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The European Printing Revolution

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1 Introduction

Printing with movable type, a European invention of the mid-15th century, revolutionized the making and use of books. The innovative nature of the invention and its implications were felt and discussed from the 15th century onwards; however, a comprehensive and systematic analysis of the phenomenon is largely a product of book history as a distinct discipline. In the 20th century, authors such as Marshall McLuhan, Lucien Febvre and Henri-Jean Martin, and Elizabeth L. Eisenstein proposed the idea of a European printing 'revolution' as an all-encompassing intellectual, social, scientific, economic, religious, and cultural revolution. Their arguments, methodologies, and conclusions have been challenged by later scholars (especially in the case of Eisenstein by Needham [review], Grafton, and Johns). Although many bibliographers and book historians now understand printed texts and MSS as coexisting, and even sometimes having a mutually complementary relationship—especially during the incunable period—it is a fact that within a generation the role of the MS book and of manuscript culture was fundamentally changed. The continuing existence of MS publication, in certain fields, is a historical phenomenon amply documented by Harold Love (*see* **15**).

2 MS production and use in Europe in the second half of the 15th century

The appearance of typographic printing coincided with a period when the production of books in MS was everywhere on the increase and the book market, as a consequence, was rapidly expanding. MS production peaked in the late 1460s in Germany and in the early 1470s in France and Italy, entering into decline immediately afterwards. For the average book user of the second half of the 15th century, the printed book gradually took the place of the MS as a natural vehicle for text (*see* **5**).

The reasons for the increasing demand and production of books lie in a number of interrelated factors, chiefly the spread of literacy in urban centres. This process had begun in the 13th century with the foundation of new lay schools next to the religious ones generally attached to cathedral chapters. In Italy, humanist schools were opened for scholars and *scuole d'abbaco*, where teaching was carried out in the vernacular, were founded to train merchants. New universities were established (ten in Germany between 1402 and 1498), and existing ones grew substantially.

Participants in this spread of literacy were part of an expanded middle class, lay professionals who were neither members of the aristocracy nor artisans or peasants. This class included civil servants employed at the numerous lay and religious courts of Europe, such as ambassadors, judges, bailiffs, and their secretaries; professionals such as lawyers, notaries, physicians, and university professors; and even schoolteachers, merchants, and traders.

Many clergymen and members of monasteries and convents were traditionally also purchasers of books. Reformed congregations—e.g. Windesheim among the Augustinian Canons; Monte Cassino, Bursfeld, and Melk among the Benedictines; the Observant Franciscans; the Reformed Dominicans; the Fratres Vitae Communis, and Christian humanists of the Netherlands—emphasized university education for their members, rebuilt their libraries, produced new literary works in both the vernacular and Latin to instruct the laity, and paid more attention to the uniformity of their liturgical texts. Naturally, such congregations attached great importance to their book collections.

3 The technical invention

The need to reproduce small images quickly, or to reproduce images with text, was evident by the beginning of the 15th century: representations of saints, with or without accompanying text, and playing cards were reproduced by woodcut. Blockbooks produced using the same method appeared around the middle of the century, their letters carved in woodblocks.

Screw-driven olive and wine presses were common at the period. Punches, with letters and symbols cut in relief on their ends, were used by seal and coin engravers and by goldsmiths to mark their wares to satisfy guild regulations; the mechanical precision necessary for matrix and mould production was also needed to make arms, armour, clocks, and watches. By the middle of the 15th century these skills were concentrated in large cities. Belonging to this milieu, the first printers, such as Erhard Ratdolt in Augsburg and Venice, Nicolas Jenson in Venice, Bernardo Cennini in Florence, and Filippo da Lavagna in Milan, were expert metalworkers and jewellers able to cut their own punches (*see* 11).

Typographic printing was introduced by Johann Gutenberg around 1450 in Mainz. The first printing experiments—indulgences and Donatus' antique Latin primer, *Ars Minor*—appear to have been conducted on materials small in size and of saleable interest, often ecclesiastical and educational in nature. The first substantial book printed with movable type is the 42-line or Gutenberg Bible. The work of Gutenberg at Mainz was continued by other printers in the city, Johann Fust and Peter Schoeffer.

After the first wave of printer-typographers, printing enterprises were undertaken by individuals familiar with the book as an object, such as scribes (Schoeffer in Mainz, Antoine Vérard in Paris), schoolteachers (the early printers of Verona, Brescia, Mantua, and Treviso), priests (Lorenzo Morgiani in Florence), and stationers and binders (Benedictus Hectoris in Bologna).

