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‘Lady Accounting’, an analogy using blood circulation to popularise an accounting view of the health of the firm

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This paper examines the attempt by Deuwez in 1933 to explain accounting concepts and ideas to non specialists through the analogy of the process of blood circulation within human beings. It comprises two main sections. The first section comprises two reviews: first, of accounting ideas of the period 1900–33 and developments therein; and, second, an examination of contemporary knowledge of blood circulation and the operation of key human organs in relation thereto. In the second part of the manuscript, the analogy is examined in more depth, with some limited attempt made to consider whether or not the blood circulation system is an apposite analogy.

Keywords: analogy; popularisation; accounting history; 1900–33; blood circulation

Introduction

Access to accounting is reputedly difficult because its vocabulary and concepts are often linked to learning about how the accounts work. This may discourage people who want to understand accounting without developing a detailed knowledge of bookkeeping. For example, people such as administrators have to understand accounting documents. In such circumstances, the issue of popularising an understanding of accounting becomes crucial. This problem is far from being new. In the booklet, *La dame comptabilité*, printed in 1933, H. Deuwez dealt with this question, using blood circulation in a female body as an analogy with accounting.

The use of analogy is common practice in the domain of social sciences (Weber 1981, 139) and in the domain of economic sciences (Ménard 1981, 139). Theoretical renewal is supported by an analogy which permits conceptual transfers. For example, according to Denis (1904, 91) and Thompson (1998, 308), Quesnay (1694–1774), who was a French doctor and king’s councillor, proposed *Le tableau économique*, the first attempt to formulate a model of economic circulation, taking as his basis the model of the system of blood circulation. In the theory of evolution, as Diani (2003) shows in his PhD, there are many mutual exchanges of ideas between economics

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and biology. As far as accounting is concerned, the use of analogy is unusual, although not entirely unheard of. This paper analyses the analogy drawn in *La dame comptabilité* in order to demonstrate the interest, the contribution and the limits of this analogy in the specific context of teaching and of popularising accounting, in French, between 1900 and 1933.

Our perspective is restricted to accounting techniques and concepts and their use for the purpose of disseminating accounting knowledge even if we are aware that a gender-studies-focus could have been another choice for this paper.

Preconditions to analysis

The use of analogy in accounting

During the period covered by this study (1900–33), we have identified four popular generalist guides to accounting (see Table 1), the intention of which was to make the subject more accessible to the non-specialist reader. Of these four works, only two books made use of analogy: *La dame comptabilité* (Deuwez 1933) and *Les concepts fondamentaux de la comptabilité* (De Fages 1933). Both authors declared that they were writing for a specific public: De Fages for engineers and Deuwez for administrators and members of the boards of companies. Neither author searched for credibility, but rather for an efficient way – i.e. one which would be understood by their intended target readership – in which to facilitate the understanding of basic accounting ideas and concepts. Whereas De Fages based his analogy on calculation theory and fluid mechanics, Deuwez based his on the general public's knowledge of anatomy.

Deuwez's 33-page booklet, *La dame comptabilité*, was printed in 1933 by a Lagny printing house in France. Three copies of the booklet are known to have survived, one is available at the French National Library, and of the others, belonging to private collections, one was shown at an exhibition of accounting textbooks held in Lyon in 1994 (Bérard and Lemarchand 1994). It has proved impossible to find out anything about the booklet's author,¹ but on the title page his intentions are made clear: 'This small work, written for administrators and board members, aims

Table 1. Analysis of four non-specialist books.

Author and date	Targeted readership	Features
Bunau-Varilla (1924)	Traders, members of council, lawyers	Explanation of the balance sheet using the personification of the accounts approach, revisited with stock accounts
Caquas (1924)	People concerned with business	Explanation of the balance sheet and operation of the accounts by the balance sheet approach
De Fages (1933)	Engineers	Accounting explained as the science of the enumeration of the movement in values Analogy in terms of flow accounts and stock accounts
Deuwez (1933)	Administrators and board members	Accounting explained by analogy with blood circulation Analogy leading to company health: true health and manipulated health

at giving, through humour, the right ideas on the role of modern accounting and the services which can be expected from it'.

The text is divided into two parts. In this paper we limit ourselves to the first part, qualified by the author as 'the accounting'. The second part, on the '*prix de revient*'² will be the subject of future research. The first part of the booklet is divided into six sub-parts whose titles indicate readily the tonality of the author:

- 'Accounting as the crow flies' (*La dame comptabilité*, hereafter referred to as *Ldc*, 2–5) presents the definition of accounting, of the accounting organisation and of the various accounts, but without indicating their operating mode. The figure, 'Lady Accounting' (*Ldc*, 6, reproduced as Appendix 1), provides a visual representation of the accounting system using a complete woman's body, together with hat and accessories.
- The organs correspond to the accounts previously mentioned in the text, and they are connected to each other by blood vessels. The comments specify that blood circulates here. This creates an analogy between accounting and blood circulation which we propose to analyse subsequently in this paper.
- 'The role of the stomach and of the intestines' (*Ldc*, 7 – reproduced as Appendix 4) presents these organs as inventory accounts (warehouse and work-in-progress) and operational accounts (labour, overheads and sales). This page shows their role in the evaluation of costs (simplified version) and the determination of the net result.
- 'Lady Balance Sheet' (*Ldc*, 8 – reproduced as Appendix 2) corresponds to 'Lady Accounting' accessorised with a basket 'for contingencies' and a small cask entitled 'for profit'.
- 'The make-up of Lady Balance Sheet'. A *vademecum* for the perfect 'book cooker' (*Ldc*, 9 – reproduced as Appendix 3) underlines the operations which improve the aspect of Lady Balance Sheet before she is presented to the board members.
- 'Old Lady Accounting, former method, annual inventory' (*Ldc*, 10) depicts an alternative method of recording the inventory accounts and sales accounts.

The eye of the reader is attracted by the illustrations of a woman. Multiple interpretations as to why this choice was made are possible. One explanation would be that the words 'company', 'management' and 'accounting' are all feminine words in French and, by extension, this facilitates and/or would make it appropriate to use a woman as an analogy for how a company is viewed from an accountant's perspective. A second explanation from a gender studies perspective is that, given the historical context, women were still largely viewed by men as objects, not subjects, to be dressed, made-up, fed and doctored by men, being denied the role of actors. Therefore it seems more likely that a woman would be chosen for the analogy rather than a man. A third possible explanation is that women have a natural open blood cycle unlike men. Since the analogy refers to an open blood cycle for accounting as well, this fact may have guided the choice of the author. A fourth possible explanation reflects the fact that researchers in accounting (e.g. Gardey 1995, 415) have shown that women have been very present in bookkeeping tasks in the field of accounting since the nineteenth century. This fact may have been known by the author. A fifth possible explanation is that since the intended target readership was largely going to be made up of men, the author may have wanted to catch the reader's eye with illustrations of women. Since details relating to the author are not known to us, we cannot extend further these investigations. Nevertheless, the text itself is rich with material for our study focused on accounting.

An overview of the state of accounting knowledge c.1900–c.1933

Before analysing Deuwez's analogy in the second part of the paper, we first of all provide an overview of the state of knowledge and thinking, as it was presented in different types of books published in the French language during the period 1900–33, regarding accounting and the system of blood circulation in the human body.

The sources

In order to study the state of accounting knowledge, we examined documents contained in the Stevelinck collection available at the library of the Université de Nantes, which contains almost 1,000 references. For the period 1900 to 1933, a period sufficiently long to permit us to appreciate whether the knowledge conveyed in each studied text was standard or not, we selected handbooks³ and books for non specialists, such as those which specialised in discussing the balance sheet. Thirty-five books, written by French or Belgian authors, were identified and examined. We chose to study French-language books⁴ from both countries, not least because there appears to have existed a community of references linking the two countries. Thus, the prolific Belgian author of handbooks and texts, Daubresse (1912, 9), quotes P.J. Proudhon (French economist, 1809–65), Léon Say (politician and French economist, 1826–96) and Gabriel Faure, a prolific French author of handbooks and professional texts. Faure (1927a, 65), on the other hand, quotes Daubresse.

We have also consulted a number of secondary sources related to the theory and history of accounting (Colasse 2005; Vlaemminck undated). However, it seems to us that the handbooks and the four non-specialists books listed in Table 1 are more relevant for our research project, because they testify to the knowledge that was well diffused at the time. In addition, the study of four non-specialists books (less numerous than the handbooks)⁵ reveals the particularly original character of *La dame comptabilité* compared to the handbooks. We produce here a synthesis of our observations relevant to the current study. A detailed analysis of the handbooks between 1900 and 1940 will form part of future research.

