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How to Make an Index — 16th Century Style: Conrad Gessner on Indexes and Catalogs

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Conrad Gessner, best known to librarians by his great *Bibliotheca universalis* included in the second part of this work (a classified subject index entitled *Pandectae*) detailed instructions on the making of indexes and excerpts for scientific work, including their technical preparation. He also gave advice on the compilation of library catalogs, and listed many indexes to scholarly works known in his time. This is probably the earliest work discussing bibliographic techniques. The article contains a complete translation of the Latin text, and analyzes both the index to the *Pandectae* and others compiled by Gessner himself to his later scientific works.   (Author)

1. Conrad Gessner's Bibliotheca universalis

Contrad Gessner[1] (1516–1565), the great Swiss polyhistory, is best known to librarians and bibliographers as the "Father of bibliography", an epithet coined by one of his biographers[2]. The expression refers to the prolific author's first major work, the *Bibliotheca universalis*, which he conceived at the age of 25 and published between the years 1545 and 1549. Although this was not the first printed bibliography listing the works of many authors[3], it was the first one to be arranged according to systematic principles of description and classification which subsequently became the guiding light for generations of bibliographers almost until our own time. It also was and still is one of the largest works of its kind to be compiled by one man, and it may be considered as the earliest attempt at what is now known as Universal Bibliographic Control[4]. The *Bibliographia universalis* is almost always mentioned in works dealing with the history of libraries and the beginnings of systematic bibliography, but it has gone almost unnoticed (save for a minor contribution tucked away in an obscure festschrift[5]) that the work also contains the earliest detailed instruction on indexing and cataloging.

Gessner had planned his work in three parts: an alphabetic listing of authors and their works; a classified listing of these works by subjects; and a detailed alphabetical index to the classified part. However, only two parts appeared: the first one, published in 1545, the *Bibliotheca universalis, sive catalogus omnium scriptorum locupletissimus, in tribus linguis ...*[6] contained entries for about 10,000 works by some 3,000 authors in Greek, Latin, and Hebrew (the three "learned" languages) with brief biographical notes, summaries of contents, critical annotations, and in most cases also full bibliographic data, namely place of publication, printer's name, year, number of pages or leaves, and format. Such detailed bibliographic description was an innovation

entirely due to Gessner's own ideas about bibliographic accuracy[7]. The second part of the work, *Pandectarum sive partitionum universalium ... libri XXI*[8], (Fig. 1) appeared in 1548. (Actually it contained only 19 "books"; liber XX, on medicine, was never published[9], and liber XXI, *Partitiones theologicae*[10], was published separately one year later.) The third part was not issued at all, mainly because the first one had not sold as well as the printer, Christoph Froschauer the Elder of Zurich, had expected. A subject index to the *Pandectae* was published instead as the last part of liber XXI.

The *Pandectae* listed every work contained in the first part in classified order according to a scheme elaborated by Gessner. It divided the universe of knowledge into 21 main classes, each of which was further subdivided into several subclasses and more detailed subdivisions. This, incidentally, was the first classification scheme expressly designed for the arrangement of books[11]. Although the work consisted mostly of a straightforward listing of books under their respective subject classes, Gessner also wrote introductions to each class and subclass, occasionally digressing at length on subjects related to the contents of a class. Such was also the case when he wrote on indexing and cataloging, two topics that were especially close to his heart. They are dealt with in liber I, "De grammatica", titulus XIII, "De variis", pars 2 "De indicibus librorum". The following is a translation of the discourse on indexing (leaves 19v–20r).

PANDECTARVM SIVE
Partitionum uniuerſalium Conradi Geſneri Tigurini, medici & philoſophiæ profeſſoris, libri xxi.

