

YULIA ALTUKHOVA-NYS, Productivity? – Yes, but subject to sustainability! An evidence of (re)emergence of accounting for sustainability from the French agricultural authors from the XVII<sup>th</sup> to the beginning of the XIX<sup>th</sup> centuries

Five decades ago, first works and researches that have as title or subject « Environmental accounting », « Ecological accounting », or « Social accounting » have emerged. In these works, there are notably examples of accounting for strong sustainability approach in the agricultural sector. This paper searches for accounting for sustainability premise in the French agricultural accounting literature of XVII-beginning of XIX centuries. It demonstrates that this literature presented some strong sustainability issues, although as a productivity and innovation diffusion condition, even earlier that the term of «accounting for sustainability» existed.

NICHOLAS R. AMOR, The origins of the putting-out or domestic system of industrial production in England

The putting-out system of production was a key feature of England's woollen cloth industry and is regarded by many historians as a step along the road to capitalism. This paper considers the evolution of the industry in the late Middle Ages, the emergence of clothiers and their dependent out-workers and the nature of the relationship between the two groups. A detailed analysis follows of the growth, between 1475 and 1510, in the value of textile related debt litigation in the Court of Common Pleas, and revised estimates are given for the scale of the industry and the size of the workforce in the early-sixteenth century. Thus an assessment can be made of the importance of the putting-out system and its contribution to the success of the textile industry at that time.

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<sup>1</sup> In questa sezione del volume abbiamo inserito gli abstracts inviatici dagli Autori.

FABRIZIO ANTONIO ANSANI, Le conseguenze economiche dell'innovazione bellica. La produzione di «artiglierie alla francese» a Firenze tra Quattro e Cinquecento

Il saggio mira a valutare l'impatto economico della rapida assimilazione delle artiglierie «alla francese» nella tattica italiana, concentrandosi in particolar modo sulle misure adottate dalla Repubblica Fiorentina per incrementare l'efficienza del proprio apparato logistico durante i primi anni della Guerra di Pisa (1494-1509). Attraverso uno studio rigoroso delle fonti contabili, la ricerca metterà in risalto i considerevoli cambiamenti intervenuti in un settore strategico dell'economia pubblica, restituendo la giusta importanza a merci scarsamente considerate dalla storiografia contemporanea ed evidenziando il significativo impulso dato dai governi rinascimentali alla costituzione di uno dei primi monopoli di stato, quale, appunto, l'industria quattrocentesca delle «munizioni».

*The paper aims to assess the financial impact of the rapid assimilation of the French-style artillery into Italian warfare. The focus will be on the policy adopted by the Florentine Republic to improve the efficiency of its logistic system during the War of Pisa (1494-1509); through the analysis of public records, the research will highlight the significant transformations occurred in late medieval military industry, reevaluating the importance of the trade in strategic materials for the early modern economy and demonstrating the concerted effort made by the rising renaissance state to establish a monopoly on the manufacture of arms and «munitions».*

DIDIER BOISSEUIL, La production d'alun en Occident: l'essor d'une industrie nouvelle à la fin du XV<sup>e</sup> siècle

Cet article se propose d'explorer les conditions dans lesquelles la production d'alun s'est déployée dans le monde méditerranéen occidental, au cours de la seconde moitié du XV<sup>e</sup> siècle. En deux décennies, entre 1460 et 1480 environ, plusieurs sites de production importants sont apparus dans la péninsule italienne ou dans la péninsule ibérique. Ils ont fourni aux industries et l'artisanat européen un alun de qualité et ont éclipsé rapidement les sources d'approvisionnements qui avaient jusqu'alors prévalu en Anatolie ou de la Mer Égée. L'article évoque les connaissances utiles mobilisées pour faciliter cet essor, notamment les techniques mises en œuvre et les acteurs de ce basculement.