The points of interest in the 35 books⁶ studied, during the period 1900–33, are as follow:

- (1) the evolution of the explanation of how the accounts are operated; this testifies to the debate between two alternative approaches, namely that of the personification of accounts and the balance sheet approach;
- (2) the great increase in the number of pages which focus on the balance sheet compared with a small increase in those focused on the 'profit and loss' account;⁷
- (3) the diversity in the way in which people used the 'warehouse'⁸ account or the 'general goods' account; this testifies to the increasing implementation of the perpetual inventory method;
- (4) the evolution of the number and the types of accounts in relation to the debate on the explanation of operating the accounts;
- (5) the emergence of the concept of a chart of accounts.

This diversity can be linked to the absence of accounting standardisation⁹ but also to the speed at which various accounting theories were diffused, either in whole or in part. Taking into account the objective of our research, we examine only the first three points.

An overview of the explanations on the use of the accounts

Two conceptual approaches were found in the sample of books studied as an explanation for the use of accounts:

- the personification of accounts;
- the balance sheet approach.

These were the subject of debate, authors supporting one or the other explanation in a specific context. During the study period, authors sought to show that accounting was a science or a theory (Daubresse 1912; Faure 1927b, 1929).

The personification of accounts

A good explanation of the personification of accounts is given by Faure (1927a, 294): ‘an account is created to know the situation of the person for whom the account is kept; one considers that only a person can have an account and then a person exists behind each account, i.e. a being having rights and obligations’. Bunau-Varilla (1924, 1) specified that:

Accounting bases its processes on the design of a series of fictitious personalities which one calls ‘accounts’, each one of them acting like a delegate of the Company, charged by it with a special service. The company appears to entrust these personalities with the exclusive management of certain well defined classes of operations, which have always entries or exits of funds, and this avoids making another operation by any other means.¹⁰

In this case, to follow the vision of extreme personification supported by Faure (1927a), the business can be seen as funds entrusted to a succession of persons. For example, an owner entrusts funds to the general manager to run the enterprise. The general manager entrusts funds to managers of material things (equipment, warehouse and cash). These managers trade also with partners. Each transfer creates an obligation between the person and the firm or enterprise, i.e. creates debts and receivables. The account exists to keep a record of obligations which a person alone is able to have (Deschamp 1926, 156). The account is kept to give the point of view of each of these people. Briefly, the convention is: the person account which donates is credited and the account which receives is debited. The explanation is detailed in the next figure.

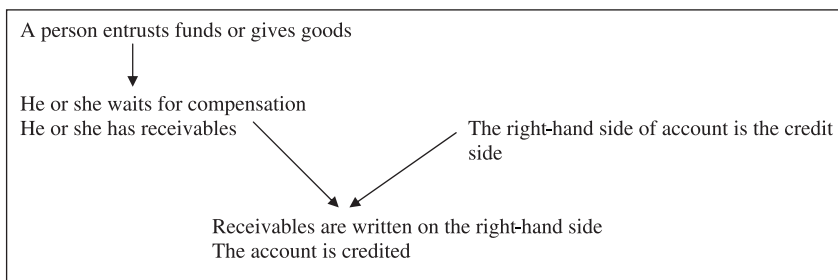


Figure 1. Example of explanation by personification.

It is the opposite reasoning for the debts when a person receives. We must correctly understand the meaning of this explanation. For example, the enterprise buys equipment. The 'equipment' account is debited to show that the 'equipment' manager is indebted up to this value to the enterprise.

But at the closing of the accounts, the balance sheet must present the point of view of the enterprise. 'The enterprise must always be thus interposed by thought as being between the account which receives and an account which gives; [as a reversible jacket, an account has two sides, one apparent and one hidden]: on the right side, we can see the credit and the debit of a person account, therefore the back of this account corresponds to the credit and the debit of the enterprise. It is essential to understand the transformation of the inventory balance into assets and liabilities of the balance sheet' (Deschamp 1926, 153). Indeed, in the balance sheet, the debit balances of the accounts appear in the assets as receivables and the credit balances of the accounts as debts in the liabilities. We see an inversion compared to the explanation of the account functioning, the debts of the company are on the right and the receivables on the left. Thus the balance sheet is not an account.

This brief restitution avoids detail, but we must notice that a few authors accept accounts of things and accounts of value instead of ones based on the management of things. Beyond this variation in the classes of account, however, it is nevertheless the same explanation of the functioning of the accounts as inherited from the eighteenth and nineteenth centuries (Lemarchand 2001). This explanation, qualified as the personification of the account, is characterised by the practice whereby 'the account which receives is debited, the account which gives is credited'.¹¹

This way of doing accounting is natural for some authors, such as Faure (1927a). For others, it creates a confusion which must be cleared up (Bunau-Varilla 1924) or it deserves to be rejected: 'no fictions, no ridiculous personifications to explain the accounting principles' (Daubresse 1912, 11). From the 1920 onwards, other authors choose straightforwardly another approach: the approach of the balance sheet.

The balance sheet approach

As Faure (1927a, 294) underlined it: 'the preceding way [the personification approach] leads to the balance sheet by the synthesis of the accounts, while this method leads to the accounts by the analysis of the balance sheet'. The authors who adopted this approach begin their books with balance sheet definitions: assets, liabilities, equity. The profit is determined as the difference between final and initial equity. The assets are 'all that a company has at one moment' (Faure 1927a, 294). The assets are 'the list of the company goods with their value: means of action . . . resources . . . receivables . . .' (Caquas 1924, 7). The liabilities are 'all that a company owes at one moment' (Faure 1927a, 294). The liabilities are 'the list of the debts of the company towards a third party' (Caquas 1924, 7).

The equity is 'the difference between assets and liabilities' (Faure 1927a, 294). 'The difference $A - L$ (assets minus liabilities) is the equity of the company at one moment, i.e. what would remain after realisation of the receivables and extinction of the liabilities' (Caquas 1924, 7). The operations modify the values of assets and liabilities. These modifications of value are increases or decreases. In this approach, the accounts record these fluctuations which also modify the value of assets and liabilities but not necessarily in the same proportion. Consequently, some operations gave rise to a profit, i.e. modifying the equity. Depending on the authors, the explanations are more or less clear (as for the preceding method). Various algebraic approaches¹² are also proposed, e.g. Desirotte (1931) and Caquas (1924).

The explanation for the use of the accounts is based here on the balance sheet and its mathematical equation: assets – liabilities = equity. It is possible to think that this approach came from the ideas of Dumarchey, who ‘presented himself readily as innovative because of the importance which he grants to the equation of the balance sheet and the classification of the kinds of balance sheets’ (Michaïlesco 2005, 101). Although he wrote in French and his work, *Théorie Positive de la Comptabilité*, dates back to 1919, he is not quoted in any of the works studied, thus undermining claims that he might be the initiator of this change. Indeed, Michaïlesco (2005, 101), referencing Mattessich (2003), notes an even earlier influence in this direction: ‘seeking to change the traditional teaching of accounting, Italian authors [of the second half of the nineteenth century] have already tried to propose a better comprehension of the rules of accounts often based on algebraic explanations where the balance sheet and the general ledger occupy a central position’.

In conclusion, the personification approach to accounts appears to be the only way of explaining accounting operations in 1900, the start date for our study, through until 1920 when the balance sheet approach begins to appear. After this date, these two explanations have coexisted. But the authors posted themselves as the defender of one or the other of the approaches.¹³ In addition, the contribution of the qualified ‘great authors’ (Colasse 2005) seems to have been limited: Leautey and Guilbault,¹⁴ for example, are quoted only for their definition of accounting in our sample. Finally, we must note that the space dedicated to the balance sheet increases during the period. The space focused on the balance sheet increased from one page to many pages or even a whole chapter. An apparent reason is the change of explanation, although the space devoted to this topic increased even where the author proposes the explanation through the personification of accounts. Besides, in the Stevelinck collection, it seems that the number of works exclusively devoted to the balance sheet increased during the period studied (this argument needs to be confirmed by future research). At the same time, the space devoted to the profit and loss account increased but remained, however, very minor in comparison with that devoted to the balance sheet. Therefore, in the following sub-section, we provide an overview of the state of knowledge about the balance sheet.

An overview of the state of knowledge of the balance sheet

Before 1940, ‘the majority of companies had an accounting system based on relatively homogeneous mechanisms but the rules of asset valuation, the risk assessment methods or the presentation of the profit and loss account varied from one company to another. This diversity authorised all kinds of manipulations’ (Touchelay 2005, 63). While the 35 books in our selection all include content on the balance sheet in one way or another, seven were exclusively dedicated to it: Bataridon (1923), Charpentier (1921), Delaporte (1925), Faure (1926), Gersten (c.1930), Grimmiau (c.1903) and Hanon De Louvet (1939). We present below an overview based on the study of these seven books.