Between 1460 and 1470, printing expanded in Germany—at Strasbourg (1459–60), Bamberg (*c.*1459), Eltville (1464), Cologne (*c.*1465), Basel (1468), Augsburg (1468), Nuremberg (1470), and Beromünster (1470)—and in Italy: at Subiaco (1465), Rome (1467), Venice (1469), Foligno, Naples, Milan, and Trevi (1470–71). By 1480 the industry extended even further: to Paris (1470) and Lyons (1473), Barcelona (*c.*1473), Louvain (1473, Dirk Martens and Johannes de Westfalia), Cracow (1473), Gouda (1477, Gheraert Leeu), and Westminster (1476, William Caxton). Altogether, presses were set up in more than 100 towns between 1471 and 1480, in almost 90 further places between 1481 and 1490, and in approximately 50 more towns between 1491 and 1500.

The social groups responsible for the increase in the demand for books also became directly involved in their production and use. The many university graduates and humanists who gravitated towards centres of learning found employment as advisers, editors, and correctors. The spread of literacy and the increased affordability of books secured them new users, further expanding the market. From its very beginnings, clergymen and religious welcomed and participated in the development of printing. Finally, the wealth of the merchant classes brought the capital investment necessary for the new craft.

For the first time, a group of literate merchants, later defined as publishers, were willing to invest in book production as a commercial activity. The great increase in the quantity of circulating books, made possible by the new method of mechanical production, resulted in the availability of a larger variety of titles, to more people, in different locations, generally at a cheaper price.

The establishment of printing in about 250 towns, most of which hosted more than one printing office, is characterized by an enormous amount of entrepreneurial experimentation. A more detailed analysis of the presses' output and period of activity would show that a number of cases involved the work of an itinerant printer or of temporary or short-lived establishments. Printers moved in and out of a profession not yet perceived as such, nor yet clearly defined by regulations, statutes, or guilds; they moved around, sometimes following an invitation, often because they felt they had exploited a limited market's capacity. Surviving business contracts, records of legal disputes, wills, and colophons are the main sources of evidence for this migratory working pattern.

There appears to have been a division between the commercially successful printers, who tended not to move, and the itinerant ones, pushed towards the exploration of new markets and opportunities by the absence of medium- to long-term prospects in the small towns, villages, or isolated abbeys and university towns where they stopped to operate. Why some printers did not succeed in establishing themselves even in large centres is a question that has to be analysed case by case. Finally, a comparison may be drawn between the high level of mobility shown by the early printers and that of professions such as teachers and university professors, whose wandering habits were determined sometimes by their fame, sometimes by economic need.

The unique socio-economic-cultural circumstances surrounding the establishment of printing offices and their subsequent activities varied from place to place and from printer to printer: proximity to the papal curia or to paper mills; the involvement of humanists, university professors, or schools; favourable trading location; the local commercial tradition; access to patronage or commissions—all played a determining role. Scholar printer-publishers, such as Aldus Manutius in Venice and Johann Froben and Johann Amerbach in Basle, were very influential. They were driven by the desire to make available to the international scholarly community works that they deemed important—chiefly classical for Aldus, biblical and theological for Froben and Amerbach—in philologically sound and aesthetically pleasing editions.

4 The physical appearance and textual content of early printed books

The MS lies behind each phase of the history of early printing, not only as a source for texts, but also as a model for the printed book's physical appearance, as reflected in choice of type, format, layout, initials, and rubrication. Types reproduced the scripts most widely used at the time. Gothic textura type had special variants according to different locations (more square in northern Germany and The Netherlands, rounder in southern Germany and Italy) and different uses (for liturgical works, legal and school texts, etc.). Roman, like italic (from 1501), was developed for classical texts, bastarda and Schwabacher founts were cut for printing French and German vernacular works. In the 16th century, a

simplification of letterforms was brought about by the growth and organization of the typefounding business, by the commercialization of matrices, and by the spread of specialist punch-cutting as a profession (e.g. by Robert Granjon). The only technical difference in the production of printed over MS books, beyond the use of types and a press, lies in the process of the imposition of the pages to be reproduced on an unfolded sheet. This involved casting off the printer's copy to determine which parts of it would come where on the respective sheets.

