

REFLECTIONS ON THE HISTORY OF INFORMATION IN EARLY MODERN EUROPE

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This essay is a brief survey of a vast subject. So vast that (as not infrequently happens in such cases), the subject is in some danger of going unnoticed. The history of western science in the early modern period is an established field. So is the history of universities and the history of the book. However, these are only parts of the topic, indeed they are just the tip of the iceberg. For example, the communication of information to students cannot be restricted to what was taught formally in schools and universities. It should also include the different forms of instruction which took place in church, in the workshop, in the field, and in the home.

To make the enterprise more difficult, there are serious problems of definition. The basic concepts 'information' and 'communication' are extremely problematic, at least for anyone who rejects positivist notions of 'hard facts' and intellectual 'progress' measured in terms of the accumulation of information and the diffusion of literacy. It is obviously impossible, for example, to avoid some discussion of what we call 'propaganda', religious or political, in a period including the Reformation, the Scientific Revolution, and the Enlightenment. After all, it would be absurd to describe the French *Encyclopédie* as a neutral work of reference.

If all these items and problems to be included in a general survey, the information available about information in this period is likely to overwhelm author and readers alike. Indeed, the subject is in danger of dissolving into a general cultural and social history. To avoid this danger it may be useful to privilege changes in the structure of different information systems, and to use the invention of printing and its consequences as the red thread tying together apparently disparate themes.

In the case of the early modern period, running from the invention of printing (in the west) to the invention of the steam press, there is an apparently clear story to tell. It is the story of what Professor Elizabeth Eisenstein has called "the printing press as an agent of social change" (1). I must confess that (despite considerable admiration for this study), I have come to believe that the author has exaggerated the role of print in the Renaissance, the Reformation, and even the Scientific Revolution. In the case of all three movements the importance of written communication must not be forgotten, the private or semi-private letters linking

1. E. EINSTEIN, *The printing press as an agent of change*. 2 vols, Cambridge 1979.

groups of humanists, reformers and natural philosophers. A strong case could also be made for the importance of oral communication in all three movements, sermons in the case of the Reformation, academies — in other words, discussion groups — in the other two cases, from the Platonic Academy of Florence to the Académie des Sciences in the France of Louis XIV (2).

All the same, there can be no question of denying the importance of what may be called the “explosion” of information made possible by print. As a way of estimating the impact of this explosion, it may be helpful to conduct a thought-experiment and imagine two European scholars attempting to acquire information about a particular subject in 1789 (say) and in 1500 respectively and to attempt to list the resources available to them. If our imaginary eighteenth-century scholar lived in the right city, he might have access to a large library. In Paris, for example the Bibliothèque Royale had about 300,000 volumes at this time and it was open to the public. On the other hand, the French royal library at Blois had only 1,626 volumes in 1518 and was much less accessible to the public. In 1789, our scholar would have had a wide choice of reference works to consult, including general encyclopaedias (The *Encyclopaedia Britannica*, the *Encyclopédie*, Zedler’s *Lexikon*, and so on), printed library catalogues, and a variety of specialised bibliographies. In 1500, on the other hand, encyclopaedias were relatively few and relatively small, library catalogues were not printed and bibliographies and book reviews did not exist.

If there is any place for the notion of progress or cumulation in intellectual history, it is, surely, in the area of the organisation of information. A quantitative historian can easily draw up graphs showing increases in the size of libraries, or the number of studies of a particular subject, or the total number of books in circulation. All the same, a clear and simple account of improving facilities for research ought to awaken the suspicion of any practising historian. The explosion of information created problems as well as solving problems. It led (as explosions usually do) to fragmentation — in this case the fragmentation of organised knowledge.

In short, the model of intellectual change underlying this paper is not so much “triumphalist”, celebrating progress and problem-solving, as “ecological” in the sense of interpreting innovations as responses to changes in the cultural environment (noting that solutions generate problems as well as the other way round). Along these lines, an attempt will be made to trace the development from the system of intellectual resources available at the beginning of the period to the system as it was in 1789. It will of course be impossible to discuss every part of the system in the detail it deserves. Among the important topics which will have to be omitted from this survey are the rise of book illustration, map-making, statistics, and archives and other locales for collecting information.

The illustrations to books on botany, astronomy (Copernicus) or anatomy (Vesalius) communicated more effectively than the texts. Their numerous illustrations gave the leading eighteenth-century encyclopaedias a great advantage

2. In the case of the Reformation, the importance of oral communication is stressed in R.W. SCRIBNER, *Popular Culture and Social Movements in Reformation Germany*. London, 1987.

over their predecessors. As for map-making, its development can be charted by comparing and contrasting the atlases of Mercator (1585-95), Blaeuw (1662) and D'Anville (1737-80), each more ambitious but also more exact than the one before (3).