Presentation

The majority of the seven authors presented the balance sheet in a format familiar to the way we do today. While some recommended the presentation of asset depreciation on the assets side of the balance sheet, others suggested placing it on the liabilities side, with Faure (1914) and Bataridon (1923) proposing both presentations. Charpentier (1921) recommended the inclusion of a comparison with the preceding year, and introduced the concept of consistency in the method of presentation.

Accounting principles

Historic cost principle: Batardon (1923) and Grimmiau (c.1903) deal with historic cost through the purchase price of fixed assets as it should appear in the books. Charpentier (1921, 89–90) indicates more precisely that the recording should be made at the ‘prix de revient’¹⁵ which can be reduced if necessary but never raised.

Conservatism principle: All seven authors agree on the need to depreciate fixed assets. It is necessary to underline the case of Grimmiau (c.1903), who devoted a quarter of his work to explaining the validity and the technique of amortisation. The authors also referred to the allowances which are entered in a provision account or in a reserve account.¹⁶

Time matching principle: This existed in the form of the recommendation to record ‘expenses payable’ and ‘prepaid expenses’ (Batardon 1923; Faure 1914) or to record ‘invoices payable’ and ‘invoices to be paid’ (Charpentier 1921, 337).

Sincerity principle: The authors of the sample were concerned about the sincerity of the balance sheet. Sincerity is often associated with accuracy. Batardon wrote: ‘So the balance sheet has to be accurate and sincere’ (1923, 243) and Delaporte (1925, 121) points out ‘the excellence of an analysis resides in the sincerity and the accuracy of a balance sheet’. Sometimes, although the word sincerity does not appear explicitly, it is implied: ‘A correct balance of the balance sheet is not enough . . . each individual item, separately considered, has to be the expression of truth’ (Grimmiau c.1903, 20).

Non-offsetting principle: Charpentier (1921, 64–5) underlined that the opposite journal entries in the receivables accounts and payables accounts should not be offset against each other in a single ‘net’ journal entry.

Consistency principle: This was introduced by Charpentier (1921, 64) who recommended the presentation of the values of the current period using the same method as those of the prior period. (1921, 345–7).

Going concern principle: This was mentioned by Charpentier (1921, 62) in the following terms: ‘the company is living’, and also by Delaporte (1925, 56) who presented the balance sheet as ‘the acceptance, of the continuation and the on going running ...’.

Valuation methods

Batardon (1923) questioned which type of value of inventories of finished goods must be taken into account. He proposed several possibilities: present value, sales value, salvage value. After explaining his reasons for rejecting them all, he determined that valuation should be at the ‘prix de revient’. On this point, he was in agreement with the recommendation of Charpentier (1921). In the handbooks, the question of the valuation of the goods was also dealt with. The answer was the use of the ‘prix de revient’ instead of the old practice of valuing them at the selling price (see next sub-section below on the ‘warehouse’ account).

Regarding terminology

According to Grimmiau (c.1903, 23), legislation was not sufficiently precise, noting that ‘it is very difficult to agree on the exact meaning of the words being used’ (c.1903, 5). For example, from other sources we note that the words for ‘reserve’ and ‘provision’ do not have the same meaning. However, Batardon (1923, 102) said that the reserves ‘are created for a depreciation which may not necessarily take place in the end’, whereas Delaporte (1925, 92) distinguished two separate categories: ‘reserves’ for permanent elements and ‘provisions’ for temporary elements.

Regulation, irregularity and forgery

Grimmiau (c.1903, 23) would prefer that, for presentation purposes, ‘balance sheet items’ conform ‘to a uniformity principle’. But all of the authors in our sample called for regulation to achieve some sort of fair view. Gersten (c.1930, 75–105) underlined that the balance sheet could be arranged and embellished in order to inflate income and even become a forged document. Grimmiau (c.1903, 34) dealt with the necessity of some form of control because the number of false balance sheets had increased. Regarding other principles,¹⁷ the other authors referred to regulation.

In conclusion, we note that the terms in which the balance sheet was treated in the seven works appear familiar to us. However, there was no unified doctrine. Indeed, certain authors underlined particular concepts that others dealt with only in a limited fashion or not at all. Often, these authors presented their ideas as new but French accounting historians such as Lemarchand (1995, 7–24) have shown that this discussion about the need for principles began before 1900.

Unlike the explanation of the operating mode of accounts, their vision was not in conflict but showed a shared concern: to make the balance sheet a credible source of shareholder information.

An overview of the use of the ‘warehouse’ account or the ‘general goods’ account and, by extension, the ‘manufacturing’ account

The study period was marked by the question of the traditional use of the ‘general goods’ account as depicted in Figure 2.

At first, the ‘warehouse’ account or ‘general goods’ account is debited with the value of purchases, and is then credited with the sales at their selling price. Therefore, the balance of this account gives neither the value of remaining goods nor of profit or loss (all goods not being sold). This is why, to close the books, a correcting entry is necessary to avoid the profit or loss incorporated in the balance of this account, and its consideration is recorded in the account of ‘profit and loss’. The values are calculated in two stages. The physical inventory enables us to value the goods leaving the ‘warehouse’ account based on the relation: inventory of prior

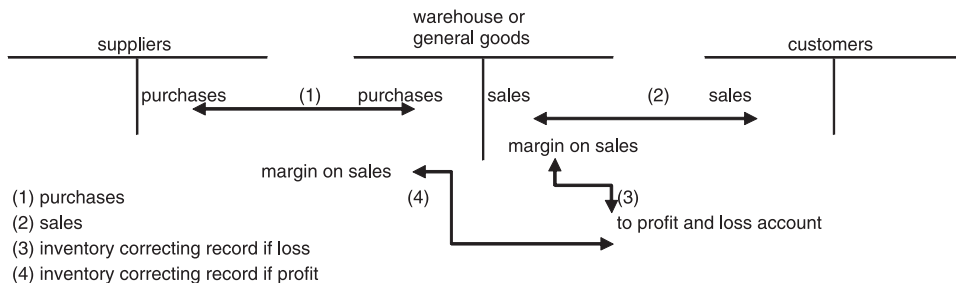


Figure 2. Simplified traditional use of general goods (or warehouse) account.

period + 'entries' – inventory of current period = exits. Then the difference between the value of sales and that of the goods remaining gives the profit or the loss.

This method was considered to have the following disadvantage: 'the balance of the account does not control the remaining goods, the physical disappearance of goods in the warehouse is not detected by the books, nobody has the assurance of the accuracy of the profit' (Desirotte 1931, 42). Alternatives existed and were presented in most handbooks. Indeed, the confusion between inventory and profit/loss worried some authors. They gradually proposed the use of an account of purchases and an account of sales, thereby dividing up the 'warehouse' account into two parts (see Figure 3). However, to close the books, the 'purchases' account must be corrected so that its balance represents the value of remaining goods. It is thus credited with the estimated value of the goods sold (obtained by calculation). For this alternative to the traditional method, the valuation can be based on the purchase price or the 'prix de revient' and the compensation is recorded in the profit and loss account at a value which is the margin on sales.

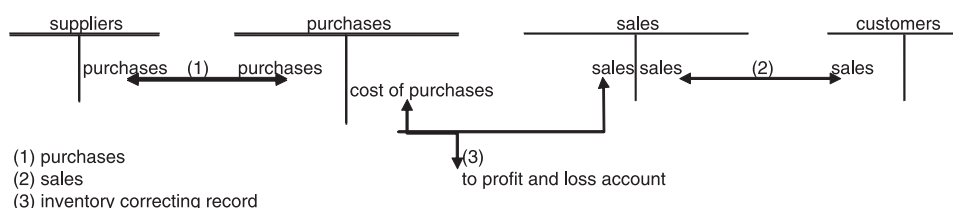


Figure 3. Improved traditional use of general goods (or warehouse) account.

For Desirotte (1931, 42), as for Daubresse (1912), the traditional method had to be replaced. Daubresse (1912) initially presented the traditional method but then proposed possible improvements. Thus, Faure (1927a) relegated the traditional method to the end of the chapter as an obsolete method, considering the improved version to now be the standard method. Some authors, however, remained unsatisfied with the traditional method, even with the improvements, wishing to know constantly the value of the inventory through use of the perpetual inventory method (see Figure 4).

