BIBLIOTHEQUE DU CERIST

Online Bibliographic Databases

An International Directory

Second Edition 1981

James L. Hall
Marjorie J. Brown

Aslib

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Online Bibliographic Databases:
An International Directory
Second Edition, 1981

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Hall, J.L. *On-Line Information Retrieval, 1965–1976*. Aslib Bibliography No. 8 [Contains over 900 references.] London: Aslib. 125 pp. March 1977. ISBN 85142 094 X

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Second Edition 1981

James L. Hall
(Culham Laboratory)

Marjorie J. Brown
(Aslib)

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Compilers:
James Logan Hall, B.Sc. (Glasgow, U.K.)
Culham Laboratory, Euratom/UKAEA Fusion Association, Abingdon, OX14 3DB, England.
Marjorie Jean Brown, B.A. (Wooster, Ohio, U.S.A.)
Aslib, 3 Belgrave Square, London SW1X 8PL, England.

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Dedicated

to all those involved in the creation of the keys to the world's knowledge stores — the abstracting and indexing journals. Their unstinting efforts and enthusiastic devotion are too often not fully appreciated.

> "The majority . . . leave to a few . . . the labor and pleasure of sifting and selecting from the original sources."
> (Dr. John Shaw Billings, 1876, when Director of what is now the National Library of Medicine, U.S.A.)

There may be grounds for reflecting that in the late twentieth century the degree of pleasure has probably remained unchanged but the labour has increased considerably!

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PREFACE

The thirst for knowledge has been one of the enduring characteristics of mankind, and with that thirst has gone an irrepressible urge to record. As the knowledge stores have grown so have the problems of finding out what is already known.

Fortunately, computer-aided retrieval has shown that it has great potential. Online* retrieval is no longer just an area of interesting research; it has become a tool of immense power when used in the right way in the right circumstances.

The bibliographic data stores now available for instant search via computer terminals are not only very large (some 70 million references): they also come from a confusingly wide range of sources covering the whole spectrum of knowledge. The main aim of this volume is to provide an inventory of the online databases* known to the compilers.

The emphasis in this Directory is on *bibliographic* databases available *online* (as opposed to slower "batch" access). Inevitably, it has proved difficult to establish a clear-cut boundary of what is, and is not, "bibliographic". In practice, a number of marginal databases have been listed, where, for example, they are essential companion tools for the most effective use of bibliographic databases. Also listed are a number of databases concentrating on "news", "patents", etc. — essential parts of the stock-in-trade for many special libraries. A full list of the databases included precedes this Preface.

The basic features of the first edition (Hall, 1979) have been retained. The entries have, however, been re-styled to enable advantage to be taken of the convenience of book format rather than A4. Surprisingly, given the right print-run conditions a case-bound volume, as opposed to A4 limp-bound, can be produced at almost no extra cost to the purchaser (Booth, 1980), (Campbell, 1980), (O'Connor, 1978).

No directory can ever be completely up-to-date. It would be most helpful if users/readers would point out any omissions, misinterpretations or errors in this text, and so help to improve any future text.

Acknowledgements

The assistance of database suppliers in checking draft entries was invaluable and is gratefully acknowledged; many improvements were suggested and suppliers' comments have been incorporated whenever possible.

We have been helped by many colleagues at Aslib and at Culham, and we are particularly grateful to Jacky Deunette and Lesley Dibb of the Online Information Centre for their expert advice and concrete assistance on a number of points. Our thanks go to all who assisted either directly or

*The terms *online* and *database* are discussed in more detail in the Introduction.

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indirectly, including our respective families for their unfailing moral support.

Thanks are also due to Aslib and to the United Kingdom Atomic Energy Authority for encouraging our interest in this work. The statements given in this volume reflect the views of the compilers and are not necessarily those of Aslib, the Online Information Centre, or the U.K. Atomic Energy Authority.

