

Introduction

The 15cBOOKTRADE Project and the Study of Incunabula as Historical Sources

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A Note of Thanks to All Involved

I am delighted to share and celebrate the results of many years of research in this volume, which brings together the contributions to a conference held on 19-21 September 2018, in the very special premises of the Musei Civici Veneziani, where almost 20 years ago I started my investigations on early Venetian printing.

In those years I was working on the catalogue of incunabula at the Bodleian Library. It was there, opening up and examining thousands of 15th-century books, that I realised how the books themselves bear witness to their movement in their manuscript annotations, decoration and binding styles, and that capturing that movement within spatial and temporal coordinates could unveil to us the central factor that was crucial to the success of the new technology and business, and yet so elusive to document: distribution.

We were sitting on the largest amount of historical evidence for understanding the impact of the new technology and trade on European society at large, yet we did not have the tools to capture it.

This is why Material Evidence in Incunabula was conceived in 2009, and I am very grateful to the vision of the British Academy and of CERL for supporting the idea and the innovative tool we created to turn it into a reality.



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But the brilliant new digital resource would not have made a dent in historical research had I not sought, and amply received, the collaboration and support of the hundreds of libraries and people who over these last ten years have been investing their expertise, time, and money to contribute thousands of data. Thank you.

In 2014, the ERC gave us the extraordinary opportunity not only of vastly increasing the scale and range of our enterprise, but also to show the scholarly world the relevance of historical investigations conducted on early printed books as primary sources.¹ The 15cBOOKTRADE Project allowed us to strengthen the structural framework to expand and expedite research with incunabula: we turned MEI into a tool capable of handling the half a million records it should eventually contain; we created TEXT-inc to support studies in the transmission of texts in print, 15cILLUSTRATION to facilitate a systematic approach to the identification, re-use, copy, and circulation of illustration; we created 15cVISUALIZATION to map the circulation of books over time and space.

By assigning a subject, keywords, and time period to every edition which still survives today and is recorded in ISTC, we have opened up the use of incunabula for non-specialists.

All these tools are there for everybody to use, supported and maintained by CERL and some of its core members, ready to welcome the continuous collaboration of an expanding library and scholarly community.

A second research strand that the ERC was keen to support is the investigation into the economic dimension of early printed book production, so essential and again, so elusive until recently. Data from the *Zornale* of Francesco de Madiis, which Neil Harris (University of Udine) and I have started to share with scholarship, and will soon make publicly available in their entirety, is quickly and fundamentally changing our understanding of the early steps of the 'knowledge economy'. They are becoming a benchmark, against which it is now very important to compare other sources: a good start is provided by the essays in the third part of this volume, covering book consumption and the cost of living in Venice, Florence, Padua, Bologna, Ferrara, Memmingen, Lyon and Catalonia.

The many avenues of research opened up or facilitated by the 15cBOOKTRADE are represented in this volume, with essays by the project's team and by many of its advisors and collaborators, as well

1 15cBOOKTRADE: An Evidence-based Assessment and Visualization of the Distribution, Sale, and Reception of Books in the Renaissance, ERC Consolidator Grant nr. 614727 (2014-19); <http://15cbooktrade.ox.ac.uk/>. A grant from the Rothschild Foundation Hanadiv Europe funded the inclusion into MEI of Hebrew incunabula from collections in the UK, Italy, and Israel. A grant from the Helen Hamlyn Foundation funded the completion of cataloguing incunabula from Venetian libraries in MEI.

as some of the engineers who worked with us: Alexander Jahnke and the Data Conversion Group of the University of Göttingen, the IT of the Bodleian Library, the Visual Geometry Group, and the e-Research Centre of the University of Oxford.

Geri Della Rocca de Candal, Matilde Malaspina, Birgit Mikus, Sabrina Minuzzi, Maria Alessandra Panzanelli Fratoni stayed with me from the beginning to the end of the ERC project, and went to many corners of the western world to promote, train, and gather valuable data.

As we approached the end of the ERC project, and ten years of MEI, we organised an exhibition, a conference, and now publish its proceedings to take stock of where we are: a strong structure and network in place, 10% of the data gathering done. The results are surprising. We are poised to re-write the history of the European printing revolution based squarely on evidence which a bottom-up, international, long-term enterprise is pulling together. And we do it as we live through the challenges that the new communication revolution has set on our society.

Historical research is not insensitive to the quality of the tools available to practise it: it is expected that the simplification which integrated research is bringing to the study of incunabula will open up the use of this material for scholars who until recently would not have considered incunabula as source material for their investigations into the economic, social, and cultural history of the late medieval to early modern period.

1 The Printing Revolution: The Data We Work with

Books printed before 1501, a conventional cut-off date in scholarship, are known as incunabula. Some 28,500 editions survive today in around half a million copies, held in around 4,000 public libraries in the world, with a heavy concentration in Europe and the United States of America.²

The editions are fully censused by the Incunabula Short Title Catalogue (ISTC) and typographically described in the Gesamtkatalog der Wiegendrucke (GW).³ However, only a fraction of private collections are included in these databases, and there are a certain num-

² ISTC was accessed on 7 August 2019. The statistics reported 447,058 copies of 30,535 editions. This number includes some early sixteenth-century editions in the past taken to be incunabula. A search in ISTC for data: < 1501 results in 28,478 editions; data: > 1501 in 1477 editions; there are 85 editions undated and therefore not captured in either query.

³ URL <http://www.bl.uk/catalogues/istc/>; <http://www.gesamtkatalogderwiegendrucke.de/>.

ber of books circulating in the trade at any given time; therefore, the number of surviving incunabula is even larger. It is clear that public collections are a priority for the curators of the international databases, both in terms of overall numbers and because they are in public ownership, yet collaboration with private owners and the trade is very much sought and fostered, for the overall benefit of ever more precise evidence-based scholarship. A photograph of the state of the matter in 2018 can be found in [ill. 1] “Where incunabula are today”. It is based on data extracted from ISTC and visualized on a GIS map by the Atlas of Early Printing, designed and curated by Greg Prickman and the University of Iowa.⁴

From the evidence we have, printing was essayed, with varying degrees of success, in 261 places in Europe. A complete listing arranged chronologically is provided in [ill. 2].

If the first two decades can be seen as the most experimental, when printing spread from Mainz to other areas of Germany, and, in Italy, to Subiaco, Rome and Venice, it is in the 1470s that the largest expansion took place, an expansion that continued in the 1480s, and, at a reduced pace, in the 1490s.

Behind these deceptively simple numbers lies a varied production history, ranging from the two editions printed by Meshullam Cuzi in Piove di Sacco to the minimum of 3,788 editions produced by around 250 printing shops operating in Venice during the last thirty years of the 15th century.

If we are able to gauge what we have with a precision unmatched for the book production, and survival, of any other period before or after these fifty years (1450-1500), it is instead very difficult to establish the size and range of the production which actually took place in those years. Not only we are aware of the fact that a number of editions, especially of more popular and utilitarian nature, have been lost completely, but the overall extent of the production escapes us. This has to do with the number of copies printed for each edition, the print run. There was no fixed number and it depended on many variables. From archival documentation and sometimes from evidence written in the book itself, we know the print run of a few hundred editions. This information has been and continues to be gathered by Eric White in a spread sheet published on the CERL website.⁵ From a few hundred copies in the early 1470s print runs quickly reached one thousand copies per edition by the late 1470s, ranging from several hundreds to even a thousand or two, towards the end of the century.

⁴ These data can be obtained by searching https://data.cerl.org/istc/_stats.

⁵ URL https://www.cerl.org/resources/links_to_other_resources/bibliographical_data#researching_print_runs. A search for Eric White's name in the “search this website” window will bring it up.

Numbers matter, because it is in these staggering numbers that we are confronted with the reality of a printing revolution. Just relying on the data we have, if we multiply 28,500 editions by a very conservative 500 copies, we come to over 14 million copies circulating by 1500. Understanding how they penetrated and changed society is the main goal of our research.

A fundamental component in the understanding of the impact of the printing revolution is how these millions of printed books circulated throughout Europe: their distribution through trade. It is to address this component, until recently so elusive, but so fundamental, that the 15cBOOKTRADE project was set up.

2 Language, Periods, Contents

Before focusing on the trade, and how to capture the evidence for it, however, there are other matter-of-fact data that are essential to describe the material we are working on. A break down of editions according to the language they were printed in, a simple query in ISTC, is provided in [ill. 3].⁶

A break down of editions according to the period in which the (main) work they include was composed is provided in [ill. 4].