Figure 1. Title page of the Pandectae

2. Gessner: "On indexes to books"

"It is now generally accepted that copious and strictly alphabetically arranged indexes must be compiled, especially for large, complex volumes, and that they are the greatest convenience to scholars, second only to the truly divine invention of printing books by movable type. Likewise, and with so much praise, those books are deservedly preferred by most scholars (certainly by those who judge them by their utility rather than by their form) to others, however elegantly written by hand. I praise in this respect the diligence of the Germans who for a long time have surpassed the French, Italians and Spaniards, because the latter's books have for the most part no indexes at all, and there are only a very few that have all too short ones. Truly, it seems to me that, life being so short, indexes to books should be considered as absolutely necessary by those who are engaged in a variety of studies, ... whether one will be reminded of something one has read before, or so that one might find something new for the first time. Because of the carelessness of some who rely only on the indexes of their inventories, lists and "pearls"[12] (as they are called as a sign of their utility) and who do not read the complete text of their authors in their proper order and methodically, the quality of those books is in no way being impaired, because the excellence and practicality of things will by no means be diminished or blamed because they have been misused by ignorant or dishonest men[13].

A method by which anyone may compile an index in the shortest time and in the best order is as follows. Whatever one wishes to refer to in an index is written down, after first having been excerpted, in no particular order on a sheet of paper of good quality, on one side only, so that the other one will remain blank. When a topic or a sentence has been treated separately a new line is started. But if a passage which you seek to index in several places by its first letter, its meaning or its subject, occurs at the beginning of a sentence, where there are several words (with single words there is no need to worry) this is alright. If not, then a capital letter or some sign, underlined in ink or in some other manner should be indicated among those entries that are to be written, so that no confusion will occur thereafter among the entries that have to be arranged. At last, all that has been written down is being cut up with scissors, and then you divide the cut slips in the desired order, first into larger parts, then subdivide again and again, however many times this is needed. Some arrange the slips after they have all been cut up. Others put them immediately into a preliminary order while cutting them up into single strips. Finally, those that have been cut with sharp scissors are separately laid out on different places on a table, or are arranged in small boxes on a table. If there are too many slips I recommend to subdivide them further, because in this way they will be much easier to sort out, and with little confusion, and it will not be necessary to move the slips in so many positions so that each one will join others in proper order. It will be easier than if one would be busy editing all slips at once in the first or second subdivision in the final and proper order. But if you wish to begin the first subdivision of the first part, put all the rest separately into boxes or between pages of a book. And thus the first part will be subdivided in the order in which you wish to have it arranged. When it has been arranged in the desired order, it may either be copied immediately or, if the original entries have been written sufficiently well (which will be better), they may be mounted with glue made from flour. If you have not used glue for wood or artisans' glue it will be easier to remove the mounted slips when wetted with water if an error has been made or else if you wish to consider another use in a new order; for which reason some prefer to paste the slips only on one side of the paper so that, if necessary, it can be cut up again.

There are those who do not mount the slips but insert them between strings of a book prepared for that purpose. They put together a book from the thickest and most solid paper available, in the form of leaves (as they are called), and from the uppermost part to the nethermost these are pierced through by strings that go straight through in four equidistant parts in the upper, median, and lower parts of the leaves. The slips are then inserted between the strings. But it is even more useful if, in addition, two strips of the same thinner paper are glued together to form thicker ones on each leaf. These strips should be exactly as long as the strings and have the width of a thumb. One of these will be pasted in the middle between the two median strings, yet not in its entire width but only on a third of its part in the middle, so that the remaining two thirds are free of glue. The ends of the slips will then be inserted between the gaps and placed beneath the strings where they will stick firmly, and the slips which have been inserted in the parts of the opposite leaf will not be mixed up with them. Another such strip will be mounted firmly in front of the first string so that it will almost touch it, the glue being put only on half of its width whereas the part that faces the string will form a gap and will be free from

TABVLA DE SINGVLIS PANDECTARVM
libris, corumģ; ordine fecundum philosophiæ diuisionem.