A more detailed study would also have to discuss the increasing tendency to present information in numerical form, whether population or price figures or star tables. The seventeenth century was the first time when systematic demographic estimates were made, whether of the whole world (from Isaac Vossius to Benedetto Riccioli), the population of a single city (William Petty on London, for example) or the mortality rate (calculated by the astronomer Edmund Halley from information about the city of Breslau) (4).

In the age of 'absolutism' and 'enlightened despotism', European monarchies (and also republics) collected information on a grander scale than before, and also in an increasingly statistical form ("statistics" are so-called because they were collected by states). Governments were increasingly concerned to know how many people lived in a particular state, how many adult males were available for military service, how many mouths there were to be fed in times of famine, and so on. In early modern Europe, the census became a regular event (5). Governments also took steps to preserve this information more carefully and to retrieve it more efficiently. As they increased in volume, these records required to be housed in special repositories, the archives, with special keepers, professional archivists, together with inventories and indexes (6).

The archive is only one of the early modern institutions and locales where information (verbal or non-verbal) was collected and transmitted. Any list of these locales would have to include the anatomy theatre, the botanical garden, the clinic (whose birth was celebrated thirty years ago by Michel Foucault), the laboratory, the observatory, and the museum or cabinet of collections, ranging from shells to coins. To these one might add the new instruments for discovering and recording information, including the terrestrial and celestial globes, the telescope and the microscope (7).

Leaving aside these developments, I propose to take a series of soundings in this sea of information and to consider in particular the history of three topics : libraries, encyclopaedias, and journals.

LIBRARIES

Archives generally contained confidential information, available only to a few servants of the state. What about the information available to the public ? In

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3. G.R. CRONE, *Maps and their Makers*. London, 1953 ; J. KONVITZ, *Cartography in France*. Chicago, 1987.
 4. H. WESTERGAARD, *Contributions to the History of Statistics*. London, 1932.
 5. D.V. GLASS, *Numbering the People*. Second ed., London and New York 1978.
 6. R.H. BAUTIER, La phase cruciale de l'histoire des archives. *Archivum* 18 (1968), 139-49.
 7. W.S. HECKSCHER, *Rembrandt's Anatomy of Dr Nicholas Tulp*. New York, 1958 ; M. FOUCAULT, *Naissance de la clinique*. Paris, 1963 ; O. IMPEY and A. MACGREGOR, eds, *The Origins of Museums*. Oxford, 1985 ; K. POMIAN, *Collectionneurs, amateurs et curieux*. Paris, 1987.

Renaissance Italy, the public library was already an important institution before the invention of printing, and storehouses of books became all the more necessary thereafter. Michelozzo's library of San Marco in Florence was built from 1438 onwards. Nicholas V founded the Vatican library in 1446 (a fifteenth-century register of borrowers still survives). Cardinal Bessarion left his books to the city of Venice in order to establish a public library, although the Marciana was not begun till 1537. The Laurenziana in Florence opened in 1571. Another great library, the Ambrosiana of Milan, was founded at the beginning of the seventeenth century. A few years later, an English visitor remarked with some surprise that it 'opens its doors to all comers and goers, and suffers them to read what book they please', as if this practice was still unusual.

Elsewhere in Europe, university libraries were increasingly supplemented by princely libraries, which were more or less open to scholars. The imperial *Hofbibliothek* goes back to 1493, the library of the Escorial to 1557, the library of Berlin to 1661. The rebuilding of libraries became increasingly necessary, not only to hold more books but to hold more readers. In Paris, the *Bibliothèque du roi* was made increasingly accessible to the public in the 1690s, and again in the 1730s, soon after its move to the rue Richelieu. By the late eighteenth century, printed forms for borrowers were in use.

In London, however, Gibbon was still complaining about the lack of library facilities in the middle of the eighteenth century. The classical scholar Richard Bentley had proposed the construction of a Royal Library in 1697, but it was only in 1753 that George III presented his books to the British Museum.

Founding a library and opening it to the public was obviously not enough to make information accessible. What was needed was a steady flow of new accessions. It was in 1537 that François I gave orders that a copy of every book printed in France should be sent to the royal library. The emperor followed suit in the late sixteenth century. Thomas Bodley was granted a similar privilege for the library he founded at Oxford in 1610. Stockholm received such a privilege in 1661, Berlin in 1699. However, few libraries were so fortunate as to receive books regularly from major centres of production without paying for them.

