* (January, 1954) catalyzed Stringer's interest and convictions to improve the existing methods although his research did not begin until his arrival at EO. Stringer was, however, ill-prepared to embark on research in this area having never taken a statistics course. Recalling his initial impression, "I began the project with the very naive notion that if I would just buy one or two good books on statistics and study them, that I could move from there right into suggesting ways and means to implement these techniques into our practice. I had no idea that I was opening up a 'Pandora's Box' nor did I realize the great amount of time it was going to take."

Having identified the research area, Stringer read a number of statistics textbooks focusing primarily on the sections dealing with statistical sampling. In the context of accounting and auditing, early writers devoted a great deal of attention to acceptance sampling and estimation sampling.

Acceptance sampling was designed as a quality control evaluation procedure for use in manufacturing processes. This technique received broad exposure when the nation's industries increased production to supply the allies during World War II. An important characteristic of acceptance sampling is its inherently dichotomous nature, i.e., the decision alternatives are either absolute acceptance or absolute rejection. Some expressed hope that acceptance sampling could be adopted for use in accounting and auditing "since the regular flow of paper work can be regarded as reasonably comparable to the continuously flowing manufacturing production line." [Trueblood and Cyert, 1957, p. v.]

When Stringer began evaluating existing statistical sampling techniques, statistical validity and audit relevance were the two primary criteria he considered. Stringer believed that the auditor is concerned with the relative degree of accuracy of accounting data. Consequently, he viewed acceptance sampling

as ill-suited in the usual audit situation since it provides an "absolute" choice of having to either accept or reject a population. Ideally, he envisioned a method of evaluation that included some form of graduated scale to measure the relative significance of the sample results. Stringer viewed such a method to be much more realistic and appropriate in the audit process. Because of the accept-reject dichotomy of acceptance sampling, coupled with the fact that this technique was severely limited in its ability to evaluate dollar items, Stringer believed that acceptance sampling lacked audit relevance. The following comments are excerpts from a paper presented by Stringer at the 1963 annual meeting of the American Statistical Association. These comments reveal the deficiencies of the statistical sampling techniques as perceived by Stringer when he arrived a EO in 1957:

... The principal sampling plans that have been proposed for use in auditing will be considered next in relation to this formulation of the auditor's problem. Some of these are designed to be evaluated in terms of particular attributes and others in terms of monetary amounts.

Among the former are the plans for acceptance sampling, discovery sampling, and estimation sampling for attributes. Although these plans may be useful to the auditor for testing compliance with internal control procedures and for some other purposes, they share the common deficiency of not being related directly to the area of his principal concern — namely, monetary amounts. In addition, these plans are subject to the following criticisms from the auditor's viewpoint: the automatic decision rules of acceptance sampling are too rigid and extreme for his purposes; the tables developed for discovery sampling provide for no evaluation of the quantitative significance of any errors disclosed by the sample . . .

## CLASSICAL THEORY AND HIGHLY SKEWED POPULATIONS

Another sampling method that was frequently encountered in the literature at that time was estimation sampling. Estimation sampling, also referred to at that time as "survey sampling", had been used primarily in research surveys in the natural and social sciences. A number of sampling proponents had been advocating the use of estimation sampling in auditing. Estimation sampling is used to estimate quantitative variables of a population, such as a population mean, proportion, or aggregate. For example, a sample mean can be calculated to estimate the mean age of the total population of accounts receivable. The most frequently used sample statistic of estimation sampling in the audit function is the population aggregate. A sample aggregate value can be calculated to estimate the aggregate value of a population such as the total dollar balance of an account, along with the range or "precision" of the probable actual dollar balance.

Stringer felt that auditors traditionally viewed the primary audit interest to be the number and magnitude of errors rather than the estimation of an account balance. Since the client's records usually provide the exact total of account balances, Stringer believed that the use of estimation sampling would not contribute significant new insight into the majority of audit situations. Consequently, he viewed estimation sampling to be lacking in audit relevance since it failed to focus on the principal item of audit interest, i.e., errors.

Another problem of estimation sampling was that this method assumes that the distribution of the sample means of errors is normal. Stringer believed that in many populations of accounting data the related distributions of sample means of errors were not normally distributed. When estimation sampling was applied to these types of populations, any inferences concerning the population could be invalid because of violations of this underlying assumption. Stringer (1963) states:

The plans for evaluating samples in monetary terms have been applied in two different ways. However, for the reasons to be mentioned briefly, I believe that neither of these approaches has been fully responsive to the auditor's problem.

The first approach has been to estimate the aggregate monetary amount of the items in the population, using a mean, ratio, or regression estimate, and to calculate reliability and precision in accordance with normal distribution theory. Aside from any question concerning use of the normal approximation for samples from highly skewed populations, this approach may be criticized because the principal component of the sampling variance is attributable to variation in the amounts of the individual sample items rather than to the amounts

or errors, if any, in such items. Assuming a population with no error in it, each of the possible distinct samples of a given size that could be selected from it would result in a different estimate and precision limit under this approach; however, from the viewpoint of the auditor, all samples which include no errors should result in identical evaluations. In other words, the auditor ordinarily is not interested in estimating the aggregate amount of items in an accounting population, since the purported aggregate amount usually is already known or is readily determinable by simpler means, but he is concerned primarily with the possibility of errors in the population. I want to point out that this criticism is not directed toward applications where the basic purpose of the sample actually is to estimate the aggregate amount of an inventory or something else for which detailed records are not available.

From his experience in the field, Stringer realized that in most audit situations relatively few errors are observed. If errors are the focus of testing, then the population to be estimated is the error population. Stringer viewed estimation sampling to be an inappropriate technique to estimate the amount of errors in a population for two reasons. First, estimation sampling techniques require a relatively large number of sample observations in contrast to the few error observations typically encountered in the field. In addition, Stringer intuitively felt that the sampling distribution of errors in accounting populations was not normal. As Stringer observes "I began to sense that where you have very few observations of your feature of interest (errors), then there is a violation of the statistical assumptions that underlie normal distribution theory."

Sampling to estimate the amount of error in a population when few errors are anticipated is a sampling problem referred to as "sampling for rare items." Very little guidance existed in the literature regarding this issue. As Trueblood and Cyert note,

Sampling for the Rare Item — The auditor is frequently concerned with the location of fraudulent items in the universe. Unfortunately, there is relatively little that statistical sampling can do if the proportion of fraudulent items is small. Except in certain special cases, the sample size necessary to give a high probability of finding the rare item would be exceedingly large [1957, p. 37].

The lack of guidance for dealing with the rare item problem may be attributed to the fact that most of the early literature concerning estimation sampling focused upon techniques designed for use in taking public opinion polls or for use in scientific surveys for which observations were usually numerous. As Stringer (1963) observes:

...[The] use of the normal approximation as comprehended in estimation sampling is questionable where samples include no errors or only a few . . .

Under the second approach [to evaluating samples in monetary terms], the foregoing objection has been recognized by designing samples to estimate the amount of monetary errors and to provide related precision limits. However, because of the extremely low rate of occurrence of such errors in many if not most accounting populations, I believe the use of the normal approximation in calculating reliability and precision for samples from such populations may be very misleading. This problem is manifested in its most extreme form in cases, which are by no means uncommon in auditing, in which a large sample includes no errors; in such cases, of course, the sample estimate and standard deviation become zero. If the sample estimate, and related reliability and precision, are computed from a sample that includes only a few errors, the results may be only slightly less misleading — in fact, they may be more so because they appear to be more meaningful than they are.

Stringer viewed the violation of normal theory, due to the issues noted above, as a particularly ominous problem with implications beyond the important issue of unreliable inferences. In 1957, skepticism as well as outright opposition to the use of statistical sampling were prevalent throughout the accounting profession. If auditors applied estimation sampling using errors as the feature of interest, Stringer feared that in litigation, critics could call competent, expert statisticians that would readily testify that these sampling techniques were unreliable due to the violation of the basic assumption of normal distribution theory. He believed that this valid criticism would, in turn, reinforce opponents and stifle any efforts or progress towards the development of reliable statistical techniques. Convinced that the inherent objective of testing was the determination of the magnitude of errors in a population, Stringer began to have grave

doubts concerning his pursuit of sampling innovations through the classical statistical literature.

#### SEEKING CONSULTATION

By December, 1957, it was clear to Stringer that the violation of normal distribution theory caused by the "rare item" issue constituted a problem that would make his "error focus" impossible or at least far more difficult to achieve than he had originally anticipated. Seeking someone in the firm with whom to share his observations and ideas, he was directed to the head of what was then referred to as the Operations Research Department of H&S which was located in Chicago. He traveled to Chicago, and met with the head of the Department in the week preceding Christmas, 1957. They began their discussions early in the morning. By lunchtime, it was clear to Stringer that the Operations Research Department was unable to fully answer his questions and comment upon his ideas.