During the 15th century, three types of MS were prevalent: the academic book, generally written in two columns on folio pages, for theological and legal works, and normally confined to library use; the humanistic and student's book, of medium (quarto) to small format; and the popular book, whether lay or religious, generally quarto or smaller (in Italy, even pocket-size). Each had its natural continuation in printed form. Data from the incunabula Short-Title Catalogue (ISTC) shows continuity with the period before printing was introduced: 8,662 editions in folio (29 per cent, although the incidence is concentrated more in the first decades of production and falls away in the last twenty years of the 15th century); 15,195 editions in quarto (52 per cent); 3,020 in octavo (10 per cent, mostly printed in the last two decades and increasing after 1501); and 232 in sextodecimo.

The use of large capital initials, paragraph marks, rubrication (titles, running heads, running volume numbers, etc.), decoration, and illustration was introduced gradually to the set page. During the first decades, printing offices drew on the same craftsmen employed by the MS book trade as rubricators, illuminators, and scribes. Far from finding themselves with less work, they saw their skills required as never before for finishing printed books. It is possible to determine whether a printing office had in-house decorators or regularly employed the services of a nearby artist, by examining copies of the same edition or of a number of editions and analysing their handiwork. Generally, rubrication was carried out at point of sale, sometimes near the place of production before distribution (Jenson in Venice, Anton Koberger in Nuremberg). Substantial illumination was mostly added after distribution (with the exception of presentation copies), at the owner's request.

From the 1480s, there appears a substantial increase in the printed component of the page and a falling-off in the need for hand-finishing: woodcut initials and borders, printed running heads, and page or folio numbers are the inevitable consequence of more sophisticated textual articulation, increased press runs, and economic policies. The use of hand-applied colour disappears almost entirely in the 16th century, its visual appeal replaced in part by engravings. The appearance of the printed book had initially been determined by the reading public's habits and tastes, which had developed during the MS period; but from the 16th century onwards, the exigencies of printing would eventually change that public's taste and perceptions.

Books were almost always sold unbound. Most bookshops were, however, able to bind items according to the customer's requirements. There were

instances of large-scale importers (e.g. Schoeffer in Mainz) who supplied the binding before offering it for retail. Bindings were provided before distribution only occasionally. Dedication copies sometimes received such bindings, as did books intended for markets known not to be capable of providing them, as was the case for the Glagolitic Breviary, printed in Venice c.1491 for the churches of Dalmatia.

A large percentage of the books printed in the first 50 years of printing contained works used during the Middle Ages, particularly within the ecclesiastical and academic worlds, such as bibles and liturgical books, patristics, theology and philosophy, law and science, certain Latin classics (Cicero and Virgil) and vernacular ones (Dante, Petrarca, and Chaucer). However, the publication of works relating to contemporary events or written by contemporary authors is a clear sign of the extent to which printing quickly became a common aspect of 15th-century society. Such works included the writings of the humanists, of authors such as Sebastian Brant and Girolamo Savonarola, diplomatic and funeral orations, *sacre rappresentazioni*, indulgences, and calendars.

An analysis of the titles available to the late 15th-century market has been prepared by Hermand *et al.*, using data from the 1998 illustrated ISTC. It shows that almost one third of the total output was in the category of literature, of which 53 per cent were lay texts and 47 per cent religious. Law supplied almost 15 per cent of the total, evenly divided between civil and canon law. Liberal arts (dialectic, grammar and philology, music, and rhetoric) accounted for almost 11 per cent; theology slightly more than 10 per cent; and liturgy almost 9 per cent. Ephemera (advertising, heraldry, practical astronomy and astrology, commerce, guides, documents pertaining to political and administrative life) supplied slightly more than 6 per cent of the total; history (including biography and hagiography) comprised more than 5 per cent, of which 51 per cent was lay history and the rest religious. Philosophy represented almost 5 per cent; medicine more than 3 per cent. Scientific subjects—alchemy, astronomy and astrology, geography, mathematics and geometry, optics, physics, and natural sciences—account for almost 3 per cent of the total. The smallest categories, each comprising less than 1 per cent of the total output (by numbers of titles, not by sheets, nor ens), are the Bible (text only), and works pertaining to the mechanical arts, such as agriculture, architecture, the art of war, cookery, and dance.

