The Beginnings of Indexing and Abstracting: Some Notes towards a History of Indexing and Abstracting in Antiquity and the Middle Ages

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Some eight years ago when the writer was asked to prepare a course in indexing and abstracting for his graduate library school, he felt that the first lecture ought to be devoted, at least in part, to the history of the subject. However, a search of the standard texts revealed either nothing at all in this area or an almost complete lacuna prior to the sixteenth century. Wheatley, for example, in his pioneering text, *How to make an index*, misunderstood the term *index* in Roman antiquity and unfortunately tells us:

> Cicero used the word 'index' to express the table of contents of a book, and asked his friend Atticus to send him two library clerks to repair his books. He added that he wished them to bring with them some parchment to make indexes upon.[1]

The pertinent letter to Atticus (IV.4a), in the writer's translation, reads as follows:

> . . . and bid them bring a bit of parchment from which title-tags [*indices*] are made. You Greeks, I believe, call them SILLYBOI.[2]

Although scholars might argue about the exact meaning of the diminutive *membranulam*, there is no doubt that *index* and SILLY-BOS meant the little parchment title tag which hung down from the papyrus roll to identify a work on a library shelf.

Accordingly the writer began to gather as much as possible on the subject from works on the history of the book and from collections of facsimiles of papyri and of mediaeval manuscripts. The following notes, of course, are far from exhausting the subject; but they might provide a point of departure for a comprehensive history.

Our investigation into the history of indexing and abstracting must go back to the time when man first began to do something to make information in written records more easily accessible, either by arranging the salient features in a known order, or by condensing long documents into convenient abstracts or epitomes.

The most ancient of either of these devices known to the writer is used on some of the clay envelops enclosing Mesopotamian cuneiform documents of the early second millennium B.C. The idea of the envelop, of course, was to preserve the document from tampering; but to avoid having to break the solid cover, the document would either be written in full on the outside with the necessary signature seals, or it would be abstracted on the envelop, accompanied likewise by the seals.[3]

Indexing itself finds its primitive origins in the arrangement of chapter heads or summaries at the beginning of historical or other non-fiction works. The Bible—in the absence of concordances and indexes—was in the

early centuries of this era outfitted with such summaries (*tituli, capitula, capita,* KEPH-ALAIA). It should be noted that the chapter/verse arrangements of our modern Bibles were still a long way off in the future. These summaries (*tituli*) are mentioned a number of times by Cassiodorus in his *Institutiones*[4], which he furnished with such headings at the beginning of each book to aid in finding information contained therein. While this seems somewhat far from indexing, as we know it, it did permit easier searching of data and enable Cassiodorus to cross-reference his text. Among other works from the early centuries of this era, which were furnished with summaries either by their authors or later editor/copyists, were the *Attic nights* of Gellius, Pliny's *Natural history*, the *Antiquities* of Josephus, and Bede's *Ecclesiastical history*. Undoubtedly a search into similar works would reveal a host of other titles so equipped.

An essential element in any index is the arrangement of the entries according to a known order. This may follow the usual order of the Roman alphabet, but the arrangement might follow some system of classification; or, for some kinds of works, it might be chronological or numerical. Since, however, alphabetic order is the most generally known arrangement in the West, we should take a quick glance at its use in ancient times. For this aspect of our inquiry we are indeed fortunate to have the relatively recent work of L. W. Daly, *Contributions to a history of alphabetization in antiquity and the middle ages* (Collection Latomus 90; Brussels 1967). This excellent work is to be recommended strongly to anyone interested in the history of indexing; the writer found most of his own previous researches confirmed in it and a myriad of additional data.

Why the letters of the alphabet are arranged as they are is a problem which has never been solved, although ingenious explanations have been presented.[5] The order of *aleph, beth, ghimel* goes back probably to the second millennium B.C., since this order

was already obviously established when the Greeks adopted and adapted the Semitic writing system in the early eighth century B.C. (or earlier?). In Hebrew the letters of the alphabet were sometimes used for numerals, as is evidenced by their use in some books of the Bible, e.g. Psalms 9, 24, 33, 36, 110, 111, 144 and the Lamentations of Jeremiah, where the letters of the alphabet precede individual lamentations. The Greeks inherited the order of the letters along with the alphabet itself and used it for one of their numeral systems.