Although Stringer's original assignment had been "broadly defined", there had been no specific reference or mention of his undertaking extensive research on statistical sampling. Consequently, he viewed himself to be operating on the "fringe" of the assignment he had been given. He decided to approach the two key figures in the chain of command, Oscar Gellein and Weldon Powell, concerning the possibility of hiring an outside consultant to assist in developing alternative sampling techniques. This request would clearly identify Stringer's desire to pursue the issue of sampling and also give his superiors the opportunity to confront the issue. Their response would either signal support of his efforts, or, conversely, challenge the propriety of his proposed research. Whether their response was positive or negative, Stringer needed to know their reactions since he felt he had been operating on the fringe long enough. In addition, as a practical matter, if he were to continue his efforts, he needed the help of someone with expertise in the area of statistics.

The response of top management was most positive; Stringer was given permission to engage an outside consultant as well as the responsibility of choosing the consultant. In receiving permission, he felt he had gained the support of Oscar Gellein and Weldon Powell as they openly concurred with his belief that research related to the use of statistical sampling was indeed a worthy undertaking. In the Spring of 1958, he began his search for a competent statistician with whom to collaborate.

First to be considered were the authors of the various texts that he had studied in the initial stages of his research. These included Deming, Cochran, and Hansen, Hurwitz and Madow. It was important that the consultant be located reasonably close to New York for the sake of accessibility.

Stringer soon acquired the proceedings of a seminar that had been conducted by The Society of Business Advisory Professions which was a group consisting of lawyers, accountants, statisticians and other professionals that serve in a consulting capacity. He acquired the proceedings from Weldon Powell who was active in the Society. The focus of the seminar was the use of statistical sampling in court cases, market research and, to a lesser extent, the possible use of statistical sampling in auditing.

The proceedings included a transcript of the discussions as well as the papers that were presented. As Stringer recalls:

I was very much impressed by what I thought was the common sense approach of one person who was a statistician. He seemed to realize that successful applications had to be a combined effort of the statistician and a person who is familiar with the subject matter. This person appeared to have an open and cooperative attitude.

This "cooperative attitude" was particularly important since H&S had once before consulted a statistician. This previous effort was terminated due principally to the condescending attitude of the statistician who alienated the senior management of H&S by conveying the notion that accountants were incapable of achieving an understanding of statistical theory and competence in the use of statistical methods. One of Stringer's colleagues commented that this unpleasant experience had "set us back five years"; consequently, he was especially interested in finding a statistician who possessed a positive, constructive attitude and a cordial demeanor.

The statistician whose seminar comments had so impressed Stringer was Frederick F. Stephan, a professor of statistics at Princeton University and former President of the American Statistical Association. Stringer recalls:

I read a few of his articles and found he was also the author of a book which had not come to my attention up to that point. I read the book and made additional inquiries concerning his standing within the profession. Based on the attitude he had displayed as reflected in

the proceedings, my review of his publications and his stature within the profession, I decided Fred was the first person I wanted to talk to. I called him and arranged a meeting at which Oscar Gellein was also present. At the end of the meeting, Oscar and I were both satisfied that Fred was the type of person we could work with. That was the beginning of a consulting relationship that was very constructive, pleasant and productive.

#### AN INTERDISCIPLINARY COLLABORATIVE EFFORT

The proximity of Princeton to New York enabled Stringer and Stephan to meet frequently; they wasted little time in pursuing the project. By the end of Spring, 1958, Stephan had reviewed the research that Stringer had done with regard to statistical sampling and they discussed the issues and problems that Stringer had identified. After these initial discussions, they decided to lav aside the statistical issues and concentrate their efforts on helping Stephan achieve a greater understanding of the nature and objectives of the audit process. This mutuallyagreed upon approach reinforced Stringer's earlier conviction that the applications of statistical theory to auditing had to be the product of a synthesis of efforts emanating from both disciplines — auditing and statistics. The successful scenario he envisioned was an auditor with an understanding of statistics, collaborating with a statistician aware of the objectives of an audit and the audit techniques employed to meet those objectives.

Stringer views his efforts to develop and gain acceptance of a statistical sampling plan as a three step process: "exploration," "development" and "selling." In the exploratory phase, Stringer familiarized Stephan with the audit process. First, they undertook field trips to practice offices to examine workpapers and to converse with practitioners. Stringer explained the audit process using the workpapers of audits which had been performed without the use of statistical sampling. Stringer describes their activity at this stage as a "two-way process." While they reviewed the workpapers, Stringer would suggest or point out auditing procedures that he hoped could benefit from the use of statistical sampling. At the same time, Stephan would be asking questions concerning the purpose of the procedures, what types of populations the data were drawn from, etc. They then visited a number of clients' offices and were permitted to examine actual accounting records to increase Stephan's understanding of the conditions experienced by the auditor in the field.

By mid-summer of 1958, after considerable exposure to the audit process, Stephan agreed with Stringer's conclusion concerning the significant limitations of existing statistical sampling methods. Stringer recounts, "...he agreed completely with my conclusion that something better than what was presently available was needed." This realization marked the end of the exploratory phase and the beginning of their search for a theoretically sound method of statistical sampling which focused upon the amount of error in a population.

Our goal was to develop an approach that would not require us to rely on normal distribution theory, but at the same time, would allow us to express conclusions about errors in a population in the form of estimates and upper precision limits even though few or no errors were detected in the sample.

In addition, to facilitate the acceptance of his approach by the firm and the profession, comprehensibility and ease of application by those in the field were key attributes to consider; this was the beginning of the development phase.

## THE DAWN OF BEHAVIORAL RESEARCH IN AUDITING

As Stringer progressed through the development stage, the focus of his efforts turned increasingly towards the next phase which was achieving acceptance of the plan and its eventual implementation. Since no other national firm had yet developed and formally adopted the use of statistical sampling, these tasks proved to be equally challenging. In terms of time and effort, the "selling stage" equaled both the exploratory and the development stages combined.

In formulating his strategy, he knew the obvious strong point was that the statistical sampling plan would provide a more objective measure of the extent of testing and the evaluation of results. Although innovations in audit technology are often welcomed by the profession, the rampant misconceptions and pervasive lack of understanding of statistical sampling that existed at that time constituted a problem which Stringer viewed to be a serious threat to its eventual acceptance by the profession.

Intuitively, he felt that there would be wide variability in the amount of testing that various auditors would decide to perform if given an exact set of circumstances. He knew that if he could somehow measure and document the magnitude of variance in auditors' judgment concerning the extent of testing, such documentation might provide persuasive evidence of the seriousness of the problem and contribute to establishing the need for the Plan. In an attempt to gain insight into the extent of variability in auditors' judgment, he designed and performed a laboratory experiment. It is likely that this experiment constitutes the earliest documented effort in what is now referred to as behavioral research in auditing.

An annual training seminar for senior accountants was held every August by H&S, in Skytop, Pennsylvania. Prior to the meeting held in August, 1959, Stringer prepared a questionnaire consisting of four descriptions of audit situations that are encountered often in the field. Each senior was then asked to decide the extent of audit procedures he would perform in each of the four cases. The questionnaire was distributed to 92 senior accountants at the beginning of the meeting. (The questionnaire and results are reproduced in the Appendix.)

The results suggested a wide variation in the extent of testing that various auditors would perform given identical circumstances. Stringer did not attempt to release the results of the survey to the firm as a whole or make them available to anyone outside the firm since he viewed the results as "not something you would be particularly proud to have circulating in public." He did present the results to various partners and managers who were aware of his work in the area of statistical sampling.

Regarding the reaction of partners who reviewed the results of the survey Stringer observes:

They were shocked and dismayed at the disparity that the survey showed. I can not say that the survey results were the deciding factor in the firm's eventual adoption of the Plan, but I think it is fair to say that the results had a significant influence on the firm's views concerning the existing disparity in the extent of testing and the need to improve the situation. However, there are two important points I always address in any public discussion of the survey results. First, given the lack of professional guidelines in this area, the results were not surprising. Second, the auditors surveyed were all employed and trained by the same firm. If the survey had been distributed to a group of auditors who had been selected randomly from throughout the profession, it is reasonable to assume that the disparity would have been even greater.

Regarding the impact of Stringer's research, an H&S Committee which was later formed to evaluate the Plan, issued a progress report in 1960 which stated:

... The results of the survey at the 1959 meeting of in-charge accountants concerning sample sizes in selected situations are disturbing and indicate that our accountants need better guides of selecting appropriate sample sizes [Stringer, 1993].