This analysis brought to light very surprising results: if medieval works were put to print in the largest number (12,518 editions), contemporary works, that is post-1450, were a close second, with 11,865 editions, while classical works are represented by 3,901 editions. The extensiveness of the contemporary production, and its variety, opened up a world where printing had penetrated all aspects of social life, not just scholarship or religion.

The allocation of a subject and multiple keywords to every edition by the 15cBOOKTRADE further defined the landscape:⁷ yes, theology was the main subject of 4,928 editions, but law was perhaps surprisingly a close second with 4,480 editions and grammar fourth with 2,516 editions, despite the fact that these kinds of books have notoriously low survival rates.⁸ Numbers, periods, languages, and subjects tell us of a time of both continuity and progress, of great variety and diversity, well worth investigating properly. Traditional scholarship

⁶ language:bre (=Breton 1) /cat (=Catalan 140) / chu (= Church Slavonic 15) / cze (= Czech 33) / dan (= Danish 1) / dut (= Dutch 571) / eng (= English 240) / fre (= French 3) / fri (= Frisian 1) / frm (= French 1780) / ger (= German 3307) / grc (= Greek 68) / heb (= Hebrew 154) / ita (= Italian 2432) / lat (= Latin 21329) / por (= Portuguese 12) / spa (= Spanish 437) / swe (= Swedish 2) / und 1 (= another edition in French).

⁷ The list of keywords can be found on the 15cBOOKTRADE website (<http://15cbooktrade.ox.ac.uk/distribution-use/mei-searching-guidelines/>).

⁸ Books for primary education tend to be thrown away or destroyed by use.

on the printing revolution had never paid any attention to this massive production of legal texts, while we acknowledge here its fundamental contribution to the consolidation not only of modern state formation but also of the regulation of human activities, which should be seen, together with the spread of literacy and of knowledge, as the foundation of democratic Europe.

In the first part of this volume, data pertaining to editions of the law are analysed by Maria Alessandra Panzanelli Fratoni, the medical production by Sabrina Minuzzi, the survival of Donatus' grammar by Eric White, editions in Greek to 1488, that is before the production of Aldus Manutius, by Geri Della Rocca de Candal, and Hebraica, with an emphasis on their use, by Marco Bertagna and Alexander Gordin.

Scholarship in law and medicine, and probably in other areas, has until recently practically skipped the first fifty years of printing, concentrating either on the manuscript period or on the modern, post-1500, production in print. Difficulties to do with locating the sources, and their scattered nature, as well as a misplaced assumption that all editions are the same, are probably at the origin of this gap. But the transmission of a discipline during the transitional years of a medium change cannot be ignored. Results of systematic work on the entire production as well as a focus on certain works are surprising.

3 A Change in the Discipline

The printing revolution has always attracted the interest and imagination of scholars, historians, the media and the public; all this attention resulted in books rich in opinions, but poor in data to support those opinions.

From Marshall McLuhan's *Gutenberg Galaxy* published in 1962 to the notorious *The Printing Press as an Agent of Change*, published by Elizabeth Eisenstein in 1979, to all the scholarly debate which followed: much thinking and theorising went on, based on very little, very circumstantial, mostly second-hand, evidence.

Not because the evidence was not there. On the contrary, 15th-century printed books survive in the hundreds of thousands. Each of these copies has a different history which can be reconstructed with the help of the material evidence it contains and of documentary and bibliographical evidence, that is auction ledgers, correspondence, historic library catalogues, booksellers and auctions catalogues, etc.: this is known as copy-specific information, or provenance, or material evidence. Five hundred years of existence can hardly pass unnoticed!

A different book, first published in 1958 in France and translated into English in 1976, and into Italian in 1977, *L'Apparition du livre* by the two social historians Lucien Febvre and Henri-Jean Martin, was

not taken into consideration by Eisenstein. This book led the way to new branches of studies in the history of the book throughout Europe, and, with its reliance on primary sources and physical evidence, inspired and motivated the cataloguing of the material evidence of early printed books in libraries for the following sixty years. To date at least two hundred and fifty catalogues of incunabula with provenance information have been published, including some very large collections such as those at the British Library, Harvard, the Bavarian State Library in Munich, the Bibliothèque nationale de France in Paris, and the Bodleian Library in Oxford. A growing number of libraries have in recent years provided provenance information about their incunabula within their general electronic library catalogues. This choice is understandable in terms of collection management, but does not facilitate research across collections in different libraries.

This wealth of new evidence, however, has not informed the content of new, better, more up-to-date books on the introduction of printing with movable types in Europe as one of the agents of progress which accompanied the transition into the early modern period. Why not? I can list three major obstacles.

First, certainly not a lack of evidence, but, quite the opposite, too much of it.

Second, the lack of effective ways to cope with the quantity, and quality, of provenance data, to inform an evidence-based history of the printing revolution; simply put: we needed a new method.

Third, the mental framework of the average historian, who did not perceive the inability to deal with the quantity of evidence as an issue. As a consequence, structural solutions were not sought for, corners were cut, and new books continued to be produced based on the very little evidence already digested by others. Book after book continues to be written on the topic, even now. *Tibetan Printing* was published in 2016. The second chapter, by Johan Elverskog, is cavalierly entitled “The Gutenberg fallacy” and without ever producing any evidence postulates that “printing became part of the technological narrative of modernity that Europeans had come to tell about themselves”. The fact that in one generation millions of books, of any kind, circulated anywhere, affordable to large sections of society, many of whom newly literate thanks to it, was not even mentioned. After all, in other parts of the world where printing was practiced even before than in Europe “it did not in fact usher in a new age as so often imagined in the West”. The concept that the same technology may have had a different impact on different societies is not contemplated.⁹ I was once met with the objection, «but early libraries are full of books nobody read»: really? Did anybody check? Of course not, but opin-

9 Elverskog, “The Gutenberg Fallacy”, 21-37.

ions can be freely dispensed. Incidentally, I have handled thousands of early printed books, and the case when nothing can be understood of the users of the past is the exception, not the rule.

A modern historian breezily claimed that the early book trade period was a failure compared to later commercial standards: but why should we compare a new phenomenon with what came afterwards instead of what was there before? Is chronology in history really irrelevant?¹⁰

The elephant in the room is of course Venice, the largest printing place in Europe with its 250 or so printing shops, and the largest distribution and exporting network. No serious assessment of the printing revolution can be put forward without the data pertaining to the production, distribution, and use of the thousands of editions generated there. Would a narrative of the digital revolution make any sense without a focus on Silicon Valley?

The fragmented state of existing evidence has allowed book or generalist historians to say whatever they wished about the printing revolution, often one thesis and its precise opposite. But the lack of a manageable large body of data has larger implications, which extend far more widely than the History of the Book.

These days economic historians and global historians are paying more attention to the printing revolution in order to compare it with the present information revolution. Not only that, some economic historians are trying to quantify the relevance of the so-called human capital for the growth of Europe in the pre-industrial period, and are finally starting to pay attention to books as an essential component of human development.

Unfortunately the data they use are not good, and what they build, they build on sand.¹¹ But we book historians do in the end want books to be taken into consideration: therefore, it is up to us to produce good-quality, extensive, measurable, sets of data which they can crunch in the way they are accustomed. Data which cannot, and should not, be ignored any longer.

10 Pettegree, *The Book in the Renaissance*, 53-5 'the crisis of print'. A tenet reproduced recently in Pettegree, Graheli, "How to Lose Money", 1-20, at 2 "in view of what we now know about the actual early history of the press, a story of repeated failure and reinvention" for which evidence pertaining to the 16th century is put forward. This line of thinking follows in the steps of a couple of misleading articles published in the eighties and nineties: Noakes, "The Development of the Book Market", 23-55 and Tedeschi, "Publish and Perish", 41-67. In both cases very specific study cases have been taken to exemplify wider trends.

11 Buringh, van Zanden, "Charting the 'Rise of the West'", 409-45; Baten, van Zanden, *Book Production*; Dittmar, *Information Technology*; Dittmar, *New Media*. The main shortcoming of these works consists in the quality and quantity of the data. Until this fundamental aspect is properly addressed, as it is expected in any serious scientific analysis, conclusions will continue to be matters of opinion.