Marjorie J. Brown
Aslib
Autumn 1980

James L. Hall
Culham
Autumn 1980

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INTRODUCTION

ONLINE DATABASES

In the library sense, an "online bibliographic database" is generally understood to mean a collection of records held online* in a rapid-access computer store. The online file is usually derived from the machine-readable version of an abstracting or indexing journal. Bibliographic records held in this form are not, of course, directly useful to users and it is the function of online "systems" to make the details held on these disc files accessible to users. The number of bibliographic records readily available online is extremely impressive — about 70 million items with an up date rate of about 10 million items per year. Allowing for duplications, some 40 million unique references, with an annual up-date rate of over 6 million unique references, are potentially at the enquirer's finger-tips. Quantitatively, while this can be matched in hard-copy form by some large libraries, it represents for most libraries a resource-pool far larger than anything they could possibly hope to afford as shelf-stock, particularly in disciplines not close to their main subject field.

ONLINE INFORMATION RETRIEVAL

In online information retrieval the searcher uses a computer terminal† usually linked by telephone to a remote computer. The computer stores the database(s) of bibliographic records on rotating magnetic discs always available for immediate access. The database(s) can be searched and re-searched using special computer programs which allow the searcher to carry out a two-way conversation or dialogue with the computer. Fig. 1 illustrates in schematic form how a user can have access to many different online stores either on a self-service basis or with a skilled intermediary.

Online retrieval offers many advantages, the following being particularly noteworthy:

- In-depth searches of computer-held files (which may contain millions of bibliographic records) can be carried out at a *speed* which no human can hope to match.
- The user is an *active participant* and can instantly adapt his request to the reality of what is actually in the reference file — perhaps very different from what he expects — and also readily recover from errors of query formulation.
- Databases can easily be *re-searched*, using new clues. (In manual searching the time available does not often permit full re-searching.)

*Online: If one unit (e.g. a computer) can be controlled by another unit (e.g. a computer terminal) then the first unit is said to be online to the second unit.

†Computer terminal: Essentially, an electric typewriter or video display unit capable of transmitting and receiving information signals via telecommunication channels.

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- The user has easy access to an extremely *wide range of indexes/databases* many of which may not be available locally.
- Databases searchable online often offer a far *greater number of access points* than the corresponding printed index.
- There is almost *no need for irksome note-taking* so typical of many conventional searches.

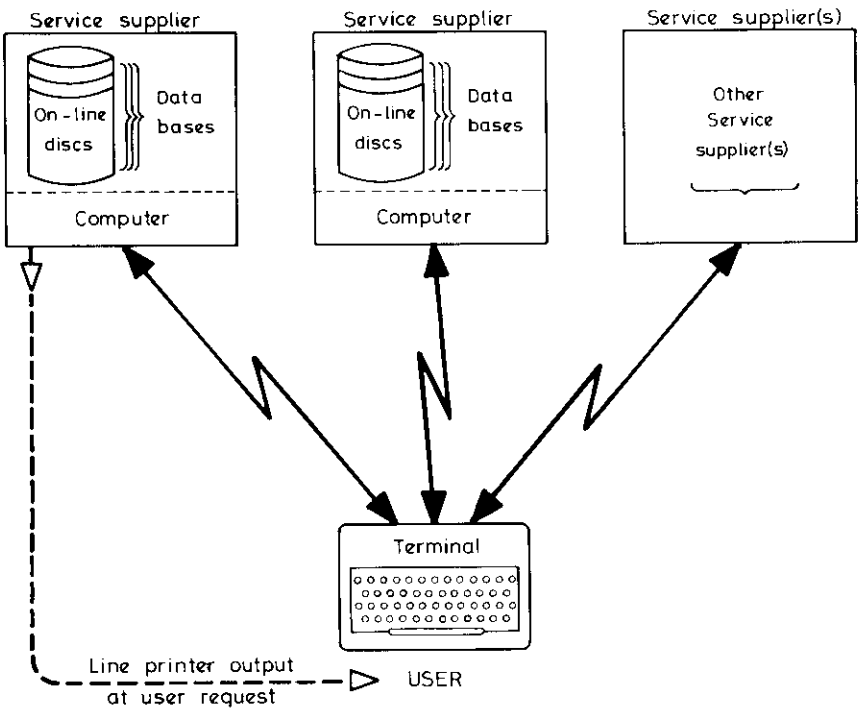

Fig. 1. Online retrieval: schematic overview. The user telephones an appropriate computer installation offering "online databases", i.e. files of bibliographic references stored on instantly-accessible rotating magnetic discs. The computer installation's "online system" uses special computer programs allowing the user to carry out a two-way "conversation" with the computer-held database. The "dialogue" allows the user to sample the online store and to refine or alter his query to best effect. The final set of document references can be printed out immediately at the terminal, or if less urgent can be ordered as line-printer output to be mailed to the user.