## Collegial Support

While developing the Plan, Stringer continually kept his supervisors aware of his activities so that he might receive feedback on various issues as well as sustain their support. During this period, Stringer reported directly to Gellein with whom he developed a close personal and professional relationship. He kept Gellein particularly well informed of all his activities and progress. During his entire tenure in EO, Gellein was the source of much encouragement and support. Stringer viewed him as his "mentor, intermediary and confidant."

Although neither Queenan nor Powell took a specific, personal interest in the project, they willingly permitted Stringer to devote the majority of his time to the project. Regarding the Plan, Stringer characterized them as "open minded", "tolerant" and willing "to give me room to run." Stringer recalls "I was receiving encouragement from Oscar, and was more or less, just being left alone by the other people." In retrospect, their receptive attitude is especially significant given the magnitude of opposition that existed in the profession at that time concerning the use of statistical sampling.

The period during which he developed the Plan proved often to be frustrating and at times discouraging, but always was intellectually challenging. A constant burden was the requirement that the Plan not only had to be statistically sound, but

practical in the sense that you could train people within a reasonable amount of time, and its application could not be economically prohibitive from the standpoint of the time and effort actually needed to apply it out in the field.

However, he never felt that the task was insurmountable; he always believed that he and Stephan would eventually develop a sound, workable Plan.

The next phase of the research will examine the remaining

issues which Stringer needed to address and resolve before the Plan was officially adopted and fully implemented. These include the problem of relating the degree of reliance upon internal control to the extent of substantive testing, the field testing of the Plan, and the mathematical and legal reviews of the Plan.

## CONCLUSION

First, this research suggests that Stringer's questioning of sampling techniques then prevalent in auditing practice and his doubts concerning the statistical validity of existing statistical sampling techniques provided the impetus for the development of PPS. The study also reveals that the Stringer's Plan, unlike existing plans, was tailored specifically to the needs of the auditor.

Second, the research reveals that Stringer, in what was probably the first use of behavioral research in auditing, successfully used a laboratory experiment to document the wide variation in auditing testing. The results of his research convinced the firm's management that a more objective method of testing needed to be developed. Stringer's success in documenting the problem and thus reinforcing the firm's commitment to his research efforts clearly illustrates the potential value of behavioral research.

Third, the study documents the manner in which Stringer engineered an interdisciplinary collaborative effort with Professor Stephan. This collaboration illustrates the potential of interdisciplinary efforts which attempt to adapt and apply scientific advances to the practice of accounting and auditing.

Fourth, the study illustrates the importance of creating within the firm an environment which is financially and philosophically supportive of research and experimentation. H&S's progressive policy regarding technological innovation provided Stringer with the support which he needed to accomplish his achievements.

Fifth, the research provides a concrete example of the importance of mentor-protegé relationships. Stringer, who viewed Gellein as his mentor during this period, believes that Gellein's encouragement and support were important factors in his success during this period. Such encouragement and support are especially important when the protegé is faced with the uncertainties and doubts inherent in any research undertaking.

Lastly, this study documents the pioneering efforts of Stringer as a means of providing younger members of the profession with a role model as well as instilling a feeling of professional pride and continuity.

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#### APPENDIX

The following is a reproduction of Stringer's questionnaire followed by the results which he compiled:

#### 1959 MEETING OF IN-CHARGE ACCOUNTANTS

#### **QUESTIONNAIRE CONCERNING EXTENT OF AUDIT TESTS**

This questionnaire is designed to contribute to our study of the problem concerning the extent of audit tests by obtaining a cross-section of the views and practices of our in-charge accountants. <u>It need not be signed</u>. Please answer all questions specifically and as promptly as possible.

The questions pertain to an examination of the following condensed hypothetical financial statements:

#### **Balance Sheet**

Current Assets:	Current Liabilities:		
Cash	\$ 1,900,000	Notes payable	\$ 1,000,000
Receivables	3,000,000	Accounts payable	2,000,000
Inventories	5,000,000	Accrued liabilities	1,000,000
Prepaid Expenses	100,000	Total	4,000,000
Total	10,000,000	Capital Stock	10,000,000
Property-net	15,000,000	Retained Earning	11,000,000
Total	\$25,000,000	Total	\$25,000,000

#### Statement of Income

Net Sales	
Costs and Expenses:	
Cost of sales	\$20,000,000
Selling and general expenses	4,000,000
Income taxes	3,000,000
Total	
Net Income	\$3,000,000

It is to be assumed that all items investigated in connection with the analytic review have been cleared satisfactorily.

- 1. The receivables include 2,000 accounts whose balances range from small amounts to a maximum of \$5,000, with no particular concentration of balances at any level. There are no accounts that appear to be especially old or otherwise unusual, and the internal control is good with respect to cash receipts, sales and receivables. State the total number of accounts you would select for confirmation and indicate briefly how you would select them.
- 2. What changes, if any, would you make in your confirmation program if the receivables consisted of 200 accounts with none exceeding \$50,000 and with other conditions remaining the same as in Question 1?

- 3. What changes, if any, would you make in your answers to Question 1 (2,000 accounts, none exceeding \$5,000) if internal control over cash receipts, sales, and receivables were bad but previous audits had not revealed material errors in the receivables?
- 4. The physical inventory includes 5,000 line items, the extensions of which range from small amounts to a maximum of \$5,000 with no particular concentration of amounts at any level. Perpetual inventory records show quantities and unit prices but they are not under general ledger control. The gross profit rate did not vary significantly from that of the preceding year. Inventory prices have not been rechecked by the client. How many items would you select for your test of inventory prices?
- 5. If your test of inventory prices revealed 5 errors resulting in a net overstatement of \$2,500 (overstatements of \$3,810, \$1,010, \$410, and \$310, and an understatement of \$3,040 in the extended amounts of the 5 line items) would you:
  - a. Consider the test satisfactory?
  - b. Extend the test? If so, how much, assuming no additional errors were found?
  - c. Take some other action? If so, describe briefly?
- 6. Your answer to Question 5 was undoubtedly based in part on your judgment as to the aggregate dollar amount of errors in the total inventory that would be material in relation to the above financial statements. What is the approximate maximum dollar amount of such errors that you would consider *immaterial*, assuming that there was no indication of fraud and that the amount given in your answer is before the income tax effect?
- 7. Your inquiries concerning the preparation and approval of vouchers indicates that internal control is good. The client issues approximately 1,000 vouchers each month. How many vouchers would you examine to afford satisfactory evidence of internal control in this respect?
- 8. If your test disclosed 3 instances of failure to comply with procedures which were necessary for control, but the vouchers appeared to be valid in all other respects, would you:

a.	control?
b.	Consider it unsatisfactory and proceed on the basis of bad control?
c.	Extend the test? If so, how many more vouchers would you consider it necessary to examine to satisfy yourself concerning control is no additional procedural or other errors were found?
А	Take some other action?  If so, describe briefly.

#### Stringer's tabulation of the results follows:

Question #1

Number of Sample Replies Size 

Indefinite

Sample

#### Ouestion #3

Questi	.0115
Number of	Sample
Replies	Size
1	100
1	125
11	200
2	225
2	250
5	300
7	400
2	450
10	500
1	550
2	600
2	667
1	750
1	800
5	1,000
_1	1,400
63	
<u>29</u>	Indefinite
92	

Average 235

Number of

#### **Question #4**

Number of	Sample
Replies	size
1	25
1	40
14	50
1	75
13	100
1	150
7	200
1	225
12	250
2	300
13	500
3	750
7	1,000
1	1,250
77	
_15	Indefinite
92	

Average 433

#### Ouestion #7

4	
Number of	Sample
Replies	Size
2	25
7	50
1	75
15	100
1	125
2	150
7	200
4	250
4	300
1	350
10	500
_10	1,000
64	-
_28	Indefinite
92	
_	

Average 334

Average 318

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## THE INSTITUTIONAL EFFECTS OF LEADERSHIP: THE UNITED STATES GENERAL ACCOUNTING OFFICE AND ITS AUDIT REPORT REVIEW PROCESS

Abstract: In accounting research, the role of organizational leaders has been underrepresented. The limited research dealing with leadership issues has focused on the impact of leadership on micro activities such as performance evaluation, budget satisfaction, and audit team performance. The impact of leadership on the structure of accounting and audit systems and organizations has been ignored.

This paper focuses on the impact that past Comptrollers General have had on the working and structure of one federal audit agency, the United States General Accounting Office (GAO). In addition, it also focuses on the influence of the two most recent Comptrollers General on one important audit related activity, i.e., the audit report review process. Using qualitative field research methods, this paper documents how the organizational leadership impacts its long-term audit practices and thereby influences auditing, especially in the public sector.