As libraries became larger and larger, cataloguing and classifying became more and more of a problem. Distinguished scholars gave this problem their attention — reasonably enough, given the influence of such category-systems on intellectual life. At the Vatican, the humanist Bartolommeo Platina was responsible for the catalogue. At the Escorial, it was another humanist, Benito Arias Montano, who devised the classification system. In Vienna, a third humanist, Hugo Blotius, devoted more than twenty years to cataloguing the imperial library. In Wolfenbüttel, the intellectual scheme underlying the system of classification was the work of no less a man than Leibniz.

A further step towards greater accessibility came with the printing of library catalogues, beginning with the university of Leiden in 1595. By 1688, the printed

catalogue for the French Royal Library had itself become a ten-volume work (8).

The increasing numbers of books available in major libraries made the problem of information retrieval more and more acute. One response to the problem was the rise of the footnote (or more commonly in this period, the marginal note) suggesting further reading. Another was the alphabetical index. Yet another was the bibliography. It might be a general bibliography, like Konrad Gesner's pioneering *Bibliotheca Universalis* (1545-55), organized by topic, the *Index universalis* by F. Justinianus (1612) and the *Bibliotheca materiarum* by J. Molanus (1618), both organized alphabetically (9). Increasingly specialised subject-bibliographies also came into existence. They include the Jesuit Antonio Possevino's bibliography of the humanities, the *Apparatus* (1593); the *Bibliotheca theologica* (1614) by Petrus Bolduanus, followed by philosophical and historical bibliographies by the same compiler; and the *Bibliographia politica* published by the scholar Gabriel Naudé, librarian to Richelieu and Mazarin (1633) (10).

The most important of these aids to information retrieval, however, was the development of encyclopaedias with entries in alphabetical order.

ENCYCLOPAEDIAS

The development of the encyclopaedia both summarises and symbolises the main themes of this survey. The encyclopaedia is not of course an early modern invention. It formed part of the manuscript culture of the Middle Ages (to say nothing of the ancient world). Printing, however, made encyclopaedias more easily available, just as it made them more necessary as a response to the problems of the information explosion.

Sixteenth-century encyclopaedias were relatively small, taking up one or two volumes, and they were organised thematically, the arrangement often corresponding to the organisation of knowledge in universities. Examples include G. Reisch's *Margarita philosophica* (c1503), Giorgio Valla's *De expetiendis rebus* (1501), P. Scalich's *Encyclopaedia* (1559), the first of these works to carry that title, and T. Zwinger's *Theatrum humanae vitae* (1586). Reisch's treatise, for example, is divided into twelve books summarizing the *trivium*, the *quadrivium*, natural and moral philosophy, while Valla, more of a humanist, combines the *quadrivium* with the *studia humanitatis*. This thematic arrangement made the books unsuitable for rapid consultation (despite their elaborate tables of contents), but at the same time allowed them to show much more clearly than modern encyclopaedias the links between different disciplines, the various branches of the tree of knowledge. It is not easy to imagine a scholar in a hurry consulting Scalich (say). On the other hand, it is even less easy to imagine anyone — apart from the late Aldous Huxley — sitting down to read a twentieth-century edition of the *Encyclopaedia Britannica*.

8. E.D. JOHNSON, *History of Libraries in the Western World*. Second ed., Metuchen NJ, 1970; L. BUZAR, *Deutsche Bibliotheksgeschichte der Neuzeit (1500-1800)*. Wiesbaden, 1976; C. JOLLY (ed.) *Histoire des bibliothèques françaises 1 (1530-1789)*. Paris, 1988.

9. A. TAYLOR, *General Subject-Indexes since 1548*. Philadelphia, 1966.

10. T. BESTERMAN, *The Beginnings of Systematic Bibliography*. Oxford, 1935.

The new form of encyclopaedia — the multivolume work with entries in alphabetical order — developed in the seventeenth and eighteenth centuries and corresponds to a new way of using the reference works. Among seventeenth-century examples may be cited L. Beyerlinck's *Theatrum vitae humanae* (1656) and B. d'Herbelot's *Bibliothèque Oriental* (1697). It is at once amusing and revealing to see the editor of the latter work, devoted to the Islamic world, apologising in advance for the alphabetical arrangement, and explaining that it 'does not produce as much confusion as one might imagine'. Herbelot's book also illustrates the rise of specialised encyclopaedias, among them Cesare Ripa's *Iconologia* (1593), describing and illustrating personifications, and Louis Moreri's *Grand Dictionnaire Historique* (1674). Encyclopaedias also grew larger and larger. The *Encyclopédie* compiled by Diderot and his collaborators ran to 35 volumes (1751-77), while Zedler's *Lexicon* reached 64 volumes (1732-50) (11). Despite their size, these encyclopaedias were frequently reprinted, revised and enlarged. They express the new assumption (perhaps a result of the Scientific Revolution) that knowledge can become 'out of date', and that the latest edition (or even the latest book) is almost certainly the best.

