

The First Systematized Uses of the Term “Management” in the 18th and 19th Centuries: Hints for a New History of Management Thought

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Abstract

Purpose – The paper seeks to reveal the familial roots of modern management thought, largely overlooked by a vast majority of management historians.

Design/methodology/approach – Using a hermeneutic approach, the early uses of the word “management” are analyzed, as well as the different literatures where it is the most frequently employed.

Findings – “Management” does not mean primarily “business management.” Rather, the first meanings of this word refer to the family realm. As such, the development of early management thought is not a matter of technical or scientific innovation, nor is it a matter of institutional size or profit. For a long time, management practices have concerned things more than people. In the 20th century, the principle of control come to supersede the principles of care and self-government.

Research limitations/implications – The paper’s findings calls for another history of management thought, as against the too narrow histories of modern business management and the too inclusive histories of management as an ancestral and universal practice.

Practical implications – This research sheds light on two forgotten roots of management thought: the principles of *care* and of *self-government*, which management practitioners could bring up to date. By presenting the family as the first locus of true “management” thought, it is an invitation to draw from domestic ways of governing.

Originality/value – The historical material here analyzed remains largely unknown to management historians. The method, focusing on text analysis rather than on the study of practices, remains rare in the field of management history.

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Introduction: hypothesis and method

Looking at modern literature on management thought, we find two main kinds of histories. The first tends to confine the managerial logic to the business sphere and ignore the older meanings of the word “management.” The second is, on the contrary, all-inclusive; it sees managerial thinking almost everywhere and at almost every epoch of human history. Both are erroneous in terms of evolutionism and universalism.

On the one hand, it would seem that, so far, a majority of historical studies of management carefully remained within the boundaries of the business enterprise. If some studies of the development of accounting have ventured outside the business and industrial arena (Freear, 1970; Noke, 1981; Scorgie, 1997; Juchau, 2002; Lamond, 2008), these non-capitalist and non-technological roots of management are hardly considered by management historians. Edward Brech’s review of management-related literature during the Victorian era remains within the boundaries of industrial business firms (Brech, 2002). Daniel Wren himself, who ventures as far as Babylon’s history in his *Evolution of Management Thought* (1972), circumscribes his books on *Early Management Thought* (1997) and on *Management Innovators* (Wren and Greenwood, 1998) to the administration of 19th and 20th centuries business enterprises.

Sidney Pollard would be an exception, who takes a small chance in farm management and admits that “the agricultural estate might foreshadow some of the methods used later in the factories” (Pollard, 1965: 30). But management meaning to him business management, i.e. to “manage large units within a competitive, progressive environment and within a framework of economic motivation” (*Ibid*: 24), he searches for its roots in the first elaborate forms of businesses, such as the industrial “domestic system” and the putting-out system. To him, the birth of management was only possible in a capitalist environment.

In his reference book on the “history of a *business* institution and a *business* class” (Chandler, 1977: 1, our emphasis), Alfred Chandler goes back as far as possible in the history of the “traditional enterprises,” to the Southern plantations, the Lowell textile factories, and the Springfield Armory (*Ibid*: 50-78). Nevertheless, he searches back in history for ancient forms of large-scale production and factory-like modes of organization. As such, he does not consider the large plantations in order to understand their logic but looks in them for familiar

practices. Throughout his life, Chandler remains interested in the emergence and development of “managerial capitalism” in the 19th and 20th century, not of managerial rationality.

On the other hand, for some historians of management thought, management would be a genetic feature of humanity. For two of the first historians of management, “wherever human activities are carried out in an organised and co-operative form, there management must be found” (Urwick and Brech, 1949: 216). Similarly, writes Claude George, “a true and comprehensive history of management would be a history of man” (George, 1968: vii). According to Wren, “management as an activity has always existed to make people’s desires through organized effort. Management facilitates the efforts of people in organized groups and arises when people seek to cooperate to achieve goals” (Wren, 1972: 11-12). Historians of British management thought John Wilson and Andrew Thompson state likewise that “management is as old as human civilization” (Wilson and Thompson, 2006: 6). And according to Stephen Robbins, author of widely used handbooks on management, “organization theory issues were addressed in the Bible” (Robbins, 1990: 32).

Armed with such an all-embracing definition, these authors consider military chiefs, priests, jurists, political leaders, and merchants entrepreneurs of the past as managers. Yet, if their definition may seem to broad in scope, their history appears on the contrary much too discriminating. Indeed, a majority of them ignore, among other appearances of the managerial ethos, the codified organization of labour and highly hierarchic functioning of European cloisters in the Middle Ages; the Christian doctrine of *administratio* as formulated by Paul in his Pastoral epistles and refined by the Roman canon law; the extreme planning, division of labour, and industrial ideal of the 18th and 19th centuries utopian socialists; the administration of European colonies; the organization of armed bodies from medieval times to the present; as well as the administration of the feudal estate, the early political parties, the brotherhoods, the fraternal societies, the guilds and the churches. As we can see, such a wide acceptance of the word “management” deprives this concept of its explanatory value. Used in this way, the notion can stand for so many things that it no longer means anything.

These two main types of management history show on the whole a retrospective bias consisting in forming an archetypal definition of management from the 20th century perspective, and in focusing on the history of entrepreneurship, trade, capitalism and more generally of what we call today the “private sector” in search for preludes, sketches, roots, ways and means of the victorious scheme of thinking they assume to be universal. By doing so, they overshadow the fact that if the word “management” today mainly refers

overwhelmingly to business management, it is only from the first decades of the 20th century that this definition takes over its older meanings.

Since its appearance in the English language in the 16th century and until the beginning of the 20th century, the word “management” has not primarily meant “business management.” From the time its use became frequent, in the middle of the 18th century, five corpuses of literature have repeatedly referred to the notion. They include husbandry, medical care of the mother and her infant, household administration, school supervision and engineering (appendices 1 to 5 present a bibliographical overview of such literature). While the word “management” is used in very different ways, on the whole these five corpuses are consistent in their common definition of the term, which could be summarized as: caring, making efficient, driving, systematizing, and calculating. This broad characterization of the word “management” was not an explicit reference for business management practitioners and theoreticians at the end of the 19th century and at the beginning of the 20th century, but rather the mental foundation upon which mechanics, engineers, and accountants chose to build their own concept of the notion. From a global overview of this early discourse on management, we draw a hypothesis on the symbolic and institutional causes of the appearance of modern management.

The purpose of this paper is to reveal a new genealogy of management. It is not a history of early forms of management practices, but a hermeneutic analysis of the meaning of the term “management.” It is based on a study of the early uses of this notion and of the different literature in which it appears the most frequently (cf. Kakabadse & Steane, 2010). In order to explore the early meaning of the term “management,” we gathered from a search in the Library of Congress a corpus of texts comprising the notion in their title, which was mostly useful to delineate five thematic fields and the historical periods to delve into. We then read through these works in search of common features and similar frames of reference accompanying the uses of the word “management.”

Of course, the risk of trampling on details and homogenizing diverse topics is great when such broad and varied writings are handled. This is why the analysis is confined to their broad lines and general features. For these five fields of expression undoubtedly display a shared set of principles and mental dispositions, exhibiting a common consideration for caring, a spirit of system and order, demands of industry and efficiency, the idea of a possible improvement of things and beings, as well as an extensive recourse to accounting and recording methods. Thus, these first systematic ways of thinking about management had features that were very

similar to what business management would become in the 20th century. Indeed, we will assume that although management thought has evolved throughout the 20th century, it is still based on the foundations laid down by Taylor and scientific management thinkers, which are: efficiency, organization, control, and knowledge (Fulmer and Wren, 1976: 74-75; Mintzberg, 1989: 511; Taneja, Pryor & Toombs, 2011).

It is not to say that current management thought simply retells Frederick Taylor's statements. Throughout the 20th century, multiple schools of management thought have developed outside his rationalistic ontology. Nevertheless, the new meaning given to the word "management" by American engineers, between 1890 and 1910, is still prevailing today. Leading authors such as Chester Barnard, Peter Senge, and Chris Argyris have developed influential non-positivist understandings of management, but they have not shifted the meaning of the word "management" in the way Taylor and his contemporaries have.

The first meanings of the term "management"

The forms "managing," "to manage," "managed," "manager," "manageable," and "management" were recorded in the second half of the 16th century with the broad and principal reference to the handling of public or private affairs with skill, tact or care (Murray, 1908: 104-106). Until the middle of the 18th century, the word "manage" and its declinations remain infrequent. At the end of this century, it was mainly used to discuss husbandry and health care. From the 1830s, household management came to synthesize elements of these two corpuses, which nevertheless followed their own path. While school management literature mostly developed from the 1860s, as well as engineering management, which included much of the literature on railway management until the end of the 19th century. We shall now consider successively these five kinds of literature concerning management.

From the middle of the 18th century, some English and American farmers began to use abundantly the notion of "management" to describe the implementation of the various activities of husbandry (see appendix 1). These books are very distinct from the general treatises on political economy then circulating, which considered with a theoretical outlook the impact of laws on trade and agriculture as a national issue. They rather focus on the farm as a single unit with a very empirical perspective: which plants to cultivate, when to sow and how much yield is expected are the kinds of issues addressed. Often compiling examples and cases, most of these books are practical catalogs of advice for the care of the farm's livestock, horses, soil, cooking food, dairy, equipment and buildings. Yet, some do intend to extract

general principles out of the myriad of husbandry practices. Arthur Young, who was to become Secretary to the English Board of Agriculture, stands as the great theoretician of farm management at the end of the 18th century.