Few would question that leadership has an effect on the goals and structure of complex organizations [Galaskiewicz and Shatin, 1981, p. 434].

The effect of organizational leadership on an organization's structure and processes has been documented in the management literature [see for e.g., Kanter, 1977; Granovetter, 1974]. More recently, the management literature has observed that the study of organizational leadership is worthy of concern [Cunningham, 1992] due to the impact that these leaders have on the work processes of organizations. Organizational leaders often have ideological patterns [Covey, 1991] which are imbued

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in organizational structures and processes, thereby affecting quality management [Farguhar, 1991], organizational performance [Hoffman, 1989] and ultimately, the survival of the organization itself [Hasenfeld and Schmid, 1989].

In accounting, the effect of leadership has been examined with reference to budgeting issues [Brownwell, 1983] and performance evaluation [Hopwood, 1974]. In the auditing arena, leadership has been studied with particular focus on its effects on audit team performance, audit task complexity [Jiambalvo and Pratt, 1982] and dysfunctional auditor behavior [Kelley and Margheim, 1990]. However, this prior work had focused on auditing in the private sector. In contrast, there has been relatively little research on examining the effects of leadership in public sector auditing.

The United States General Accounting Office (GAO) is an extremely important audit organization whose oversight activities cover all agencies that receive federal funding (except the Central Intelligence Agency). That includes the \$4 trillion public debt, the \$1.5 trillion federal budget and the \$250 million annual interest on the debt. The chief executive officer of the GAO is known as the Comptroller General. As the leader of such an organization, the Comptroller General has the ability and opportunity to influence the structure and direction of the audit activities of the GAO. In particular, with reference to the researcher's fieldwork, past Comptrollers General have placed a great deal of attention on modifying the primary vehicle with which the GAO communicates with such external constituents as Congress and the press.

This primary vehicle is in the form of audit reports which are important to Congress as support for testimonies relating to the effective discharge of its stewardship function. This is documented by their use, in as many as 217 testimonies in 1989 [GAO, 1989] and 306 in 1990 [GAO, 1990] an increased demand of 41% in one year. According to Walker [1986, p. 131], these audit reports also allow members of Congress to claim credit in the eyes of the press and others for identifying and acting on pervasive problems in government. The press, in turn, uses GAO audit reports as an information source on government operations.

The first draft of the audit report is essentially a team effort that almost exclusively involves only the audit team members located in the practitioner component of the professional bureaucracy [Freidson, 1986; Mintzberg, 1979]. Thereafter, this first draft goes through a review process by such members of the administrative component [Freidson, 1986] as the report review staff within divisions and the offices outside of the division such as the Office of General Counsel (OGC), and the Office of the Chief Economist (OCE). It is during this process that the report is modified and refined into a final product.

In 1978, a task force of the Government Oversight Committee, chaired by Congressman Jack Brooks, reported on the GAO's view of report review by commenting that "each proposed report must be reviewed at appropriate levels within the office, to make sure that it is of high quality and that it conforms to their approved policies and standards" [p. 33]. It was this task force that identified lack of report timeliness as being a major complaint against the GAO. On this subject, a member of the GAO History Program who participated in the study observed, "the audit report review process has often been considered the cause of lack of timeliness by the GAO in presentation of its reports." The member also said, "Because people outside are scrutinizing the reports, the GAO would rather be right and late than on time and wrong." The emphasis on being "right" has manifested itself in the rigorous audit report review process of the GAO.

The purpose of this study is two-fold. One purpose is to examine the influence of past Comptrollers General on the overall workings of the GAO. The second purpose is to examine the influence of the two most recent Comptrollers General (i.e., Elmer Staats and Charles Bowsher) on one of the more important activities of the GAO, i.e., the audit report review process.

#### RESEARCH CONTEXT AND METHODS

#### Research Context

The United States GAO, headed by the Comptroller General of the United States, was formed by Congress in 1921 as a result of the Budget and Accounting Act of 1921. It was intended to be an independent, non-partisan agency whose purpose was to assist in Congressional oversight of the executive branch of the Federal government. In the United States, the Constitution gives final authority over public finances to Congress. The GAO is responsible to the Congress to provide information it needs about the safeguarding and administration of public funds. This

assistance takes the form of audits, which serve as preventive control by identifying illegality, fraud, waste, extravagance, and reports on the soundness of policies, programs, and projects [Brown, 1970, p. 9].

As Charles A. Bowsher, Comptroller General of the United States (GAO, 1987), observed:

... as an arm of the Congress, GAO's basic mission is to look for ways in which the government can better and more efficiently meet the needs of the people.

The GAO, as an organization, has received relatively little research scrutiny. Rourke [1978] attributed this lack of academic attention to the image of the GAO as an agency concerned exclusively with routine fiscal auditing. However, the GAO now undertakes audits of a general policy-oriented nature such as the evaluation of programs in terms of efficiency and conforming to legislative intent.

#### Research Methods

The current study could be classified as a qualitative interpretive field-based study which attempts to solicit the interpretations and impressions of important organizational actors involved in the GAO audit report review process concerning events that have already taken place. In addition, the researcher used unobtrusive techniques such as archival analysis to capture the formal, documented aspects of this process.

#### Interviews

One of the most important aspects of field research is gaining access to the setting of interest [Berg, 1989]. Toward this end, the researcher had conducted semi-structured interviews with GAO employees at various levels in two phases of data gathering. The purpose of these early interviews was to gain a general understanding of the institutional and the technical environments of the GAO and to establish personal contact based upon which the second phase could be founded. During the first phase, interviews were sporadic and were preceded and followed by extensive research on the GAO and available documentation. Before the second phase of the study (i.e., the fieldwork) could be initiated, extensive telephone interviews were conducted with such individuals as the Associate Director of one GAO Division as to who would function as a liaison for the

study and how the study was to be conducted. It was important and necessary to have a liaison office to legitimize the activities of the researcher in the eyes of the organizational participants and also to facilitate the data gathering process.

Intensive and extensive interviews were then conducted with a sample of members of the GAO spanning all levels involved with the audit report review process. These members included the senior-most members of the GAO such as Charles H. Bowsher, the Comptroller General of the GAO, Elmer Staats, the former Comptroller General of the GAO (1966-1981), Assistant Comptroller Generals, Directors, and Assistant Directors down to senior evaluators and evaluators. These individuals spanned a variety of functions, ranging from the practitioner and administrative components within the divisions sampled, to the administrative components outside of these divisions. In addition, members outside the GAO such as press reporters, Congressional staffers, and agency officials were interviewed to provide an outside perspective as to the audit report review process and audit reports.

## Archival Analysis

To add strength to the data gathered during the interview phase, concurrent reviews and studies were undertaken of both private and public archival material. To grasp a more complete understanding of the review process, the "master product folders" of three jobs of three divisions of the GAO were requested. The "master product folder" is a highly confidential file containing, among other things, sets of report drafts with comments from various GAO members as it moves through the review pipeline. As a result of this confidentiality, the GAO members requested that no copies be made of the contents of these folders, a condition to which the researcher adhered.

In addition, newspaper reports in *The Wall Street Journal*, *The New York Times*, and *Washington Post* were analyzed to check for any references to the specific GAO audits that were reviewed. *The Congressional Record* was also reviewed in a similar fashion.

In addition to a review of the newspaper indexes to check for references to specific audits during the period of the audit, the indexes of *The Wall Street Journal*, *Washington Post*, *The* New York Times, Los Angeles Times, Christian Science Monitor, Chicago Tribune, Boston Globe, and the Atlanta Constitution were reviewed for a citation count of the GAO press coverage over the past five years.

## History of GAO Leadership

To keep the GAO relatively free from political involvement, the two top officials of the GAO, the Comptroller General and the Assistant Comptroller General, have fifteen-year appointments. They are appointed by the President of the United States, subject to Senate confirmation, and are only removable by a joint resolution of Congress for clearly specified reasons. This removal clause allows the GAO leadership to operate independently of executive interference. It was this clause that caused President Woodrow Wilson to veto the Budget and Accounting Act in 1921 [Trask, 1991]. Wilson thought that the power to remove should lie within the President's office. However, President Harding signed the bill in 1921, thus creating the independent Comptroller General.

## Comptroller General John Raymond McCarl

John Raymond McCarl was the first Comptroller General of the GAO. He was a lawyer by profession and therefore looked upon the problem of accounting for public money, not as an accounting problem, but rather as a legal one, where legality was defined by Congressional intent. The authority of the Comptroller General to countersign expenditure warrants made the legality question of paramount importance to agencies. To avoid the embarrassment of being turned down, the agencies consulted with the GAO to make sure that their disbursements conformed with the GAO's interpretation of Congressional intent.