Reference books for a non-scholarly audience also made their appearance, for example the *Nutzbares galantes und curieuses Frauernzimmer-Lexicon* published in 1715, which combined a biographical dictionary of learned women with notes on cooking and fashion. At a still more popular level, the almanac, already mass-produced in the seventeenth century, if not before, was more of an encyclopaedia than an annual weather forecast, and generally included medical, astrological and agricultural information, lists of fairs and markets, and not infrequently a table of the most important dates in world history. Practical information was also provided by the printed "directories" or lists of addresses of merchants and others in major cities such as Paris and London. Examples from the seventeenth century can be found, but it was in the eighteenth century that directories of this kind came to be published annually.

JOURNALS

An account of libraries and encyclopaedias runs the danger of placing too much emphasis on information for scholars. Another major development in communications in early modern Europe was of course the spread of news. In the sixteenth century, a good deal of political and economic news was spread in manuscript form, not only via private letters (from Florentine or Genoese merchants in London or Seville to their relatives and partners at home, for example) but also via "news-letters" produced by professionals, either for a particular client, such as the Fuggers of Augsburg, or for a network of readers. In the course of the period, however, a growing number of printed news-sheets and pamphlets provided information on current events for a wider public. Since the news-sheets sometimes took the form of ballads which could be sung aloud, it is clear that this kind of information was not restricted to the literate.

11. R. COLLISON, *Encyclopaedias*. London, 1966.

In the sixteenth century, the news was generally printed in the form of pamphlets or *Flugschriften*, produced for a particular occasion — a battle, an execution, an earthquake. Venice was a great centre of production for texts of this kind. Regular newsletters tended to circulate in manuscript, to subscribers. These *Flugschriften* did not disappear in the seventeenth century, but they were supplemented by a new printed genre, that of news-sheets (with names like *gazette* or *courant*), in other words a printed version of the newsletter, appearing in numbered issues at regular intervals, often once or twice a week. Amsterdam was an important centre of news-sheets in the early seventeenth century, with a *Courant* available in Dutch from 1618 and in French from 1620 (the outbreak of the Thirty Years' War doubtless boosted sales). A London weekly, *The News and Affairs of Europe*, began to appear in the 1620s. These papers were criticised by some moralists for pandering to vain curiosity, and by others for revealing political secrets and encouraging ordinary people to criticise the actions of rulers, but they were an economic success. In the eighteenth century, the newspaper became a European institution. In Germany, 2000 new *Zeitschriften* were founded between 1765 and 1790, and some of them enjoyed a wide circulation (the French Revolution doubtless boosted sales). The *Hamburgische Correspondent*, for example, sold 25,000 copies in 1798.

Meanwhile, the learned journal developed into a genre of its own, including the *Journal des Savants* of Paris (1665-) the *Proceedings of the Royal Society of London* (also 1665-), the *Acta Eruditorum of Leipzig* (1682-), and the *Nouvelles de la République de Lettres* of Rotterdam (1684-). The title of the last-named journal sums up the aims of this type of journal. They spread news about the Republic of Letters by printing obituaries of scholars, intellectual projects, and above all, reviews of recent books.

Another type of journal was less concerned with recent events and more with entertaining and edifying its readers. Its most famous eighteenth-century exemplar was the London *Spectator* of Joseph Addison and Richard Steele (1711-14), an example which was imitated all over Europe (often with names like *Spectateur*, *Zuschauer*, *Tilskuer*, and so on), especially in the so-called "moralischen Wochenschriften" of the German-speaking world (12). A number of them, notably the *Mercure Galant* (1672-) were specifically addressed to women readers. Although they were less concerned with topical issues, these journals also contributed to the diffusion of information.