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THE BIBLIOMETRICS OF ONLINE DATABASES

The remainder of this Introduction is largely statistical in nature, using information drawn from the main body of the text of this Directory. The main aim is to present a statistical profile of the online database repertory, and in particular to:

- estimate the total number of references available online via publicly-accessible systems together with the current annual update rate; and to estimate the number of unique references available after taking account of duplications;
- estimate how many of these references fall into various arbitrary knowledge fields;
- show how, despite the limited time-span often covered online, the *volume* of literature in an online file can be a very significant fraction of the total literature covered by the database in its conventional printed form;
- establish the provenance of the online suppliers on a broad regional basis;
- examine the time-span covered by online databases;
- discuss the sizes of databases in terms of small, medium and large (on an arbitrary basis).

The Growth in Total Number of References Available Online

Although online databases were available from the mid-1960s these early databases were generally in-house or otherwise not openly available. They included the large limited-access online database systems built under contract by Lockheed (e.g. the NASA-RECON system) and by SDC (e.g. the National Library of Medicine's AIM-TWX system); for further information on these and many other early developments see Hall (1977b).

It is fair to say that no sizeable public access systems were available until about 1972. Growth thereafter was rapid as Table I demonstrates.

Table I

No. of Bibliographic References Available Online

1968	1972	1976	1980
< ¼ million	3 million	24 million	65 million

Notes on estimates:

1968 Estimate by J.L. Hall.
1972 From Hall (1972) together with other information in Culham files for 1972.
1976 From Hall (1977a).
1980 From this Directory.

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In quantitative terms, at the end of 1980 some 65 million references were available for online search on public access systems, the rate of addition of new references being about 9,400,000 per year.

The total online repertory in 1981 contains over 70 million references with an update rate of about 10 million references per year. Obviously there is some duplication between databases, but it is probably fair to say that in 1981 some 40 million unique references are searchable online with an update rate of about 6 million unique references during the year. When it is remembered that the massive indexing operations of the largest libraries in the world serve as the keys to holdings of only some 10–20 million documentary units, it is clear that the power now available through a simple computer terminal in even the smallest library is such as to stagger the imagination.

Knowledge Fields Covered by Online Databases

An attempt is made in Fig. 2 to show how the contents of the existing online databases cover the whole range of knowledge, the subject classifications shown being those used in the major decimal schemes. For convenience Class 6 is divided into three: (i) Applied Sciences (other than Agriculture and Medicine), (ii) Agriculture, and (iii) Medicine.

Notes on Fig. 2

(i) The subject categories shown are based broadly on the commonly used decimal systems (excluding "Generalities").

1 Philosophy; Psychology; etc.
2 Religion; Theology
3 Social Sciences; Statistics; Political Science; Economics; Law; Public Administration; Education; Commerce; etc.
4 Linguistics; Languages
5 Pure Science (Astronomy . . . . . Zoology)
6 Applied Science; Engineering; Business; Chemical Technology; Manufacturers; Building Construction; Medical Sciences; Biomedicine; Health Agriculture; Food Production (all methods)
7 Arts; Recreation; Music; etc.
8 Literature
9 History; Geography; Biography

(ii) Some databases contribute to more than one class of knowledge and in such cases they have been totalled under each appropriate relevant class. The overall total of all the class-bars is therefore not identical to the overall total of citations available online (c. 65 million).

(iii) The "Interdisciplinary" databases have been assessed as contributing on a weighted basis over the eleven classification areas shown in the Figure. This is an arbitrary judgement and doubtless suffers from some inaccuracy. It does, however, serve to show that virtually all fields of knowledge are searchable, to a greater or lesser extent, using online databases.

(iv) It would be valuable to know what proportion of the *total* literature in each field is actually available online. Unfortunately this information was not readily available to the compilers.