In any discipline, and certainly in scientific ones, the quality of results is only as good as the data used to research them. Economic historians necessarily rely on the data provided by book historians; such data have therefore to be gathered and crunched. Assertions such as “surprisingly we have no statistics for the number of books printed by content [i.e. subject] so we are reduced to a few snapshots” from a renowned book historian of our time are scarcely acceptable in the 21st century: the work just needs to be done.¹²

A good idea is not enough if the data are not there to support it or if the implementation of its argument is wanting. Results can be devastating and there is no better example than the book written by Eisenstein. I know I may sound harsh in my judgement, but it is precisely because I know how hard it is to re-establish not only the topic (the Printing Revolution) but also the discipline (incunabula studies and early book history) at university level. Eisenstein’s book became popular because people were rightly interested in the subject, but nobody followed up on the research, perhaps because it was never presented as such. A book which relies on statements uttered by other scholars, not on first-hand investigation, will seldom stimulate further research. Is it not surprising that with the myriad variety of humanities undergraduate and postgraduate courses in hundreds of universities in Europe and the United States, not one is dedicated to an event so vastly transformative for human society? The detractors of the book did not find it difficult to demolish ideas not rooted in solid evidence. But the most fundamental flaw lay in the methodology: “Can the historical effects of printing be assessed accurately by someone ignorant of the history of printing? And it proves the answer to be: no”.¹³

There could have been no clearer, stronger, call for a new approach, one which took the evidence which survives in large quantities as the starting point of a bottom-up assessment. Instead, the concept itself of the printing revolution evaporated from scholarship, the sources still sitting, literally, on the shelves of thousands of libraries, untapped.

All the while the best scholars in the field continue to be specialist librarians. This is understandable, as they make good use of their vicinity to the essential primary sources, and take their role of curators very seriously. But the short-term teaching classes the lucky ones are allowed to offer to students, as well as individual scholarship, excellent as it may be, are not sufficient to re-establish a research school, the next generation of historians of the printing revolution.

Luckily my concerns and my vision for an innovative solution to this impasse had been understood by the British Academy, who first

¹² Dondi, review of *Gutenberg’s Europe*, 668-70.

¹³ Needham, review of *The Printing Press*, 23-5, 32-5, at 35.

funded the creation of the database *Material Evidence in Incunabula*, then by CERL, who embraced it by designing, hosting and maintaining it. Finally, by the European Research Council, who has given me the opportunity to make the database truly global within the 15cBOOKTRADE Project.

4 The 15cBOOKTRADE Project

The idea that underpinned the 15cBOOKTRADE Project was to use the material evidence from thousands of surviving books, as well as unique documentary evidence - the unpublished ledger of a Venetian bookseller in the 1480s which records the sale of 25,000 printed books with their prices - to address five fundamental questions relating to the introduction of printing in the West which had so far eluded scholarship, partly because of lack of evidence, partly because of the lack of effective tools to deal with existing evidence.

For the last five years, we have been working with a bottom-up approach on the distribution of books, the circulation of texts, the cost of early printed books, the copying and re-use of illustration, and the visualization of these data.

5 Distribution, Use, and Reading Practices

Mobility is part of the very nature of printed books. For the new business enterprise to be successful, the hundreds of copies of a printed edition needed to find a market beyond the place of production, which could not absorb the entirety of a print run by itself: the issue of distribution was, and continued to be, vital. We could not understand the printing revolution without studying the trade in books.

The book trade differs from other trades operating in the medieval and early modern periods in that the goods traded survive in considerable numbers. We can therefore rely not only on scattered documents,¹⁴ but also on hundred of thousands of surviving books. Not only do they survive, but many of them bear stratified evidence of their history in the form of marks of ownership, prices, manuscript annotations, bindings and decoration styles. They are material evidence of the expansion of the trade, signalling the response of different publics to the introduction of printing, documenting book buying as well as reading habits.

¹⁴ Cortesi, "Incunaboli veneziani", 197-219. Scattered literature on the sources available has been gathered in Nuovo, *Il commercio librario*, and *The Book Trade*. Cortesi's article is repeatedly quoted as evidence of the difficulties of the early trade, so much so that some scholars are beginning to theorise that the trade itself was small and not very successful.

Whenever a book printed in Venice presents a contemporary German binding, or French or English manuscript decoration and annotations, it is evidence of the fact that that book, once printed, was quickly shipped or taken from Venice to Germany, France, or England; it is evidence of its circulation, that is of the new trade in printed books.

Until recently, the book trade barely made an appearance among publications devoted to the Renaissance commerce in goods and its impact on the socio-economic development of Europe. Just to focus on Venice, the largest place of book production and distribution of 15th-century Europe, monographic studies on the Venetian trade in salt, raisins, grain, olive oil, sausages, wool, silk, second-hand clothes, glass, hosiery, ceramics, arms, majolica, paintings, marbles, antiquities, and slaves have been published in the last fifty years. However, there has been no such study on the Venetian book trade.¹⁵ In a case where books have been taken into consideration, in a multi-volume publication on the Italian Renaissance in Europe centred on commerce and trade culture, it offers a rather inadequate and distorted picture, lacking engagement with the evidence that exists for books as commodities.¹⁶ Indeed the author specifies that: “it would be appropriate to try and penetrate the world of printing by its economic coordinates: costs, prices, profit; but this world repeatedly probed has so far opened up only unsatisfactory bits and pieces and monographic studies of limited coverage”.¹⁷ This will not do. No mention is made of a single surviving book. Clearly the writer was not familiar with the priced books listed in the *Zornale* of the Venetian bookseller Francesco de Madiis, or with books in the Colombina and Chapter Library of Seville, the most impressive collection of priced incunabula.¹⁸

In 2008 an Italian economic historian published a book which utilised the manuscript and printed book trade in Bologna and Florence to study the emergence of market systems.¹⁹ Apart from the repeated complaint about the lack of prices, the author, who is not a book his-

15 A quick survey includes Aymard, *Venise, Raguse et le commerce du blé*; Ciriaco, *Olio ed ebrei*; Hocquet, *Le sel et la fortune de Venise*; Trivellato, “Women at Work. Venetian Glass Beads”; Bovolato, *L’arte dei luganegheri*; Allerston, “Reconstructing the Second-hand Clothes Trade”; Molà, Mueller, Zanier, *La seta in Italia dal Medioevo al Seicento*; Trivellato, *Fondamenta dei vetrai*; Lanaro, *At the Centre of the Old World*; Sella, *Trade and Industry in Early Modern Italy*.

16 Perini, “I libri e la stampa”, 191-225.

17 Original text: “Sembrirebbe opportuno, in relazione al tema trattato, cercare di penetrare nel mondo della tipografia e della stampa attraverso le sue coordinate economiche - costi, prezzi, profitti -, ma questo mondo ripetutamente scandagliato ha lasciato finora affiorare solo deludenti avanzi e studi monografici di portata molto limitata” (Perini, “I libri e la stampa”, 200-1).

18 On the *Zornale* cf. below. Wagner, “Hernando Colón”, 475-92; Dondi, “The Venetian Booktrade”, 221-9.

19 Bonifati, *Dal libro manoscritto al libro stampato*.

torian himself and relies on published secondary literature, has been led completely astray by partial sources so much as to state that the success of the Venetian book trade was Aldus Manutius' achievement. In fact, this was due to the entrepreneurial skills and trade links of the more than 250 printing shops active in the city in the thirty years following the establishment of presses in the city, and the 15cBOOKTRADE is finally gathering the evidence to prove it.²⁰

Probably because the physical objects generally do not survive to this day, material evidence had not been used until now as a systematic historical tool to advance our knowledge of the trade network and social history of the 15th century. In a way there was the need to bring into the discipline a quantitative and archaeological approach, to achieve the best results from the sheer quantity of surviving books and the evidence they contain.

The only well-known exceptions were the works of Lotte Hellinga and Margaret Lane Ford on the importation of foreign books into England and Scotland in the 15th and early 16th centuries. Hellinga's work was based on 1,000 incunables with British ownership up to about 1520 and was published in 1991.²¹ This pioneering research was expanded in 1999 by Margaret Lane Ford who compiled *Early British Owners in Britain* (EBOB), in spreadsheet form, to write her contribution to the third volume of the *Cambridge History of the Book in Britain*.²² EBOB includes data from some 4,474 books which were used in England and Scotland up to the 1550s and still survive today in libraries in the UK, corresponding to 3,495 editions. Since it was the largest and most comprehensive such sample, Ford's survey allowed a preliminary analysis of where books were coming from and when, as well as what books were circulating. It offered a picture of the intellectual climate as much as of the book trade. Needless to say, Venetian imprints figured high in the list of imports.

The work of Hellinga and Ford showed what could be achieved by approaching the evidence systematically.

What ten years of work on the incunabula in the Bodleian library taught me is that the evidence is plentiful, but, crucially, needs to be not only carefully gathered but intelligently retrieved.

A first pilot investigation, which subsequently led to the British Academy and ERC projects, was researched and published in 2008.²³

²⁰ Needham, "Venetian Printers and Publishers", 157-74. The last count, of 254 printing shops, was done by Dondi in 2019 using ISTC data.