CONCLUSIONS

1. This paper began with a comparison between the resources of information available to two scholars at the beginning and the end of the early modern period. To conclude, it may be useful to consider the changing place of information in everyday life in early modern Europe. One might begin with the spread of clocks and watches, which made increasing numbers of people conscious of the exact time. This made it possible to establish a network of synchronised communi-

12. W. MARTENS, *Die Botschaft der Tugend*. Stuttgart, 1968.

cations — the postal service organised by the Tassis family, stage-coaches, Dutch canal-boats and so on, all with their printed time-tables. The rise of the weekly and the daily newspaper is another illustration of the penetration of everyday life by new media of information. So is the advertisement, whether it took the form of a poster (already common in the sixteenth century) or that of a paragraph in a journal (a seventeenth-century development).

2. Another general theme which deserves to be explored in detail is that of the secularisation of information. The media theorist Harold Innis exaggerated when he spoke of the 'information monopoly' of the medieval church, but one might at least speak of an information 'hegemony' at a time when the major libraries were monastic, while the majority of university students and teachers were clerics.

3. A comparison of the situation at the beginning and end of our period suggests the increasing importance of the market in information, which was turning into a commodity. The information broker or information entrepreneur is a phenomenon of the early modern period. The best-known of such brokers is probably Théophraste Renaudot, founder of the *Paris Gazette* and also the *Bureau des adresses* (which arranged meetings between potential buyers and sellers, employers and employees, and so on) (13). A similar role was played by Leo Aitzema in Amsterdam and by Edward Lloyd in London. Lloyd owned a coffeehouse in Lombard Street which was frequented by merchants. He founded a newspaper, *Lloyd's News*, which specialised in information about shipping. His successor's developed the maritime insurance for which Lloyd's is still known today.

In a broad sense of the terms one might also describe publishers, particularly the publishers of newspapers and encyclopaedias, as buyers and sellers of information. Obvious names to mention are Elsevir of Leiden, who commissioned the famous series of volumes on the leading world states (edited by Johannes de Laet) ; Blaeu of Amsterdam, map-maker to the Dutch East India Company and the publisher of a famous series of atlases ; Leers of Rotterdam, who financed Bayle's *Dictionnaire* ; and Pancoucke of Paris, who bought the right to publish the *Encyclopédie* after its first edition (14). It is surely no accident that seventeenth-century Amsterdam became both a leading intellectual and commercial entrepôt, a centre of publishing and news as well as a centre of trade and finance (15). Its Stock Exchange offers a vivid example of the economic importance of information (especially oral information).

A glance at China may throw the western entrepreneurial organisation of knowledge into relief by contrasting it with a more bureaucratic mode of organisation. On one side one finds the hegemony of state patronage, on the other the dominance of market forces. The difference may be illustrated by the contrasting modes of producing and using encyclopaedias in the two cultures.

13. H. SOLOMON, *Public Welfare, Science and Propaganda in Seventeenth-Century France*. Princeton, 1972.

14. R. DARNTON, *The Business of Enlightenment*. Cambridge, Mass., 1979.

15. G.C. GIBBS, The Role of the Dutch Republic as the Intellectual Entrepot of Europe in the 17th and 18th centuries. *Bijdragen en Mededelingen betreffende de Geschiedenis van de Nederlanden* 86 (1971), 323-49.

In China, encyclopaedias were produced under imperial patronage. They were compiled by mandarins for mandarins. They were amazingly comprehensive: a fifteenth-century encyclopaedia, the *Yung-lo ta-tien* or "Great-Handbook", was divided into 10,000 volumes, while an eighteenth-century example, the *T'u-shu chi-ch'eng* or "Collection of Pictures and Writings" consisted of about 750,000 pages, making it perhaps the longest printed book in the world. Circulation was low, however. The "Collection" was printed in only a handful of copies, while the "Handbook" was not printed at all. In the West, on the other hand, the making of reference books was a commercial enterprise. It was even possible to buy shares in Chambers' *Cyclopaedia*. Hence the number of copies sold was of crucial importance. The different types of encyclopaedia, and of the information and communication systems of which they formed a part were at once expressions of dominant values in the different cultures, and a powerful means of what Pierre Bourdieu would call "cultural reproduction" — though not so powerful as to prevent change, whether in this period, as we have seen, or in the nineteenth and twentieth centuries (16).

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Summary

This paper offers an outline for a possible history of information and its communication in early modern Europe. Noting the vast size of the topic, the problematic nature of the concept 'information', and the need to avoid a 'triumphalist' account of intellectual progress, the author concentrates on the consequences of the invention of printing and takes three soundings in the sea of information, viz. concerning the development libraries, encyclopaedias and journals. The conclusion suggests that the organization of knowledge in the West was relatively 'entrepreneurial', in contrast to its more 'bureaucratic' organization in Ming and Qing China.