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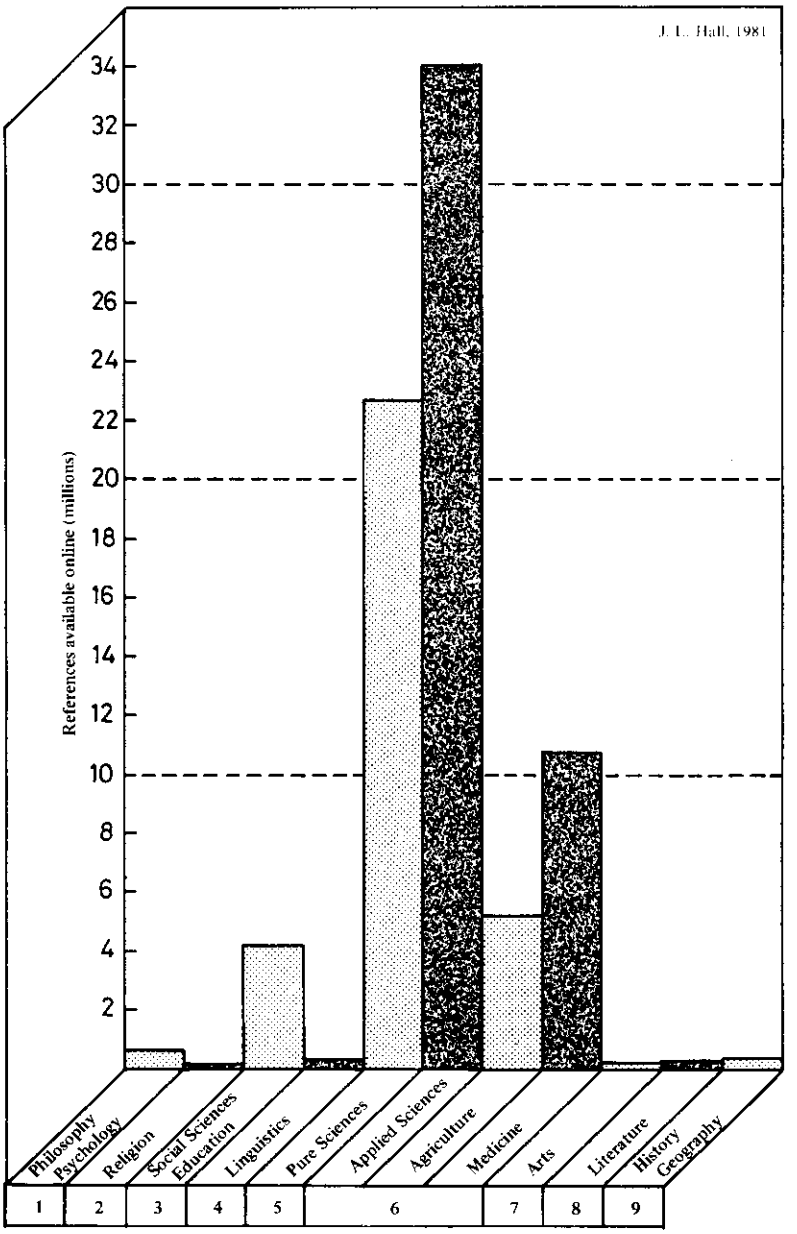

Fig. 2 The main fields of knowledge with an indication of the number of references (in millions) available for online search.

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It is clear from Fig. 2 that the sciences (Classes 3, 5 and 6) make up the vast bulk of the literature searchable online but it should not be thought that the humanities have been completely neglected. The scaling used (in Fig. 2) to accommodate the sciences has of necessity appeared to dwarf the humanities, but in fact sizeable numbers of references are searchable online over the whole field of human activity as Table II shows.

It should be noted that the databases contributing to Table II, while small in terms of the 1980s, would have been considered very large databases in the early 1970s. While the online treasury is now very rich indeed, a note of caution is not, however, out of place. Many subjects (e.g. art) can be searched very intensively online, but there are still many fields where online reference coverage is as yet less than complete, or indeed non-existent. It is encouraging to note, however, that the trend of recent years — with impressive arrays of new databases becoming available year by year — augurs well for ever-improved subject coverage.

Table II

Number of Non-Science References in Online Databases

		In core databases	In inter-disciplinary databases	Total (approx.)
1	Philosophy; Psychology; etc.	435,000	200,000	635,000
2	Religion; Theology	nil	50,000	50,000
4	Linguistics; Languages	200,000	100,000	300,000
7	Arts; Recreation; Music; etc.	120,000	100,000	220,000
8	Literature	200,000	100,000	300,000
9	History; Geography; Biography	180,000	200,000	380,000

Note on Table II. The interdisciplinary databases contribute to all fields but their exact numerical contribution is not easy to establish. As an extreme example it is possible to find theological documents in the NASA database. The figures shown are therefore arbitrary estimates.