²¹ Hellinga, "Importation of Books Printed on the Continent", 205-24. Cf. also Needham, "The Customs Rolls as Documents", 148-63.

²² Ford, "Importation of Printed Books", 179-201. The data has been converted by CERL into a database using the same data model as MEI: https://data.cerl.org/ebob/_search.

²³ Dondi, "La circolazione europea degli incunaboli veneziani", 179-90.

It was based on the 1,123 Venetian editions (a third of the total) in 1,387 copies of the Bodleian Library, and their descriptions, provided by the Bodleian Catalogue of incunabula (Bod-inc). In the pilot, and now in the MEI database, evidence for the distribution and use of the books was collected not only from ownership inscriptions, but also from the decoration, bindings, manuscript notes, and later provenance history of the books.

The distribution of Venetian editions in the 15th and 16th centuries, based on the Bodleian sample, could be summarised as following: 183 copies (13%) were acquired in England, Scotland, and Wales; 263 (19%) were used in Germany; 481 volumes (34%) were distributed, purchased, and kept in Italy, which is a very substantial percentage. When assessing the Venetian book trade, it is very important to note that the internal and local distribution – to other parts of Italy and within Venice itself – is as substantial as the international trade, because it is a matter of fact that the international book trade of the city has completely overshadowed the internal market in the perception of scholarship. Surprisingly, the systematic way in which material evidence was recorded in Bod-inc made possible the localisation of the early use, hence of the distribution, of some 572 volumes for which there was no ownership note as such, the equivalent of 41% of the total number of copies printed in Venice now in the Bodleian Library. I was able to gather and use provenance data for 86% of the examples, that is, 1,205 copies out of 1,387. Only 194 copies (14%) did not provide any form of localisation.

While the Bodleian incunabula are not exceptional in the preservation of historical evidence relating to their use, the Bodleian catalogue was exceptional in taking notice of that evidence systematically and in great detail. This investigation alerted me to the necessity of a system to process efficiently the information available, a system which would be able to record and process these ‘anonymous indicators’ of invaluable historical relevance.

6 Material Evidence in Incunabula (MEI)

The creation of MEI was necessary first to offer a central repository for the copy-specific data on incunabula either not yet described – the majority – or described in scattered printed or electronic catalogues. Secondly, to produce sophisticated integrated searches on any aspect of the material evidence of incunabula, therefore significantly improving the use of these resources as historical evidence.

I conceived and planned the Material Evidence in Incunabula database (MEI) in 2010, and it was developed by Alex Jahnke, Head of the Data Conversion Group of the University of Göttingen, with funding from a British Academy Research Development Award (BARDA) grant-

ed to Prof. Nigel Palmer (then Principal Investigator) and to myself (then Project manager). The database is linked to the *Incunabula Short-Title Catalogue* (ISTC) of the British Library, from which it derives the bibliographical records; it is hosted by the Consortium of European Research Libraries (CERL), and is freely available on its website.

Not only former owners, but also every other piece of evidence, such as a certain style of decoration or binding, the period of a manuscript note, etc., is treated as a valuable clue for provenance, enabling it to be geographically located and chronologically dated. This allows us to track the movement of books across Europe and through the centuries. From its start, MEI was developed to provide a physical representation of the circulation of books throughout the centuries, from place of production to their present locations.

The development of the database started from its beginning as a collaboration with libraries: the National Central Library of Rome and the British Library in London were its very first partners and contributors, followed by the network of libraries of Regione Lombardia, under the supervision of Edoardo Barbieri of the Catholic University of Milan. For a book historian the close, continuous relationship with libraries, the custodians of books, is a must, not an option. The international success of MEI is a witness to this simple statement. The number of libraries which are contributing to the database has been steadily growing: the CERL pages dedicated to libraries in MEI and to MEI editors are kept up to date.²⁴ The ERC grant allowed me to place two researchers for four years, full time, to work on two key collections of incunabula, the British Library and the Marciana Library of Venice. Their efforts to capture the vital historical memory of the institutions' acquisition policies was greatly facilitated by the close collaboration with the curators of those institutions. Indeed, the presence of the scholarly support provided by the project stimulated the investigation of the institution's archive. In the second part of this volume, essays by Giachery and Sciarra share the successful results of those investigations. Essays by Barbieri, Vaitkevičiūtė-Zemkajūtė, and Lancaster present their experience as MEI editors in different parts of the globe. The digital tools we have created are increasingly part of other research projects, including digitization and preservation projects. The essay on the Polonsky project at Subiaco, a collaboration of CERL and the National Central Library of Rome, is one of these.

Before the start of the ERC grant in April 2014, the database counted around 3,600 editions in around 6,500 copies, and 7,000 former owners; the data were derived from 36 library collections in Europe and US, created by 40 MEI editors.

²⁴ URL <https://www.cerl.org/resources/mei/about/libraries>; <https://www.cerl.org/resources/mei/about/editors>.

By the end of the ERC grant in March 2019, MEI included over 14,000 editions in over 46,000 copies and 18,000 owners, from 433 libraries and 193 editors.

It is undeniable that the systematic and intense research work of the 15cBOOKTRADE team, fostered by the ERC grant, has made a significant difference in quantity (of records produced) but, most importantly, in the quality of the records and of the research based on them. The success of MEI is not only the result of a good idea, of the right solution at the right time, but of its painstaking implementation.

Being the Secretary of CERL meant that I was in constant dialogue with European and American research libraries. Having a team meant that we could multiply our presence many times over. Lectures, seminars and training workshops have been given in Europe and the US. A de-centralised approach meant that active members of the community could take the initiative to further promote the database. This was shown by the team headed by Prof. Edoardo Barbieri of Centro di ricerca europeo libro editoria biblioteca (CRELEB), Università Cattolica of Milan, who has been overseeing the cataloguing of incunabula in Regione Lombardia. Various research grants, from Regione Lombardia, Fondazione Cariplo, and two Italian Government Research Funding grant (PRIN) were obtained by the CRELEB team to catalogue incunabula in MEI.

Internships for cataloguing incunabula in MEI have been offered by CERL in collaboration with member libraries since 2014. Others have taken place at the British Library and at the National Central Library of Rome. Progress reports and presentations of the database applications for historical research are offered regularly to all CERL members attending the Consortium's meetings, and PowerPoint presentations are available on the CERL website; written papers and announcements in circulation lists ensure a wide awareness of MEI work among the scholarly and library community.

During the ERC grant we also introduced uploads into MEI of electronic library catalogue records with provenance information of major collections: data from the Bodleian, Cambridge UL, the Royal Library of The Hague and the National Library in Vienna.²⁵

25 Uploaded records still need to be manually edited to conform with the MEI model, especially with the provision of chronological and spatial tagging.

7 A New Methodological Approach: Converting Physical Evidence into Historical Evidence

An innovative approach was devised to address the need to make the best use not only of conventional provenance evidence in tracing the history of books, such as former owners' inscriptions and various marks, but also of physical evidence which is strictly speaking anonymous: a German binding of the 16th century, French illumination, or Italian manuscript annotations of the 15th century, an English purchase note recording price in the 19th century. They may not tell us who used the book, but can certainly direct us to where and when it was used, that is, to certain areas and certain periods of time.

In MEI we have dozens of fields pertaining to provenance. We can single out distinctive copy features: complete, incomplete, made up copy,²⁶ composite volume,²⁷ variant, *cancellans/cancellandum*, parts of text in facsimile, parts of text in manuscript, manuscript signatures, no evidence of use, no rubrication, reuse of manuscript leaves, chain-hole, fallen type, bound with manuscript, binding waste, later decoration. The type of provenance evidence is classified according to inscriptions, coat of arms, genealogical tables, supralibros, ex-libris, mottos, emblems, stamps, fire stamps, binding, decoration, manuscript notes, bibliographical evidence, shelf mark, accession mark, deaccession mark, seller's mark/note, and documentary evidence.

The method of acquisition can be distinguished among purchase, donation, bequest, exchange, institutional transfer, dedication copy, consignment, requisition, theft, restitution, deposit.

Each former owner is further defined by his/her gender, status (lay, religious), and profession. Decoration can be searched according to illustration coloured by hand, illumination, ornamental letters, coat of arms, rubrication, partial rubrication, pen trials, and illustration stamped in. Manuscript annotations can be studied according to their typology and frequency.²⁸

Because our goal is to describe the life of the book, from the time it was printed to the time it entered its current holding institution, every piece of provenance evidence is recorded in a separate block of provenance, which is tagged geographically and chronologically. The movement of a book over its 500 years is therefore visually represented in MEI records as a sequence of blocks of provenance, whereby the last provenance block is always the same as the holding institution field.