This technique and its advantages were dealt with by Daubresse (1912, 58–63) and Faure (1927a), but they also highlighted the difficulty of implementing it due to the problem of determining the cost of goods sold for each sale. This is why the perpetual inventory remained an ideal for these authors. Other authors presented the perpetual inventory method as one of the possible practices (Batardon 1923) or the only practice (Caquas 1924; Desirotte 1931). For them, its implementation was not a problem. These books focus on inventory of merchandises, but what are the recommendations about inventory of finished goods?

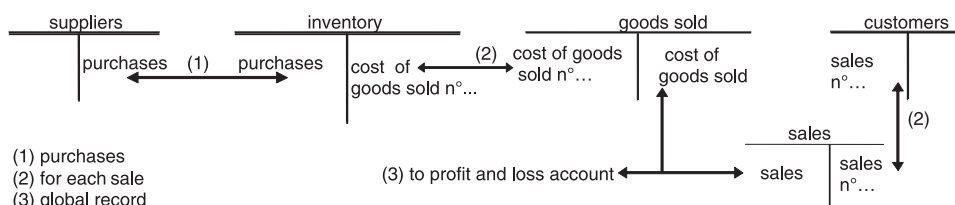


Figure 4. An example of recording based on perpetual inventory method.

The practices of an industrial company are comparable to those of a commercial enterprise: 'The trader', like the manufacturer, has a '*prix de revient*'. It is true that the manufacturer is less attentive to this, but one can only regret it. The general goods account, as the manufacturing account, must be debited with all the expenses related to the goods' (Daubresse 1912, 31). In the same way that the general goods account is debited with purchases and some expenditure, 'the debit side of the manufacturing account records all consumptions of the workshop giving thus the cost of the manufactured products. This value is credited in the manufacturing account and the compensation is the debit of the manufactured goods warehouse account when the products enter into the warehouse or of another workshop account if it is necessary' (Faure 1921, 347).

But, generally, not all products are finished ones. For Faure (1921, 348), most people make an inventory of the workshop, then they value the work-in-progress by means of more or less exact calculations. The difference between what remains and the consumption determines the cost of the finished products. Wherever possible, Faure recommended directly determining the '*prix de revient*' of the finished products by a rational method. The manufacturing account was credited with this value. Thus the manufacturing account remained debtor in respect of the sum representing the value of the work in progress.

We can conclude that the above recommendations sought to distinguish the consumption, the purchases, the sales, the profit and loss, and the value of remaining goods and products. We note that, between 1900 and 1933, little by little the perpetual inventory method was becoming the standard method.

Blood circulation and pathology and care

In this section, we attempt to evaluate what knowledge of the blood circulation system readers of *La dame comptabilité* would have possessed at the time of its publication. We do this initially by providing a summary of the timing of major scientific discoveries regarding blood and its circulation. There still remains, however, the problem of estimating the proportion of this knowledge known by groups such as administrators or members of the boards of companies. To enable us to proceed, we have hypothesised that such people had at least completed an elementary school education. Consequently, we studied elementary school handbooks to yield the minimum level of understanding. Then we studied the *Nouveau Larousse Illustré*, issued at the beginning of the twentieth century. Considering the importance of the book, seven large volumes of almost 1500 pages each, it was probably the reference book of middle-class families, i.e. those likely to have been administrators. The *Nouveau Larousse Illustré* was continually upgraded by the monthly publication *Larousse Mensuel Illustré*. The whole was published from 1907 to 1922.

The major scientific discoveries relating to blood

The major discoveries, prior to 1933, have been identified from reading the *Universalis Encyclopaedia* and *Le sang et les hommes* (Binet 2001). It was in 1623 that William Harvey, an English doctor, affirmed that the blood circulates in a closed loop, from the heart towards the organs and from the organs back to the heart. Harvey's reasoning on double circulation is still valid today: the small circulation brings blood to the lungs before its return to the heart, where, via the great circulation, the blood is sent towards all the organs before returning to the heart. Harvey specifies that the heart enables the bringing of 'nutritive rich and hot blood' to organs and to return 'poor unnutritive and cold blood'. With regard to the contents of blood, red cells were discovered around

1670 by Leuwenhoek, white cells in 1768 by Spallanzani and platelets in 1840 by Donné. We must wait for Selye in 1867 to know the role of the red cells in the transport of oxygen. Cardiac disorders were known, via listening to the rhythm of the heart (during the nineteenth century) and via the first clinical applications of the electrocardiogram (1912). It is not until 1944 that these problems could be solved through the use of cardiac surgery.

Blood-letting has been practised by physicians since antiquity. During the seventeenth and eighteenth centuries, doctors applied it without reserve, but it fell gradually into disuse, being practised only in very particular cases like those described by A. Lebigre (1984) in her book, *Et saigner et purger! Les maladies ont une histoire*. Transfusions of animal blood, which had begun in the seventeenth century, proved to be a failure, while the discovery of different blood groups in 1900 by Landsteiner initially raised very little interest. Nevertheless, as a result, in particular, of technical contributions resulting from problems arising out of the various conflicts of the twentieth century, the development of blood transfusions did occur. In 1917, Doctor Jeambreau added sodium citrate to the collected blood to prevent coagulation and to permit the storage and the transport of blood during the First World War. In parallel, the organisation of blood collection was being achieved: for example, in 1923, the first blood transfusion centre opened in Paris and, in 1929, France was the first country to have an organisation which met the needs for a blood bank.

Knowledge in the handbooks

We studied three elementary school handbooks: Brémant (1919), Lepigoché and Seltensperger (1912) and Fabre (post-1882). Each presents a chapter entitled blood circulation. All explain the small and great circulation and the various types of blood vessels. All present a cross-section illustration of the heart and indicate the role of blood as a carrier of oxygen and nutritive elements. The two most recent works also present an illustration of a human being which presents the whole of the circulation with also the small and great circulation. These books specify the contents of the blood such as the red cells (the white cells are not mentioned) and the serum, which is described as the liquid in which red cells stand. They also present information about pathologies such as anaemia, infection, apoplexy and about the rules of hygiene. Lepigoché and Seltensperger (1912, 82) note that ‘The state of our health depends mainly on the number of our [red] cells. If it is too small, we are anaemic; if it is too large, we have too thick blood, as one says, and we are prone to the “coup de sang”, with attacks of apoplexy’. Brémant (1919, 16) noted that: ‘Because blood goes to all parts of the body, inoculation into the veins of one little drop of foreign liquid can be so dangerous but sometimes so salutary’.

In conclusion, we can assume that the intended public of *La dame comptabilité* had a basic knowledge of anatomy and that it knew about the connection between blood quality and health. This conclusion should be consolidated in future research by analysing a greater number of handbooks prior to 1912 (for instance books dating back to 1870 could be taken into account, because some of the administrators had been schoolboys before 1912).

To provide us with an idea of the knowledge available to well-off members of society, this vision of the minimal level of knowledge is supplemented by a study of the *Nouveau Larousse Illustré*.

Knowledge in the Nouveau Larousse Illustré

In the editions of this encyclopaedia, dating from 1905–6, we have found early knowledge of blood circulation and of blood identical to that conveyed by the handbooks of 1912 and 1919. However, the content is more detailed, more complete and more scientific. For example, the

contents of blood are no longer composed simply of red cells and plasma but also of leucocytes (mono and polycellular, eosinophilic . . .) and of albumins, of which a portion coagulates to form fibrin. Haemoglobin, rich in iron, allows the transport of oxygen. The same precision can be found for describing blood pathologies, i.e. a very detailed, very complete and scientific approach.

In the *Larousse Mensuel Illustré*, we note two types of articles: in-depth articles (approximately one page) and topical articles. In the in-depth articles, we noted one dealing with transfusions (1914) and one dealing with blood pressure (1920). Both articles define the subject and give its detailed history. Then they present in detail the clinical procedures, the equipment, and note the difficulties. Among the topical articles, we noted one on fibrillation tests and one on transplantation tests. It appears that this encyclopaedia diffused in-depth and topical scientific knowledge. It was available in well-off households for those wishing to have answers to precise questions, but it seems unlikely that the work would have been read in its entirety – it was a reference work.

In conclusion, we can assume that the audience of administrators and board members, for whom *La dame comptabilité* was intended, would have had some basic knowledge of the connection between blood circulation and good health thanks to the growth of elementary education programmes during the second half of the nineteenth century (Faure 2002; Csergo 2002). They also potentially had at their disposal more detailed scientific knowledge.