*This article explores the conditions under which alum production has developed in the Western Mediterranean, in the second half of the fifteenth century. In two decades, between about 1460 and 1480, several important production sites have appeared in the Italian peninsula or in the Iberian peninsula. They have provided European industries and crafts with quality alum, and they quickly overshadowed sources of supply, that had previously prevailed in Anatolia or the Aegean Sea. The article discusses the useful knowledge mobilized to facilitate this growth, in particular, the techniques used and the players involved in this changeover.*

JULIA BRUCH, Transmission of useful knowledge in texts written by craftsmen. Two case studies from the Holy Roman Empire

In medieval and early modern crafts, useful knowledge was taught in the workshops. There, innovation took place. Craftsmen exchanged knowledge on journeys or through voluntary and forced migration. This system of knowledge transfer does not need writing, although craftsmen used writing both in the workshop and in the administration of the guilds and the towns. However, transmission of knowledge remained oral. This contrasts with countless craftsmen's manuscripts that conveyed technical knowledge about crafts in text and images. This essay argues that these manuals were equally crucial for the transmission of useful knowledge between master craftsmen as well as the sale of products to clients. A book on plate harnesses and one on bell and gun casting are introduced as examples.

RAFFAELE DANNA, The spread of Hindu-Arabic numerals among practitioners in Italy and England (13<sup>th</sup>-16<sup>th</sup> c.): two moments of a European innovation cycle?

Together with introducing a set of key innovations in commercial practices, the merchant-bankers of the commercial revolution of the 13<sup>th</sup> century were also the first European economic agents to adopt Hindu-Arabic numerals. As practical arithmetic provided the mathematical foundation for commercial innovations, studying its European spread provides a particularly suitable angle to study the diffusion of practical knowledge in the pre-modern period. Italy was the early adopter of these techniques, while in England these practices became widespread at the onset of the little divergence. In this paper, I discuss in comparative perspective the social diffusion of this knowledge in Italy and England, and its wider impact. On the one hand, this analysis makes it possible to show a number of parallels between the trajectories followed by these societies. On the other hand, it allows to observe the complex interactions between practical knowledge and wider economic, institutional, and social changes.

MARKUS A. DENZEL, Bookkeeping as a 'key technology' of pre-modern commerce. Its relevance for the economic development in Europe

It is the aim of this paper to analyse the importance of (double-entry) bookkeeping for the economic development in Europe and its possible indirect influence on economic growth. Being one of the most important commercial techniques of the European merchants double-entry bookkeeping stayed in close relationship to the expansion of trade. So, the distribution of different bookkeeping techniques all over Western and Central Europe, took place, on one hand, through the extensive commercial contacts of Italian merchant-bankers with merchants of regions north of the Alps and because of the need of many non-Italian merchants to consolidate their commercial knowledge in Italy through specific studies and/or through acquiring practical knowledge. On the other, treaties on (double-entry) bookkeeping supported its diffusion. The study analyses examples of ledgers as

‘mirrors’ of their enterprises’ activities, and it will be shown how such ledgers served as instruments for reducing various risks of entrepreneurial engagement. As a result it will become clear that the knowledge of the technique of double-entry bookkeeping was one of the preconditions of the commercial and, later on, the industrial expansion of the Europeans, which made a significant difference to other merchant cultures in the world.

*Questa presentazione mette in risalto l'importanza della contabilità in generale e la partita doppia in particolare nel contesto dello sviluppo dell'economia europea e la sua influenza sulla crescita economica. La partita doppia era una tecnica essenziale nell'ambito commerciale dei mercanti banchieri, ed aveva quindi un rapporto fondamentale con l'espansione del commercio. Perciò la diffusione delle diverse tecniche contabili in Europa occidentale e centrale si svolse attraverso i contatti intensi tra i mercanti banchieri italiani e quelli delle regioni al nord delle Alpi e a causa del bisogno di mercanti non italiani di consolidare la loro conoscenza commerciale in Italia con studi specifici o imparando praticamente. I manuali di contabilità e di partita doppia contribuirono a questa diffusione. Questo studio analizza esempi di libri mastri come "specchi" dell'attività di impresa e intende mostrare come essi funzionarono come strumenti per la riduzione di rari tipi di rischio. Ne risulterà che la conoscenza delle tecniche della contabilità e la partita doppia fu un prerequisito dell'espansione del commercio e, di seguito, dell'industria europea, e costituì una differenza essenziale con le altre culture mercantili nel mondo.*