²⁶ A volume made up of parts taken from different editions.

²⁷ A volume made up of more editions, or even manuscripts, bound together.

²⁸ This is further discussed in the paragraph below on "The Use of Books".

For example, a copy of Cicero's orations printed in Venice in 1471 was sold by an anonymous bookseller in Milan already in 1472, purchased there by Renobertus de Campo of Dole for over three ducats and taken to France. After the sack of Dole by Charles d'Amboise in 1479, the book was purchased by the Carmelite of Chalon-sur-Saône Jacobus Benedictus, professor of theology, in that same year, and in 1483 gifted by him to the Carmelite Laurentius Burellus, confessor to the kings of France Charles VIII and Louis XII. After Burellus' death, the book stayed probably with the Carmelites of Dijon until it was acquired by the Duc de la Vallière; at the sale of his collection in 1783, it was purchased by Pietro Antonio Bolongaro-Crevenna, a snuff merchant based in Amsterdam, and finally, at his sale in 1789, purchased by the Bodleian and brought to the UK. The MEI record is therefore made of seven blocks of provenance: Milan, Dole, Chalon-sur-Saône, Dijon, Paris, Amsterdam, Oxford.²⁹

By clicking instead on any single former owner of this record, for example Bolongaro-Crevenna, we can immediately access information on his book collection, now dispersed: MEI at present holds descriptions of his books not only in Oxford (116), but also in The Hague (135), Cambridge University Library (6), London British Library (4), Princeton (3), Athens Aikaterini Laskaridis Foundation (1), Milan Biblioteca Trivulziana (1), Venice Fondazione Cini (1).

The more libraries that contribute to MEI, the better we can virtually reconstruct dispersed collections. It is that simple.

Whilst it is understandable that a library or library system wants to keep together all sorts of data pertaining to the collections in their custody, whether in manuscript, print or digital format, and that there is an attempt at offering more and more analytical ways to access that data, it has to be accepted that specialist databases which integrate data from many different libraries, when designed properly and intelligently, can address historical queries that a library catalogue alone is not in a position to support. Databases should be seen as complementing and supplementing the information that a library catalogue can hold.

Each of the MEI fields has been devised with clear historical questions in mind, questions which we were unable to answer, but can now begin to address. Just to offer one example: scholars of books and libraries are aware of the tremendous impact that the secularisation of religious institutions had on the dispersal of old, and formation of new, libraries. Historical collections in France, Great Britain and the United States would not be what they are today without the vast mobility of books triggered by national policies towards religious insti-

²⁹ Cicero, Marcus Tullius, *Orationes*. Ed: Ludovicus Carbo. Venice: Christophorus Valdarfer, [not after 9 Nov.] 1471. Folio. GW 6765; ISTC ic00542000; MEI 00203715.

tutions and their libraries. In MEI we are finally capturing the extent of the phenomenon: to date, some 4,975 copies in MEI have been recorded with the descriptor “institutional transfer”.³⁰

8 A New Methodological Approach: Tracking and Visualizing the Movement of Books

Why is it important to know the movement of books? Because until the age of the internet, ideas and knowledge spread via the medium of books. So by tracking the movement of the books, we follow the diffusion of ideas and knowledge.

Where a book was printed and where the book is today tell us very little about where the book has been during the 500 years of its existence, because books moved extensively over the centuries, entering and leaving private or institutional collections.

Provenance data is our key to discover where books have been, at any given time.

If we want to learn about the provenance history of a book the first port of call is generally the library catalogue, one entry at a time.

But where do we look if we want to learn about a collection of books, a former private or institutional owner, whose books are today scattered across several libraries around the world? Before MEI existed, only Paul Needham had gathered extensive provenance of incunabula into a Word file which he would generously share with colleagues, while Margaret Lane Ford had brought together early British incunabula users in EBOB.³¹

The traditional perspective of provenance indexes or tools provided us with a snapshot of what was in a library or collection, at any given period of history.

The researcher could either follow the story of one book at a time, then, or have a snapshot of a collection, at a fixed moment in time. For example, the Provenance Index of the Bodleian Catalogue of Incunabula tells us that 23 incunabula from Weissenau are now in Bodley. But to know where each book was before and after its presence in Weissenau we have to read each catalogue entry. And of course we have to look elsewhere to discover where other Weissenau books are today, beyond the small group which ended up in Oxford.

³⁰ Searching “data.provenance.acquisitionMethod:e” of 27 Aug. 2019. Advanced queries to the database can be found in MEI Searching Guidelines on the 15cBOOKTRADE website <http://15cbooktrade.ox.ac.uk/distribution-use/mei-searching-guidelines/> or by clicking the Help button in MEI.

³¹ IPI was made available to the public by CERL in 2010. Both IPI and EBOB are today in the same data model as MEI and freely available: https://data.cerl.org/ipi_search; https://data.cerl.org/ebob_search.

We needed a change of perspective: libraries are static entities, while books are dynamic entities which move in and out of libraries. Therefore we needed a dynamic concept of provenance, from the book's point of view, as well as from a collection's point of view, as the study of provenance has been approached until now.

The innovative solution was the use of geographical (GeoNames) and chronological indicators applied to every element of provenance. Now we are in the position to track and visualise the movement of thousands of books over space and time, and the formation and dispersal of libraries, to understand patterns and trends in the use and survival of early printed books and to grasp trends in book acquisitions and collection formation.

9 Visualization of the Movement of Books

The objective behind MEI has always been the visualization of the circulation of books and of the texts they contain, throughout Europe, and beyond.

Professor Min Chen and Doctor Simon Walton, of the Oxford e-Research department, applied scientific visualisation techniques to MEI and TEXT-inc data, to represent, geographically and chronologically, the movement of 15th-century printed books and of the texts they contain.

The result is 15cVISUALIZATION, a visualization suite where data are seen on a cartesian diagram, in which place, of printing and later of ownership, is represented in the vertical axes, and time, from 1450 to the present, on the horizontal axis. The movement of each book is represented as a line which originates in a place of printing, a triangle, various places of provenance over the 500 year period, circles, and a final place of holding institution, a square.³²

10 Historical and Trade Copies, and Private Collections

We should never forget that what survives today is but a small part of what was originally produced in the 15th century. Understanding how the half a million copies came to us, surviving obsolescence, theft,

32 The backend of the software is a Python application using Tornado as a web server to host the API. It interfaces directly with the APIs provided by the project, as well as using a local redis cache for improved speed and reverse lookup calculations. This redis database is less than 2GB in size. The frontend is a standard node web application written in modern ES6 Javascript, compiled and bundled using Parcel. The actual rendering of the visualization in the web browser is done with D3.js.

A video of the visualization and an explanation of the way it works can be watched at <http://15cbooktrade.ox.ac.uk/visualization/>.

requisition, institutional policies towards cultural heritage in general, and ecclesiastical heritage in particular, is an essential way to fathom what ended up being destroyed. However, archival evidence of various kind does record the existence of books and entire libraries, even after their destruction.

In MEI we also devised a simple and effective way to capture ‘historical copies’, that is copies which we know, from library catalogues or inventories, existed until a certain time in a certain place, but are now lost, either destroyed, or more likely in some library where they have not yet been identified as belonging to that former ownership. In the lucky event of a match between a ‘historical copy’ and a physical copy, all we have to do is to replace ‘historical copy’ in the ‘library holding’ field, with the name of the library now holding that copy, and its shelfmark. At present ‘historical copies’ from the libraries of Prospero Podiani of Perugia, of the Benedictines of San Giorgio Maggiore in Venice, and of Francesco Maria della Rovere, 2nd Duke of Urbino, are being gathered in MEI.³³ The same approach is applied to copies in the trade, though the priority of the work-load of the 15cBOOKTRADE project has been collections in public libraries.³⁴ Equally, MEI can accommodate copies in private collections, whenever their owners are happy to join in our research efforts; it is pleas-

33 An example of an historical copy is Conradus de Alemania, *Concordantiae bibliorum*. Nuremberg: Anton Koberger, 27 June 1485. Folio. GW 7420; ISTC ic00851000; MEI 02006694; the evidence of its former ownership by the Benedictines of San Giorgio Maggiore of Venice sits in two archival documents: a list of 78 incunables owned by the monastery prepared by Giovanni Rossi in Venice between Aug. 1806 and Mar. 1807 (Venice, Archivio di Stato, Direzione dipartimentale del demanio e diritti uniti, Atti, b. 380, 2/15, fasc. II: S. Giorgio Maggiore. Libri a stampa del secolo XV della Biblioteca di S. Giorgio Maggiore, “C22, ‘Concordantiae Bibliae Nuremberg. 1485 p. Koberger F.o.’”) and ‘Catalogo generale, ossia riunione di tutti gli elenchi di libri scelti dalle biblioteche delle Corporazioni Regolari concentrate nel già convento di S. Anna di Padova’, compiled by Giuseppe Dainese (Padua, Biblioteca Universitaria, maggio 1811, ms. 2250, p. 144 nr. 22: ‘Concordantiae Bibliae, fol. Nurembergae 1485’). It is most unlikely that this copy was destroyed in the 19th century. Most probably it is one of the 126 still surviving copies. An essay on the reconstruction of the library of the Benedictines of San Giorgio Maggiore will appear in Dondi, Prosdocimi, Raines, “Tracing the Dispersed Incunable Collection”.