The second corpus of literature widely using the term management before the 20th century concerns the care of the mother and her infant (see appendix 2). Most of these books focus on infants till weaning, while later books may apply the term “management” to the handling of older children and even of adolescents (Abbott, 1871; Shearer, 1904). On the whole, “written for the young and inexperienced mother” (Bull, 1840: iii), they display in a plain familiar style medical and paramedical advice, descriptions of pathologies and treatments as well as hints on moral and physical education, with a particular view on hygiene. Most of these books pay great attention to the mother’s and her children’s environment and sanitary condition. Here is an example of the classical exposition, as summed up by two Irish professors of medicine in a much quoted treatise: “The subjects treated in the ensuing chapters, naturally divide themselves under two heads, viz.: 1. Those which relate to the management of children, in order to ensure the preservation of their health, and the removal or prevention of any cause that might obstruct their moral and physical development; and 2. Those which relate to the detection, discrimination, and treatment of diseases to which the constitution of the child is liable” (Evanson and Maunsell, 1836: 14). The common book on infant management teaches mothers the proper supervision of the infant’s health, growth and development in their multiple dimensions: “how often to bathe, suitable diet, air, exercise, and a regular manner of living,” as writes the physician to the Princess of Wales (Underwood, 1789: 10), as well as drinking, motions, rest, sleep, clothing, retentions, secretions, excretions, diseases, passions and cultivation of the mind. Some treatises and manuals are dedicated to the care of a peculiar organ, disease or symptom, and occasionally to one’s general health (Bell, 1779; Wilson, 1847; Baird, 1867; Vines, 1868; Godfrey, 1872; Drewry, 1875; Bulkley, 1875; Angell, 1878; Lyman, 1884). In particular, the management of teeth is considered specifically. (James, 1814; Parmly, 1819; Clark, 1835; Spooner, 1836; Knapp, 1840; Palmer, 1853).

From the beginning of the 19th century blossom books and magazines of advice to middle-class women in their capacity not only as mothers and nurses but also as mistresses of a family, housekeepers and cooks (see appendix 3). The terms “domestic management,” “home-management,” “household management,” “family management,” or “the management of the house and household” are then used to describe not only common household tasks but the

general appearance and *train de vie* of the family. Such manuals are on the whole more informal lists of advice than theoretical treatises. They often mingle plans, principles, rules and technical instructions for such things as cooking, dressing food, knitting, cleaning, warming, ventilating, nursing, decorating, and the upkeep of yards, gardens and animals. The subtitle of Anne Cobbett's most famous *Manual of Domestic Management* sums up what the term "household management" could stand for at the beginning of the 19th century: *Containing Advice on the Conduct of Household Affairs and Practical Instructions Concerning the Kitchen, the Cellar, the Oven, the Store-Room, the Larder, the Pantry, the Dairy, the Brewhouse. Together with Hints for Laying Out Small Ornamental Gardens, Directions for Cultivating Herbs and Preserving Herbs; and some Remarks on the best means of Rendering Assistance to Poor Neighbours* (Cobbett, 183-). While the task of the housekeeper evolved considerably from the 1870s and 1880s – the housewife being more and more deprived of salaried servants and family helpers, buying more and more products formerly homemade, and externalizing tasks such as the education of children and the care for the sick –, the elaboration of systems of household management developed unabated.

School and classroom administration is also field of study and counseling where the notion of "management" is widely used. Books on "school management" appeared at the beginning of the 19th century in Great Britain but became common from the 1860s and greatly developed in the United States at the very beginning of the 20th century (see appendix 4). This literature is mainly written by progressive principals, superintendents and teachers in ordinary schools in order to present a new method of educating children, as opposed to the mainly authoritarian and coercive military-like style of the old system. School management's theories share the same set of principles with other fields of management thought examined here, but add a recurring use of the term "organization." As a teacher in school management admits, "whatever difference there may be between a book on school management and one on the management of any other organization is only a difference in details" (Tompkins, 1895: 32).

Engineering management also developed in the second half of the 19th century (see appendix 5). It refers predominantly to the handling and care of complex machines such as boilers, motors and engines. Such books hardly mention the supervising of laborers and are often purely technical. We can assume that the engineers manufacturing industrial equipment at the end of the 19th century, such as Frederick Taylor, read some of these books.

It is of course sometimes difficult to draw clear-cut distinctions between these five kinds of publications. Some authors may deal with several of these topics in the same book or in separate publications. John Henry Walsh wrote, for instance, a *Manual of Domestic Economy* (1853), another of *Domestic Medicine and Surgery* (1858), edited a cookery book (1858), and authored books on dog management (1859) and horse management (1861). Apothecary James Nelson was the first to add hints on manners and education to his medical essay on the management of children (Nelson, 1753), a practice soon to be imitated. More generally, farm management manuals often included a chapter on the medical care of animals. And the farm and the household, were, for a long time inseparable. The gentleman farmer Arthur Young noted for instance in 1770 that “another point of some consequence in a gentleman’s œconomical management, is *house-keeping*, so far as it concerns the farm” (Young, 1770b: 240). And when established in 1923, the American Bureau of Home Economics was a part of the Department of Agriculture. When it developed into a literary branch, household management came to absorb topics such as infancy management, garden management, and the management of diseases. There was also a continuum between the management of women during pregnancy, in labor, in child-bed, and the management of the children and of the home. Until the last quarter of the 19th century, child management constituted a part of books on the domestic duties of housewives. (Parkes, 1825; Child, 1831; Beecher, 1841; Walsh, 1853; Beeton, 1861; Beecher and Stowe, 1869; Mann, 1878). Up to these years, as historian Robert Smuts remarked, “most of the burden of medical care fell on the women of the family,” even among the well-to-do (Smuts, 1959: 13).

Similarly, animal management fell under both the heading of farm management and medical management. Let us note here that the literature on horse management was considerable in the 19th century and went beyond the use of horses for farming (Flint, 1815; Lawrence, 1830; Nimrod, 1831; Youatt, 1834; Capt. M, 1842; Hieover, 1848; Horlock and Weir, 1855; Mayhem, 1864; Mahon, 1865; Graves and Prudden, 1868; Sherer, 1868; McClure, 1870; Gough, 1878; Reynolds, 1882; Sample, 1882; Magner, 1886; Galvayne, 1888; Cook, 1891; Heard, 1893; Armatage, 1896; Abye, 1903; Bell, 1904; Axe, 1905). The term “management” was commonly applied to the training, handling, and directing of a horse in its paces from the 16th century, probably as a result of the confusing proximity between the word “manage” and the French word “manège” (*riding stable*). Books on dog management are also common (Ellis, 1749; Cook, 1826; Loudon, 1851; Horlock, 1852; Hill, 1881; Sample, 1882), as well as books on sheep, mules, cattle, pigs and poultry (Daubenton, 1782; Moubray,

1816; Williams, 1849; Youatt, 1855; Jacques, 1866; Graves and Prudden, 1868; Sherer, 1868; Vaniman, 1885; Periam, 188-; Heard, 1893). The same author may decline his system of management to various races of animals in the same book or in different ones, such as William Youatt writing successively upon the management of horses (1834), sheep (1836), cattle (1837), dogs (1854), and hogs (1855), or George Armatage speaking on *The Varieties and Management in Health and Disease* of sheep (1873), cattle (1893), and horses (1894).

The word “management” is often cast as a general umbrella to depict a broad field of interest. For instance, school management often includes “not only school economy proper, but also school government and school ethics,” as well as school requisites, school work and management of the teacher, as states an American superintendent (Raub, 1882: 11-12). Some books might use the term in their title and no further, in which case we might suspect some editors’ choice. On the contrary, books might treat our five themes without using repetitively the notion of management. And indeed, many books were specifically devoted to child care from the end of the Middle Ages, and to husbandry, household administration and education from Antiquity. We limit ourselves to those which made a thorough use of the term “management” to reflect upon their subject, for we suggest that it is the mark of a peculiar way of thinking.

Moreover, there exists an obvious discrepancy between the authors’ cultural background and the epochs when they were writing, even if many books were published and republished over times both in Great Britain and the United States. Some were English, others Americans, and one or two books here considered are translations from the French. But from the middle of the 18th century to the end of the 19th and whichever side of the ocean we look at, the word “management” kept a stable meaning. The great semantic change came, as we shall see, at the beginning of the 20th century.

Finally, the books examined here did not have the same diffusion. Some books were widely read and serve as models, in each one in its specific field, while others were published in a single and private edition. In infant management for instance, the famous William Cadogan and Hugh Smith stand as authorities at the end of the 18th century. The statistician, agronomist and empirical scientist Arthur Young, who imagined “systems of management” as early as 1768, was similarly a reference in farm management. In household administration, Catharine Beecher, Isabella Beeton and Ellen Richards are popular even now. Isabella Beeton’s 1861 book, which popularized the expression “household management,” sold over

sixty thousand copies in its first year of publication and almost two millions copies by 1868 (Humble, 2000: vii).

The logic underlying the early uses of the term “management”

Taken as a single corpus, the books herein considered show a conceptual coherence and share a common understanding of the term “management.” To manage then means to care, to be industrious and to make efficient, to drive and improve, to arrange and act in a systematic way, to count and calculate. We shall now examine these five dimensions of 18th and 19th century management.