The analogy

Without taking part in philosophical debates, we must define analogy in order to distinguish it from metaphor and comparison. We propose the definition of Coster in *L'analogie dans les sciences humaines*:

the analogy reveals a similarity of ratios or relations which can be expressed by the next formula: $A/B = C/D$. C has a relation with D, this relation is of the same nature as the relation between A and B. The similarity does not aim to consider the terms separately, but the relation which links them respectively. Thus A and B on the one hand, C and D on the other, must be known as being connected by the same ratio. (1978, 19–20)

Coster also quotes Brown (1977, 20): ‘the analogical model is based on the transfer of units (terms, features, dimensions . . .) from one domain to another: for example, the model of the human body or the model of the operation of a machine used to explain society’. This known domain is also the limit of the analogy. An analogy relevant in a given period and culture could be less relevant in another period or culture. During the nineteenth and twentieth centuries, we can observe the evolution of domains of references such as mechanics, body health, cybernetics and networks. The reason why the analogy used by Deuwez may have been chosen may never be known exactly, since we have no details on the author’s personal background. At best, we can only make assumptions as to the reasons for his choice. It is important to understand that the time at which this text was written in France coincided with more than a decade of public health campaigns that emphasised this link between ‘good practises’ and ‘good health’. The subject is shown in handbooks, in several films and advertisements (Faure 2002; Lefebvre 2002; Nourisson 2002; Zarch 2002). The good practises included eating well and washing yourself regularly. The historical context of the rise of fascism in Italy or in Germany is also rich with associations related to the health of the nation. All these elements may have impacted on Deuwez.

Consequently, the use of the model of blood circulation in order to explain the link between accounting and the health of the firm potentially constituted a good way to popularise accounting.

In the literature, the authors make distinctions between the various kinds of analogies according to the intentions (analogy of invention, analogy of evidence, analogy of representation) or the mode (analogy based on attribution, analogy based on proportionality). In our case, the author of *La dame comptabilité* does not claim to establish the conceptual bases of accounting. Rather the intention is to use the knowledge of blood circulation in order to shed light onto the less well-known domain of accounting. As we will show, this analogy is based on the similarity in circulation between the body (term A) and accounting (term C). But although this similarity is limited and weak, because it does not conform to anatomical knowledge, it quickly conveys useful information to the reader. Indeed, after having compared accounting to blood circulation, the relationship between accounting and the health of the company (D) emerges from the relationship between blood circulation and the health of an individual (B). This allows the author to underline the actions which have an impact on the true health (management) and also those which manipulate the appearance of the health (window-dressing). Thus, this exotic analogy seems relevant to the author's intention.

Blood circulation and accounting

A count of non-technical terms used in the part of *La dame comptabilité* devoted to accounting reveals the following. The large majority are connected to the lexical field of blood and of its pathologies and its treatments. Then come the references to the human body, and finally those concerning women's accessories. The first two fields are connected to the use of blood circulation as an explanatory mode. We can make assumptions that the women's accessories are used to improve the good impression given by the Lady.

At the beginning of the booklet, the author makes a short traditional presentation (prologue) of the basic knowledge elements of accounting: the kinds of accounts, the account books, single entry, double entry, etc. Deuwez showed the importance of accounting as a mechanism for recording the transfer of funds which have an impact on the company. 'Every event must be translated by the money flow from a clearly defined account to another account, named without ambiguity. . . Then, the company will be divided into compartments. . . we will consider it as a person in flesh and bone, and quite alive, we will number these organs' (*Ldc*, 2). These organs correspond to the accounts and will exchange sometimes blue blood or sometimes red blood. The flow from one account-organ to another could suggest that this explanation is of the kind 'the account which receives and the account which gives' characteristic of the personification of the accounts. But this is not the case. Indeed, the flow circulates between the account-organs within one human body which corresponds to the company and not between the account-persons which form parts of the company. This is a global vision which shows the interdependencies that are necessary for a management decision (see next section). However, the model of blood circulation is a closed flow model, whereas the conceptual model of accounting is an open model based on stocks and flows.¹⁸ This leads the author to take liberties with anatomy and to reinvent a somewhat exotic blood circulation in order to explain accounting.

For example, the author makes reference to different kinds of blood: desiccated blood, cold run blood, new blood and old blood. This is explained by the different functions of the money-blood which are as follows (see also Table 2):

- money is an instrument of payment;
- money is a measuring instrument of the economic value;
- money is an instrument of conservation of the economic value.

Table 2. Analysis of quotations about the blood.

Quotations, <i>Ldc</i> , page 6	Analysis
Debtor and creditors – desiccated blood – which usually stays for a long time in a waiting room, awaiting the moment to join the dance, i.e. to transform itself into true blood.	Desiccated blood = instrument of conservation of the economic value => stock of receivables and stock of debts
In the fixed assets, the blood runs cold.	True blood = instrument of payment
There is a congestive state which decreases by depreciation of assets.	Cold run blood = instrument of conservation of the economic value => stock of fixed assets and stock of depreciation of assets
The customers are foreigners. Through the sales, they become debtors. They receive goods which contain old blood. In exchange, they give more new blood (as a principle) than the volume of old blood received.	New blood, old blood = a measuring instrument of the economic value
Suppliers are foreigners. Through the purchases, they become creditors. Sooner or later, these vampires will suck blood. On the other hand, they fill up the Lady with the veal roasts and the spinach that the Lady stores in her stomach. All occurs as if the heart directly sends blood to the store.	Will suck blood = instrument of payment. The heart sends blood to the store = measuring instrument of the economic value. Stored blood in the stomach = stock

The account-organs of the balance sheet are described as a blocked flow of blood (dried, solidified, stored blood), i.e. they correspond to stock accounts (as opposed to flow accounts). They are connected by blood vessels through which the flow of blood circulates. These vessels will disappear when Lady Accounting becomes Lady Balance Sheet. Although Deuwez specifies: ‘the blood which vivifies all and bathes all the bodies, is an instrument of measure’ (*Ldc*, 6), we consider that these multiple kinds of blood go far beyond the average reader’s general knowledge. Indeed, the reader needs to know, *a priori*, blood circulation in terms of small and great circulation with the red blood (due to oxygen) and the blue blood (due to carbon dioxide). In addition, the text adds confusion when it associates red blood with the creditor account and blue blood with the debtor account without an explanation of this term. Consequently, at this stage of analysis, we can consider that the use of the blood circulation model to represent accounting appears badly adapted. Indeed, the same word ‘blood’ is used for two different concepts: the explicit concept of flow and the implicit concept of stock.

Another difference exists. The blood circulation is a naturally closed system whereas the model used in *La dame comptabilité* is open because of the exchanges with the customers, suppliers and administrators. This distortion is necessary to explain the formation of income as shown by the following quotation in Table 2 and the illustration in Appendix 2:

the customers are foreigners. Through the sales, they become debtors. They receive goods which contain old blood. In exchange, they give more new blood (as a principle) than the volume of old blood received. The margin constitutes the profit, or more precisely, the excess to blood which is the equivalent of profits. (*Ldc*, 6)

It is useful information for administrators to understand that the profit is born from exchange with customers without making confusion between sales and profit.

There is another biological difference. ‘Profit, which is the difference between new blood and old blood, becomes fat . . . because the Lady Balance-sheet will teach you that profit is fat and not

blood' (see Appendix 1). This specification drives the reader to distinguish the profit-fat from the heart, treasury centre. This distinction is again underlined when the heart is described:

[the heart] is unable alone to make either profit or loss ... When the heart is filled with blood, one says that the treasury is comfortable. It does not mean that the company has made a profit. When the heart is bloodless, it could be said that the treasury is hard up. It is a bad sign, because this could be enough to lead to cardiac arrest and death. But that does not mean inevitably that the business made a loss. This simply means that the Lady is anaemic because she has danced too much. (*Ldc*, 6)

We must underline that in this period (c.1933), the appearance of fatness was still considered to be a positive sign of health, and fat was not bad for the heart or blood circulation. In reality, of course, we now know that this is not the case, showing the historical and cultural limits of analogy as mentioned at the beginning of this section.

Regarding the inventory, in 'The role of the stomach and the intestines' (*Ldc*, 7), the work in progress is valued in the manner indicated by Faure (1921) as the standard practice (see Appendix 4). In 'Old Lady Accounting, former method, annual inventory' (*Ldc*, 10), the author Deuwez criticises the traditional method of keeping the warehouse account, but does not mention the alternative method of the perpetual inventory.

We can conclude that the presentation of accounting through blood circulation is made to the detriment of anatomical knowledge but in accordance with accounting knowledge of the time. Compared to contemporary works, this presentation gives a global view of the system and underlines the difference between profit and cash. As we specified at the beginning of this section, the interest of analogy is not in the quality of the initial similarity (the term A blood circulation compared with the term C accounting), but in the use of the ratio A/B (the relation between blood circulation and person's health) to reveal C/D (the relation between accounting health of the company). This issue is examined in the following section.