SEIJI HORII, Promotion of high-quality textiles by prize competitions during the Enlightenment in Saxony. From raw material to finished product manufacturing

Preisaufrage, or «prize competitions» were implemented in Saxony in 1764 to promote industry after the Seven Years' War. We investigated the purpose of them and by whom, by analysing primary historical texts to uncover four criteria: (1) the best quality prototypes; (2) equivalent quality to foreign products; (3) establishment of training facilities, and (4) manufacture of new products. The competitions promoted high-quality products and disseminated knowledge. Numerous prototypes were submitted and prizes awarded. Most participants were already engaged in textile or related industries and the strategy relied on this intellectual foundation. Assessment of Saxony's situation and enlightenment principles informed the competitions.

MÅNS JANSSON, GÖRAN RYDÉN, The *œconomia* of iron and steel. Material transformations, manual skills, and technical improvement in early modern Sweden

Sweden was a major exporter of iron during the early-modern period, but there was also an important domestic steelmaking. We analyse the Swedish iron and steel trade in a long perspective in a European context. Our approach departs from recent discussions on industrial and scientific developments, in which the spheres of «Hand» and «Mind» are brought together, and where artisanal skills and natural resources are highlighted. We emphasise how the migration of people, and movements of materials and knowledge, influenced a process of gradual change. A key feature was the ongoing interactions between working people and educated

*savants*. Our conclusion points to the perseverance of artisanal skills well into the nineteenth century, but also towards new links between work, technology, and markets.

CARLOS LALIENA CORBERA, The knowledge economy in the preindustrial era

The aim of this paper is to verify that in economies prior to the 18th century and from the Middle Ages onwards, there was a significant increase in the application of knowledge in the goods produced and a development of both technological and organizational innovation, i.e. «useful knowledge». It is also a question of verifying the effect of cultures, institutions and power structures on the generation of knowledge, its diffusion and its technological and productive use. In conclusion, the reduction of risk and the increase of productivity were aspects linked to the "knowledge economy" also in the pre-industrial era.

CARLOS LALIENA CORBERA, Useful knowledge, technological innovation and economic development in the European ceramic industries, 14<sup>th</sup>-18<sup>th</sup> centuries

Ceramics have been essential in the domestic sphere and their production has undergone in the preindustrial era technological and cultural changes whose importance is obvious. This paper is to show in a very concise way how the production of European glazed ceramics underwent three phases of intense transformation of useful knowledge related to its production, with a successive accumulation leading to increasingly efficient results and a higher level of productivity. Moreover, it can be safely stated that, without this accumulation, the great progress of the 19<sup>th</sup> century in this area would have been impossible.

HEINRICH LANG, «Li vostri che tenghono li libri non sanno tenere tanti chonnti». Useful knowledge and accounting as seen through the accountant's lenses and the logic of capitalism

Knowledge of accounting before the evolution of academic economic knowledge was practical knowledge. In the context of the studies about the development of accounting techniques, the debates leave out the bookkeeper. The hypothesis here is that, due to the diversification of investments on the behalf of the personal properties in late fifteenth and early sixteenth centuries, an expert accountant appeared as bookkeeper of the personal account books at the merchant bankers' households. In Florence, future merchants were trained in elementary schools and later on in classes the masters of abacus. In their exercise books, the masters of abacus published, we find a lot of algebraic problems which are illustrated by accounting operations. However, at least in Florence manuals on accounting did not exist. So, the young merchant bankers and bookkeepers learned by doing. A case study about an accountant, Matteo Brandolini, who was the bookkeeper of the papal banker's son Alamanno Salviati, shall exemplify this tendency. When the patricians and merchant bankers invested more extensively in secondary markets, they were in the need of highly qualified staff.

ANDREA OTTONE, Market assessment and risk prediction: resources and know-how of a seventeenth-century bookseller of Venice coping with competition

This article explores the likelihood that early modern printers had developed rudimentary practices aimed at assessing their market of reference to pursue strategic commercial planning. It surveys the inner evidence of a single manuscript bibliographic compiled by a minor member of the Giunta publishing house active in Venice in order to propose the hypothesis that said catalogue may have been instrumental to commercial bibliometrics aimed to avoid harmful competition between redundant editions within the same market area.