The principle of care is the focal point of the 18th and 19th literature on management. “The *care* is all” in management, as writes the pamphleteer, farmer and journalist William Cobbett (Cobbett, 1821: 113) The notion then makes sense in regard to the different dimensions of this principle, which are prevention, treatment, hygiene, cleanliness, sanitation, breeding and healing. Some authors may talk about “moral” and “mental management” of children and adults (for example Thompson, 1841), and possibly of the moral management of insane persons (Haslam, 1817; Millingen, 1841). But the concept was also widely applied to the careful maintenance of the house and of farm equipment. In the second half of the 19th century, several engineers and machinists adopted this meaning of the term management to describe the maintenance and repairing of diverse kinds of machinery. Let us note here that this predominance of the principle of care in the first meaning of the word “management” should not receive a gender explanation, as analysis and histories of household management often suggest. Farming was predominantly a manly practice, and it stressed the importance of caring as much as the more womanly activities of the household.

Industry and efficiency form the second structuring managerial principle of the arts of nursing, husbandry and housekeeping. At the end of the 18th century, the word “economy” was commonly used by writers on farm management in the sense of thrift and of a judicious use of resources. The insistence on the profitability of a farm or of a particular crop then implied more their productivity than a potential pecuniary profit on a market. For these authors, nothing was worse than keeping idle the soil, animals or men. Medical advisers repeatedly stress the importance of exercise for the proper development of children. But it was in farm, household and school management that these principles of industry and efficiency were the most prevalent. They then refer to the maximum output, to the virtues of work and to

frugality. In household management, to be industrious and keep good hours is a necessity. As stated the *Housekeeper's magazine* in 1825, "absolute idleness is inexcusable in a woman, because the needle is always at hand for those intervals in which she cannot be otherwise employed" (*Housekeeper's magazine*, 1826, n°2: 27). Besides being industrious, a housekeeper must be efficient, whether in making or in spending. The purpose of the *Cassell's Household Guide* is thus to show "how by the *minimum* of expenditure the *maximum* of comfort and of luxury may be obtained" (*Cassell's Household Guide*, 1869: 1). And classroom management often means supervising efficiently industrious pupils.

Perhaps the most common significance of the verb "to manage" from its first uses at the end of the 16th century was "to handle," "to conduct" or "to carry on" (Murray, 1908: 104-105). In many of the texts considered here, the word management means altogether breeding, training and curing. Management is less about discipline and tradition than about accompanying according to a spirit of reason. For instance, goodness and patience rather than "main strength and stupid harshness" (Graves and Prudden, 1868: 38) are systematically recommended in the management of horses. For most authors on school and classroom management, cooperation more than discipline is the basis of a sound education, as military methods of instruction were relegated to a distant past. "The management, wrote an educational pioneer, should be so systematic and vigorous as to render severer punishments unnecessary" (Baldwin, 1881: 166). In the management of infants and pupils, a good management mostly consists in giving proper habits – that is, organized reactions. And by essence, conduct books devise ways of improving their readers' behavior. Most of the writings considered here thus share a common concern for intelligibility.

Order, arrangement, system, and regulation are watchwords of the 18th and 19th century literature on management, and especially of the literature on farm and household management. The expressions "system of managing," "plan of management," "method of management" are found in almost every book here considered. The very idea of management seems to imply the notion of a regular and ordered arrangement. For instance, many of the books on school management devote a chapter or a whole part to "organization," which usually contains instructions regarding the number and size of the classes, the distribution of the staff, the syllabus of work for each class, the classification of the scholars and the time table. The plans, systems, and methods imagined by most of the authors considered here rely on numerous tools among which diagrams, schedules, work orders, tables of duties, calendars, compendia, reminder cards and files, bulletin boards, ledgers, and accounting books.

To manage meant also, in the 18th and 19th centuries, to know how to measure, quantify, record, calculate and even how to put into percentages and equations. In many books on farm and household management, accounting is a secondary consideration, often appearing at the very end in the “miscellaneous”. It is not so much accounting as calculating that forms the core of early management thought, even if isolated authors such as Arthur Young devised vanguard systems of accounting (Scorgie, 1997; Juchau, 2002). The calculus of costs is a very secondary concern of the first authors of management books. School teachers and headmasters are, indeed, among the most advanced thinkers of accounting and measurement at the end of the 19th century. In 1916, an author even elaborates schemes for “the measurement of teaching efficiency” (Arnold, 1916).

If most of the books here gathered consist merely in descriptive lists of empirical practices, some try to formulate general principles and laws out of it. Whether explicitly or implicitly, these principles are linked to one another and form a kind of system. Indeed, the care should be efficient, accounting should be regular in order to gain appropriate knowledge, gaining knowledge should be useful for training, keeping records and setting time-tables has an important influence in promoting regularity, etc. As states pioneering educator Joseph Baldwin, “school management is the art of so directing school affairs as to produce system, order, and efficiency” (Baldwin, 1881: 15). That is, in the 18th and 19th centuries, the word “management” does not have different meanings but different dimensions coherently articulated the one to the other.

From this hermeneutic study, lessons can be drawn regarding the institutional and symbolic frameworks of emergence of an early management thought.

Lessons from the development of an early management thought

The authors here examined cannot be considered as the scattered progenitors or precursors of modern management systems, methods and tools, like few spots of enlighten forerunners in a sea of dark ignorance and traditional beliefs waiting for the business corporation and its professional managers to gather and systematize their insights. The builders of the systematic management schemes and of the scientific management movement were inspired by the mechanics’ practices, accountants’ tools and scientific engineers’ dispositions of mind, not by the important literature on medical, farm, school and household management (Nelson, 1975; Chandler, 1977; Merkle, 1980; Noble, 1984; Shenhav, 1999). If some management thinkers,

such as Frank and Lillian Gilbreth, may have transposed techniques and experiments elaborated at home to the factories they were reorganizing, it was not a common practice – the reverse became more common from the 1910s, and we can suppose that scientific management techniques and methods were easily translated to the household, the farm and the school because management theories and a managerial frame of mind pre-existed in these fields.

For there exists a strong continuity between the 18th and 19th century acceptance of the word “management” and the way the notion was shaped by American engineers and business managers at the beginning of the 20th. By using this term, the latter unconsciously inherited an intellectual framework and mental stereotypes. Words are not neutral. If their use authorizes a certain liberty, they are also loaded with a patrimony of mental schemes. When English political scientists coined the word “politics” at the beginning of the 16th century, they adapted as much as adopted the Greeks’ representations of authority, law, power, and government built in the notion of *polis*. Similarly, when late-19th century mechanics, engineers, and accountants chose to use the term “management” to define their practices and themselves, they inherited inevitably from its earlier meaning. Or rather, should we say, they adopted this concept *because* of its earlier meanings, which fitted their own practices and representations. And indeed, English and American engineers started to use the word “management” from the middle of the 19th century in the way matrons, doctors and farmers did. As such, the early plans of management were neither a prelude to the first business management systems nor an explicit reference for their theoreticians, but rather the mental foundation and the symbolic material upon which they built up their own concept of management.

As much as engineering practices and accounting methods preceded their existence, a shared mental representation of management as a rational way of improving and ordering efficiently things, living beings, and organizations provided a precedent for their own conceptions and definitions of this term. And this systematic way of managing could be developed in a feminine, non-mechanized and non-standardized environment, in the absence of salaried workers and managers, with a limited use of money-payment, no competition, little or no credit and no profit-motive in the pecuniary sense. An hypothesis which runs counter to much of management histories’ dogmas.

1) The development of early management thought was not a matter of technical or scientific innovation

In the spirit of management thinkers and historians, the formation of a managerial logic is often tied to technical innovation. According to Yehouda Shenhav for instance, “the organizing concepts around which managerial rationality was engineered were systematization and standardization. The underlying assumption was that the machine-like manufacturing firm would generate predictability, stability, consistency, and certainty” (Shenhav, 1999: 102). According to German economist Werner Sombart, “the farm is incompatible with what we have called the administrative system, for neither the tasks it requires nor its organization are prone to standardization” (Sombart, 1928: 530-531). On the contrary, our analysis clearly shows that a form of managerial rationality could develop in a barely developed technical environment

Schemes of farm management developed before the application of industrial processes to agriculture and the introduction of complex farming tools from the middle of the 19th century and authors developed household management principles and systems long before the domestic use of running water and electricity (Cowan, 1983: 92). At the very beginning of the 20th century, some of them adapted the Taylor system to the home activities while manual work was still the norm in spite of the progressively wider introduction of mechanical appliances (Furst, 1911; Leupp, 1911; Gilbreth, 1912a; Guernsey, 1912; Bruere, 1912; Frederick, 1913; Pattison, 1915). Scientific management was similarly applied to the non-mechanized and non-standardized field of education (Rice, 1913). Moreover, references to mechanics appeared at the end of the 19th and at the beginning of the 20th centuries to cover the farm, the household and the school as “machineries,” but remained vague and sporadic.

Our hypothesis is then that the management thinking movement, including systematic and scientific management thought, was part of a larger movement of rationalization, which impacted the medical profession, the farm, the school and the home independently from the factory. Business management thought, as well as industrial innovation, is probably an expression of the rationalizing spirit which Max Weber made the true moving force of modern history.

2) The development of early management thought was not a matter of institutional size

Another common idea among observers of capitalism and the factory-system is that management is a matter of size and size a matter of management (Cooke-Taylor, 1891, p.422; Knight, 1921, p.278; Pollard, 1965, p.11 et p.16; Wiebe, 1967, p.23; Chandler, 1962 and 1977; Zunz, 1990, p.202; Milgrom and Roberts, 1992, p.539). Our examples show that a formalized discourse on management could apply to small-scale going concern deprived of an intermediate stratum of managers, and even deprived of salaried employees.