Classical texts, distributed among these categories, represent more than 9 per cent of the total. This percentage can be further broken down according to periods of publication, production within large geographical areas, or according to locale. More than 30 per cent of the total Italian output is made up of editions of the classics, almost 17 per cent of which were printed in Venice alone. In France, classics constituted 7 per cent of the total publication; in Germany more than 6 per cent; in Belgium almost 7 per cent; and in The Netherlands approximately 12 per cent. At present, it is not possible to offer data for the percentage of medieval or contemporary authors published in the 15th century, as a biographical profile of all authors is not yet available.

Continuity with MS production is also evident where language is concerned. Out of some 29,000 editions recorded in the online version of the ISTC database (consulted April 2007), almost three-quarters were printed in the ancient languages: 21,122 were printed in Latin (72 per cent), 154 in Hebrew, 65 in Greek, and 14 in Church Slavonic. As for modern languages, 3,141 editions were printed in German (10 per cent), 2,391 in Italian (8 per cent), 1,611 in French (5 per cent), 566 in Dutch (1 per cent), 421 in Spanish (1 per cent), 234 in English, 134 in Catalan, 33 in Czech, 11 in Portuguese, 2 in Swedish, one edition each in Breton, Danish, Frisian, Provençal, and Sardinian. The editions for which no percentage figure is supplied together represent 3 per cent of the total.

If a country's vernacular output is related to its total output, the extent of modern-language printing by geographical areas can be better understood. In Germany, a total of 9,859 editions were printed, of which 2,897 (29 per cent) were German texts. In Italy, 2,374 of 10,417 editions were in Italian (22 per cent); in France, 1,485 out of 5,167 editions were in French (28 per cent); and in the Low Countries, 554 out of 2,328 editions were in Dutch (23 per cent). Spain shows a higher rate of vernacular printing: of the 882 editions known to have been printed in Spain, 336 were in Spanish (38 per cent). In England, for which more elaborate calculations were carried out by Hellinga, 395 editions are known, of which 63 per cent of the total production was in English, against 9 per cent in legal French, and only 28 per cent in Latin (*BMC* 11.43). Coq observed that at centres where printers had limited commercial power, such as at Florence, or with a number of French and English presses, they tended to specialize in the production of vernacular texts, while the great export centres, such as Venice, published primarily in Latin for a wider European readership.

5 The contribution of the Church and religious orders

From its beginning, members of the Church were very actively involved with the new medium. They acted as benefactors (Nicholas of Cusa, Cardinal Johannes Bessarion, Pope Sixtus IV), as editors and correctors (Franciscan and Augustinian editors of liturgical texts, mathematics, logic, and literature), as authors of lay as well as religious works (Werner Rolewinck), as translators (Niccolò Malermi of the Camaldoli order translated the Bible into Italian), as printers (Benedictines in Augsburg, Erfurt, Subiaco near Rome; Augustinian Hermits in Nuremberg; Cistercians in Zinna; the Dominican nuns of Ripoli at Florence; Fratres Vitae Communis in Marienthal, Rostock, Brussels, and Cologne; Franciscans of Santa Maria Gloriosa in Venice), and finally, as book users and owners, both privately (Jacopo Zeno, bishop of Padua, Cardinal Grimani in Venice) and institutionally (the Dominicans of San Marco in Florence). The preservation of thousands of incunables for posterity has to be credited in large part to the libraries of religious institutions.

6 New aspects

Unlike writing a MS, a private individual could not casually print a book, nor could a printer produce a book by himself without establishing a printing office. Moreover, printing required capital investment, principally for the purchase of paper. In addition, it generally required some knowledge of the subject to be printed, to help in the selection and correction of what was printed. Finally, printing called for marketing knowledge: although texts were initially produced with an ideal customer in mind, in order to be profitable a diverse range of buyers had to be reached. In sum, what distinguishes the production of printed books from that of MSS is the necessary collaboration of individuals, each contributing his or her own skills or assets. Behind the publication of most editions lay the joint efforts of artisan printers, financial backers, commercial dealers, and scholars. Never before had these different segments of society worked so closely together.

The 15th-century printer normally operated in an office where a team of people with different skills was assigned to various aspects of the technical process. The few exceptions, such as wandering printers, would necessarily have had to find support wherever they temporarily set up a press: for example, the assistance of members of an aristocratic household might be needed, or of monks and lay brothers if the printer had been called to print a liturgical book in a monastery.