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Cumulative Growth in the Literature Available

The ever-increasing annual growth in the literature is so well-known as not to bear re-examination here. The *cumulative* growth, however, is less often presented, although it is of course one of the major factors to be taken into account when considering the problems of information retrieval. The case of Chemical Abstracts is particularly well-documented (Chemical Abstracts Service, 1980) and illustrates a number of important points (Fig. 3).

(i) While the time-span available online is only some 14 years out of the total database existence of 74 years, the time-fraction available online is the *recent* literature. This is generally acknowledged to be the most immediately useful portion of the literature for most end-users.

(ii) The number of references available online (well over 4 million by the end of 1980) represents over 55% of all references printed in Chemical Abstracts from 1907.

(iii) Since online searching allows much deeper searching than do conventional printed indexes, the references available online can be searched so intensively that a "value-added" factor can be considered to apply to them.

(iv) Many requests do, of course, call for searches to be carried out over a search period exceeding that available online. There is a very real fatigue factor involved in long manual searches; the availability of online searching reduces this considerably, allowing the searcher to search the "old" material with a reasonably fresh mind.

Provenance of Database Suppliers

Fig. 4 shows that all database suppliers are situated in either North America or Europe, the most active countries being the U.S.A. and the U.K. The actual coverage of the world's literature by most of these suppliers is of course international.

It should be noted that in some cases, notably databases compiled by international systems such as INIS, other continents do in fact contribute directly and the database supplier serves as a collecting, computer machining, and distribution point. A number of other databases also have arrangements for international input; for example, a not-insignificant proportion of MEDLINE is contributed by sources outside the U.S.A.

It must be stressed that Fig. 4 relates to online *bibliographic* databases. Europe is a very rich source of numerical databanks and it is arguable that, taken overall, Europe is more information-rich than North America.

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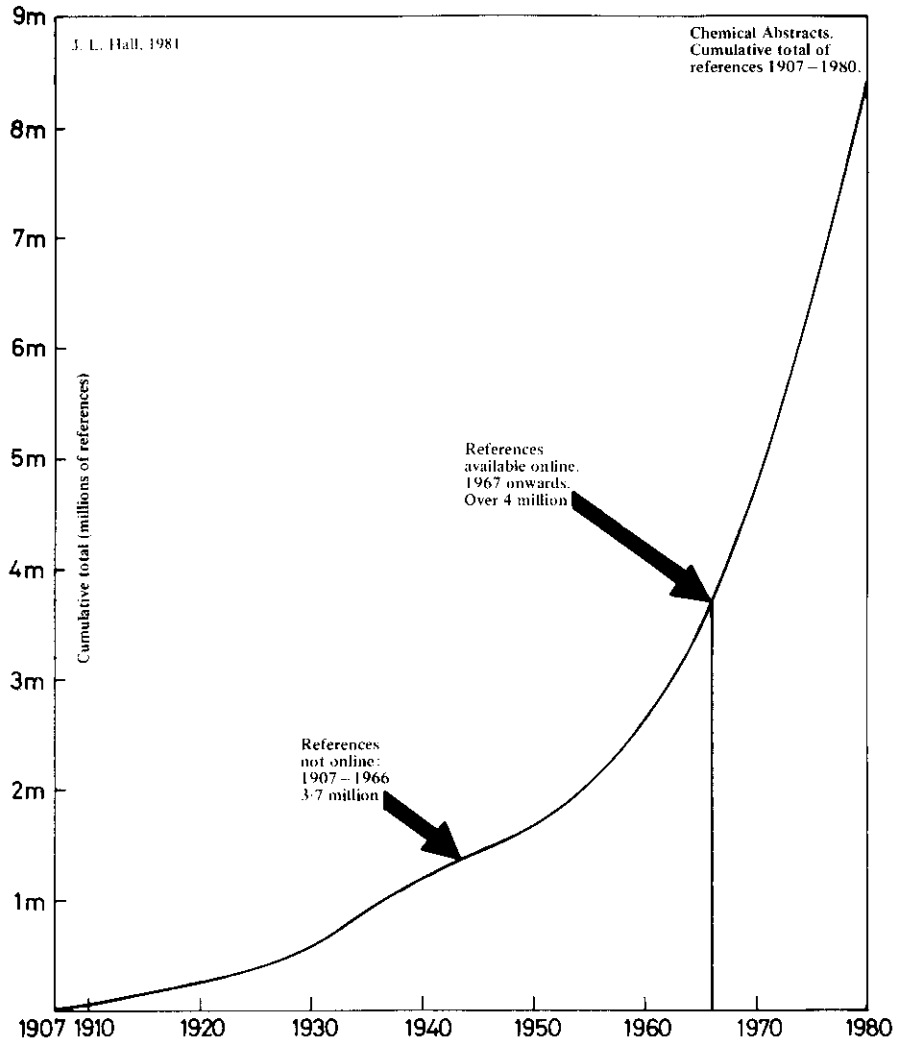