Size was rarely a relevant factor for early management thinkers. For the author of famous prescriptions for “the American Frugal Housewife,” “neatness, tastefulness, and good sense, may be shown in the management of a small household, and the arrangement of a little furniture, as well as upon a larger scale” (Child, 1829: 5). Doctrines of school management were elaborated before the appearance of a class of school directors, administrators, and supervisors differentiated from the teachers. In 1904 in the United States, writes William Estabrook Chancellor about these new characters, in a widely read book, “so recent has been their appearance in the world of education that not only the general public, but even many instructors, do not yet understand the nature and value of their work” (Chancellor, 1904: v). As such, most school management books published at the end of the 19th century were written for the attention of teachers, not for the specialized class of principals and superintendents.

Managerial methods can also be developed without any elaborate scheme of division of labor. Division and arrangement of procedures, more than division of labor, are important issues of the early management literature. It is striking that highly rationalized methods of management were imported into the American house precisely at a time when the housemaid became less of a manager and more of a worker, “as domestic servants, unmarried daughters, maiden aunts, and grandparents left the household and as chores which had once been performed by commercial agencies (laundries, delivery services, milkmen) were delegated to the housewife,” as states historian Ruth Cowan (1976: 23).

3) The development of early management thoughts was not a matter of profit

Taylor was not motivated by pecuniary profit, but his plans of management were mostly applied to profit-motivated institutions. On the contrary, in the early books on management, the term “profitable” means producing the greatest results with the lowest expenses rather than making profit by exchange on a market. When writers of manuals on farm management talk about profit, we clearly understand that it is an argument to attract young gentlemen to

this profession. In medical management and household management, the profit end is even more remote. The end sought by these systems is the physical vigor and health of individuals and the welfare of the family. The household is a non-for-pecuniary-profit institution. It produces use-values, not exchange-values. It is not run for profit but to provide the necessaries and comforts of life for the family members. The sound development of children, home cleanliness, beauty and hospitality, and the general happiness of the family are the true objectives of household management. In the address of the first number of *The Economist* we can read: "Economy, in our interpretation of the word, means the art of being comfortable and happy" (*The Economist*, 1825: 2). As sums up college lecturer Mabel Atkinson, the most efficient housekeeper's "reward for her good management does not consist in a raised salary or increased profits. It is, in fact, not pecuniary at all, but is the increased well-being of those whom she serves." (Atkinson, 1911: 177) School management similarly aims at bettering society and sharing a close link with the progressive movement that shook the United States and Great Britain at the end of the 19th century and at the beginning of the 20th.

Thus, in the 19th century a large part of managerial thinking blossomed far from capitalist institutions such as banks, partnerships, fairs, stock exchanges, and markets - and far away from engineering and accounting practices too. While farming has largely been submitted to the capitalist frame of mind, the family still constitutes an alternative mode of production and of sociality as compared to the business corporation.

Another lesson from the early literature on management is that there can be a systematic plan of management in the absence of productive activities. Curing activities as well as consuming activities can be managed as much as productive ones.

4) Management of things and personal supervision

In the 18th and 19th centuries, whether in household management, in medical management, in farm management or in school management, the handling of people is considered as something highly personal, subjective, and hard to systematize. As states feminist-abolitionist Lydia Maria Child, "there is such an immense variety in human character that it is impossible to give rules adapted to all cases" (Child, 1831: 35). At home, the relationships between the mistress and maids, the mistress and guests, and the mother and other members of the family are personal relationships. Even if the employees are not admitted to the family circle, they are members of the household, often belonging to the same church. Thus the handling of

servants or of family members is less a matter of technique than of tact and patience. People are not tools, they are characters.

In the 18th and 19th centuries, the term “management” referred most generally to the management of elements, things, pieces, tools, phenomena, institutions or living being necessitating a careful guidance or in “the plastic period of immaturity” (Bagley, 1907: 7). When slaves are occasionally considered more or less “manageable,” it is in their capacity of private property, not as laborers (Grainger, 1764; Smith, 1776: 167; Majoribanks, 1792; D. Collins, 1803; Mill, 1848: 250-251; R. Collins, 1852). In the medical and para-medical books, the human beings who can be managed are the pregnant mother, the infant, the invalid, the old and the sick; that is, helpless and dependent persons in need of a careful government. The management of children often serves as a model for the management of persons. For instance, Hugh Smith notes about sickness that “a man under these circumstances, with some regard to his accustomed manner of living, and the particular disease is to be considered as a child, and consequently ought to be submitted to female management” (Smith, 1792: 222). For the household management writer Frances Parkes, “servants, when ill, require the same kind of management as children” (Parkes, 1825: 243). Throughout this early literature on management, the terms “supervision,” “overlooking,” “looking after,” or “attendance” were used when considering autonomous grown-ups.

To apply the notion of “management” to working people was a conceptual revolution in itself, but it may also inform us about the view held by the manager of the managed – even if we will not venture to infer that in the eyes of the first the second stood as something between an inanimate tool and a child.

5) Control VS. self-government

Apart from school and classroom management texts, the principle of *control* is a dimension almost absent from the early literature on management. Many authors included for instance in “the business of the housekeeper” the task of supervising the servants, but few propose methods of control. General supervision rather than detailed control was the common practice. Of course, mothers and nurses control children through habits, rewards and punishment as well as moral and religious principles, but in the end autonomy and self-control are sought and highly valued. According to the American educational reformer William Alcott, whose 1836 book on the management of children had gone through seventeen editions by 1849, “the future health, and even the moral wellbeing of the child, depend much more on

the proper management of the mother herself than is usually supposed” (Alcott, 1836: p.121). Self-management is also sought in farming. “Each worker,” writes Warren, “must be a foreman of his own work, and usually the owner must work, because he cannot supervise enough workers to justify him in being idle” (Warren, 1913: 12). Control is often an important element of school and classroom management. According to Prof. Albert Salisbury for instance, “management is the act or art of control towards a desired result. School management, then, is the direction and control of school activities towards the true ends of education” (Salisbury, 1911: 12). Nevertheless, self-government is praised throughout this literature, as school management is recognized to aim at developing pupils into autonomous youth. As a respected education writer states, “a good teacher educates his pupils into self-government” (Kellogg, 1880: 104). “Self-government is the central idea in school management” confirms “educational artist” Joseph Baldwin (Baldwin, 1881: 15). Government from within, rather than extraneous control, is the ideal of most of early writings on management and is expected from everyone at school. As states professor of school administration at Columbia University Samuel Dutton, “he who manages the school must first manage himself” (Dutton, 1903: 11).

Impersonal and centralized control is a genuine feature of the 20th century literature on management. As stated the Taylorite Henry P. Kendall, “the central planning and control of work which is such a vital part in Scientific Management is not developed to the same degree in the systematized” (Kendall, 1914: 126). What the Taylor System attacks is precisely workers’ autonomy and self-government.

Conclusions: the family institution

The emergence of modern management science cannot be explained within the boundaries of the business enterprise. The domestic sphere played the role both of a point of reference and of a point of repulsion.

On the one hand, scientific management thinkers and their heirs have clearly redefined the word “management” by keeping much of its earlier meaning. And this word meant a lot to them, as they used it as a social rallying point, as a battle flag and as an intellectual tool. On the other hand, it is as if management science had been built on the negation of its patriarchal roots as well as the concealment of its non-commercial and non-technical origins. Far from being the core institution around which managerial practices revolved, the family would be, as

Chandler put it, an obstacle to, or even an enemy of the modern corporation, embodying rival principles (Chandler, 1977: 1). The corporation had thus to get rid of these familial traditions and networks of personal ties to become a managerial institution.

Conversely, management thinkers and historians strived to show how political thinkers, thoughtful engineers, and great military leaders shaped management thought. Not surprisingly, a discipline under construction seeks prestigious godfathers and illustrious foundations. Yet, such an explanation does not completely account for this mythical foundation of management science. Comparisons with political science, with a special emphasis on the emancipation of political thought from domestic and patriarchal references from the end of the 17th century (Schochet, 1975), might throw additional light on the relationships between early and modern management thoughts.

Why did the managerial rationality shaped from Taylor's time supersede the early ways of thinking about management? We would venture an institutional explanation. The family, this institution around which revolved medical management, household management and farm management, has taken a secondary role in social life, as the business corporation gained independence from it and came to the fore. While the managers were gaining power within the corporation against the entrepreneur-owner, who was often running his company according to family principles as against contractual principles, they appropriated the word "management" from engineering literature and redefined it while they applied it to the shop, the company, and workers. By doing so, they paradoxically fought the logic of the family by brandishing a concept inherited from the domestic world. With one notable difference: they cast aside the principle of *care* from the managerial rationality and "superseded" it by the principle of *control*.

Nevertheless, the influence of the domestic and family frame of mind over the first large scale businesses deserves a close look, rather than being dismissed as a relic of outdated practices which disappeared without leaving a trace when the dilution of ownership and the rise of a managerial class contributed to push the family owners aside from the management of large corporations. As much as the influence of the church over the state did not disappear in Europe when these institutions were legally separated, the family way of managing survived to the growth of the large corporation.

As a conclusion, this paper advocates further research to uncover the familial roots of modern management thought breaking with the retrospective histories written so far. Why has the family never been recognized as one major institutional origin of modern management

thought? This rejection of the family way of governing by management theoreticians and historians should be addressed. In particular, stressing the importance of the principle of care for early thinkers of management and its concealment by 20th century managers has great implication for research, practice and society. Is not time to rekindle this principle and to really *care for workers*?