McCarl, himself, received mixed reviews [Flesher, 1993; Mosher, 1984]. On the one hand, he was lauded for his conformance with the letter of the law. On the other hand, this conformance made him appear to be inflexible and despotic. It was during his tenure that the *Division of Law* was renamed the *Office of General Counsel* (OGC) in 1928. In 1930, this legal office had 29 attorneys recovering over a million dollars in debts owed to the United States Government. During McCarl's tenure, the OGC also prepared as many as 784 reports for Congress and the President, along with over 5,000 legal decisions.

## Comptroller General Lindsay Carter Warren

Lindsay Carter Warren was the second long-tenure Comptroller General of the GAO and was appointed by Roosevelt in 1940. Warren's tenure saw two notable events taking place; the first was the *New Deal*, which resulted in larger problems for the GAO by creating more agencies with larger budgets and greater discretionary powers for public servants [Falker, 1986]. Secondly, America's participation in World War II sent government expenditures skyrocketing.

After World War II. Warren instituted a number of innovations in the GAO's mode of operating. He started working with agencies in a more cooperative manner than did his predecessors. Aside from compliance audits, Warren broadened the GAO's audit functions to review audit systems and management effectiveness of agencies [Flesher and Flesher, 1989]. He did away with the centralization of GAO activities and established the practice of on-site audits. After Congress passed legislation in the early 1940s requiring the GAO to audit military expenditures, Warren established as many as 276 on-site locations for contract audits. This was necessary in order to be able to deal with the volume of payments to be made, claims to be settled from war contractors and armed force members, and auditing of transport payments. He also established regional offices outside of Washington, D.C., both within the country and outside of it, starting with Europe and thereafter in East Asia and Latin America.

## Comptroller General Joseph Campbell

Joseph Campbell was appointed as Comptroller General in 1955. Campbell was an accountant by profession and was first appointed to the Atomic Energy Commission before being nominated by President Eisenhower as the Comptroller General of the GAO. His initial appointment was blocked by Democrats who were not pleased with his involvement while he was with the Atomic Energy Commission in the Dixon-Yates project, an Eisenhower proposal to provide electric power to the city of Memphis by bypassing the Tennessee Valley Authority (TVA) and working instead with the Atomic Energy Commission. He was considered to be an extremely tough leader who believed in working through the hierarchy of the organization. He was in-

tolerant of mistakes and expected to have information about audits at his fingertips.

As a professional accountant, he believed that audits were conducted to identify mistakes and consequently encouraged the GAO auditors to place their emphasis there. Campbell's audit approach alienated him from both the departments and agencies as well as some elements in Congress who thought that the GAO had become overly aggressive. It was Campbell's philosophy of trying improve the auditing of defense work that resulted in the rapid increase of reports dealing with defense contracts. This number went up from 48 reports in 1964 to 57 in 1965. However, strongly worded, negatively oriented titles resulted in objections from both the Department of Defense (DOD) and defense contractors [Task, 1991]. This agenda resulted in the Holifield Hearings of 1965 which was chaired by Chester Holifield, a Democrat from California. The hearings expressed a dissatisfaction with the style, format and content of GAO reports; the handling of confidential data, and the naming of officials in reports etc. This report resulted in a change of GAO procedures and, some say, even in leadership. Campbell sought and was granted premature retirement due to ill-health. He was succeeded by Elmer Staats.

## Comptroller General Elmer Staats

Elmer Staats was appointed as Comptroller General in 1966. Staats held a doctorate in Public Administration from the University of Minnesota. He was regarded by many to be extremely politically conscious and sensitive to Congressional needs, both Democrat and Republican. Having been a director with the Bureau of Budget (BOB), he was well aware of the workings of Capitol Hill.

Staats believed in better government and instituted program evaluation audits in a more pervasive manner than did his predecessors. Unlike Campbell, Staats did not place as much emphasis on the auditing of defense contracts, preferring to concentrate on evaluation of such social programs, such as the poverty program. Congressional requests were welcomed and personal relationships with Congressional staffers were encouraged. GAO's services to Congress were expanded by adding advisory services in reviewing and drafting proposed legislation. In addition, Staats broadened the employee expertise at the GAO,

consistent with the renewed focus on program auditing, by employing larger numbers of non-accountants.

Another notable step under Staats' leadership was the participation in the International Organization of Supreme Audit Institutions (INTOSAI) founded in the early 1950s in Vienna, Austria. The INTOSAI is a consortium of supreme audit agencies, like the GAO, from various countries. It currently has a 150 members and holds regular triennial international conferences designed to advance and develop more effective audit approaches in governmental auditing.

In summary, under the Staats leadership, the GAO went a long way toward establishing its legitimacy in the eyes of Congress. Elmer Staats retired in 1981 and was succeeded by Charles Bowsher, the current Comptroller General.

Just before appointing Charles Bowsher in 1981, President Reagan made it a point to emphasize his own administration's efforts to attack the problem of waste and to acknowledge the GAO's contribution in this regard. In a memorandum issued to all heads of agencies and departments on March 26, 1981, he said.

I expect each of you to provide the necessary support and cooperation to ensure that our objective is accomplished. One specific action I am asking you to take is to designate a top level individual who will have the responsibility for following up on the recommendations of your official who is responsible for coordinating efforts to eliminate fraud and waste and the recommendation of the *General Accounting Office* (emphasis added).

## Comptroller General Charles H. Bowsher

The current Comptroller General, Charles Bowsher, was appointed by President Reagan on July 9, 1981 for a period of 15 years. Charles Bowsher received his bachelor's degree from the University of Illinois in 1953 and a master's degree from the University of Chicago in 1956. He served as the Assistant Secretary of the Navy from 1967 to 1971 where he was in charge of financial management and had fiscal responsibilities of about 20 billion dollars with about 4,500 people working under him. During his tenure as Assistant Secretary, Bowsher had several interactions with members from the GAO, Organization of Management and Budget (OMB), and Congressional Committees.

From 1971 until his appointment to the helm of the GAO, Charles Bowsher was a managing partner with Arthur Andersen & Company in Washington D.C., specializing in the government sector.

Mr. Bowsher has generally followed Elmer Staats' agenda, continually attempting to improve the image and work processes of the GAO. In recent times, he has been involved with the issue of deficit reduction. In this regard, he observed that

Nineteen-Ninety was the year in which the budget crisis came to dominate the nation's political agenda. Both in the administration and on Capitol Hill, policy makers finally faced the facts about the deficit. (GAO, 1990, p. 2)

He has encouraged GAO employees to testify before Congress as evidenced by a dramatic 41% increase in the number of testimonies given by GAO employees in 1990 over 1989.

As indicated earlier, one of the purposes of the paper is to examine the influence of the two most recent Comptroller Generals (i.e., Elmer Staats and Charles Bowsher) on the GAO audit report review process. This is discussed in the next section.

## A HISTORICAL PERSPECTIVE OF GAO LEADERSHIP IN THE DEVELOPMENT OF THE AUDIT REPORT REVIEW PROCESS

The Staats Years

Staats headed the General Accounting Office from 1966 till 1981, and much of what the GAO does today is attributed by participants to his leadership initiative. During an intensive interview conducted as part of the current research, Mr. Staats recounted that, after terms at the Office of Management and Budget (OMB) and Program Planning and Budget (PPB), he took over the GAO with a view to ascertaining how best the GAO could serve Congress. He observed,

Upon my conversations at the Hill, I found that the Hill on average did not appreciate GAO work and found it not relevant. In most cases, GAO work was considered irrelevant in terms of subject matter and slow in terms of timing. About that time, only 8% of GAO work was Congressionally requested.

In order to improve the GAO's usefulness to Congress, one of the primary areas that Elmer Staats focused on was the audit report. In a memorandum to his staff dated February 24, 1970, Mr. Staats stressed the need to improve the language of audit reports. In that memorandum he said:

The language in many GAO reports continues to be of concern to me. In general, the reports are reasonably clear, if carefully read, and the information presented is usually convincing. However, the quality of the language used in many instances could be substantially improved. Too often, language is repeated unnecessarily, and the language is stilted, unnecessarily complicated, ponderous and sometimes even a bit pompous.

In seeking to establish an action agenda, Elmer Staats thought it necessary to begin this task by tracing GAO's mission back to its legislative history from the Budget and Accounting Act of 1921, both in terms of its stated and apparent intent. His interpretation led him to believe that the GAO's role in government accountability was to conduct financial compliance, efficiency/economy and program results audits all of which were subsequently articulated in Government Auditing Standards [e.g., GAO 1972; 1981; 1988].