Fig. 3. Cumulative total of Chemical Abstracts references from 1907–1980. More than half of the total can be searched online. The growth of the searchable knowledge bank is very striking; in stark contrast, the time available to each individual searcher is, and always will be, a virtually constant factor.

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Time-Span Available Online

Online databases are usually a by-product arising from the computer-production of conventional printed indexes (Fig. 5). The time-span available online is therefore often closely matched to the date of switch-over to computer-driven photo-composition.

Fig. 6 shows the percentage of databases covering a given time-span, in years counting backwards from 1980. All the databases (excluding discontinued databases) cover one year (1980) and 86% cover the last five years. Somewhat surprisingly, nearly half the databases cover the decade 1970–1980. In a few very fortunate areas, 6% of the databases allow online retrieval from databases covering over 20 years of literature (retrospective data punching having been undertaken).

Size of Databases

In the early years of online retrieval there was a definite emphasis by suppliers on the loading of large, well-known databases such as Chemical Abstracts, Physics Abstracts, etc. In recent years the smaller, specialized databases have become an important part of the online repertory, and Table III shows that 46% of all the databases available (at mid-1980) were "small", i.e. fewer than 100,000 references. It is of course relevant to note that in many subdisciplines the total number of relevant and significant papers certainly does not exceed 100,000; in such well-covered areas online retrieval is an exceptionally powerful tool. Only 11% of the databases available at mid-1980 can be classified as large, i.e. exceeding 1 million references.

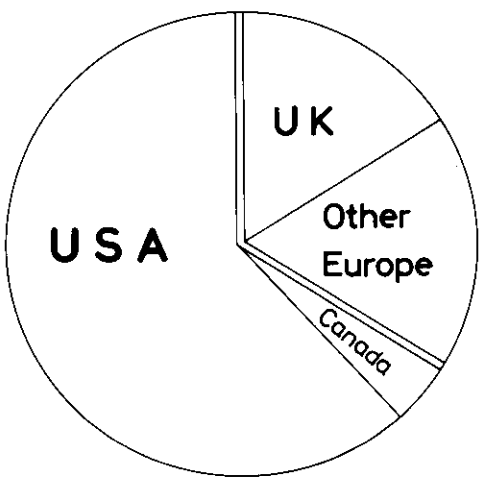

Fig. 4. Provenance of online database suppliers.