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Appendix 1 : selection of books on farm management from the 18th to the beginning of the 20th century

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- With the Facts of the Nineteenth Century, Together With an Elaborate and Scientific Essay on Horse-Shoeing; also, the Ordinary Diseases of Horses and Dogs, and Their Treatment, with Many Valuable Recipes.* San Francisco: N. p., 280-vi p.
- SANDERS J. H. (1885). *Horse-Breeding: Being the General Principles of Heredity Applied to the Business of Breeding Horses, with Instructions for the Management of Stallions, Brood Mares and Young Foals, and Selection of Breeding Stock.* Chicago, J.H. Sanders & Co., 249 p.
- SHERER John (1868). *Rural Life Described and Illustrated, in the Management of Horses, Dogs, Cattle, Sheep, Pigs, Poultry, etc. etc.: Their Treatment in Health and Disease: With Authentic Information on all that Relates to Modern Farming, Gardening, Shooting, Angling, etc. etc..* London; New York: London Printing and Pub. Co., xvi-1016 p.
- SMITH H. H. (1898). *The Principles of Landed Estate Management.* London: E. Arnold, xii-340 p.
- TAFT L. (1898). *Greenhouse Management.* New York: Orange Judd company, x-382 p.
- TEGETMEIER W. B. (1854). *Profitable Poultry; Their Management in Health and Disease.* Darton and Co., 48 p.
- THOMAS J. J. (1844). *Farm Management*, in WELLS (1858). *The Farm: A Pocket Manual of Practical Agriculture; or, How to Cultivate All the Field Crops: Embracing a Thorough Exposition of the Nature and Action of Soils and Manures; the Principles of Rotation in Cropping: Directions for Irrigating, Draining, Subsoiling, Fencing, and Planting Hedges; Descriptions of Agricultural Implements; Instructions in the Cultivation of the Various Field Crops, Orchards, etc., etc..* New York: Fowler and Wells, pp.82-99
- VANIMAN A. W. (1885). *A Treatise on Swine; Their Care and Management, Diseases and Remedies.* St. Louis, Mo.: Commercial publishing Co., 32 p.
- WALSH J. H. (1859). *The Dog in Health and Disease; Comprising the Various Modes of Breaking and Using Him for Hunting, Coursing, Shooting, etc., and Including the Points or Characteristics of Toy Dogs.* London: Longman, Green, Longman and Roberts, xiv-384 p.
- _____ (1861). *The Horse, in the Stable and the Field: his Management in Health and Disease,* Philadelphia: Porter & Coates, x-622 p.
- WARD and LOCK (1881). *Book of Farm Management and Country Life. A Complete Cyclopedia of Rural Occupations and Amusements.* Ward and Lock, 1370 p.
- WARREN G. (1913). *Farm Management.* New York: The Macmillan company, xviii-590 p.
- WILLIAMS T. (1849). *Farmer's Guide in the Management of Domestic Animals, and the Treatment of Their Diseases: A Treatise on Horses, Mules, Neat Cattle, Sheep, Swine, Poultry, Bees, etc..* New York: Ensign, Bridgman, & Fanning, 98 p.
- XENOPHON (1876 [362 B.C.]). *The Economist.* translated by A. D. O. Wedderburn and W. G. Collingwood, London: Ellis and White; [etc., etc.], xlvi-141 p.
- YOUATT W. (1834). *A History of the Horse, in All Its Varieties and Uses: Together with Complete Directions for the Breeding, Rearing, and Management; and for the Cure of All Diseases to Which he is Liable.* Washington: D. Green, viii-360 p.
- _____ (1837). *Sheep: Their Breeds, Management, and Diseases, to which is Added the Mountain Shepherd's Manual.* London: Baldwin and Cradock, viii-568 p.

- _____ (1836). *Cattle: Their Breeds, Management, and Diseases*. Philadelphia, Grigg & Elliot, viii-600 p.
- _____ (1847). *The Pig; a Treatise on the Breeds, Management, Feeding, and Medical Treatment, of Swine; with Directions for Salting Pork, and Curing Bacon and Hams*. London: Cradock and Co., viii-164 p.
- _____ (1854). *The Dog*. London: Longman, Brown, Green, and Longmans, vii-401 p.
- _____ (1855). *The Hog: A Treatise on the Breeds, Management, Feeding and Medical Treatment of Swine; With Directions for Salting Pork and Curing Bacon and Hams*. New York: C. M. Saxton, iv-231 p.
- YOUNG A. (1768). *The Farmer's Letters to the People of England; Containing the Sentiments of a Practical Husbandman, on Various Subjects of Great Importance; Particularly, the Exportation of Corn. The Balance of Agriculture and Manufactures. The Present State of Husbandry... The Means of Promoting the Agriculture and Population of Great-Britain, To which are Added, Sylvae; or, Occasional Tracts on Husbandry and Rural Economics*, Second edition, corrected and enlarged. London: Printed for W. Strahan, 482 p.
- _____ (1770a). *The Farmer's Guide in Hiring and Stocking Farms. Containing an Examination of many Subjects of Great Importance both to the Common Husbandman, in Hiring a Farm; and to a Gentleman on Taking the Whole or part of his Estate into his own Hands. Also, Plans of farm-yards, and Sections of the Necessary Buildings*. 2 vol., Printed for W. Strahan, ii-458 p. and viii-500 p.
- _____ (1770b). *Rural Economy: or, Essays on the Practical parts of Husbandry: Designed to Explain Several of the Most Important Methods of Conducting Farms of Various Kinds; Including Many Useful Hints to Gentlemen Farmers Relative to the Economical Management of their Business...: To which is Added, The Rural Socrates: Being Memoirs of a Country Philosopher*. London: Printed for T. Becket, 520 p.
- _____ (1773). *Observations on the Present State of the Waste Lands of Great Britain: Published on the Occasion of the Establishment of a New Colony on the Ohio*. London: Printed for W. Nicoll, 83 p.

Appendix 2 : selection of books on medical management from the 18th to the beginning of the 20th century

- ABBOTT J. (1871). *Gentle Measures in the Management and Training of the Young*. New York, Harper & brothers, viii-330 p.
- ALCOTT W. (1836). *Young Mother, or Management of Children in Regard to Health*. Second edition, Boston: Light & Stearns, 332 p.
- ANGELL H. (1878). *How to Take Care of Our Eyes, With Advice to Parents and Teachers in Regard to the Management of the Eyes of Children*. Boston: Robert Bros., 70 p.
- ANONYMOUS [An American Matron] (1811). *The Maternal Physician: A Treatise on the Nurture and Management of Infants, From the Birth Until Two Years Old. Being the Result of Sixteen Years' Experience in the Nursery*. New York: Isaac Riley, 291 p.
- ANONYMOUS (1884). *A Few Suggestions to Mothers on the Management of Their Children*. London: Churchill, 182 p.
- APPLETON E. (1820). *Early Education: Or, The Management of Children Considered with a View to Their Future Character*. Printed for G. and W. B. Whittaker, viii-424 p.

- BAIRD J. (1867). *The Management of Health: a Manual of Home and Personal Hygiene: Being Practical Hints on Air, Light, and Ventilation; Exercise, Diet, and Clothing; Rest, Sleep, and Mental Discipline; Bathing and Therapeutics*. London: Virtue and Co., xi-231 p.
- BARD S. (1819 [1807]). *Compendium of the Theory and Practice of Midwifery, Containing Practical Instructions for the Management of Women, During Pregnancy, in Labour, and in Child-Bed. Illustrated by many Cases, and Particularly Adapted to the Use of Students*. fifth edition enlarged, New York: Collins and Co., viii-417 p.
- BARKER S. (1865). *The Domestic Management of Infants and Children in Health and Sickness*. London: Hardwicke, iii-298 p.
- BARRETT H. (1875). *The Management of Infancy and Childhood, in Health and Disease*. London: G. Routledge & sons, 268 p.
- BELL B. (1779). *A Treatise on the Theory and Management of Ulcers: With a Dissertation on White Swellings of the Joints*. printed by Macfarquhar and Elliot for Thomas Cadell, London; and Charles Elliot, Edinburgh, 436 p.
- BRAIDWOOD P. M. (1874). *The Domestic Management of Children*. London: Smith, Elder, and Co., 160 p.
- BRUEN E. T. (1887). *Outlines for the Management of Diet; or, The Regulation of Food to the Requirements of Health and the Treatment of Disease*, Philadelphia: J. B. Lippincott company, 5-138 p.
- BULKLEY L. D. (1875). *The Management of Eczema*. New York: G.P. Putnam's Sons, 390 p.
- BULL T. (1840). *The Maternal Management of Children, in Health and Disease*. London: Longman, x-276 p.
- CADOGAN W. (1748). *Essay upon Nursing, and the Management of Children, from their Birth to Three Years of Age, in a Letter to a Governor, In a Letter to one of the Governors of the Foundling Hospital, Published by Order of the General Committee for Transacting the Affairs of the Said Hospital*. London: Printed for J. Roberts, 34 p.
- CHARLES J. R. (1838). *Hints on the Domestic Management of Children*. Longman, Orme, Brown, Green, & Longmans, xv-89 p.
- CHAVASSE P. H. (1839). *Advice to Mothers on the Management of Their Offspring*. London: Longman, Orme, Brown, Green and Longmans, 49 p.
- _____ (1843). *Advice to Wives on the Management of Themselves, During the Periods of Pregnancy, Labour, and Suckling*. second edition. London: Longman, Brown, Green and Longmans, 87 p.
- CLARK J. P. (1835). *A Practical Treatise On Teething, and the Management of the Teeth, from Infancy to the Completion of the Second Dentition*. London: Longman, Rees, Orme, Brown, Green and Longman, xi-82 p.
- CLARKE J. (1793). *Practical Essays on the Management of Pregnancy and Labour, and on the Inflammatory and Febrile Diseases of Lying-in Women*. London: printed for J. Johnson, xi-167 p.
- COMBE A. (1840). *A Treatise on the Physiological and Moral Management of Infancy: Being a Practical Exposition of the Principles of Infant Training, For the Use of Parents*. Edinburgh: Maclachlan & Stewart, 89 p.
- CORY E. A. (1844). *The Physical and Medical Management of Children*. 5th ed., London: J. Draper, vii-161 p.