MAARTEN PRAK, PATRICK WALLIS, Transferring useful knowledge. Quality mechanisms in European apprenticeship

Human capital is central to current debates about the sources of growth and divergence in the premodern economy. Apprenticeship, the key formal arrangement by which occupational skills were transferred in this period, has in the past often been associated with guild monopolies and exclusion, implying a drag on the accumulation of human capital. Several stimulating recent contributions have pointed to apprenticeship as a potentially important explanation for English or European advances in manufacturing and technology in the run up to industrialisation. In this paper, we explore mechanisms that helped improve quality among artisans. We focus on one in particular: the selection of training masters by apprentices.

JORAN PROOT, The economic revolution in book design that went unnoticed: changing paper thickness in folios, quartos and octavos. The case of the Southern Netherlands, 1473-c. 1550

This contribution discusses the evolution of paper thickness of books produced in the Southern Netherlands in the period 1473 until the middle of the sixteenth century. Changing paper thickness is one of the key elements which in all likelihood helped coping with the problem of the rapidly increasing demand for paper by the press. After a description of relevant aspects of the production of hand laid paper and of the resulting morphology of sheets, a methodology is proposed to deal with the problem of establishing paper thickness in bound volumes and further problems dealing with the compression effect and of binding and rebinding are discussed.

TANJA SKAMBRAKS, Tally sticks as media of knowledge in the contexts of medieval economic and administrative history

Tally sticks worked as ubiquitous stores of numerical knowledge and tools of accounting and administration in medieval Europe. Previous research emphasized both the potential and value of the wooden notched sticks not only for the social and economic history of the middle ages, but also for the history of writing,

intellectual history. This article combines the analysis of archival objects and written sources from England and Germany analysing their various contexts of use. These involve the centralised, highly professional and ritualised tax accounting at the English Exchequer, husbandry and agriculture, consumer taxation as well as public credit and circulating money-substitutes. Furthermore tallies were often used as evidence in court and functioned alongside written administration.

CARLOS FERNANDO TEIXEIRA ALVES, Knowledge, economy, and university in the south of Europe at the end of the eighteenth century. The case of Salamanca and Coimbra

In this paper, we will try to analyze the reforms of philosophy curricula at the Universities of Salamanca and Coimbra, and their connection to the economic development of their respective economies. We will demonstrate how this reform altered curricular contents with the purpose of guaranteeing a formation that could potentiate a better exploitation of the natural resources, mainly of their colonies. In this logic, the most emblematic disciplines were natural history, botany and chemistry. However, factors external to these educational reforms demonstrated their limits. We speak of a lack of jobs for philosophers (and mathematicians), but also a decline in national economies.

SANDRA DE LA TORRE GONZALO, Management and governance of the kingdom's finances. Financial literacy as useful knowledge in late-medieval Aragon (1365-1515)

This paper's primary research question is to what extent change in mechanisms and instruments of financial management proceeding from trading knowledge improved the efficiency of late-medieval polities. To do so, we have examined a territorial state experience in medieval Iberia. In the mid-14th century, Aragon designed its autonomous fiscal system managed by a kingdom's finance. The new supra-local polity made use of financial accounts to keep track of revenues and to access credit, which led to the refinement of documentary practice and monitoring methods. The analysis brings up the agency of a group of merchants that shaped the functioning of the Aragonese treasury from budgeting to tax collecting. Particular attention is paid to the impact of the increasing prominence of financial numeracy on institutional accountability and governance.

RICHARD W. UNGER, Ships, shipping, technological change and global economic growth, 1400-1800

The major breakthrough in ship design around 1400 creating the full-rigged ship constituted a general purpose technology. It had far-reaching effects on shipping, trade volume, orientation of trade routes, location of production, settlement patterns and many other aspects of life throughout the globe from 1400 to 1800. The greater efficiency of the type in a number of uses led to its dissemination, to a limited degree, throughout the world. Spillovers from the success of the design

were extensive and included for example a literature on designing and building ships, improvements in navigation and in government practices. Advances in shipbuilding were one of the very few technologies in the period that qualified as a technological advance with massive consequences.