An example of a historical copy later matched with an existing copy is Platea, Franciscus de, *Opus restitutionum, usurarum, excommunicationum*. [Venice]: Bartholomaeus Cremonensis, 1472. 4°. ISTC ip00752000; GW M00836; MEI 02006676: another San Giorgio book, which, after exiting the same depot in Padua where the previous example was kept, ended up in the hands of the British bookseller Thomas Thorpe who sold it to the Bodleian in 1831.

34 We treat trade copies likes historical copies; an example of trade copy can be found here <https://data.cerl.org/mei/02128929>: it is Aegidius (Columna) Romanus, *De regimine principum*. Ed: Oliverius Servius. Venice: Simon Bevilacqua, 9 July 1498. Folio. GW 7219; ISTC ia00089000; MEI 02128929, the copy was formerly in the Donaueschingen collection, then lot 1 of the Sotheby’s sale, held in London in 1994. If the new owners of this book joins MEI, “trade copy” will be substituted by their collection place and name, or indeed “private collection”, and added as new final block of provenance.

ing to notice that this category is also growing, with private collections in the United States, Germany, the United Kingdom, and Italy.³⁵

11 The Use of Books

Attention to the way books were used and read has been steadily growing. In 2001 the *Marginalia Project* of the Catholic University of Milan reproduced and textually analysed the annotations on some 200 incunabula in the Trivulziana Library of Milan.³⁶ In more recent years a couple of digital projects have been devised for that purpose. The *Reading Experience Database* (RED), 1450-1945, is a collaboration of UK, Australia, Canada, The Netherlands, and New Zealand, with records mostly from the late modern and contemporary period.³⁷ *Annotated books online* (ABO) is a digital archive of early modern annotated books developed by the University of Utrecht.³⁸ The *Archeology of Reading in Early Modern Europe* (AOR) uses digital technologies to enable the systematic exploration of the historical reading practices of Renaissance scholars nearly 450 years ago.³⁹

Most of these databases focus on the content of the marginal annotations in great detail, to unveil the interaction of the owners with the text. Their approach is qualitative.

MEI presents instead a more quantitative approach, as it aims at the identification of the extent of the interaction between readers and books. In doing so it also acts as a first filter for the specialist databases, by flagging extensively annotated copies, or copies annotated by well-known figures.

To understand who were the buyers and users of the first printed books, in MEI explicit ownership notes are further categorised as private or institutional, religious or lay, female or male, and by profession. These categories can be combined with spatial and temporal markers, as well as bibliographical ones (author, work, imprint information, subject, keywords, period), to outline in unprecedented quan-

³⁵ A few private owners read about the project in the national papers and got in touch; one example for all is Mr Günter Elo, from Mackenheim <https://data.cerl.org/mei/02128902>.

³⁶ URL <http://libriantiqui.it/risorse-in-pdf/item/14-marginalia-un-censimento-di-incunaboli-postillati-preso-la-biblioteca-trivulziana-di-milano>.

³⁷ Only 4 records for the period 1450-1499. Cf. <http://www.open.ac.uk/Arts/reading/UK/index.php>.

³⁸ URL <http://www.annotatedbooksonline.com/>.

³⁹ URL <https://archaeologyofreading.org/>. In 2019, a corpus of thirty-six fully digitized and searchable versions of early printed books filled with tens of thousands of handwritten notes, left by two of the most dedicated readers of the early modern period: John Dee and Gabriel Harvey.

titative and qualitative detail the social impact of the introduction of printing in early Modern Europe, and later elsewhere.

Many of the books described in MEI bear evidence of reading practices. Manuscript notes, vital for understanding the readership of the early editions, are classified, and can be searched, according to their frequency (occasional, a few, several, extensive), position within the book (first few pages, first half, throughout, parts only), and their type: corrections, completions, supplements, extraction of keywords, collation,⁴⁰ translation, structuring the text, comments, censorship, reading marks (underlining and pointing hands), drawings, corrections by the printer, lecture notes, later rubrication, autograph, pen trials, personal notes.

12 The Books' Contemporary Market Value

Groundbreaking new evidence for the history of the book trade in the 15th century has emerged from the in-depth study of the manuscript *Zornale* or day-book of Francesco de Madiis, which I have been editing together with Neil Harris, Professor of Bibliography and Library Studies at the University of Udine.⁴¹ The *Zornale* recorded the daily activity and sales of a Venetian bookshop from May 1484 to January 1488, as well as the inventory of the stock-in-trade for just over one year, to June 1485. In this period 11,100 entries with their prices are registered, involving 6,950 sales, sometimes gifts or barter, and over 25,000 copies. For its scale, for its detail, and for its importance as a fly-on-the-wall documentary of what happened in a Renaissance Venetian bookshop, the *Zornale* is unique.

Other documentary evidence for the period is piecemeal and of varied nature, such as post-mortem inventories of bookshops and lawsuits that contain estimate of value, but not real prices.

Scholars have long shown an interest for the *Zornale* and for its significance as a record of the Renaissance book trade, beginning with the very partial transcription published by Horatio Brown in 1891.⁴² In more recent years, Martin Lowry discussed the material in two publications, but his early death prevented any in-depth analysis.⁴³ Its exploitation has had to overcome two principal challenges, the sheer size of the document, 160 long leaves in agenda format, and the very condensed nature of the entries, which require palaeographical and bibliographical expertise for their interpretation.

⁴⁰ In its philological sense of comparison with other texts.

⁴¹ Venice, Biblioteca Nazionale Marciana, MS Ital. XI, 45 (7439).

⁴² Brown, *The Venetian Printing Press*, a sample of 234 entries out of 11,100 and the whole stock-in-trade.

⁴³ Lowry, *The World of Aldus Manutius*.

The detailed study of this exceptional document is finally bringing to the attention of scholarship the economic aspects related to the introduction of printing in the West. Scholars working on any area of classical through to early modern texts (from school and devotional books to legal, medical, theological, classical publications, etc.) will find here evidence of the sales records, hence the reception and market value, of works they are studying, which comes from a source both authoritative and representative, a major bookselling outlet in the heart of the most important printing city of the 15th century.

We have now completed the identification of all the entries in the *Zornale* and plan to make these available on the web in 2020.

They will be accompanied and complemented by data coming from a second major source of pricing, the books themselves: prices and currencies, fundamentally important for the economic dimension of the book trade, are individually recorded in MEI to facilitate their retrieval for research. Several hundred pertaining to the 15th century alone are now gathered together in the database. Finally, for a number of years now Dominique Coq has been entering this kind of evidence into a spreadsheet from published catalogues of incunabula, some 650 so far. He has shared it with me. This information too will be made available to the public. These data, pertaining to the sale of books printed not only in Venice but also elsewhere, and purchased anywhere in Europe, will allow a critical mass of evidence to be effectively compared with the documentary evidence recorded in the Venetian ledger. Collectively, all these new data will finally bring to the attention of scholarship the economic aspects related to the introduction of printing in the West.

But to understand what it meant, and what it took, for the people of Europe to acquire the new printed books it was essential to contextualize the economic values emerging from the *Zornale* and the books themselves with the cost of living during the last fifty years of the 15th century.

The essays by Cecchini, Pinelli, Dondi, Harris, Mansutti, Peric, Böninger, Gatti, Tinti, Bolton, Hulvey, and Iglesias in the third part of the volume are intended to begin to offer such contextualization. The collaborative work now established will continue, as the primary sources are not as scarce as we were led to believe. Yet again, it was a matter of paying attention to them and of finding a way to bring them together.

13 The Transmission and Dissemination of Texts Printed in the 15th Century

Incunabula usually contain multiple texts by multiple authors, partly pertaining to the 'paratext', that is editorial matter such as dedicatory letters, verses in praise of the author, the editor, the printer, the work etc., partly authorial works properly different from the main

author and title as indicated in modern catalogues; for example, the work *De venenis* by Petrus de Abano, printed in Padua in 1487,⁴⁴ does not only contain his work on poison, but also contains works by three other authors on the Bezoar stone, on knowledge of poison, and on epidemics. Such information has been so far hidden from the scholar because there were, until now, no complete catalogues or databases that included the varied content of 15th-century printed books.