By establishing this, the GAO was able to extend its range of audit activities from the *voucher audits* of old to economy/ efficiency and program results audits. This new jurisdictional domain, in turn, allowed the GAO to develop standards of audit conduct to cover the new types of audits. In addition, the GAO also specified standards for their audit reports as guidance for their auditors. It specified that the contents of the audit reports should have sections on objectives, scope and methodology, audit findings and conclusions, and the causes of agency problems and recommendations for improvement.

As mentioned above, the extension and articulation of audit report requirements in the *yellow book* allowed Mr. Staats to then establish a basis for audit report review. Importantly, he felt that the audit report was an "institutional product," not one to be attributed to any one individual or audit team, but to the organization as a whole. To increase the quality of these reports, among other things, Mr. Staats worked with a panel of consultants from different backgrounds allowing him to utilize a diverse range of expertise. Out of this consultation, Mr. Staats instituted a form of centralized report review so that "an institu-

tional consistency in the report was achieved to some extent". This centralized report review function was to be housed in an administrative component [Freidson, 1986] of the GAO, known as the Office of Policy (OP). To Mr. Staats, this report review function was a way of ensuring report quality in terms of its technical characteristics. In a memorandum issued in 1979, he said,

Procedural controls are available to help ensure the quality of the final report. These controls include the independent verification of the facts, findings, conclusions and recommendations contained in the report; careful review by those responsible for the report; and advanced review by program administrators and other officials responsible for the program being evaluated . . the independent verification of all the facts contained in the report is an important quality control procedure.

Consistent with this view, Mr. Staats observed when interviewed, "The only way the GAO can survive is through its credibility, non-partisanship, and professional competence."

#### The Bowsher Years

Staats's successor, Charles Bowsher, shared many of the concerns that Elmer Staats's expressed and built on Staats's progress in adding quality to GAO reports. In this regard, Bowsher set up a Reports Task Force (RTF) in the early part of his tenure to address the issue of audit report quality. This task force was headed by Ira Goldstein, who is now with Arthur Andersen in Washington, D.C., Charles Bowsher's former organizational affiliation. In order to get a feel for the motivation that led to the Reports Task Force (RTF), an extensive interview was conducted with its former chairman, Ira Goldstein.

Goldstein recounted that while Bowsher was at Arthur Andersen, he used GAO reports and therefore had some prior impressions concerning their quality, believing that GAO reports were "not very professional." The Reports Task Force emerged as a consequence of a meeting where Charles Bowsher shared his concerns about GAO report quality. The RTF activity was held in two phases: a preliminary scoping phase of about three weeks and a second more detailed phase of about six months. During the second phase, a core of senior GAO managers including Mr. Goldstein closely examined approximately 100

GAO reports and tried to develop standards for report quality by rating the reports. It was thought at the time that the concept of quality was largely "cultural" and "dependent on the individual reading the report".

Based upon the collective experiences of this task force, and on receiving extensive feedback from Congress, the RTF came up with a list of ten items that would comprise report quality. These items included usefulness, timeliness, accuracy, completeness, constructiveness, convincingness, objectivity, clarity, simplicity, and conciseness. The RTF also recommended that the focus on quality be built into the front end of the job rather than during the report review stage. At that point, there was less disagreement on the components of quality but more on whether the individual reports that had been examined by the Task Force met those standards.

To help in disseminating this message of quality to the rest of the organization, a centralized office called the Office of Quality Assurance (OQA) was established. The OQA became the new centralized report review office, taking over the function from the Office of Policy in 1983. It was judged that the OQA could function as a place where GAO employees could be trained in the concept of report quality and where auditor would be given greater interaction with report reviewers, thereby developing a "collective consciousness" in a Durkheimian sense [Aron, 1967, p. 15]. The purpose behind developing a common consciousness of a quality report was to allow the GAO to move in the direction desired by Charles Bowsher. As a result of this endeavor, Mr. Goldstein observed that "over a period of time, the senior members of the GAO began to get a sense for what Mr. Bowsher's philosophy of quality meant." The OQA also tried to instill this in a more widespread manner by holding presentations and training sessions for GAO employees.

Eventually, the division heads thought that, given sufficient resources, they could handle the responsibility of report review at the divisional level. The OQA continued to spread the message of quality by training report reviewers for divisions, experimenting first with the Resources, Community and Economics Division (RCED), and then with other divisions. It was then up to the division heads to disseminate the message of report quality to their subordinates, such as Issue Area directors, and for them to extend the message downwardly. Once it was felt that progress had been made, the OQA was disbanded in 1986.

## Report Timeliness

The GAO, however, has not been without its critics. In 1985, the Brooks Committee, chaired by Congressman Jack Brooks of the Government Oversight Committee, criticized the GAO for lack of timeliness in processing its reports. The Committee report indicated that its members thought the GAO took an inordinately long time to process its reports through report review once the fieldwork was completed.

The issue of timeliness has existed since the early 1970s and the problem was recognized as such by Elmer Staats. He attempted to rectify the situation and improve the processing of reports [memoranda dated March 29, 1972; and May 1974] by keeping track of delayed reports on a monthly basis in order to expedite their publication. On this point, a Congressional staffer who participated in the study observed that "Congress needs information quickly to make decisions. The review process is necessary, but is probably an overkill. They could kill half the levels on review and still not lose too much." Staats went on to point out that, in his opinion, "the GAO was an ivory tower, a think-tank that needed its time to function." At the same time, he acknowledged the efforts of Charles Bowsher in attempting to correct the situation.

In support of the staffer's assertion, Bowsher issued a memorandum dated September 6, 1985, titled "Improving GAO's Responsiveness to Congressional Requests." In this document, Mr. Bowsher indicated that feedback from Congress continued to criticize the timeliness or the lack of it on GAO's part in meeting deadlines and issuing audit reports. In order to facilitate improvement, Bowsher suggested a greater involvement on the part of Congressional staff at targeting specific areas of audit of more use to them where time might be of the essence. He observed that:

Over the last few years, we have undertaken several efforts to improve our capacity to address the needs of the committees and the members of Congress. We have improved report quality, refocused on issue area plans, and reorganized the GAO to better accomplish its mission.

We recently launched a program taking a comprehensive look at how we do our work. The Assistant Comptroller General for Operations and a steering committee of senior GAO members have developed an approach

that will involve everyone in further improving GAO operations, primarily regarding timeliness and overall efficiency of our work.

#### CONCLUSIONS AND FUTURE RESEARCH

In the early years of the GAO's existence, Comptroller General Raymond McCarl focused the GAO's activities on enforcing agency compliance with the letter of the law. As a result, under his tenure, the Division of Law was born which is now known as the Office of General Counsel (OGC). At the same time, his lack of on-site auditing resulted in work backlogs with lack of attention from Congress. Comptroller General Warren inherited the GAO at a time when government was getting much larger. He professionalized the GAO as an audit agency by conducting on-site audits, instituting a comprehensive audit program and setting up various regional offices all over the country and even abroad. Comptroller General Campbell continued to professionalize by recruiting heavily from colleges and universities. However, his policy of aloofness alienated the GAO from the agencies and Congress partially resulting in the Holifield Hearings in 1966 and thereby damaging relations with both constituents.

Comptroller General Staats improved relations by expanding the scope of GAO audits to concentrate the Agency's efforts on performance audits and service to Congress. Comptroller General Bowsher continued on Staats' path by focusing on the Congressional customer and attempting to increase GAO resources.

In the area of audit reporting, the roles of Elmer Staats and Charles Bowsher have been extremely important. Staats' proactive approach in focusing on the Congressional customer allowed him to define government accountability, broaden the audit scope of GAO audits and thereby generate audit reports spanning a wide range of government issues. This meant, among other things, focusing on the language of the audit report in an effort to improve its comprehensibility. Guidelines for audit reporting were articulated in the GAO 'Yellow Book' and enforced by report reviewers in a centralized report review wing of the GAO. This allowed the GAO to work towards standardization of the audit report in a manner consistent with Elmer Staats' initiative.

Charles Bowsher also realized that the GAO audit report was extremely important and formed a Reports Task Force (RTF) to help study the quality of GAO reports. After centralizing the audit report review process in a unit known as the *Office of Quality Assurance* (OQA), the process was then decentralized to operating divisions. In fact, the audit reporting process as it is today, is a result of the directives of both Elmer Staats and Charles Bowsher.

Past research in accounting and auditing has focused its attention on the effect of leadership on the accomplishment of specific tasks and the effect on team performance. In contrast, the study of leadership on organizational activities and structure has been underresearched. This paper demonstrates how organizational leaders' perceptions and reactions to the organizational environment impacts the long-term operations and structure of an organization.