Figure 2. The classification scheme of the Pandectae. The main classes or "books" are enumerated in the right margin. (Leaf [8]v.)

glue. On the other edge of the leaf the same kind of strip will be mounted behind the last string, so that it faces the inner margin where books are bound and sewn together. The string at the outer margin will be put at a distance of about a thumb's width from the edge[14]. In this manner, about 100 leaves of strips and strings are built up into one volume (if there would be more leaves, the book would become too thick or would fall apart). Georg Joachim Rheticus, the foremost mathematician of this age, compiled his treatise on the discoveries of astronomy[15] in this manner.

That much I can assert with certainty, that I know many learned men who are pleased to apply this convenience to almost all their studies; whether it is something to be written or something to be taught orally in public, they collect the subject matter of their discourse roughly and arrange it in the following manner. Both material that was recently compiled, and that which had long since been acquired is being prepared for use on separate slips (not mounted) so that when needed for whatever subject is to be treated, they can produce them and select from the many slips those that serve best for the present purpose; the slips are fastened together with small pins, and are then arranged in whatever useful order one wishes to have them for the purpose of a discourse; what seems to be appropriate is noted down or left out at will, the slips then being put back again in their place. But the subject matter to be copied is partially collected from what one will have observed gradually while reading, partially from citations of authors which have been cut out of other books. For this purpose two copies are needed, of which in one the first page, in the other the second one will be crossed out in black or red ink, so that from the two books one single copy, as it were, will be made. By this method, where it is possible, one can really achieve many shortcuts of labor and various advantages to studies[16]. Verily, this is more than enough of instruction.

What has compelled me to this digression is the remarkable utility of the thing. Only he who has experienced it will appreciate how easy it is to make it. Because not only will time be saved in this manner, and the labor and tedium of writing (add to this how much it can help when writing two or more books at the same time[17] in doing everything, that is, copying, arranging, pasting) but for putting both subjects and proper names together in the best possible manner this method is almost indispensable. Truly, the use of this art is the best teacher and what we have said above properly and in a new manner will teach you how to acquire it. . . . Others are indexes to subjects, either all of them or the more significant ones, in which also proper names can be indexed (by no means all, but only the more significant ones). Published indexes to the works of most authors have mostly been made in this manner.

There are those who list in one index both subjects and names together, while others distinguish between certain categories[18] . . . Similarly, some distinguish between Greek and Latin words as in Budaeus' commentary on Pollux the Athenian[19], where in one index the Latin words, in another the Greek ones are contained. The index to the *Antiquitates* by Caelius[20], certainly one of the most comprehensive and most useful ones, combines the Greek and Latin words.
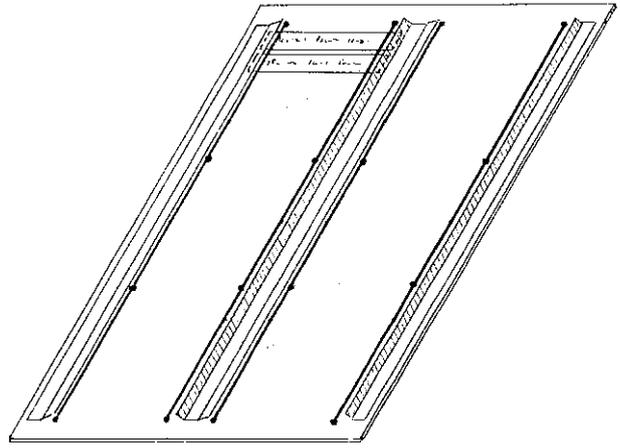

Figure 3. A leaf of an "indexing book" or ledger with strings and paper strips holding indexing slips, according to Gessner's instructions.