The analogy: from real health to the apparent health of the 'woman-company'

The notion of the global circulation of a vital liquid such as blood is used to transfer the teaching of the medical world to the world of business: 'a flow of blood snakes throughout an organisation. The life of a business is a phenomenon of the blood circulation' (*Ldc*, 6). Consequently, through the blood circulation and notably the pathologies and the treatments that relate to it, the events of the life of the company can be perceived by the reader (see Table 3). From the concern with health, the text then shifts to the subject of the appearance of health.

From circulation to health

References to pathology and to treatments are found on pages 6 and 8 in Lady Accounting (see Appendix 1) and Lady Balance Sheet (see Appendix 2). For example, 'we practise blood-letting known under the name of dividend. The lady hates this blood-letting, which she says weakens her'. The reader (member of a general meeting) can perceive that ill-considered distributions are dangerous for the company (*Ldc*, 6).

The heart and the blood which circulate through the 'woman company' are like cash. One negligent operation on this heart for an insufficiency of fresh money-blood puts the health of the woman-company in danger from anaemia and/or heart failure, which is possible even in the case of profits being made. It is remarkable that, very quickly, the attention of the reader is drawn to the difference between cash and profit (fat) through their localisation (the profit for the stomach and the intestine in an exchange with the exterior, and cash concerning the heart). The interest of

Table 3. Pathologies and medications.

Organs-departments	Condition of organs or pathology	Medications
Heart = cash	Never too fat, never too red	Cf. debtors problem or creditors problem
Under the heart = debtors	Prone to serious illness which is unpaid liabilities	Therefore, it will be good to vaccinate them to put the specific medication in the basket
The left arm = creditors	A voracious tribe of parasites	They must be exterminated with blood that they are devouring
Stomach = inventories	To avoid over-loading	Avoid food which is full of blood and indigestible Put in the basket a good amount of rhubarb
The right side of the trunk = fixed assets	The fixed assets paralyse the right side	Input energy by accumulation of depreciation

the comparison is the use of accounting/circulation as an explanatory model for the health of the company by the accounts/organs.

In Appendix 2, the balance sheet of the company is represented by a lady where the assets (debtors accounts) would be the torso in which the heart is compared to the cash, the stomach to the inventory, the fixed assets on the right side, when the liabilities (creditors accounts) would be the arms: on the right depreciation, on the left the creditors, and the head would be the equity. In fact, it is Lady Accounting whose blood does not circulate any more. But the organic image is not strong enough; the author uses some accessories such as the cloche hat, which covers the equity and the reserves (retained earnings) and which 'gives it a more majestic air'; the shopping basket, which is garnished 'with a good dose of rhubarb' (allowance for inventory losses) or some vaccines for the shortfall in payments; and finally a small cask containing the profit 'pure nectar'. One can think that the accounts represented in the form of accessories are in fact those which result from a voluntary decision. Dressed as such, Lady Balance Sheet can be presented to the administrators who will appreciate her health.

In the text (*Ldc*, 8), Deuwez highlighted a certain number of events or practices affecting the health of the firm:

- cash: the heart 'never too large';
- debtors: 'subject to a rather serious disease such as the shortfall in payments';
- creditors: 'a voracious tribe of parasites';
- fixed assets: which 'paralyse the right side of the chest';
- inventories: 'it is necessary to avoid overloading it [the inventory]'.

So, Deuwez stressed facts about the different items of the balance sheet, highlighting those of concern to administrators (the weak points which will affect the viability of the company). Regarding the result, the analysis remained limited (only two sentences), echoing our finding of the minimal interest shown by the authors of accounting handbooks to an analysis of the result.

From health to the appearance of health

Subsequently, Deuwez (*Ldc*, 9) bases his argument on the preceding organic and accessory representations to explain how to give the appearance of health in a sick company. This point of interest for administrators, members of general meetings and readers of the book was approached in a critical way, since the author highlighted the means of disguising elements in the balance sheet and thereby of falsifying the accounts. We find again the concerns raised by the authors of the time but illustrated in the most pessimistic and nightmarish way, as illustrated in Table 4, which recapitulates the manipulations described in the text and the illustration. The author stressed that everything can be modified except for equity and cash.

Appendix 3 illustrates all of the possible manipulations. The shopping basket is abandoned; administrative expenses and labour are injected into the fixed assets; water is reddened with wine but, even so, it is not blood, i.e. it represents a pseudo-value injected into the inventories and accounts receivable. Value is pumped out from the liabilities. Consequently, thanks to these manipulations, into the small barrel of profit we inject artificial fat.

We can note that the recommendations aim at improving the income. As the aim of Deuwez is to popularise the accounting point of view using humour, he proposed recommendations to fake the balance sheet. The comic effect is here; the reader is addressed as a faker whereas, in reality, the reader is a potential victim.

But Deweuz warns also that the authorities can intervene when there has been a lot of obvious falsification (the law of 1867, for example, punished the distribution of fictitious dividends):

You could go much further, and you could follow all the whims of your imagination; as fertile that this could be, accounting would be able to follow some the creations easily, because it is a docile servant and full of resources but you would then arrive in another situation where the authorities of your country could try to pick a quarrel with you. Although examples abound and although newspapers are full of them, we will not follow you as far as there. (*Ldc*, 9)

The final advice given by Deuwez is to be ‘an average swindler’ in order to pass unnoticed: ‘dress the Lady well without disguising it’ (*Ldc*, 9). If we were being anachronistic, we would speak of income smoothing.

In conclusion, starting from a limited similarity between blood circulation and accounting, in which the author has avoided some explanations as to the operation of accounts, this analogy helps to increase the reader’s awareness of potential problems with the quality of the information which is produced and of the need to ask appropriate questions at the administrators’ meeting.

Analogy in the accounting domain: usual practice?

In this study, we have examined an example of the use of analogy in the accounting domain. But to what extent was it usual practice as a means of trying to diffuse accounting knowledge during the study period? For this purpose, we identified three groups of work: the books specialising in balance sheets; accounting handbooks; and popular books for a general readership.

In the books devoted to the balance sheet, we note the use of images related to clothing but only rarely to humans. For example, Liesse states (1919, 3rd edition, quoted in Hanon De Louvet 1939, 13)¹⁹:

Make them speak, have them open their mouth, examine them with the magnifying glass and the microscope; like a doctor, check if the organs of the balance sheet are not atrophied or are not hypertrophied, finally do not let yourself be taken in by the phantasmagoria of the figures, because many companies whose assets are not very significant are in a better situation, are more solid and, more attractive than others for which the figures are excessive.

Table 4. Analysis of quotations about the manipulations.

Manipulated item	Manipulations	Quotations	Problem dealt with in book
Fixed assets	To increase the value	‘you can inflate the value of a piece of land under the pretext that the value has tripled’	Problem of the evaluation
		‘write down small repairs of buildings as new works’	Historical cost
		‘enter the administrative expenses in installation account or equipment account under pretext that you moved a machine or a boiler’	
	To increase the value To mask information	‘do not depreciate’ ‘for avoiding indiscreet questions, include them in a group account’	Conservatism principle Standardised presentation
Debtors	To backdate	‘Why could you not backdate some invoices?’	Matching principle
	Absence of allowance	‘and for the worst accounts count for the value the account as receivable’	Conservatism principle
Inventories and work-in-progress	To increase the value	‘chicanery on the quantities, also chicanery on the values’	Evaluation and sincerity
	Absence of allowance	‘the damaged goods and unsold old goods will be quoted at the highest quotation possible’	Conservatism principle and evaluation
	To mask information	‘the works in progress are very advantageous because they are ongoing and it is not possible on the 5 January to know what occurred on the 31 December’	Evaluation and sincerity
Various	To mask information	‘you can create some complicated and obscured accounts . . . you can hide them in a group account’	Standardised presentation and sincerity
Creditors	To mask information	‘you put them in a corner and you act as though unaware of some invoices’	Evaluation and sincerity

Grimmiau (c.1903, 5) presents the following quotation of a parliamentary speaker, Bara, before the adoption of the law of 1881 on false balance sheets: “‘post-closing balance’ and ‘balance sheet’ are identical twin brothers; it is the same person who presents himself twice with different clothes, sometimes more and sometimes fewer clothes’. These images have an air of familiarity with the analogy of Lady Accounting, but they illustrate simply the speech of the parliamentary speaker without being used to introduce a reasoning based on the ratio A/B. This can be connected with the objective of these books. They are written for professionals or for the teaching of professionals who already have some accounting or legal knowledge.