We still cannot answer fundamental questions such as how many times, when and where were Cicero or Petrarch printed in the 15th century, because some of their works were often added as secondary texts in editions which appeared under the heading of other authors and are so catalogued today. Works by Petrarch can be found inside editions of Caesar, Cicero, Juvenius, Ludolphus de Saxonia, Jacopo di Poggio, Poggio Bracciolini, Terence, Lucianus Samosatensis, and Nicolaus de Cusa.⁴⁵

We cannot place in the appropriate socio-historical context the preparation of medical or legal or classical editions, whose publication was the collaborative work of printers and scholars, with the frequent involvement of their students, but whose intervention is only documented in secondary textual material, such as letters and verses, normally not recorded in catalogues. Nor can we fully document the links with the political and ecclesiastical establishment, as this information is again often untapped in dedications and letters.

Most early editions are textually composite, the result of decisions taken by printers and very often by editors who collaborated with them, anonymously in the early period, more visible later on.

44 Petrus de Abano, *De venenis*. Add: Matthaeus Silvaticus, *De lapide Bezoar*; Arnoldus de Villanova, *De arte cognoscendi venena*; Valascus de Tarenta, *De epidemia et peste*. [Padua]: Matthaeus Cerdonis, 18 Dec. 1487. 4°. GW M31877; ISTC: ip00442000.

45 Caesar, Gaius Julius, *Commentarii de bello Gallico*. [Strasbourg: Printer of the 1472 Aquinas 'Summa'], 1473. Folio. GW 5874; ISTC ic00027000. Cicero, Marcus Tullius, *Epistolae ad Brutum, ad Quintum fratrem, ad Atticum*. Add: Francesco Petrarca: *Epistola ad Ciceronem*; Cornelius Nepos: *Vita Attici*. Venice: Nicolaus Jenson, 1470. Folio. GW 6859; ISTC ic00500000. Juvenius Presbyter, *Historia evangelica heroicis versibus conscripta*. [Deventer: Richardus Pafraet, between 23 June 1491 and 25 Jan. 1492]. 4°. GW M15923; ISTC ij00672000. Poggio, Jacopo di, *Sopra il Trionfo della fama di messer Francesco Petrarca*. Florence: Francesco Bonaccorsi, for Alessandro Varrochi, 24 Jan. 1485/86. 4°. GW M34528; ISTC ip00852000. Poggius Florentinus, *Facetiae*. Add: Aesopus: *Fabulae* (Tr: Laurentius Valla); Francesco Petrarca: *De salibus virorum illustrium*. Paris: [Au Soufflet Vert (Louis Symonel et Socii), about 1475]. 4°. GW M34576; ISTC ip00857000. Terentius Afer, Publius, *Comoediae*. Ed: Raphael Zovenzonius. Add: *Vita Terentii*. [Venice: Vindelinius de Spira] for Johannes de Colonia, [not before 23 Nov.] 1471. 4°. GW M45573; ISTC ISTC it00065000. Lucianus Samosatensis, *Dialogus de funerali pompa* [Latin] (Tr: Rinucius Aretinus). Add: *De praecedentia Alexandri, Hannibalis et Scipionis* [Latin] (Tr: Johannes Arispa [i.e. Aurispa]). Francesco Petrarca: *Recommendatio heremi*. Isidorus Hispalensis: *Synonyma de praesentis vitae regimine*. [Cologne: Heinrich Quentell, about 1492-93]. 4°. GW M19022; ISTC il00325000. Nicolaus de Cusa, *De vera sapientia (Ydiodia)*. [Cologne: Cornelis de Zierikzee, about 1499]. 4°. GW M31551; ISTC in00100000.

Moreover, the complete analysis of the contents of editions is essential to the study of the transmission of texts in print (*stemma editionum*) and of their dissemination, as shown by the masterly publication of the works of Thomas Aquinas by the Leonine commission or by the transmission in print of the *Facetiae* of Poggio Bracciolini established by Lotte Hellinga.⁴⁶ However, the descent of texts in print is still too seldom studied, mostly because of the lack of adequate resources.

The 15cBOOKTRADE Project offered a solution by acting on two fronts: a systematic description of the contents of 15th-century editions, and a manner to improve their quantitative analysis.

In 2005 were published the six volumes of the Bodleian catalogue of incunabula (Bod-inc) which provided ground-breaking textual descriptions and identifications for over 5,500 editions.⁴⁷

The catalogue was transferred into electronic form by the Bodleian Library. The 15cBOOKTRADE Project has converted Bod-inc into a database which can accommodate the content of editions not in the Bodleian and therefore not yet described to the same high standard. This new database, TEXT-inc, offers a corpus of texts printed in the 15th century and provides one platform for the storage and access of this highly valuable data, linked to ISTC, GW, and MEI.

In TEXT-inc we approach the content of printed editions in terms of textual units.

The 15cBOOKTRADE Project team augmented the Bodleian core with editions outside Oxford, that is in the British Library, Venice libraries, Greek and Aesop editions and others available in digital form.

For each text, *tituli*, *incipit*, and *explicit* are provided, and where they occur within the edition (leaf signature). The colophon is fully transcribed, the *secundo folio* is provided.⁴⁸

I will provide just one example of the importance of transcribing *tituli*.⁴⁹ During the process of identification of the editions sold by the Venetian bookseller Francesco de Madiis in his *Zornale*, Neil Harris

⁴⁶ *Sancti Thomae Aquinatis doctoris angelici Opera omnia*; Hellinga, "Poggio's *Facetiae* in Print", 168-200.

⁴⁷ *A Catalogue of Books Printed in the Fifteenth Century now in the Bodleian Library* in six volumes.

⁴⁸ A full description of the database fields and the *Guidelines to TEXT-inc*, in its English or Italian version, can be found in the TEXTS section of the 15cBOOKTRADE website; <http://wordpress-prd.bodleian.ox.ac.uk/booktrade/wp-content/uploads/sites/4/2015/09/Editing-TEXT-inc-English.pdf>; <http://wordpress-prd.bodleian.ox.ac.uk/booktrade/wp-content/uploads/sites/4/2015/09/Editing-TEXT-inc-Italian.pdf>. On *secundo folio*, cf. Willoughby, "The Secundo Folio and its Uses, Medieval and Modern".

⁴⁹ "Tituli 'inscriptions' placed at the beginning of texts, colophons at the end, were used throughout the middle ages to provide the reader with orientation [...] may include information on the author [...] the title [...] the meaning of *titulus* is closer to the modern 'title-page'" (Sharpe, *Titulus*, 30). This custom continued in 15th-century printed books.

and myself were challenged by a very popular item on sale. A “De contemptu mundi” sold in 135 copies, but a first look at ISTC for such title produced 115 potential entries associated with this title, from authors ranging from Baptista de Finario, Pseudo Bernardus Claravallensis, S. Augustinus, Bartholomaeus Pisanus, Bernardinus Senensis, the anonymous author of a dialogue with that title, Eucherus bishop of Lyon, Hugo de Sancto Victore, Innocentius III, Zacharias Lilius, Bartholomaeus Moronus, Otto von Sonnenberg bishop of Constance, and Petrarca. The correct identification turned out to be not even listed in ISTC as such: a work of Thomas à Kempis circulating then under the name of the more famous Chancellor of the University of Paris, Johannes Gerson (1363-1429) and recorded everywhere with the title *Imitatio Christi*.⁵⁰ The opening (*titulus*) of the 1483 Venice edition states: “Incipit liber primus Johannis Gerson cancellarij parisiensis. De imitatione Christi et de contemptu omnium vanitatum mundi”, and the colophon: “Johannis Gerson cancellarij parisiensis de contemptu mundi devotum et vtile opusculum finit M.cccc.lxxxij [...]”.

The Index of authors is conceived so as to provide not only biographical information, but also statistical, such as the role played within an edition (besides authorship: dedicatee, editor, translator etc.), gender, status, profession, area and period of activity. These are the same descriptors that the Material Evidence in Incunabula (MEI) database applies to former owners of books.

Any record in TEXT-inc starts with a short-title description taken from ISTC. It is followed by a systematic description of its content, and by other information pertaining to the edition: bibliographical elements (collation, illustration, the *secundo folio*), and reference to the source of the data (the library on whose copy the record has been created).

During the first phase of TEXT-inc we concentrated on the description of the texts contained in 15th-century printed editions, not on their identification and collation with reference to modern critical editions. This analytical phase, which was systematically pursued in Bod-inc, but which requires specific skills and considerable extra time, is planned for a further phase, beyond the scope of the 15cBOOKTRADE Project.