- DEFOE Da. (1715). *The Family Instructor: In Three Parts, With a recommendatory letter.* London: Sold by Eman. Matthews ... and Jo. Button, in Newcastle upon Tine, 444 p.
- DIX T. (1880). *The Healthy Infant, A Treatise on the Healthy Procreation of the Human Race, Embracing the Obligations to Offspring; the Management of the Pregnant Female; the Management of the Newly Born; the Management of the Infant; and the Infant in Sickness.* Cincinnati: P.G. Thomson, 80 p.
- DREWRY G. O. (1875). *Common-Sense Management Of The Stomach.* London: Henry S. King and Co., viii-187 p.
- DUNCAN T. (1880). *The Feeding and Management of Infants and Children: And the Home Treatment of Their Diseases.* London: Duncan brothers, xiii-432 p.
- EVANSON R. & MAUNSELL H. (1842 [1836]). *A Practical Treatise on the Management and Diseases of Children.* fourth edition, Dublin: Fannin, 300 p.
- FLINT J. H. (1826). *A Dissertation, on the Prophylactic Management of Infancy and Early Childhood.* Northampton: Printed by T. W. Shepard, 129 p.
- FOX D. (1834). *The Signs, Disorders, and Management of Pregnancy: The Treatment to Be Adopted During and After Confinement, and the Management and Disorders Of Children Written Expressely for the Use of Females.* Derby: published by Henry Mozley and Sons, viii-202 p.
- GETCHELL F. H. (1868). *The Maternal Management of Infancy: For the Use of Parents.* Philadelphia, J. B. Lippincott & Co., vii-67 p.
- GODFREY B. (1872). *Diseases of Hair: A Popular Treatise Upon the Affections of the Hair System, With Advice Upon the Preservation and Management of Hair,* Philadelphia: Lindsay and Blakiston; London, J. & A. Churchill, xii-183 p.
- GRIFFITH J. P. C. (1898). *The Care of the Baby: A Manual for Mothers and Nurses, Containing Practical Directions for the Management of Infancy and Childhood in Health and in Disease.* 2d ed., Philadelphia, W. B. Saunders, 17-397 p.
- HAMILTON A. (1781). *Treatise on the Management of Female Complaints, and of Children in Early Infancy.* Edinburgh: printed for J. Dickson, W. Creech, and C. Elliot, vi-304 p.
- HANCORN J. R. (1844). *Medical Guide for Mothers, in Pregnancy, Accouchement, Suckling, Weaning, etc. and in Most of the Important Diseases of Children.* New York: Saxton and Miles; Philadelphia: G. B. Zeiber and Co., viii-117 p.
- HASLAM J. (1817). *Considerations on the Moral Management of Insane Persons.* London: R. Hunter, 80 p.
- HERDMAN J. (1804). *Discourses on the Management of Infants and the Treatment of Their Diseases, Written in a Plain Familiar Stile, to Render it Intelligible and Useful to all Mothers, and Those Who Have the Management of Infants.* Edinburgh: Archibald Constable, 121 p.
- HOGG C. (1849). *On the Management of Infancy: With Remarks on the Influence of Diet and Regimen.* London: Churchill, v-102 p.
- HUME G. (1802). *Observations on the Origin and Treatment of Internal and External Diseases and Management of Children.* Dublin: Fitzpatrick, xiii-290 p.
- JAMES B. (1814). *A Treatise On the Management of the Teeth.* Boston: Published by Charles Callender, Printed by Joseph T. Buckingham, 141 p.
- KNAPP F. H. (1840). *A Few Brief Remarks Concerning the Proper Management of the Teeth.* Baltimore: J. Murphy, 12 p.

- LYMAN H. (1884). *The Practical Home Physician and Encyclopedia of Medicine: A Guide for the Household Management of Disease, Giving the History, Cause, Means of Prevention, and Symptoms of all Diseases of Men, Women and Children and Most Approved Methods of Treatment, With Plain Instructions for the Care of the Sick: Full and Accurate Directions for Treating Wounds, Injuries, Poisons, &c. Free From Technical Terms and Phrases.* Guelph, Ontario: World Pub. Co., 1308 p.
- MILLINGEN J. G. (1841). *Aphorisms on the Treatment and Management of the Insane.* Philadelphia: E. Barrington & G. D. Haswell, 78 p.
- MOSS W. (1781). *An Essay on the Management and Nursing of Children in the Earlier Periods of Infancy: And on the Treatment and Rule of Conduct Requisite for the Mother during Pregnancy, and in Lying-in.* London: printed for J. Johnson, xv-360 p.
- NELSON J. (1753). *An Essay on the Government of Children under Three General Heads: viz. Health, Manners and Education.* London: printed for R. and J. Dodsley, vii-358 p.
- PALMER T. (1853). *The Dental Adviser: a Treatise On the Nature, Diseases and Management of the Teeth.* Mouth, Gums &c., Fitchburg: The author, 80 p.
- PARMLY L. S., (1819). *A Practical Guide to the Management of the Teeth.* Philadelphia: Published by Collins & Croft, xix-198 p.
- POWERS S. R. (1866). *The Mother's Book of Health, and How to Manage a Baby.* London: Ladies' Sanitary Association
- SEAMAN V. (1800). *The Midwives Monitor, and Mothers Mirror: Being Three Concluding Lectures of a Course of Instruction on Midwifery: Containing Directions for Pregnant Women, Rules for the Management of Natural Births, and for Early Discovering When the Aid of a Physician is Necessary, and Caution for Nurses, Respecting Both the Mother and Child: to Which is Prefixed, a Syllabus of Lectures on That Subject.* New-York: Printed by Isaac Collins, xii-123 p.
- SHEARER W. (1904). *The Management and Training of Children.* New York: Richardson, Smith & Co., 287 p.
- SMILES S. (1838). *Physical Education; or, The Nurture and Management of Children, Founded on the Study of their Nature and Constitution.* Edinburgh: Oliver & Boyd, viii-200 p.
- SMITH H. (1792). *Letters to Married Women on Nursing and the Management of Children.* Sixth edition, revised and considerably enlarged, xv-239 p.
- SPOONER S. (1836). *Guide to Sound Teeth, or A Popular Treatise on the Teeth: Illustrating the Whole Judicious Management of these Organs from Infancy to Old Age.* New York, Wiley & Long, xiv-207 p.
- STARR L. (1889). *Hygiene of the Nursery. Including the General Regimen and Feeding of Infants and Children, and the Domestic Management of the Ordinary Emergencies of Early Life.* 2d ed., Philadelphia: P. Blakiston, Son & Co., xi-17-280 p.
- THEOBALD J. (1764). *Young Wife's Guide, in the Management of Her Children. Containing Every Thing Necessary to Be Known Relative to the Nursing of Children, from the Time of Their Birth, to the Age of Seven Years; together with a Plain and Full Account of Every Disorder to which Infants are Subject, and a Collection of Efficacious Remedies, Suited to Every Disease.* London: printed and sold by W. Griffin, R. Withy, G. Kearsly, and E. Etherington, 49 p.

- THOMPSON A. (1841). *The Domestic Management of the Sick-Room, Necessary, in Aid of Medical Treatment, for the Cure of Diseases*. London: Longman, Orme, Brown, Green & Longmans, 228 p.
- UNDERWOOD M. (1835 [1789]). *A Treatise on the Diseases of Children: With Directions for the Management of Infants*. ninth edition with notes by Marshall Hall, London: John Churchill, xx-108 p.
- VINES C. (1868). *Mother and Child: Practical Hints on Nursing, the Management of Children, and the Treatment of the Breast*, London, Frederick Warne; New York: Scribner, Welford, and Co., 102 p.
- WALSH J. H. (1858). *A Manual of Domestic Medicine and Surgery; With a Glossary of the Terms Used Therein by J.H. Walsh; Illustrated by Numerous Engravings*. London: Routledge, 720 p.
- WHITE C. (1773). *Treatise on the Management of Pregnant and Lying-in Women, and the Means of Curing, but More Especially of Preventing the Principal Disorders to Which They are Liable: Together With Some New Directions Concerning the Delivery of the Child and Placenta in Natural Births. Illustrated with Cases*. Worcester, Massachusetts: Isaiah Thomas, xix-476 p.
- WILSON E. (1847). *On the Management of the Skin as a Means of Promoting and Preserving Health*, 2d ed. London: J. Churchill, xxx-382 p.