Financial backing frequently came from the commercial sector, quite often from the Church, occasionally from the aristocracy. The financier would generally supply the cost of paper—equal to approximately half the total investment required to produce a book—and could also have an important role relating to the distribution of copies. The number of sheets per copy and the total press run had to be calculated in advance so as to buy enough paper; sufficient money had to be set aside for that part of the investment. Press runs in the 15th century varied substantially according to the technical and financial capabilities of the printers and publishers. Among the important elements in determining the print run were: production costs, anticipated demand, ability to reach the market, the work's genre, and the printing office's commercial practices. For the first two decades, the typical press run seems to have been between 200 and 300 copies: 180 for the 42-line bible, 275 to 300 for the editions of Conrad Sweynheym and Arnold Pannartz in Rome. Yet, there are exceptions: 1,025 copies of Pliny were printed (on commission) by Jenson in Venice in 1476; 930 copies of the Bible were printed by Leonardus Wild, also in Venice, in 1478. Antonio Zarotto in Milan always produced around 1,000 copies.

A mistake in the calculation of the print run could compromise the business, and the great variety of runs in this period seems to reflect the search for a balance between conflicting needs. Numbers grew substantially—sometimes to above the level of 1,000 copies—when there were better prospects for distribution, either because the edition had been commissioned or because of the work's

great popularity. The popular sermons of Roberto Caracciolo were printed by Mathias Moravus in Naples in 1489 in 2,000 copies. In 1492, Bartholomaeus Ghotan in Lübeck produced 800 paper copies and sixteen vellum copies of the *Revelations* of St Birgitta, commissioned by the monastery of Vadstena, Sweden. The work of Savonarola was printed in Florence in 1500 in a run of between 2,000 and 3,000 copies.

The printer's reader or proof corrector, a key figure in the process, had to be an educated person. Different publications demanded different skills from the corrector. He prepared the text for the compositor, marking corrections, spaces to leave blank, and parts of the text to omit. The liberty a compositor ultimately took with a text should not be underestimated: to justify the right-hand margin, he might vary the number and width of blank spaces, introduce or expand abbreviations, intervene in the spelling and punctuation, and sometimes even alter the text. This sort of compositorial intervention is often investigated by analytical bibliography.

Printers frequently used correctors to oversee their editions: Giovanni Andrea Bussi was the editor of Sweynheym and Pannartz's classical editions in Rome. When German printers arrived in Italy, they were helped by local humanists in the selection of works that passed into print; humanists did the same for the presses established in the university towns of Bologna and Paris. The corrector's new professional role involved turning MS into print, paying especial attention to the text's linguistic features.

A further round of collaborative effort is evident at the editorial level. A 15th-century edition commonly contained much more than what was announced in the title. Other works by the same author, by different authors, and excerpts from anonymous works, may all be found before or after the principal work. Moreover, the paratext might contain a number of letters from and to the editor, and verses in praise of the author, of the text, of the editor, or of the printer are also quite commonly present; their authors were generally contemporaries of the editor—perhaps a student, a colleague, or a local worthy. This historical evidence is, in part, what makes each edition unique—yet it is habitually ignored. The exact content of the surviving *c.*29,000 editions published in the last 50 years of the 15th century is still not known, despite the important position they occupy within the transmission of the West's cultural heritage.

It is erroneous to assume that incunable editions of any given text were all similar, depending ultimately on the *editio princeps*. In cases where an edition's position within the textual transmission of incunabula (often of the 1470s) has been established, results have shown substantial variation, as would be expected in editions published in different places and, therefore, most probably based on different MSS. In this respect the work of the Leonine Commission on the early editions of Thomas Aquinas, and of Lotte Hellinga on the tradition of Poggio Bracciolini's *Facetiae*, are exemplary. In later years, a successful or influential edition of a frequently reprinted text, not necessarily the first edition, tended to be reproduced again and again: the main text would be retained, the paratext

often changed and additional material inserted. These later editions may appear to be of little philological importance; nonetheless, for someone pursuing 'the study of texts as historical phenomena reflecting social, intellectual, and economic circumstances in which they were produced' (Jensen, 138), they have an important bearing on the transmission and reception of the specific text during the Renaissance. The establishment of an editorial stemma, still carried out too rarely, allows the fundamental distinction to be drawn between those texts that were based on previous editions and those based on a MS exemplar.