A federal audit agency like the GAO operates in an environment where the demands of multiple constituents have to be satisfied in order to assure long-term survival and legitimacy [Meyer and Rowan, 1977; DiMaggio and Powell, 1983; 1990]. As the high profile leader of such an organization, the Comptroller General has to be able to set the tone for quality audit work at the GAO, assure Congress that it is meeting its audit oversight needs and demonstrate non-partisanship and objectivity in the conduct of its audit engagements. The initiatives of the organizational leader have not only short-term, but also long-term implications in their effect on accounting and audit activities, a point that is often overlooked in accounting research.

An important audit organization like the GAO has a great deal of impact on legislation and public perceptions through its audit reporting and other related activities. Future research involving the GAO could focus on the historical relationship of the GAO and various audited agencies over the years. The role of leadership in these relationships could be studied to provide insight into the influence that various Comptrollers General have had in its development. Further research in the audit reporting area could examine the ways in which GAO reports are used by Congressional members to satisfy their own political agendas and how it may impact the funding of federal programs.

This paper has attempted to address some research gaps by examining the historical role of past GAO Comptroller Generals in general and the audit report review process in particular. It is hoped that this paper would prompt accounting researchers to

examine the extremely important role of organizational leaders in their study of accounting issues.

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# 1993 ACCOUNTING HALL OF FAME INDUCTION: RICHARD T. BAKER

## INTRODUCTION

by
Ray J. Groves
Chairman, Ernst & Young

Richard T. Baker is best described as a great leader in everything he has done: athletics, business, civic and charitable, education, and professional.

Dick Baker's leadership is exemplified by his unique ability to urge his colleagues to perform to their highest potential. Characteristic of a good leader, he achieved by providing others the opportunity and encouragement to achieve, and then by giving them the recognition for their accomplishments.

Progressing rapidly in the profession during a period when there were major distinctions between partners and staff, Dick continually strived to reduce these barriers. He was very successful in developing a collegial environment in Ernst & Ernst, where every person was treated with respect for their respective individual abilities regardless of their position. The result was the improved realization of everyone's talents.

Long a strong proponent of education, Dick led his firm to design, construct, and staff an education center for the professional education of its people, as well as for others in the academic and business community. He also encouraged continuing education throughout a person's professional career, realizing that rapid changes in the business environment required that each professional's skills be continually updated and enhanced.

Dick Baker always encouraged the profession to address and resolve its challenges and problems through its own efforts rather than by looking to the government. He believes that the private sector is capable of making even greater contributions to our economy and our well being through utilizing and organizing the many capabilities of its private citizens. Throughout his career, Dick freely gave his personal time and resources to many civic, business, and educational leadership positions.

In summary, Dick is a man who has challenged himself and others to achieve their personal best, while always being fair to and respectful of every person. It is a personal privilege and pleasure to know him and to have worked with him.

#### INDUCTION CITATION

by Thomas J. Burns Deloitte and Touche Professor The Ohio State University

Always a leader, his lifetime, like Gaul, can be divided into three parts, each one crowned with distinction and widespread recognition. In the first phase, he achieved the ambition of every American schoolboy to become a national champion athlete. In his maturity, he rose through the ranks of his public accounting firm to become its managing partner and worldwide leader for over a dozen years during a period of increased awareness of an accounting information, great professional growth, and major social change. In the third phase, for a fifteen year period, he served on the boards of directors of seven Fortune 500 companies (none of which were clients of Ernst & Ernst). In 1986, he was selected by the National Association of Corporate Directors as the Outstanding Director of the Year. On all seven companies, he was chairman of their increasingly powerful audit committees. Now retired from all boards except one, he plays golf. fishes, and hunts a little and has time to enjoy the accomplishments of others including those of his four college degreed children and playwright son.

He also keeps close tabs on the pronouncements of the Financial Accounting Standards Board. Born during World War I in Anderson, Indiana, he was educated in a one-room school house through the sixth grade. He was the voungest of three sons of a father who worked for General Motors-Delco Remy Division for 35 years at a managerial level. In Anderson High School, Dick achieved the dream of every Indiana youth. In his senior year, he starred on the basketball team which won the state championship and was named on the all-state team. He came to Ohio State with only a waiver of the out-of-state tuition to play basketball and to major in accounting. He worked part-time as an assistant trainer to support himself for four years. His many honors included being elected president of his fraternity, president of an all-university honorary and president of his senior class. He was on the basketball team from his sophomore year on. In his senior year, he led the team to the Big Ten Championship and received All-American honors. The team was defeated in the final game of the first National College Championship in 1939.

After graduation, the only one of his family to do so, he married Marty, the Ohio State senior prom queen, who continues as his wife over 50 years later. In 1939, the country was still recovering from the Great Depression, jobs in public accounting were difficult to get and notwithstanding his academic record, he went with Goodvear. Six months later, he was hired temporarily with the firm A. C. Ernst had started in Cleveland in 1903. After the busy season, the firm let go many of the temporary hires, but not, of course, Dick Baker. He rose through the ranks, still as a temporary hire, until he became managing partner, a post he held for 13 years. He refined A.C.'c concepts with emphasizing client services by having the most offices of a firm, always offering management services, and by stressing interaction of its members with its clients, the business community, and beyond. During four wars and thirty-seven years with the firm, he switched the firm's role from avoiding involvement in national and global accounting policy to one of being the most effective and respected participants in these matters. He faced an ever increasing demand for reliable and comprehensive financial information. This rising demand brought about increasingly active capital markets and the expansion of American business. Accounting became front page news as society pressed through courts and Congress for more publicly available accounting. He led his firm to become a leading participant in meeting these challenges and in vindicating the accounting profession as a vital and effective private-sector financial information function. The firm's direct involvement was supported by extensive and widely disseminated publications. Examples of programs, once unique, were the faculty assistance program for minority colleges, a leave of absence salary continuation, annual academic seminars, schools of accounting, and accounting accreditation. His leadership demonstrated an understanding of social issues and the needs of education. For decades he has shown extraordinary leadership in the voluntary sector now called United Way. He has long been active in Blue Coats. Inc., an organization which gives assistance to families of police and firemen killed in the line of duty. He helped arrange the Metropolitan Opera cross country tours. He served on the founding Ohio Board of Regents which formulated a master plan for higher education in Ohio. Without parallel, for his dedication as an alumnus, he has been

awarded two honorary doctorates and was named as the National Public Accountant of the Year.

Without peer for achieving equilibrium of the firm's professional integrity, professional innovation and entrepreneurial competitiveness, he is the 53rd Accounting Hall of Fame Member,

## RICHARD THOMAS BAKER.

#### RESPONSE

by Richard T. Baker Chairman Emeritus Ernst and Whinney

Many thanks, for those very nice comments about me. I am reminded of the time that Ohio State invited our 1939 Big Ten champion basketball team back to celebrate our fiftieth year reunion. It was fun to be back with my former teammates to reminisce about old times and before the weekend was over we weren't even missing any of our warm-up shots. Nothing was said about our losing the final game to Oregon State in the very first NCAA tournament. Thankfully, our memories over time have a tendency to treat us kindly and I must tell you they have pulled out all the stops today on my behalf.

For a guy who is going to be 76 years old in less than a month, and is a loyal graduate of Ohio State University, this recognition is truly an unexpected honor. I am also indebted to all of you for coming here before breakfast, to help me celebrate this recognition.

When I retired from Ernst & Ernst sixteen years ago, I received a binder of over sixty letters from college professors who were very close personal friends of mine. This binder had been prepared by Don Edwards. I miss those associations that had been so beneficial to me during the years that I was with E&E.

As mentioned, after my retirement from E&E, I began a second career by going on the Boards of Directors of some outstanding companies, including General Electric, Hershey Foods, Anheuser-Busch, International Paper, Textron, and Louisiana Land & Exploration. It has been a wonderful way of extending my usefulness to the business community and has given me an excellent opportunity to see the other side of the fence as far as business is concerned. Last, but not least, it has paid very well.

I think that is enough about my career and now I would like to devote the remainder of my time discussing your careers and the possible ways that you might enhance them somewhat in the same way that I did mine. Let me first give you my view as to the way things are now and why it offers you new opportunities to continue doing what you now are doing and supple-

menting it by going on some boards of directors of public companies.

This may not appeal to all of you, but it certainly should appeal to some of you. I am not sure how many of you are now serving on boards of public companies, but I am confident that you all have the basic training and talent to make outstanding board members.