Appendix 3 : selection of books on household management from the beginning of the 19th to the beginning of the 20th century

- ANONYMOUS (1827 [1823]). *A New System of Practical Domestic Economy; Founded on Modern Discoveries, and the Private Communications of Persons of Experience. A New Edition, Revised, and Enlarged; with Estimates of Household Expenses, Adapted to Families of Every Description*. London: Henry Colburn, xii-402 p.
- ATKINSON M. (1911). "The Economic Relations Of The Household." in RAVENHILL Alice, SCHIFF Catherine J. (Eds). *Household Administration: Its Place in the Higher Education of Women*. New York: H. Holt and Company, pp.121-206
- BEECHER C. (1849 [1841]). *A Treatise on Domestic Economy for the Use of Young Ladies at Home and at School*. Revised edition, New York: Harper & Brothers, 369 p.
- BEECHER C. & STOWE H. B. (1869). *The American Woman's Home, or, Principles of Domestic Science: Being a Guide to the Formation and Maintenance of Economical, Healthful, Beautiful, and Christian Homes*. New York: J.B. Ford and Company; Boston: H.A. Brown & Co., xi-390 p.
- BEETON I. (1861). *The Book of Household Management*. London: S. O. Beeton
- BEVIER I. (1911). "Mrs. Richards' Relation to the Home Economics Movement". *Journal of Home Economics*, 3(3), 214-216
- BRUERE M. B. & R. (1912). *Increasing Home Efficiency*. New York: Macmillan, 318 p.
- BUTTERWORTH A. (1913 [1902]). *Manual of Household Work and Management*. third edition, revised and enlarged, London; New York, etc.: Longmans, Green, and Co., xvi-249
- CADDY F. (1877). *Household Organization*. London: Chapman and Hall, xvi-209 p.
- CAMPBELL H. (1897 [1896]). *Household Economics: A Course of Lectures in the School of Economics of the University of Wisconsin*. New York and London: G. P. Putnam's sons, xxi-286 p.

- CARTER M. E. (1904). *House and Home: A Practical Book on Home Management*. New York: A. S. Barnes, 271 p.
- Cassell's Household Guide: Being a Complete Encyclopaedia of Domestic and Social Economy and Forming a Guide to Every Department of Practical Life* (1869). 3 vol., London: Cassell, Petter, and Galpin
- CHILD L. M. F. (1829). *The Frugal Housewife, Dedicated to Those Who Are Not Ashamed of Economy*. Boston: Carter and Hendee, xii-95 p.
- _____ (1831). *The Mother's Book*. Boston: Published by Carter, Hendee and Babcock
- COBBETT A., [183-], *The English Housekeeper: or, Manual of Domestic Management: Containing Advice on the Conduct of Household Affairs and Practical Instructions Concerning the Kitchen, the Cellar, the Oven, the Store-Room, the Larder, the Pantry, the Dairy, the Brewhouse. Together with Hints for Laying Out Small Ornamental Gardens, Directions for Cultivating Herbs and Preserving Herbs; and some Remarks on the best means of Rendering Assistance to Poor Neighbours. For the Use of Young Ladies Who Undertake the Superintendence of Their Own Housekeeping*. 2nd ed., London: A. Cobbett; Dublin: T. O'Gorman; Manchester: W. Willis, xxiii-475 p.
- COPLEY E. (182-). *The Cook's Complete Guide, on the Principles of Frugality, Comfort, and Elegance: Including the Art of Carving and the Most Approved Method of Setting-Out a Table, Explained by Numerous Copper-Plate Engravings: Instructions for Preserving Health and Attaining Old Age: With Directions for Breeding and Fattening All Sorts of Poultry and for the Management of Bees, Rabbits, Pigs, &c. &c., Rules for Cultivating a Garden and Numerous Useful Miscellaneous Receipts, by a Lady, Authoress of "Cottage Comforts."* London: George Virtue, iv-838 p.
- CORSON J. (1885). *Miss Corson's Practical American Cookery and Household Management: An Every-Day Book for American Housekeepers, Giving the most Acceptable Etiquette of American Hospitality, and Comprehensive and Minute Directions for Marketing, Carving, and General Table-Service, Together with Suggestions for the Diet of Children and the Sick*. New York: Dodd, Mead & Co., 620 p.
- ELLIS S. S. (1839). *The Women of England: Their Social Duties and Domestic Habits*. New York: D. Appleton, 214 p.
- FREDERICK C. (1914 [1913]). *The New Housekeeping: Efficiency Studies in Home Management*, Garden City, New York: Doubleday, Page, xiv-265 p.
- _____ (1919). *Household Engineering: Scientific Management in the Home. A Correspondence Course on the Application of the Principles of Efficiency Engineering and Scientific Management to the Every Day Tasks of Housekeeping*. Chicago: American School of Home Economics, 7-527 p.
- FRICH L. (1912). *Basic Principles of Domestic Science*. Muncie, Ind.: Muncie Normal Institute, 198 p.
- FURST M. L., *Syllabus of Household Management*. Teachers college, Columbia University, 1911, 24 p.
- GILBRETH L. (1928 [1927]). *The Home-Maker and her Job*. New York, London: D. Appleton and Co., vii-154 p.
- GILBRETH F. Jr. and E., *Treize à la douzaine*, trad. de l'américain par J N. Faure-Biguet; ill. de R. Sabatier, Paris : Gallimard, 2001 [1949], 264 p.
- GUERNSEY J. B. (1912). "Scientific Management in the Home." *Outlook*, C, April, p.821

- HILL J. (1754). *On the Management and Education of Children, a Series of Letters Written to a Neice. By the Honourable Juliana-Susannah Seymour*. London: printed for R. Baldwin, 305 p.
- HUNT C. (1908). *Home Problems From a New Standpoint*. Boston, Whitcomb & Barrows, xi-145 p.
- LEUPP F. (1911). "Scientific Management in the Family". *Outlook*, XCVIII, August, p.832
- LUCAS J. R. (1910 [1904]). *The Woman who Spends, A Study of her Economic Function*. Boston: Whitcomb & Barrows, 161 p.
- MANN R. J. (1878). *Domestic Economy and Household Science*. London: E. Stanford, ix-338 p.
- PARKES F. (1829 [1825]). *Domestic Duties, or, Instructions to Young Married Ladies, on the Management of their Households, and the Regulation of their Conduct in the Various Relations and Duties of Married Life*. J. & J. Harper, ix-487 p.
- PARLOA M. (1879). *First Principles of Household Management and Cookery*. Cambridge: Riverside Press, xi-133 p.
- _____ (1898). *Home Economics: A Guide to Household Management, Including the Proper Treatment of the Materials Entering into the Construction and Furnishing of the House*. New York: The Century Co., xii-378 p.
- PATTISON M. (1918 [1915]). *The Business of Home Management: The Principles of Domestic Engineering*. New York, R.M. McBride & Co., 310 p.
- RADCLIFFE M. (1823). *A Modern System of Domestic Cookery, or, The Housekeeper's Guide: Arranged on the Most Economical Plan for Private Families, Containing...: a Complete Family Physician, and Instructions to Female Servants in Every Situation, Showing the Best Methods of Performing their Various Duties, the Whole Being the Result of Actual Experiments: to Which Are Added, as an Appendix, Some Valuable Instructions of the Management of the Kitchen and Fruit Gardens*. Manchester: J. Gleave and sons, 676 p.
- RICHARDS E. (1899). *The Cost of Living as Modified by Sanitary Science*. New York: J. Wiley & sons, 121 p.
- _____ (1910). *Euthenics: The Science Of Controllable Environment. A Plea For Better Living Conditions As A First Step Toward Higher Human Efficiency*. Report on National Vitality, Boston: Whitcomb & Barrows, xii-162 p.
- _____ (1911) "The Ideal Housekeeping in the Twentieth Century: Fundamental Principles for Health and Economy". 3(2), 174-175
- SALMON L. (1897). *Domestic Service*. New York: Macmillan, xxvii-338 p.
- SYLVAIN A. (1881). *Household Science, or Practical Lessons in Home Life*. New York [etc.]: D. & J. Sadlier & Co., 164 p.
- TALBOT M. and BRECKINRIDGE S. (1912). *The Modern Household*. Boston: Whitcomb & Barrows, 93 p.
- TAYLOR A. M. (1816 [1815]). *Practical Hints to Young Females, on the Duties of a Wife, a Mother and a Mistress of a Family*. sixth edition, London: Printed for Taylor & Hessey and Josiah Conder, vii-188 p.
- TERRILL B. (1905). *Household Management*. Chicago: American School of Household Economics, 163 p.
- The Housekeeper's Magazine, and Family Economist; Containing Important Papers on the Following Subjects: The Markets. Marketing. Drunkenness. Gardening. Cookery.*

Travelling. Housekeeping. Management of Income. Distilling. Baking. Brewing. Agriculture. Public Abuses. Shops and Shopping. House Taking. Benefit Societies. Annals of Gulling. Amusements. Useful Receipts. Domestic Medicine. &c. &c. &c. (1826). vol. 1, Sept. 1825-Jan. 1826, London: Printed for Knight and Lacey; [etc., etc.]

U.S., PRESIDENT'S CONFERENCE ON HOME BUILDING AND HOME OWNERSHIP (1932). *Household Management and Kitchens*. Reports of the Conference, vol. 9, Washington, D.C., xii-228 p.

WALSH J. H. (1874 [1853]). *A Manual of Domestic Economy, Suited to Families Spending £100 to £1000 a Year, Including Directions for the Management of the Nursery and Sick Room, Preparation and Administration of Domestic Remedies*. New York and London: George Routledge and Sons, xvi-736 p.

Appendix 4 : selection of books on school and classroom management from the beginning of the 19th to the beginning of the 20th century

ARNOLD F., *Text-Book of School and Class Management*. 2 vol., New York: Macmillan, 1908

_____ (1916). *The Measurement of Teaching Efficiency*. New York: Lloyd Adams Noble, vii-284 p.

BAGLEY W. (1907). *Classroom Management: Its Principles and Technique*. New York: The Macmillan company, xvii-322 p.

BALDWIN J. (1881). *The Art of School Management: A Textbook for Normal Schools and Normal Institutes, and a Reference Book for the Teachers, School Officers, and Parents*. New York: D. Appleton and Co., 196 p.

BENNETT H. E. (1917). *School Efficiency: A Manual of Modern School Management*. Boston, New York [etc.]: Ginn and Co., x-374 p.