The fact that print caused so many more texts to become widely available had the effect of stimulating their critical assessment. MSS gained a new significance as independent sources of earlier authority, a basis for collation, or simply a better alternative to already printed versions. Indeed, the work of 16th-century scholars such as Desiderius Erasmus broke away from the established textual tradition by returning to earlier MSS, which provided fresh evidence for the study of the Bible and the Church Fathers. The wider availability of texts in print did much to foster this critical spirit.

7 Distribution

To distribute their new product, printers initially relied on the same commercial networks in place during the MS period, one that centred on the stationer's shop, traditionally the supplier of writing materials and books. The famous Florentine bookseller and stationer Vespasiano da Bisticci—purveyor of grand MSS to the likes of the Medici of Florence, Federico da Montefeltro of Urbino, and Matthias Corvinus, king of Hungary—refused to accept the new invention of printing with movable type and ended his commercial activities in 1478. His main rival in Florence, Zanobi di Mariano, managed to stay in business as he started to deal in printed books as well. In Florence, the number of stationers' shops rose from 12 to 30 during the first half century following the advent of the printing press. The stationers were immediately involved in the new business of printing: by finishing or selling books, occasionally by becoming typographers themselves, but in particular by editing and publishing. Knowing the public's taste and with an established clientele, their contribution to printing was in many instances essential, if never generally substantiated by large financial investments.

The production and distribution of MSS took place almost invariably for local markets, but a successful printer had to have established networks of distribution that went far beyond the boundaries of the town where the printing actually took place. The need to move from a known public to an unknown, potentially larger one strengthened the printer's connection with merchants and traders. The printed book entered the market as a saleable commodity, one not dissimilar to others that were traded in the Middle Ages and during the early modern period. The book trade made the transition from a local to an international business; but because the book was usually not an essential

possession, this trade had its own peculiarities. Surviving documents testify to the many problems encountered by the early printers. Relying on the work of agents and on a network of warehouses and bookshops, they only gradually achieved a stable trading pattern, developing a tendency to share risks and costs by creating joint business ventures. The establishment of a family business with branches abroad (e.g. the Giunta and Giolito firms) was one natural way of ensuring reliable distribution across borders. The circulation of many thousands of printed books throughout Europe—a further new aspect in the transmission of knowledge and information—was inherent in the rise of printing.

8 The Venetian success

The largest and most successful place for printing in the 15th century was Venice, which boasted a cosmopolitan, entrepreneurial, and merchant tradition, the rich libraries and widespread learning of the patriciate and the religious orders, and a large population of professional and non-professional readers. The 233 presses set up in the city before 1500—some transient, others among the most distinguished in Europe—offered the Italian and international markets a full range of printed products.

The state maintained a non-interventionist attitude. After granting a five-year privilege to Johannes de Spira in 1469, which expired with the printer's death in 1470, privileges were issued only ad hoc for specific publications, the first to Marcantonio Sabellico in 1486. Until well into the following century, printers were not required to join a guild or conform to established regulations, as was common in most other longer established professions. However, from the very beginning printers in Venice joined confraternities, which helped their integration into the city's social network, bringing obvious benefits.

The first ten years of Venetian printing were dominated by foreign printers, working alone or in syndicates; their success was determined by their advanced distribution networks (often by exploiting their links with fellow foreign traders), as well as by the production side of the business. The following two decades saw the establishment and consolidation of Italian firms, such as Arrivabene, Giunta, Torresani, Scotto, Aldus, and many others. Venetian printers and publishers became market leaders in the production (often on commission and, therefore, at low risk) of missals and breviaries for dioceses and religious orders throughout Europe. Many technical innovations originated in Venice, something that again reflects the city's attention to different cultures as a potential market: Glagolitic type for the Slav communities, type for musical notation (for whose invention Ottaviano de' Petrucci obtained a privilege in 1498), and Greek printing for Greece (Venice being the leading place of publication for such works until the 19th century), as well as Armenian, Hebrew, and Arabic types (see 8, 40).

Of the 1,123 Venetian editions represented in 1,387 copies now in the Bodleian, 481 (34 per cent) were distributed and used in the 15th and 16th centuries

in Italy; almost the equivalent number, 446 (32 per cent), ended up being used either in England (183, 13 per cent) or in Germany (263, 19 per cent). Indeed, England and Spain remained dependent on the importation of foreign books until the following century (see Ford, Needham, 'Customs Rolls'). Latin textbooks used in schools arrived in England mostly from Germany and the Low Countries, until English printers started to print them towards the end of the century. Textbooks for university students and teachers and for professionals came from Italy, mainly Venice, which was only challenged in the field by Lyons towards the end of the century. Research on this fundamental aspect of the international book trade, and its impact on economic and intellectual history, can be advanced by the discovery and study of archival documents and by the physical examination of the thousands of surviving incunabula.