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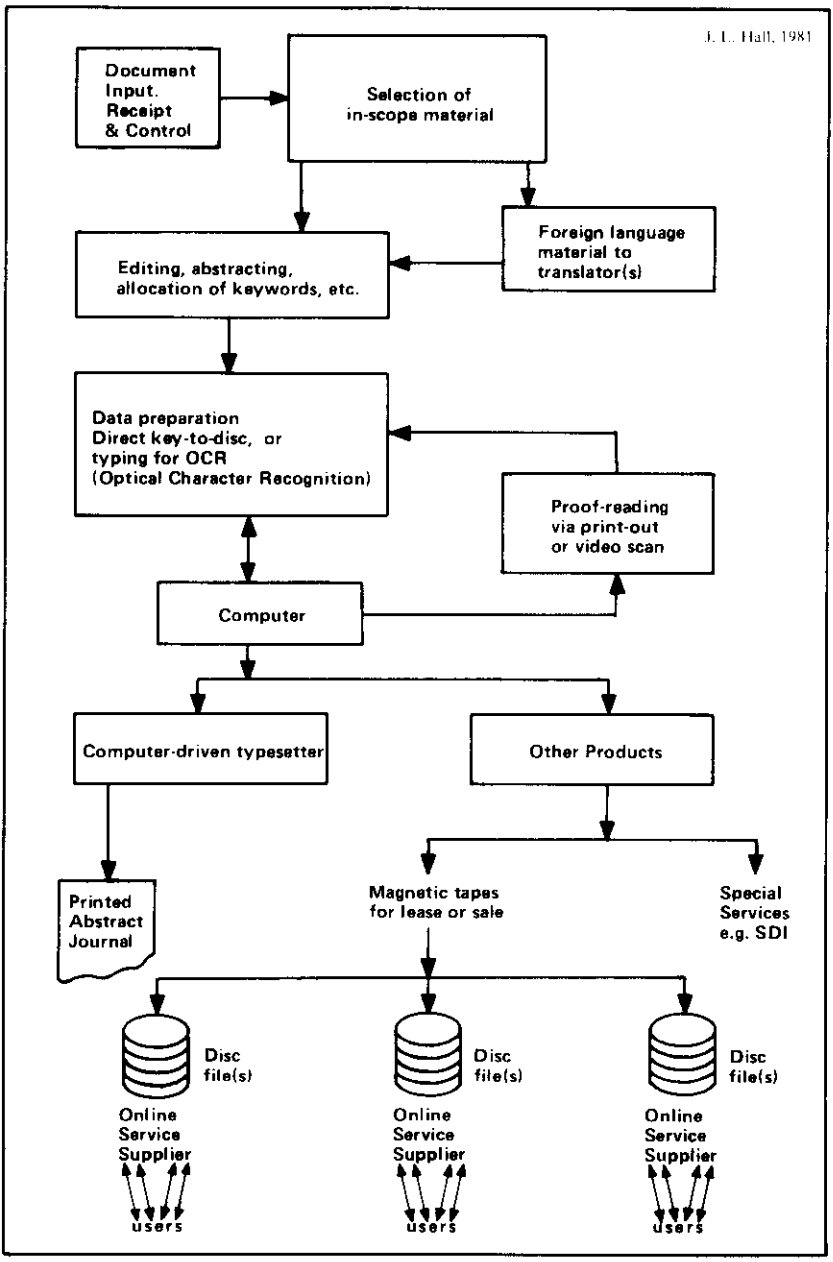

Fig. 5. Schematic outline of database production.

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Table III
Databases by Size

	No. of references		%	
Small*	Up to	50,000	25	46
	50,000	100,000	21	
Medium*	100,000	200,000	15	43
	200,000	300,000	6	
	300,000	400,000	5	
	400,000	500,000	6	
	500,000	1,000,000	11	
Large*	1,000,000	2,000,000	7	11
	2,000,000	4,000,000	2	
	4,000,000	upwards	2	