CATLOW S. (1813). *Letters on the Management and Economy of a School, Including a System of Studies, and a Classification of Books, Requisite for the Liberal and Extended Education of Professional and Commercial Pupils. Addressed to a Young Clergyman, on Commencing a Seminary in the Country*. Printed by G. Sidney, sold by T. Underwood, vi-102 p.

CHANCELLOR W. E. (1904). *Our Schools: Their Administration and Supervision*. Boston: D.C. Heath & Co., 434 p.

_____ (1910). *Class Teaching and Management*. New York and London: Harper & brothers, xi-342 p.

COLLAR G. & CROOK C. (1901). *School Management and Methods of Instruction: With Special Reference to Elementary Schools*. London, New York: Macmillan, viii-336 p.

DUTTON S. T. (1903). *School Management: Practical Suggestions Concerning the Conduct and Life of the School*. New York: C. Scribner's sons, 278 p.

GILL J. (1863 [1857]). *Introductory Text-Book to School Management*, ninth edition, London: Longman, Green, Longman, Roberts, & Green, viii-272 p.

HARDING F. E. (1872). *Practical Handbook of School-Management and Teaching for Teachers, Pupil-Teachers, and Students*. London and Edinburgh: T. Laurie, xxiii-259 p.

HOLBROOK A. (1873). *School Management*. Cincinnati: Geo E. Stevens and Co., Publishers, 270 p.

- JOYCE P. W. (1863). *Hand-Book of School Management and Methods of Teaching*. Dublin: McGlashan & Gill; London: Simpkin, Marshall and Co., viii-180 p.
- KELLOGG A. M. (1880). *The New Education: School Management, a Practical Guide for the Teacher in the School Room*. New York: E. L. Kellogg & Co., 124 p.
- LANDON J. (1883). *School Management: Including a General View of the Work of Education, with Some Account of the Intellectual Faculties from the Teacher's Point of View; Organization; Discipline; and Moral Training*. London: K. Paul, Trench, & Co., xxi-360 p.
- MAJOR H. (1883). *How to Earn the Merit Grant, an Elementary Manual of School Management; For Pupil Teachers, Assistant and Head Teachers; Compiled from Notes of Lectures Delivered to a Class of Ex-Pupil Teachers*. London: George Bell and sons, 52 p.
- MORRISON T. (1863 [1859]). *Manual of School Management: For the Use of Teachers, Students, and Pupil-Teachers*. Glasgow: William Hamilton, viii-359 p.
- PERRY A. C. (1908). *The Management of a City School*. New York: The Macmillan Co., viii-350 p.
- PRINCE J. (1906). *School Administration, Including the Organization and Supervision of Schools*. Syracuse, N. Y.: C.W. Bardeen, vi-423 p.
- RAUB A. (1882). *School Management; Including a Full Discussion of School Economy, School Ethics, School Government, and the Professional Relations of the Teacher; Designed For Use Both as a Textbook and as a Book of Reference for Teachers, Parents and School Officers*. Philadelphia: Raub and Co., 285 p.
- RICE J. M. (1913). *Scientific Management in Education*. New York: Publishers printing company, xxi-282 p.
- SALISBURY A. (1911). *School Management; A Text-Book for County Training Schools and Normal Schools*. Chicago: Row, Peterson & Co., 196 p.
- SEELEY L. (1903). *A New School Management*. New York: Hinds & Noble, x-329 p.
- TAYLOR J. S. (1903). *Art of Class Management and Discipline*. New York: A.S. Barnes & Co., 113 p.
- TOMPKINS A. (1895). *The Philosophy of School Management*. Boston and London: Ginn & Co., xiv-222 p.
- WHITE E. (1893). *School Management: A Practical Treatise for Teachers and All Other Persons Interested in the Right Training of the Young*. New York, Cincinnati, Chicago: American Book Co., 320 p.
- WICKERSHAM J. P. (1864). *School Economy. A Treatise on the Preparation, Organization, Employments, Government, and Authorities of Schools*. Philadelphia: J.B. Lippincott & Co., xviii-366 p.

Appendix 5 : selection of books on engineering management from the middle of the 19th to the beginning of the 20th century

- BIGGS C. H. W. (Ed.). (189-). *Practical Electrical Engineering. A Complete Treatise on the Construction and Management of Electrical Apparatus as Used in Electric Lighting and the Electric Transmission of Power*. London: Biggs & Debenham, 2 vol.
- BOURNE J. (1858). *A Catechism of the Steam Engine in its Various Applications to Mines, Mills, Steam Navigation, Railways, and Agriculture. With Practical Instructions for*

- the Manufacture and Management of Engines of Every Class*. London: Longman, Green, Longman, and Roberts, xvi-558 p.
- COLBURN Z. (1851). *The Locomotive Engine: Including a Description of its Structure, Rules for Estimating its Capabilities, and Practical Observations on its Construction and Management*. Boston: Redding and Co., 187 p.
- EDWARDS E. (1882). *The Practical Steam Engineer's Guide in the Design, Construction and Management of American Stationary, Portable and Steam Fire-Engines, Steam Pumps, Boilers, Injectors, Governors, Indicators, Pistons and Rings, Safety Valves, and Steam Gauges*. Philadelphia: H. C. Baird & Co. [etc., etc.], 380 p.
- FOX C. D. & FOX F., edited by FORREST J. (1874). *The Pennsylvania Railroad; with Remarks on American Railway Construction and Management*. Excerpt minutes of proceedings of the Institution of civil engineers, vol. XXXIX. Session 1874-75, London: William Clowes and sons, 66 p.
- HOMANS J. (1902). *Self-Propelled Vehicles; A Practical Treatise on the Theory, Construction, Operation, Care and Management of all Forms of Automobiles*. New York: T. Audel & company, 598 p.
- HOUGHTALING W. (1899). *The Steam engine Indicator and its Appliances. Being a Comprehensive Treatise for the Use of Constructing, Erecting and Operating Engineers, Superintendents, Master Mechanics, and Students, with Many Illustrations, Rules, Tables, and Examples for Obtaining the Best Results in the Economical Operation of All Classes of Steam, Gas and Ammonia Engines... Its Correct Use, Management and Care, Derived from the Author's Practical and Professional Experience*. Bridgeport, Conn.: American Industrial Pub. Co., 307 p.
- HUTTON W. (1886). *The Works Manager's Handbook of Modern Rules, Tables, and Data for Civil and Mechanical Engineers, Millwrights, and Boiler Makers; Tool Makers, Machinists, and Metal Workers; Iron and Brass Founders, etc.* London: C. Lockwood and Co., xiv-410 p.
- LE VAN W. B. (1876). *A Treatise on Steam Boiler Engineering; Being Notes on the Strength, Construction, Erection, Fittings, and Economical Management of Steam Boilers. Containing Rules and Useful Information for the Safe Use of Steam*. Philadelphia: Inquirer book and job print, 120 p.
- LIECKFELD G. (1896). *A Practical Handbook on the Care and Management of Gas Engines*. New York [etc.]: Spon & Chamberlain, 103 p.
- MOULSON V. G. & alii (1898). *Management and Care of the Steam Boiler*. Pittsburg, Pa.: Klotzbaugh & company, 144 p.
- ROPER S. (1875). *Hand-Book of Land and Marine Engines, Including the Modelling, Construction, Running, and Management of Land and Marine Engines and Boilers*. Philadelphia: Claxton, Remsen & Haffelfinger, 593 p.
- _____ (1889). *Hand-Book of Modern Steam Fire-Engines: Including the Running, Care and Management of Steam Fire-Engines and Fire-Pumps*. 2d ed. rev. and corr. by H. L. Stellwagen, Philadelphia, Pa.: E. Meeks, xiii-411 p.
- SHOCK W. (1880). *Steam Boilers: Their Design, Construction, and Management*. New York: D. Van Nostrand, 473 p.
- SINCLAIR A. (1885). *Locomotive Engine Running and Management: A Treatise on Locomotive Engines*. New York, J. Wiley and Sons, xviii-390 p.

- SMITH D. O. (1882). *The Sewing Machine. Its Management and Adjustment. The Difficulties that Arise and How to Overcome Them*. Mobile: Shields & Co., book & job printers, 43 p.
- TOMPKINS C. (1889). *A History of the Planing-Mill, with Practical Suggestions for the Construction, Care and Management of Wood-Working Machinery*. New York, J. Wiley & sons, vi-222 p.
- TULLEY H. C. (1907). *Handbook on Engineering. The Practical Care and Management of Dynamos, Motors, Boilers, Engines, Pumps, Inspirators and Injectors, Refrigerating Machinery, Hydraulic Elevators, Electric Elevators, Air Compressors, Rope Transmission and all Branches of Steam Engineering*. St. Louis, Mo.: H.C. Tulley & Co., xxvi-1072 p.
- VERITAS VINCIT (1847). *Railway Locomotive Management, in a Series of Letters*. reprinted from the "Railway Record", London and Birmingham: Printed for the author, iv-232 p.
- WARD J. H. (1847). *Steam for the Million. An Elementary Outline Treatise on the Nature and Management of Steam, and the Principles and Arrangement of the Engine*. Philadelphia, Carey and Hart, 16-59 p.
- WATSON E. (1867). *The Modern Practice of American Machinists & Engineers, Including the Construction, Application, and Use of Drills, Lathe Tools, Cutters for Boring Cylinders and Hollow Work Generally... Together with Workshop Management, Economy of Manufacture, the Steam-Engine... etc., etc.*. Philadelphia: H. C. Baird, 276 p.