Under the Ptolemies the Hellenistic Greeks of Egypt seem to have begun using alphabetic order for complicated lists of names such as one would find in a library catalogue or the tax collector's office.[6] From a close study of the fragments of Callimachus's catalogue of the Alexandrian Library and the literary references to it, it would appear that he used alphabetic order for the arrangement of authors under broad subjects. And papyrus fragments from the 'rubbish heaps' of Egypt show that alphabetic order was sometimes used in the centuries just preceding this era for lists of taxpayers from various villages and districts, which themselves also appear sometimes in alphabetic order. But the virtues of this arrangement seem not to have been universally received among the Greeks, to judge by the many lists among extant papyri which seem to have no recognizable order at all.

When we speak of alphabetic order in antiquity, we do not mean the detailed, 'letter-for-letter-to-the-end-of-the-word' arrangement so dear to the heart of the librarian. This precision was not deemed necessary either in antiquity or the middle ages, and, according to Daly, it has not completely won out even in modern times.[7] Actually, the order might be considered relatively close if it were kept through the first three letters of a word; but often only the first letter is considered in these documents. Nevertheless, these represent a start towards progress. Later on in this era there

can be found, particularly among Greek writers, an interest in alphabetic verses of an acrostic nature for presenting certain aspects of Christian thought in a mnemonic form. These so-called *Erbauliche Alphabete* are cited extensively in Karl Krumbacher's history of Byzantine literature.[8]

Religious literature was not unique in its employment of the alphabet for mnemonic purposes. The second-century author, Sextus Pythagoreus, arranged his so-called *Pythagorean sentences* in alphabetic order—a group of 123 maxims reflecting the thoughts of the Pythagorean school. And the first and second centuries of this era also saw many lexicographical compilations in alphabetic order—glossaries of terms in various fields.[9]

Also closely associated with efforts to bring out pertinent information rapidly from documents is the employment of symbols in textual criticism and hermeneutics. Aristophanes of Byzantium and Aristarchus, Hellenistic scholars at Alexandria, are probably the most outstanding for the invention of critical symbols, but a man like Cassiodorus, though of the sixth century of this era, is not to be ignored; for he worked out an elaborate system of symbols to be used in biblical commentaries, so that the student could readily find the kind of information he needed on a particular passage.[10] However, although we have in Græco-Roman times the use of alphabetic order and the employment of the *capitulatio* or placing of summaries at the beginning of certain non-fiction works, we do not—as far as the writer has been able to ascertain—have anything like an alphabetic index to a work before the Middle Ages. But now let us take a look at abstracting in classical times.

The Alexandrian scholars at the *Museion* realized the problem of the large book not only for the library, but for the reader. Callimachus may have had large, uninspired epics in mind when he wrote that a 'big book is equivalent to a big nuisance',[11] but this could well be applied practically in his days to any large work which would occupy

a number of papyrus rolls; after all, his own work, the *Pinakes*, occupied 120 rolls.[12] Therefore, from Alexandrian times many works, particularly histories and other non-fiction, were epitomized, i.e. abstracted; and often our only sources are the epitomes. But the Alexandrian critics also decided that editions of the plays of the great dramatists would be more useful if preceded by abstracts of the plots. These were called HYPOTHESEIS in Greek, and appear at the beginning of each play (sometimes in verse) along with a list of the characters. The following is the abstract (hypothesis) found at the beginning of the *Agamemnon* of Aeschylus, in the writer's translation:

Agamemnon upon departing for Troy had promised Clytemnestra that, if he sacked Troy, he would signal by beacon on the same day. Consequently Clytemnestra set a hired watch to look out for the beacon. Now when he saw it, he reported; she then sent for the assembly of the elders—of whom the chorus is composed—to make an inquiry concerning the beacon. When they hear, some sing a song of triumph. Shortly afterwards Talthybios (herald) makes an appearance and describes in detail the events of the voyage. Then Agamemnon comes on a chariot followed by another chariot in which are the booty and Cassandra. While he then goes forth to enter the house with Clytemnestra, Cassandra, before entering the palace, prophesises about her own and Agamemnon's death and the matricide of Orestes; then rushing in like one ready to die she casts down her insignia. This part of the play is admirable because it arouses fear and proper pity. Characteristically Aeschylus has Agamemnon slain off-stage; says nothing about the death of Cassandra until he displays her corpse. He has Aegisthus and Clytemnestra each rely on personal arguments for the murder: hers is the slaying of Iphigenia; his, the misfortunes of his father at the hands of Atreus. The play was staged during the archonship of Philocles in the second year of the eightieth Olympiad (459/8 B.C.). Aeschylus won first prize with the *Agamemnon, Libation bearers, Eumenides,* and his satyr play, the *Proteus.* Xenocles Aphidnaios led the chorus.[13]

It will be immediately noted that the abstract, concise as it is, contains a bit of literary criticism towards the end and includes historical data based on Aristotle's *Didascaliae.* Later on in Roman times the comedies of the playwrights Plautus and

Terence were graced with such abstracts, except that these summaries were all composed in verse.[14] The use of the abstract, however, was not confined to belles-lettres in ancient times, as is evidenced by the custom of abstracting documents of sale, forfeitures, and contracts at Tebtunis in the third century B.C.[15]

Later in the Middle Ages one can find in manuscripts of scholarly works, like histories, marginal summaries of a page's contents, a custom that has been carried over into modern times.[16] Marginal summaries can be noted in some of the ninth and tenth-century manuscripts of Justinian's code also.[17]

Another device which can be associated with the origins of indexing is the work carried out on the text of the Scriptures by Eusebius of Caesarea in dividing the Gospels into sections, numbering them, and arranging related material in the ten *Canones evangeliorum*.[18] While again this is not indexing as such, it does provide for relatively quick consultation of data hidden in long, connected textual matter.

But it is really with the general adoption of the codex form of the book that the idea of an alphabetic index becomes practical. The papyrus roll obviously did not—nor does the microfilm roll—lend itself to ready reference.

The earliest approach to an alphabetic subject index that the writer has been able to find appears in an anonymous work of the fifth century of this era, the *Apothegmata*, a list of the sayings of various Greek fathers on certain theological topics. Although originally composed in another order, it was arranged into alphabetic order in the sixth century.[19] Of course, in this age of manuscripts we must remember that exact citations are a rarity. Some authors divided their works into chapters and numbered sections, which is very helpful for citations; e.g. Cassiodorus in his *Institutiones* can cross-reference his work by referring not only to the chapter number, but also to the *titulus* of the chapter.[20] However, the 'book con-

sciousness' of Cassiodorus is almost a unique phenomenon for antiquity.

Two centuries later we encounter what amounts to an alphabetic subject index to the great fathers of the church and the Bible in the *Sacra parallela* by John of Damascus.[21] In his introduction he calls attention to his summaries or table of contents which appear at the beginning of the text:

> Furthermore, the easier to find what is sought, a list of headings PINAX TON KEPHALAION or summaries (TITLOI) in alphabetic order has been compiled; and each subject that is sought will be found under its initial letter. (Col. 1041.)

Then there follows in rough alphabetic order the theological statements arranged by keyword, with passages from the Bible and the Greek fathers illustrating them. Some examples of the subjects from the table of contents read as follows:

Letter A (Col. 1045)
The eternal Divinity PERI *Aïdou* THEOTETOS, etc.
The inevitability of God PERI TOU *Apheukton* EINAI THEON.
The incomprehensibility of God PERI TOU *Akatalepton* EINAI TON THEON.

Letter B (Col. 1050)
The kingdom of heaven PERI *Basileias* OURANON.
The counsel of God PERI *Boulês* THEOU
The help of God PERI *Boêtheias* THEOU.