In the handbooks, the balance sheet is presented either as a synthesis of the accounts (as in the approach of the personification of the accounts) or by its definition (the balance sheet approach). The comprehension of the balance sheet is conducted within the context of the explanatory method of the operating accounts. This seems coherent with the intention declared by the majority of the authors. They want to show accounting as a theory or as a science. The objective of this type of book could also explain the lack of analogies. Firstly the use of an analogy borrowed from another science can point to accounting’s lack of resources to produce its own explanation, and thus to its lack of credibility. Secondly, since these books are aimed at future professionals, we assume that the authors did not want to divert their attention away from the core of the matter by using analogies borrowed from another discipline.

In our sample, only four books are popular generalist guides, i.e. adapting a subject to make it available to the non-specialist reader. As indicated earlier, of these four works, only two made use of analogy: *La dame comptabilité* (Deuwez 1933) and *Les concepts fondamentaux de la comptabilité* (De Fages 1933). Whereas De Fages used fluid mechanics to explain the recording of accounts and accounting, the analogy based on blood circulation used by Deuwez enabled him to avoid explaining the technique of bookkeeping. Within nine pages, he reveals:

- that accounting records flows and stocks (as opposed to just flows);
- the difference between income and cash balance;
- the retention of cash in the inventories, the debts;
- that accounting produces a view of the financial health of the firm and that this is subject to deconstruction and manipulation.

Finally, although *La dame comptabilité* is not representative of the diffusion of accounting knowledge, it is a very instructive book on accounting’s didactics.

Conclusion

First, our study has examined the state of knowledge and discussions between 1900 and 1933 regarding explanations of how the accounts, the balance sheet and the inventory work. However, this contribution is only an analysis of 35 works and in one French-speaking context. It would be useful to continue with a thorough study of the various books on accounting from this period. The comparison with studies from other countries would also enable us to trace the mode of diffusion of the accounting concepts (but not their implementation).

Second, as far as accounting is concerned during the period studied, we make the assumption that analogy is reserved for the purpose of popularisation, particularly for a specific public. This use of analogy would benefit from a comparison of its use in other disciplines.

Finally, with regard to the *La dame comptabilité*, the analogy can be a good means of popularisation. Indeed, the useful concepts are made available through the means of health problems

which are a shared concern for the intended public. However, it would be interesting to test this document with a public not trained in management to validate our impressions. This document also challenges us as teachers, particularly with those students who are not graduating in management.

We are aware that our analysis is based on accounting domain references. It would be useful to enrich it with research knowledge about gender or about hygiene. The document can also be studied in its historical context. Indeed, the period of the 1930s presents specific economic, political and social characteristics.

Notes

1. Details of the author, H. Deuwez, remain unknown. We will sometimes refer to the author 'he', designating not the gender but the professional category to which this person belongs.
2. For the period studied, the 'prix de revient' is the purchase price of general goods or material with some expenses added to it.
3. *Petit Robert* (a famous French dictionary) defines a handbook as follows: 'an educational book which presents essential notions of a technique in a handy form'. In our collection, those books are characterised by a large section devoted to exercises and to applications unlike other kinds of books.
4. Bulletins of professional or academic reviews were not systematically examined.
5. In the Stevelinck collection, for the period studied, we have only identified four works of this type so far.
6. Two later works are included in this group, namely Hanon de Louvet (1939) and Delaporte (1925). In the case of the first, the reason is that there is only a later version of an earlier work available in the Stevelinck collection, and for the second, the earlier version on the rational method is being restored at the present time.
7. This is the exact translation of the terms used by French authors at the time.
8. The term 'warehouse' is used as a translation of the French term 'magasin' which can also mean shop.
9. However the handbooks make reference to a conformity with the programmes for the athenaeums (Belgium) and for the education of school teachers (France). Regarding France, *Le nouveau dictionnaire de la pédagogie* (1911) shows us, under the reference 'accounting', the programmes whose contents primarily refer to the organisation of the accounting entries.
10. We could note that this personification of the accounts is associated in the handbooks with a distinction between the firm and the owner which has been described as the theory of the double personality (Degos 2005).
11. According to Lemarchand, André was the first in to use this formulation: 'Qui entrera ou recevra sera débiteur, et qui sortira ou baillera sera créateur'.
12. The signs + and – are also used by certain authors in the person-account framework but not in the same way.
13. Faure (1927a) is a particular case because he presents the two approaches in the same handbook even though he is an ardent defender of the personification approach.
14. For more details about these authors, (Degos 2005) and (Labardin and Nikitin 2009)
15. See note 2.
16. Throughout the period studied, the concepts of 'provision' and of 'reserve' (retained reserve) were not used or differentiated consistently in the manner in which they are distinguished in modern usage.
17. Lemarchand and Praquin (2005) point out that financial scandals continued after 1914 until halfway through 1930, when light accounting regulation intervened.
18. This explanatory model of bookkeeping (Grenier and Bonnebouche 1998) is not contemporary to the studied document, but it seems relevant to us for this analysis.
19. We could only consult only the 4th edition where this quotation no longer appears. Two of the eight chapters of this work are devoted to the symptoms of the social body corresponding to an analogy.

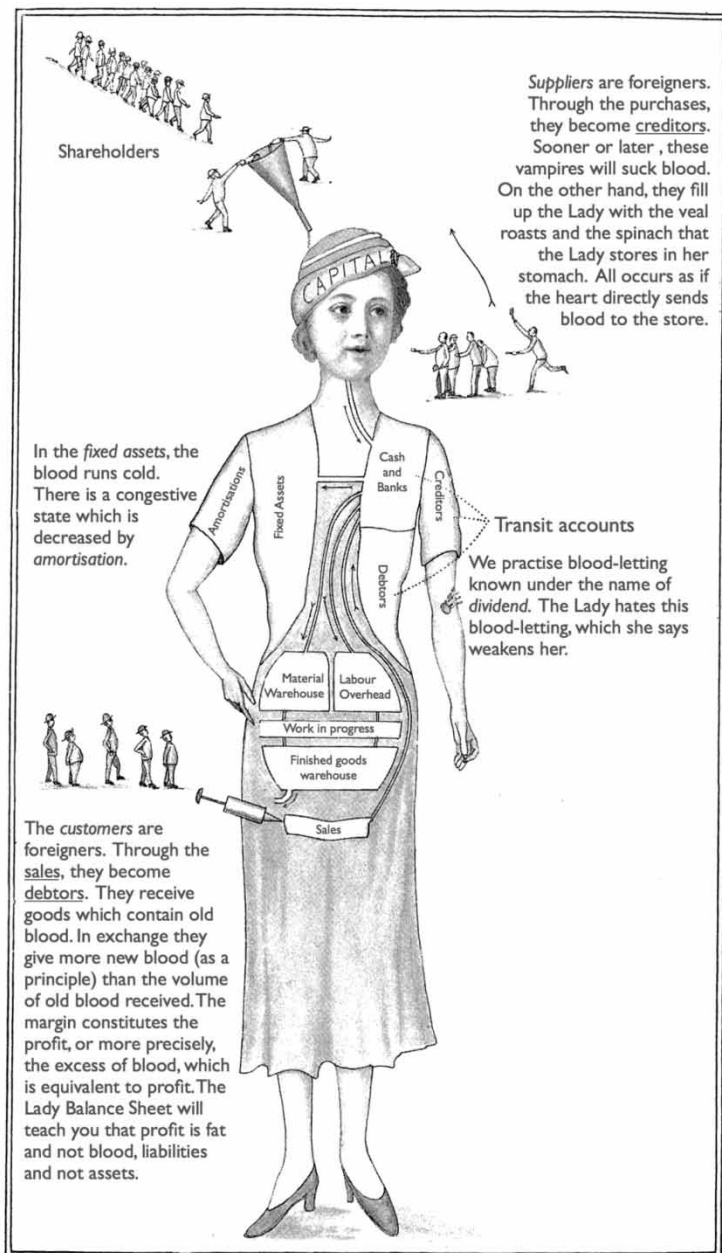
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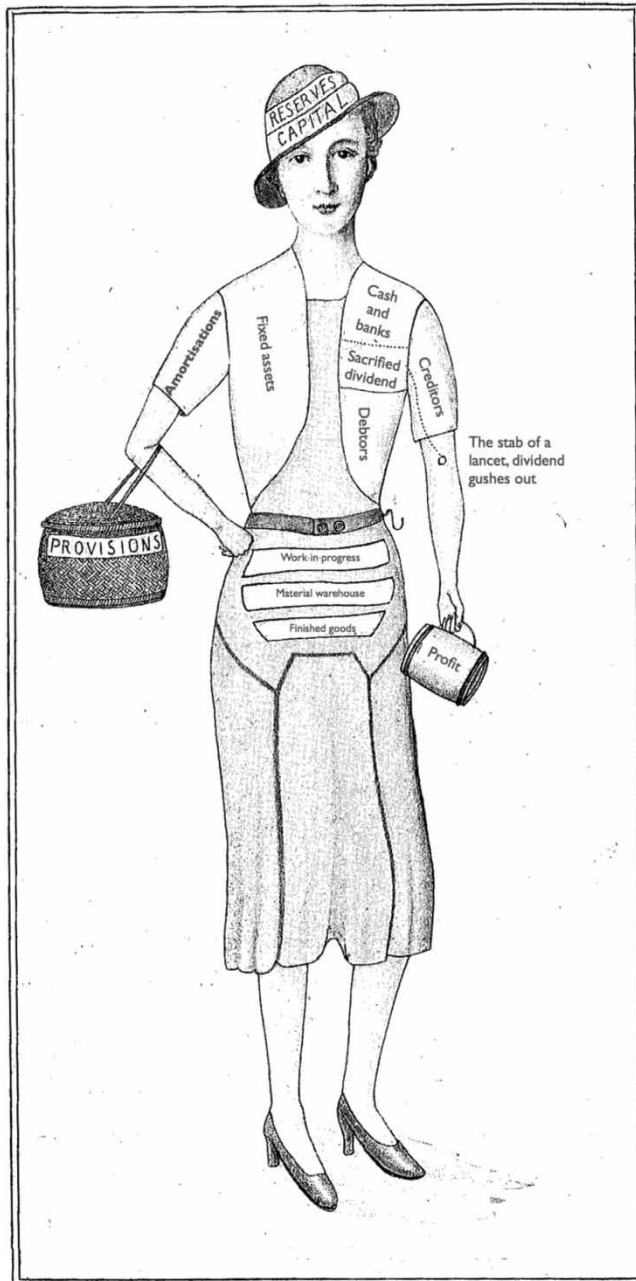
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Appendix 1. Lady Accounting