*Arbitrary classification

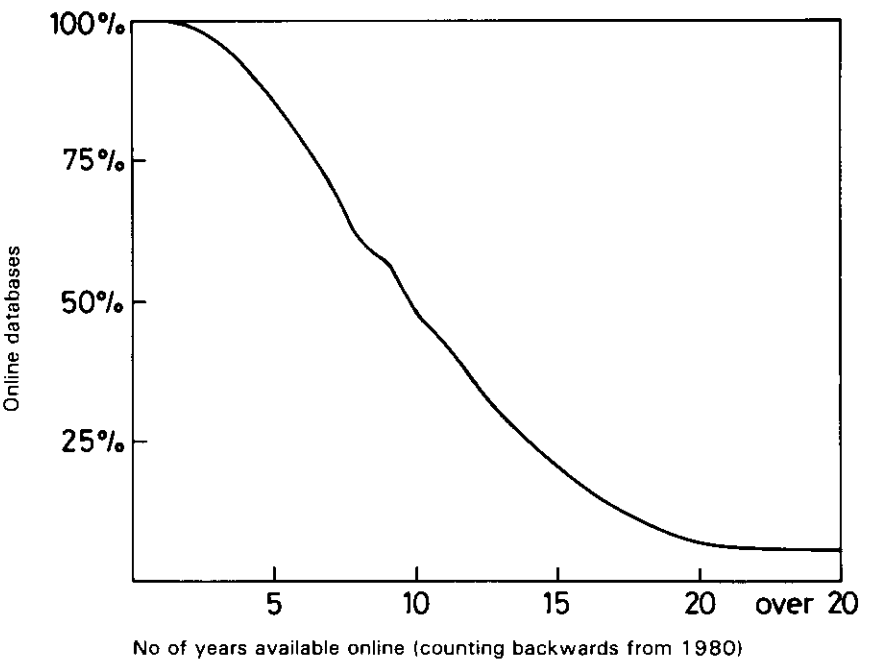

Fig. 6. Time-span available online. Nearly half of the databases provide complete coverage of the decade 1970–1980.

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SEARCHABLE FIELDS: DIFFERENCES BETWEEN SYSTEMS

A database supplier will normally supply files of bibliographic references, abstracts, key terms, etc., on standard magnetic tapes on a routine basis. It should be noted, however, that the different computer program systems operated by online service suppliers vary in the way they organize or "format" these references for online searching. For example, Conger (1980) usefully compares, for 34 databases, the various fields searched on BRS, Lockheed and SDC, when a single unqualified search term is entered in a file search. This emphasizes the point that while most would-be searchers can carry out searches online, only the skilled searcher is likely to know the many factors which may affect the search result (good or bad) as examined at the terminal. Online retrieval therefore displays a not-unexpected paradox (common to all aids to information retrieval); online searching is easy — online searching is difficult!

ONLINE DATABASES: A BRIEF PERSPECTIVE

It is characteristic of human adaptability to technical change that any advance, no matter how amazing, is rapidly taken for granted. This has certainly been true of online retrieval. It has become commonplace to read that 10 million references are available for online search — or 20 million or 50 million.

The reality of the present database industry is that the very existence of the present enormous online knowledge pool is a staggering intellectual and technical achievement, accomplished in less than 20 years. It has required the combined efforts of thousands of people in fields ranging from computing and programming to surface and satellite communications technology. To this must be added the truly enormous amounts of effort poured into the production of the primary databases, whether online or paper-based. The existence of the online knowledge pool is a remarkable tribute to the small number of original online pioneers, and to the even smaller number of far-seeing financial sponsors.

The two decades since the *Golden Book Encyclopaedia* was loaded in 1960 for machine-search (Cuadra, 1975) have been marked by excitement and exuberent growth. Increasingly, the database and online industries are becoming more ready and technically able to respond to the needs of everyday users. The individual technologies will improve, and in the future will no doubt offer further enhancements: storage in even more compact physical devices, full-text databases, more reliable telecommunications, improved and more standardized access protocols, better access terminals, routine retrieval via domestic television receivers, and so on. For the present, however, it can truly be said that (for those who care to make use of it) information retrieval from online databases is now so powerful that it can be considered a mature tool of the information age.

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Many (perhaps most) searchers have access to only a limited range of conventional retrieval tools (printed indexes, card catalogues, etc.). It is arguable therefore that of all the information retrieval methods available only one — online retrieval — can closely approach the desirable ideal of putting the enquirer *instantly* in touch with a substantial part of mankind's collective memory — the world's abstracting and indexing resources.

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A NOTE TO THE READER

Other Directories Available
A number of other directories are available. Some cover *all* machine-readable databases (whether batch or online), while others concentrate on a particular area (either geographic or thematic). The burgeoning field of fact and numeric *databanks* is well covered by several directories. Bibliographical details of these various directories are given in the references at the end of this Introduction.

Online Service Suppliers
The addresses of the 39 organizations listed in this Directory as online service suppliers are given in the Appendix. It is worth noting that the "user manuals" provided by many suppliers often contain valuable descriptions of individual databases, listing searchable data "elements", "fields", etc.

Some Limitations of this Directory
The primary function of this book is to serve as a quick-reference directory. The time available to the compilers has not permitted a number of germane aspects of online databases to be examined, e.g. how particular data elements (abstracts, descriptors, etc.) for different databases are handled on different suppliers' systems; vocabulary control and indexing policies of database producers; etc.

Further Reading
Those interested in more detailed reading may care to consult some of the items in the selected reference list at the end of this Introduction.

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