By the end of the project, 8,339 editions have been included, some three thousand more than the initial Bodleian core. The reason for the slower than planned progress lies in the precision with which the team has approached its task.⁵¹ There are ways to speed up the pro-

⁵⁰ Gerson, Johannes [pseudo-; Thomas à Kempis], *Imitatio Christi*. Venice: Peter Loeslein, 1483. 4°, 52 leaves. GW M46816 [“Thomas a Kempis, Imitatio Christi”] ISTC ii00005000 [“Imitatio Christi”]. Cf. also Dondi, “From *Corpus iuris*”, in this volume.

⁵¹ We were able to upload the description of the content of editions in Cambridge University Library and not in Oxford; however, the various textual components (author, dedicatee, texts, etc.) still need to be arranged according to the database fields.

cess. As ever, collaboration is essential and welcome; priorities will include working on digital copies and targeting unica as a matter of urgency, now that it is easy to identify them in ISTC.

In the present volume, the essays of Panzanelli Fratoni and Della Rocca de Candal are specifically based on data from TEXT-inc.

Understanding what early modern European society deemed worth committing to print with the new technology, either transferring to the new medium works from their classical and medieval past, or publishing for the first time 15th-century works relating to contemporary life, tells us a great deal about that period of our history. TEXT-inc is the tool which is allowing us to achieve that understanding.

14 Tracking the Dissemination and Reception of Printed Works

Because all the texts described in TEXT-inc are linked to ISTC, that is, to the edition of which they are part, and ISTC is linked to MEI, which describes the ownership and use of the copies of editions, it has now become possible to track the dissemination and reception of printed works using MEI, by examining by whom, where, when, and how the copies of the edition were used. The MEI database allows any scholar to produce a much appreciated type of research which until recently was attainable by very few scholars: assessing the reception of works in print, an intellectual exercise which requires the method of copy census.

The most famous example is perhaps former Harvard professor of Astronomy Owen Gingerich, whose detailed survey of the extant 601 copies of Copernicus' *De revolutionibus*, to disprove the claim of some colleagues that the work had little impact, took some 30 years to complete.⁵² There is also Anthony West on Shakespeare's First Folio,⁵³ or the survey of editions of the medieval longseller *Imitatio Christi* in Parisian libraries.⁵⁴ Specifically for the incunabula period there is Paul Needham's census of the Gutenberg Bible, now continued by Eric White;⁵⁵ Lilian Armstrong on the copies of Nicholas Jenson's Roman Breviary;⁵⁶ my own survey of all extant copies of books of hours printed in Italy in the 15th century, some 74 editions in 196 copies.⁵⁷

Until recently not much else, the reason being that it is at present very difficult and tremendously time-consuming to chase the histo-

⁵² Gingerich, *An Annotated Census of Copernicus' "De revolutionibus"*.

⁵³ West, *The Shakespeare First Folio*; "Ownership of Shakespeare First Folios", 405-8.

⁵⁴ Delaveau, Sordet, *Édition et diffusion de l'Imitation de Jésus-Christ*.

⁵⁵ Needham, "The Paper Supply of the Gutenberg Bible"; White, *Editio Princeps*.

⁵⁶ Armstrong, "Nicolaus Jenson's Breviarium Romanum", 421-67.

⁵⁷ Dondi, *Printed Books of Hours from Fifteenth-Century Italy*.

ry of these 15th-century survivals across two continents. By gathering provenance information pertaining to the surviving copies of any 15th-century edition MEI offers a practical and intelligent solution to the barriers imposed by the dispersion of the material and of its cataloguing records.

This type of research is now multiplying. Team members are working on the extant copies of editions in Greek, on Aesop; recent DPhil students are working on the Bible in Italian, and Giancarlo Petrella surveyed all copies of all editions produced by the Brescia printer Battista Farfengo.⁵⁸

We all know how the pursuit of scholarly topics, indeed the existence of disciplines at university level, is influenced by the availability and accessibility of the material to work on. Until very recently research on 15th-century printed material was the preserve of a very few scholars, because the primary sources were scattered and the tools to work on them were either not in place or difficult to use. We hope that the 15cBOOKTRADE has brought a positive change and its digital tools, created with the collaboration of many hands, will continue to grow to support fundamental research on the transmission of our European written heritage.

15 The Circulation and Re-use of Illustrations

The Project created the 15cILLUSTRATION database to detect the re-use and copying of 15th-century illustrations, in collaboration with the Visual Geometry Group of the Department of Engineering Science at Oxford.

In the fourth part of this volume, the collective essay of Dondi, Dutta, Malaspina and Zisserman outlines the reasons which brought us to the creation of the database and how it works. The scholarly context which led to the database is set by the broad overview of the transition from manuscript illumination to book illustration of Armstrong and by the Venetian focus of Marcon, and of Andreoli and Maschietto.

Digital resources such as those described in this section do not substitute for research but are designed to support it, by enhancing its range, comprehensiveness, and speed.

58 Petrella, *L'impresa tipografica di Battista Farfengo*.

16 Technical Collaboration for an Integrated Approach to the Study of Incunabula

We owe our advancement in the study of incunabula to the historical and still strong collaboration among the main actors involved in the creation and management of digital tools which are comprehensive and systematic in their approach.

Essays by Goldfinch and Limper-Herz, and by Prickman take a long view on ISTC, while the final essay, by van Delft, presents the latest tool offered to the research community by CERL, a database of images of provenance.

17 The Work Continues

The work necessary to reach our objectives is vast. It requires the specialist skills of book cataloguers with the palaeographical knowledge to be able to read ownership inscriptions in Latin, Greek, Hebrew and any European vernacular language, who can date and locate a binding or a decoration style to 15th-century Italy, or 16th-century Germany or 17th-century England, who can identify a coat of arms, who can distinguish different types of marginal annotations, from corrections, comments, to censorship, who know how to trace back the history of a book using booksellers' and auctioneers' catalogues and library acquisition registers.

Further, it required the development of appropriate database systems not only to record but to enable intelligent retrieval of data of value.

Finally, it necessarily relies on extensive collaboration. The 15cBOOKTRADE Project coordinates the work of very many people, in different countries, over several years. It is the largest project to date totally centred on incunabula and it builds on and brings together decades of specialist cataloguing and research on incunabula, as well as making available completely new data and an innovative way to use these data for historical research. My role as Secretary of CERL has been essential. Just as important, we work very closely with the other developers of digital tools for the incunabula period, ISTC, GW, and the Atlas of Early Printing, and we make extensive use of freely available digitizations provided by libraries.

But this is the only sensible way. If we want to understand, and communicate, how newly printed books impacted the lives of different segments of 15th-century population, spreading knowledge, information, increasing literacy levels, supporting the growth of universities, creating a new business, contributing to the international trade, we better have a good look at the books themselves and find effective ways to communicate our findings.

What was the impact of the printing revolution on European society? I have been wanting to answer this question for twenty years. I believe we now have the correct methodology in place, the tools, and the network to answer it. The papers in this volume are an outline of things to come.

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I would like to thank the reviewers of these papers most warmly for their careful reading and valuable suggestions, and Edizioni Ca' Foscari for bringing this large and slightly challenging volume to a successful publication.

Abbreviations / Websites

15cBOOKTRADE = <http://15cbooktrade.ox.ac.uk/>
 15cILLUSTRATION = <http://zeus.robots.ox.ac.uk/15cillustration/>
 15cVISUALIZATION = <http://15cv.trade/>
 Bod-inc = *A Catalogue of Books Printed in the Fifteenth Century*; see below
 CERL = <https://www.cerl.org/main>
 EBOB = https://data.cerl.org/ebob/_search.
 GW = <http://www.gesamtkatalogderwiegendrucke.de/>
 IPI = https://data.cerl.org/ipi/_search
 ISTC = <http://www.bl.uk/catalogues/istc/>
 MARGINALIA = <http://libriantiqui.it/risorse-in-pdf/item/14-marginalia-un-censimento-di-incunaboli-postillati-presso-la-biblioteca-trivulziana-di-milano>
 Reading Experience Database = <http://www.open.ac.uk/Arts/reading/UK/index.php>
 Annotated Books online = <http://www.annotatedbooksonline.com/>
 The Archeology of Reading = <https://archaeologyofreading.org/>
 MEI = https://data.cerl.org/mei/_search
 TEXT-inc = <http://textinc.bodleian.ox.ac.uk/>
 Eric White on print runs = https://www.cerl.org/resources/links_to_other_resources/bibliographical_data#researching_print_runs

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