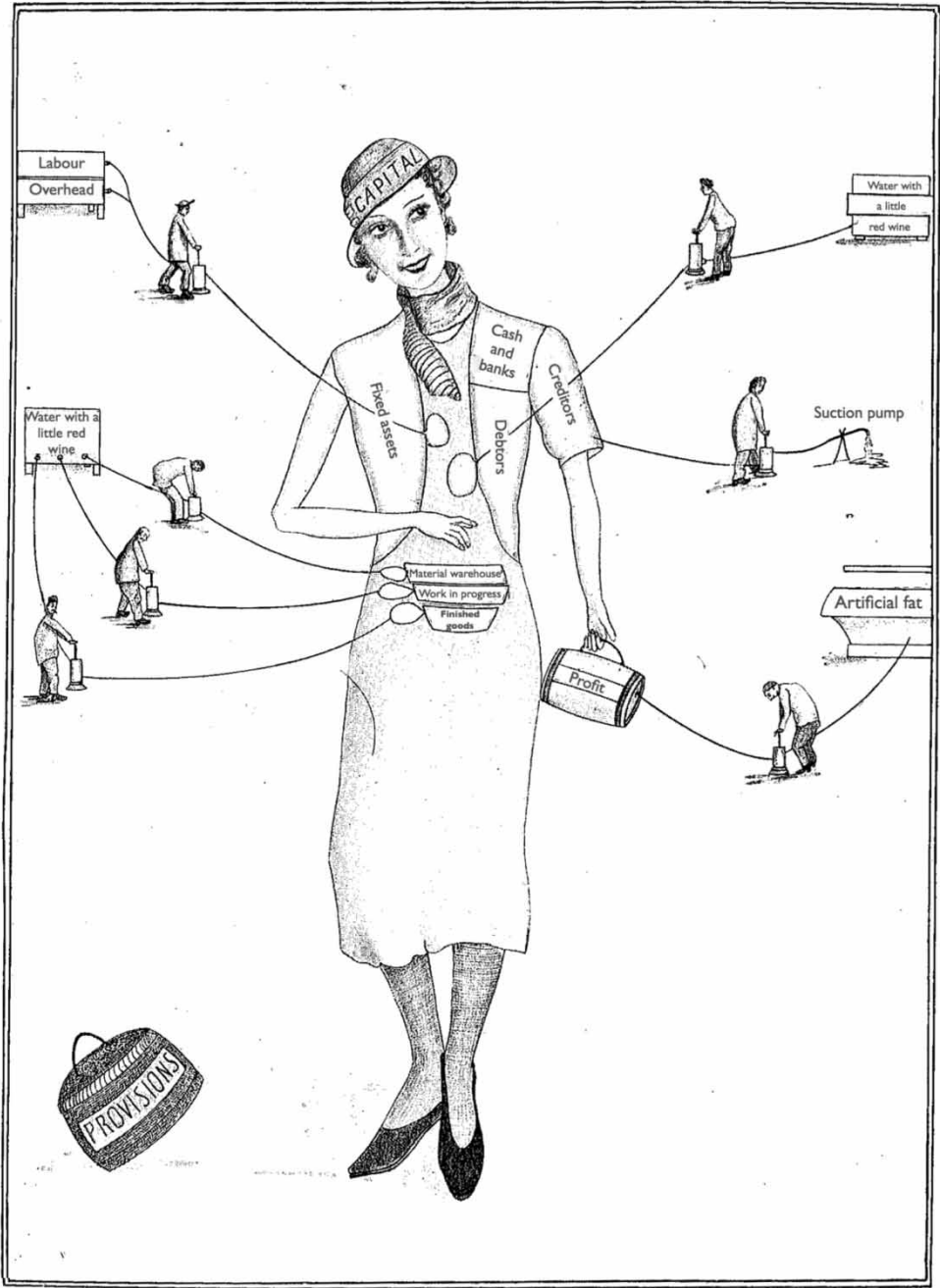
Source: Deuwez (1933) *La dame comptabilité*.

Appendix 2. Lady Balance Sheet



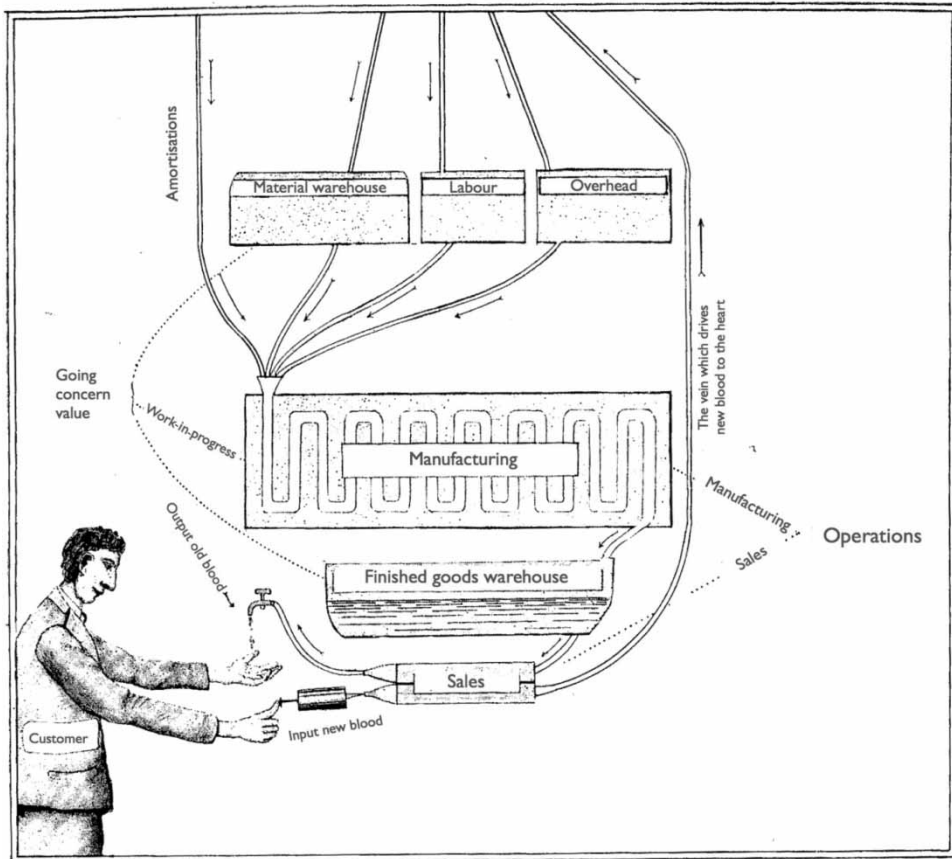
Source: Deuwez (1933) *La dame comptabilité*.

Appendix 3. The make-up of Lady Balance Sheet



Source: Deuwez (1933) *La dame comptabilité*.

Appendix 4. Role of the stomach and the intestines



Source: Deuwez (1933) *La dame comptabilité*.