Here are some of the reasons that this opportunity is more available to you than ever before. There are many changes in the way our business community is being challenged including the basic concept of the governance of our publicly-owned corporations. Here is just a brief outline of some the significant changes:

- 1. The Board of Directors is no longer comprised primarily of CEOs of other public companies with basic overlaps being the norm, rather than the exception.
- 2. In a large majority of cases, the CEO is restricted from being on more than one or two other public companies.
- 3. No longer are the lawyers, bankers and suppliers who work with the corporation automatically considered prime candidates for the board.
- 4. Institutional investors are challenging the relationships of the CEO and the board members.
- 5. A few years ago, the certified public accountants added this sentence to their reports on financial statements: Quote "The management of the company is responsible for their financial statements."
- 6. Corporations are being forced to make a decided effort to get a broad-gauged board which can deal with the many new complicated problems, such as the vast government regulations, the increasing number of lawsuits, international operations, and the ongoing accounting changes prescribed by the Financial Accounting Standards Board.

If I could digress for just a minute — Dennis Beresford, Chairman of the FASB, is with us this morning. Denny, for many years, was a partner with E&E and is now in his second term and is doing an outstanding job as Chairman. It's not easy being a member of that board. Imagine the difficulty of explaining the current issue — accounting for stock-based compensation — the exposure draft consists of exactly 100 pages of explanation of why and how this issue is to be handled.

(Dennis Beresford, FASB Chairman), many of us remember

that General Eisenhower took the better part of one page to outline the successful battle plan for World War II!

I have outlined six major reasons why the public companies are widening the field for directors and why professors of accounting should qualify for consideration. With the new responsibilities placed on management for the financial statements and the increasing complication of the accounting rules, management needs someone on the board that understands accounting in detail and can help protect the company by serving on the audit committee.

The best sources of this talent are those that have spent their careers in accounting and foremost would be retired public accountants and teachers of accounting. You people qualify for this and the big question is how do you go about getting invited. This is complicated, but it can be done.

First, please understand, you must initiate a program of getting acquainted with the management of the company. Second, you must demonstrate that you can be helpful!

A classic example could be the contemplated change in the handling of accounting for stock-based compensation. Many companies are not pleased with the proposed change and would be delighted to have your input on it — especially if you really agree with them.

Each of you should work out a program that you are comfortable with.

I am going to close by telling you of an incident that occurred shortly after I became the managing partner of E&E. A long time friend who had become president of a large company called me and said that they were unhappy with their auditors and that they were going to make a change. I obviously was pleased and asked what do you want me to do? He replied "nothing, you make your friends before you need them."

I hope you will take this suggestion seriously. I will be watching for your names on the proxy statements.

Thank you very much.

## THE ACCOUNTING HALL OF FAME MEMBERSHIP

Year	Member
1950	George Oliver May*
	Robert Hiester Montgomery*
	William Andrew Paton*
1951	Arthur Lowes Dickinson*
	Henry Rand Hatfield*
1952	Elijah Watt Sells*
	Victor Hermann Stempf*
1953	Arthur Edward Andersen*
	Thomas Coleman Andrews*
	Charles Ezra Sprague*
	Joseph Edmund Sterett*
1954	Carman George Blough*
	Samuel John Broad*
	Thomas Henry Sanders*
	Hiram Thompson Scovill*
1955	Percival Flack Brundage*
1956	Ananias Charles Littleton*
1957	Roy Bernard Kester*
	Hermann Clinton Miller*
1958	Harry Anson Finney*
	Arthur Bevins Foye*
	Donald Putman Perry*
1959	Marquis George Eaton*
1960	Maurice Hubert Stans*
1961	Eric Louis Kohler*
1963	Andrew Barr
	Lloyd Morey*
1964	Paul Franklin Grady*
	Perry Empey Mason*
1965	James Loring Peirce
1968	George Davis Bailey*
	John Lansing Carey*
	William Welling Werntz*
1974	Robert Martin Trueblood*
1975	Leonard Paul Spacek

<sup>\*</sup> Deceased

(continued on page 222)

## THE ACCOUNTING HALL OF FAME MEMBERSHIP

(Continued)

1976	John William Queenan*
1977	Howard Irwin Ross*
1978	Robert Kuhn Mautz
1979	Maurice Moonitz
1980	Marshall Smith Armstrong
1981	Elmer Boyd Staats
1982	Herbert Elmer Miller
1983	Sidney Davidson
1984	Henry Alexander Benson
1985	Oscar Strand Gellein
1986	Robert Newton Anthony
1987	Philip Leroy Defliese
1988	Norton Moore Bedford
1989	Yuri Ijiri
1990	Charles Thomas Horngren
1991	Raymond John Chambers
1992	David Solomons
1993	Richard Thomas Baker

<sup>\*</sup> Deceased

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# Accounting Historian Toron CEMENT art. 16

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Journal

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CONTENTS

#### **Editors**

James Guthrie and Lee Parker

Abstracts and Keywords
<b>Editorial</b>
Corporate Accountability and Rorty's Utopian Liberalism
Tom Mouck
Job Satisfaction, Organizational Commitment, and Turnover Intentions of United States
Accountants: The Impact of Locus of
Control and Gender
Sarah A. Reed, Stanley H. Kratchman and
Robert H. Strawser         31
Absorbing LMS: The Coping Mechanism of a Small Group
Richard Laughlin, Jane Broadbent, David Shearn and
Heidrun Willig-Atherton59
Better Informed Judgements: Resource Management in the NHS
David M. Rea
Book Review
Ad Hoc Manuscript Referees 1993

## ANNOUNCEMENT

#### ACCOUNTING AND BUSINESS RESEARCH

Volume 24

Number 93

Winter 1993

#### CONTENTS

Predictive Performance Evaluation Measures:

Field Study of a Multi-Outlet Business

Steven J. Adams Howard Toole Paul Krause

The Review Report: An Empirical

Investigation

Tom Brown David Hatherly John Innes

Initial Public Offerings on the Unlisted Securities Market: The Impact of

**Professional Advisers** 

K. M. Holland J. G. Horton

The True and Fair View Requirement: Impact on and of the Fourth Directive

C. W. Nobes

An Empirical Study of the Audit Expectation-Performance Gap

Brenda Porter

The Relation between Returns and Earnings:

Evidence for the UK

Norman Strong

Goodwill—Further Attempts to Capture The Will-o'-the-Wisp: A Review of an

ICAEW Research Paper

Tom Lee

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## ACCOUNTING AND BUSINESS RESEARCH

Volume 24

Number 94

Spring 1994

#### CONTENTS

Editorial

The Provision of Other Services by Auditors:

Independence and Pricing Issues

Lynn Barkess Roger Simnett

Accountants' Attitudes and Environmentally-

sensitive Accounting

Jan Bebbington Rob Gray Ian Thomson Diane Walters

Management Compensation and Payback Method in Capital Budgeting: A Path

Analysis

Shimin Chen Ronald L. Clark

A UK Empirical Test of the Larson-Gonedes

Exchange Ratio Model

Terry Cooke Alan Gregory Bernard Pearson

Earnings Response Coefficients and

**Dividends Policy Parameters** 

Vivek Mande

The Working of the Auditing Practices
Committee—Three Case Studies

Christopher Pong Geoffrey Whittington

Robert Watson

An Empirical Analysis of Financial and Non-financial Managers' Remuneration in Small and Medium-Sized UK Enterprises

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## CONTEMPORARY ACCOUNTING RESEARCH

Spring 1994, Vol. 10 No. 2

of Intraday Event Studies
Discussion of "Market Microstructure: An Examination of the Effects on Intraday Event Studies"
The Determinants of Accounting Professors' Publishing Productivity:  The Early Career
A Reexamination of Auditor Versus Model Accuracy within the Context of the Going-Concern Opinion Decision James McKeown, William Hopwood and Jane Mutchler
The 'LIFO Reserve' and the Value of the Firm: Theory and Empirical Evidence David Guenther and Mark Trombley
Corporate Tax Incentives for Conglomerate Mergers: Model Development and Empirical Evidence
The Effect of Corporate Merger Transactions on the Information Content of Earnings Announcements
Experimental Evidence of Market Reactions to New Consumption Taxes Steven Kachelmeier, Stephen Limberg and Michael Schadewald
Using Experimental Economics to Resolve Accounting Dilemmas Joyce Berg
Commercial Lenders' Use of Accounting Information: The Effects of Source Credibility and Experience
French Translation Of "Commercial Lenders' Use of Accounting Information: The Effects of Source Credibility and Experience" Philip R. Beaulieu
Foreign Currency Accounting Policy: The Impact of Asset Specificity
Voluntary Interim Disclosure by Early 20th Century NYSE Industrials
Fact and Theory in Accounting History: Presentmindedness and Capital Market Research
Education Research Section
The Effects of Second School Accounting Education on University Accounting Performance—A Canadian Experience
An Experimental Investigation of Increased Professional Education Requirements

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