9 Loss and survival

From the Renaissance to the present day, incunabula have been lost in very large quantities: 'a single copy is by far the commonest survival state for incunable editions' (Needham, 'Late Use', 36). From archival and early bibliographical sources, we know of the existence of editions printed before 1500 that do not survive today in even a single copy; more editions must have existed of which we know absolutely nothing. To assess when and how, and possibly why, the loss of incunabula occurred is as important as understanding how, where, and why copies managed to survive to this day. Scholars such as Needham and Harris have recently engaged with this problem.

Among the direct or indirect agents that destroyed editions and copies are reckless consumption—common with school books, some popular vernacular literature such as romances, and, occasionally, devotional books such as books of hours—and obsolescence (typically the publication of more complete and up-to-date works on the same subject). Survival rates are also affected by a book's physical size (small-format books, or books with few leaves are more likely to be lost), its language (Greek and Latin works were more highly valued than vernacular ones), and provenance (institutionally owned books are more likely to survive than individually owned books). Titles may be lost to war, political and administrative changes (notably the secularization of religious institutions and the dispersal of their libraries), censorship, and occasional floods and fires.

10 The outlook now

At the present time, the great majority of known incunable editions have been included in the ISTC. Practically all 15th-century editions have been surveyed and included in some form of national, local, or subject catalogue. However, the historical evidence, which is so important for contextualizing each edition and each copy, is far from being systematically recorded: copy-specific information

from thousands of incunabula in US and Italian libraries is still lacking. For many other European libraries, what there is remains patchy.

No serious analysis of the impact of printing on Renaissance and early modern society can be comprehensive until the historical information is gathered from the extant books to assess where and when they were used, by whom, and how. As with archaeological objects, scholars need to interpret the material clues they retain (decoration, binding, MS notes), and identify ownership inscriptions, which may be contemporary or from later periods, institutional or private, male or female, lay or religious. Much has been discovered and published since Febvre and Martin half a century ago attempted a similar analysis, but much remains to be done.

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The Book as Symbol

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'Books are not absolutely dead things,' wrote John Milton in 1644 in *Areopagitica*. A book is a physical object, yet it also signifies something abstract, the words and the meanings collected within it. Thus, a book is both less and more than its contents alone. A book is a metonym for the words that we read or for the thoughts that we have as we read them. At one level, like any domestic object, a book takes on the imprint of its producer and its users. Old books have further value as containing the presence of many other readers in the past. Yet, more than other objects, a book is felt to embody not only a physical memory but also a record of past thoughts. The book contains both its reader and its author. In Milton's more poetic terms, books 'contain a potency of life in them', because they 'preserve as in a vial the purest efficacy and extraction of that living intellect that bred them'. The book thus achieves a further mystery, of transforming what appears to be purely immaterial and conceptual into something with a concrete form. It is therefore not entirely extravagant for Milton to claim that a book possesses 'a life beyond life'. Destroying a book, then, Milton says, is like an act of homicide—indeed it is worse than that, since a book encloses the life of more than one person and exists in more than one time. Paradoxically, regardless of the material survival of a physical copy or artefact, a book is something immortal and imperishable.

Curtius found the origin of the idea of the book as a sacred object in the ancient Near East and Egypt, where the production of books was cultic and their possession restricted to a priestly caste. Writing is a mystical act, and scribes are accorded a corresponding status as its masters and interpreters. The ancient Egyptian word for the script now known as hieroglyphs meant 'words of god'. The earliest inscriptions in the tombs of kings acted not only as a literary record but also as physical totems for the pharaoh to avert danger in the afterlife and to communicate with the gods. In contrast, Curtius asserted, in classical Greece there was 'hardly any idea of the sacredness of the book' (Curtius, 304). Indeed in the notorious formulation in Plato's *Phaedrus* (274C–276A), writing is purely functional, and fails even to perform properly that function. Knowledge exists in the mind of the philosopher: writing is a mere aide-memoire, and an untrustworthy and ephemeral one at that. Only in the Hellenistic period do the Greeks acquire a 'culture of books'. In the later grammarians, indeed, things