Aside from this eighth-century work, however, the writer has been unable to find any other indexes of such a nature before the fourteenth century. L. W. Daly corroborates this for the Vatican Archives: 'Evidence indicates that alphabetic indexing was not introduced into papal record-keeping as represented in the Vatican Archives until the fourteenth century'.[22]

Before leaping over to the fourteenth century, however, mention should be made of the famous, early sixth-century codex of the *Materia medica* of Dioscorides Pedanius. Although the author seems not to have been very systematic in the composition of his treatise, those responsible for the now famous Vienna manuscript[23] decided to arrange the work in alphabetic order. Since the treatise deals with various herbs and other medical

materials, each having a numbered paragraph of its own, the alphabetic re-arrangement, like a dictionary, 'requires no index. The Vienna codex does have a *capitulatio* or listing of the *materiæ* in the front and, of course, this naturally falls into alphabetic order. However, it might be added that this outstanding codex, often called *Codex Julia Anicia,* is more famous for its rich illumination than for its introduction of the alphabetic approach to medicinal herbs.

With the rise of the universities in the late twelfth and following centuries and the renewed interest in theology, philosophy, and law, and particularly the passion that seemed to prevail for scholastic disputation, one is not surprised to see the beginnings of alphabetic indexing, as we know it. Disputation (debate) would require ready reference to the authorities (Aristotle, Thomas Aquinas, Peter Lombard, *et al.*).

The indexes that the writer has been able to examine from the fourteenth century are extremely simple in their make-up, but not particularly easy to read. For this was the period when Gothic script was prevalent throughout Western Europe, and when this hand is done with any speed, it sometimes becomes almost illegible for the unpractised reader. The texts of these manuscripts are usually done with some care, but the indexes seem to show all the characteristics of haste and impatience. Perhaps the texts of the manuscripts examined were copied by professional scribes, while the indexes were compiled and written by the owners.

The texts which the writer has found of fourteenth-century manuscripts in facsimile so far have all been either philosophical-theological or of the *Materia medica* of Dioscorides. In the article *(supra)* on ' Early Indexing Techniques ' two such works were examined in some detail: a commentary on the first book of the *Sentences of Peter Lombard* by Egidio Colonna and two Vatican manuscripts of Dioscorides. Since the Colonna work is written in the usual scholastic way, it consists of a number of *theses*

(statements to be proved) with explanations of terms and syllogistic arguments. These are all numbered as *distinctiones* and *quaestiones;* thus the index which lists these propositions by catchword makes citation fairly simple, e.g. ' d : 24. q. 3 ' means *distinctio* no. 24, *quæstio* no. 3. There seems to be no effort made to bring out more than one catchword from each proposition; e.g. the statement *Actio et passio sunt una res et duo predicamenta* gets an entry under *actio* but not under *passio*, etc. While such superficial indexing is easily criticised now, it must be admitted that it represents a great step forward from the mere listing of *theses* at the beginning of a work, as will usually be found in manuscripts of this century as well as in incunabula of the next. The Dioscorides manuscripts are just as simply treated in their indexes, for the numbered *materiæ* are easily cited in an index. But nothing beyond the principal item is mentioned in the index. The example of ' ink ' (MELAN) is used in the article *(supra)*; ink is described in section 825 of the work, and so the index entry is merely ' OKE. MELAN ' or ' 825. Ink '.

Although the alphabetic listing of chapter headings and *theses* represents some progress in information retrieval, it would seem, even from a survey of books printed in the next century, that our own concept of indexing is some distance in the future. For the writer surveyed as many incunabula as possible either at first hand or through facsimiles or catalogue descriptions, but he was forced to conclude that indexing was still not a very common practice, even after the mechanical multiplication of texts through printing had made the notion of an index much more feasible and practical. The writer's article cited above presents an analysis of the *Nuremburg chronicle* (1493) of Hartmann Schedel printed by Koberger.[24] Briefly it was found that most of the index entries (the index is in the front) were taken verbatim from the text and sometimes not entered under what would seem the proper keyword; e.g. the statement about the invention of

printing in Germany is entered under *Ars imprimendi libros* with no entry at all under any form of *imprimere, impressio, Germania,* or *liber.* It should be added that Koberger included his usual numbering of leaves, but the index citations give only the leaf number with no designations of recto or verso. Alphabetization, as can be expected, is rough— not ordinarily past the first syllable.

The sixteenth and later centuries are beyond our scope, but it might be mentioned that the writer found tremendous improvements in book indexes of the sixteenth century. But with the appearance of the first scholarly and scientific periodical literature in the seventeenth century, indexing in that area leaves a lot to be desired. A brief example can be seen in the index to the *Acta eruditorum* (Leipzig): in the volume for the year 1682 the *Index auctorum ac rerum* (author and subject index) divides the subjects into six general categories and under each group is an alphabetic listing of authors with the titles of their articles. But how often in the twentieth-century periodical indexes have we not found similar or even poorer treatment?

References

(1) (London 1902) p. 6.

(2) M. Tulli Ciceronis *Epistulæ*, ed. W. S. Watt, v. 2, pt. 1 (Oxford Classical Texts; Oxford 1965) p. 126.

(3) G. Contenau, *Everyday life in Babylon and Assyria* (New York 1966) p. 177.

(4) Cassiodori Senatoris *Institutiones.* Edited from the Manuscripts by R. A. B. Mynors (Oxford, repr. 1961) p. 18 (1.2.13), p. 27 (1.6.5).

(5) D. Diringer, *The alphabet, a key to the history of mankind* (3rd ed., London 1968) v. I, pp. 169-70.

(6) *Tax lists and transportation receipts from Theadelphia,* edited by W. L. Westermann and C. W. Keyes (Columbia Papyri: Greek series, no. 2; New York 1932), 'Papyrus Columbia 1 recto, 1 a-b', pp. 3-36, and 'Papyrus Columbia 1 recto 2', pp. 37-78.

(7) *Op. cit.,* p. 92: in his epilogue he remarks: 'Finally there is a curious irony in the fact that in the middle of the twentieth century there appeared at Alexandria, the birthplace as it were of alphabetization, a book which reverts to the simple first-letter alphabetic order of the third century B.C. This is the *Catalogue of the patriarchal library of Alexandria'.* He then quotes part of this list showing the following order: 'Ioannes, Ierotheos, Isidoros, Ignatios, Ieronymos'.

(8) *Geschichte der byzantinischen Literatur* (2nd ed., Munich 1897) pp. 717-720.

(9) E.g. ΛΕΞΕΙΣ ΡΗΕΤΟΡΙΚΑΙ 'rhetorical terms' in no. 1804 of the *Oxyrhynchus papyri.*

(10) The pertinent passages have been cited and discussed in the writer's *Writing and the book in Cassiodorus* (Ann Arbor, Mich. 1967) pp 46-49.

(11) *Callimachus,* ed. R. Pfeiffer (Oxford 1949-53) v. I, frag. 465.

(12) F. J. Witty, 'The Pínakes of Callimachus', *Library quarterly* 28 (1958) pp. 132-36.

(13) Aeschylus. *Septem quæ supersunt tragoediæ* recensuit Gilbertus Murray (Oxford Classical Texts; 2nd ed., Oxford 1957) p. 205.

(14) *Oxford classical dictionary,* edited by N. G. L. Hammond and H. H. Scullard (2nd ed., Oxford 1970): 'Hypothesis" pp. 535-36 and 'Epitome' p. 402.

(15) *The Tebtunis papyri,* edited by B. P. Grenfell and A. S. Hunt (London 1902-38) v. 3, pt. I, nos. 814-15.

(16) The use of marginal summaries as the basis for the index entries is seen in G. Budé, *De asse et partibus eius* (Paris 1541), an index studied by the writer in his 'Early indexing techniques: A Study of Several Book Indexes of the Fourteenth, Fifteenth and Early Sixteenth Centuries', *Library quarterly* 35 (1965) pp. 141-148; cf. pp. 147-8.

(17) E. Chatelain, *Paléographie des classiques latins* (Paris 1884-1900) plates 184, 186.

(18) D. S. Wallace-Hadrill, *Eusebius of Cæsarea* (London 1960) p. 70.

(19) L. W. Daly, *Op. cit.,* p. 64; other pagan *apothegmata* are mentioned on p. 62.

(20) *Op. cit.,* p. 47 (1.15.10).

(21) *Patrologia graeca* (Migne) 95. 1039-1588, 96. 9-442; also L. W. Daly, *Op. cit.,* pp. 63-4.

(22) 'Early Alphabetic Indices in the Vatican Archives', *Traditio* 24 (1963) p. 486.

(23) *Ms Vindobonensis suppl. graec. 28.*

(24) Hain 14508.