At present, some indexers compile indexes giving references to numbers of leaves or pages. Some of these simply add either the number of lines or they divide the area of a leaf by letters[21]. I recommend as best those which indicate the number of chapters and paragraphs[22], so that all editions of a work in whatever form would be compatible, such as the edition of Plinius' *Historia naturalis* prepared by Camers[23], however many single paragraphs there may be in some separate parts. Although many books are not yet divided into separate paragraphs, indexes can nevertheless be compiled for those works too: this division into paragraphs can still be accomplished. Lately, we enhanced the Greek edition of Aristotle's collected works, very soon to be issued by the most worthy printing shop of Isingrin, with a new subdivision into paragraphs and arguments[24]; we retained the old subdivision, preserved in Latin editions in which all of Aristotle's works are already arranged by paragraphs. We have begun and tried to do the same for the works of Cl. Galen[25]. There is no lack of those who compile indexes of books only from paragraphs, not having read the text (as they call it)[26] itself. Some put the contents of the individual paragraphs at the beginning of a work instead of an index, but this, I think, is not enough"[27].

This lengthy "digression" on indexing is followed by a brief review of some outstanding indexes, such as the one by Hieronymus Gemusaeus to the works of Galen[28], an index to Virgil's works by Nicolaus Erythraeus[29], which is singled out as being "strictly alphabetical", an index to the works of Cicero by Nizolius[30], and a general index to several Latin authors by Zanchius[31]. These works are, of course, concordances rather than subject indexes, and Gessner mentions in this context appropriately that there are also concordances to legal and theological works (without citing titles). This part is completed by a list of 17 major indexes to Greek and Latin authors (including those specifically discussed in the previous review).

The next section contains a listing of sales catalogs by well-known printers and a list of catalogs of famous libraries with which Gessner was familiar and where he had made notes towards the compilation of the *Bibliotheca universalis* (leaves 20v—21v)[32]. The word "index" is thus used by Gessner for various types of bibliographic

12

Intern. Classificat. 8 (1981) No. 1 Wellisch – Gessner on indexes

listings: first of all, for what we now call indexes to individual works, secondly, for printers' trade lists, and third, for library catalogs (which were of course still handwritten and existed in only one copy in the respective libraries)[33].

3. The compilation of library catalogs

After having listed some specific library catalogs, Gessner next embarks on another detailed explanation concerning the compilation of library catalogs and shelf lists (leaves 21v–23v). He starts with a description of the catalog of the Zurich cathedral library, compiled by his former teacher, Conrad Pellikan (1478–1556), a Hebrew scholar and theologian[34]. Taking this catalog as his paradigm, Gessner recommends to shelve books by size in two sequences — large and small — and to assign running numbers to those two sequences, written in black ink on the spines of the books. This constitutes the "ordo primus", to which two indexes should be made: one, "index primus", alphabetically by authors' names, the other, "index secundus", by number, i.e. a shelflist. In both indexes, only numbers and authors' names, but no titles are to be listed. Gessner says that if a library does not grow, this system would be sufficient. He was of course well aware of the fact that most libraries tend to grow, but his remark seems to indicate that in his time quite a number of libraries remained static or almost so. Gessner then deals with the problem of cataloging additional books. These are to be put on the shelves in the proper sequence according to their size, and be given new numbers, this time in red ink. These red numbers then constitute the "ordo secundus" and are also entered in the index secundus. Since that index can now no longer function as a shelf list, one must make a new shelf list, the "index tertius". For each of these shelf lists Gessner provides examples, using the names of 11 and 14 authors respectively, i.e. to an initial array of 11 books by different authors three more of different sizes are added, and the various "indexes" are updated accordingly. Gessner then reverts to a remark in the preface to his *Bibliotheca universalis* in which he suggested a possible use of the work as a catalog for an individual library by indications in the margins which of the books it held, adding the shelf marks taken from the "orders".

Contrary to the practical advice on the arrangement of indexes to books given in the earlier part of the chapter, these instructions for the physical arrangement of books on shelves, and the compilation of catalogs and shelf lists are complex and cumbersome, lacking any provision for the collocation of works by the same author or works on the same subject, the only criterion for the arrangement of books being their size. Gessner's own work provided of course both author and subject access, and it may have seemed to him that once such a foundation had been laid (to be updated by himself and continued along similar lines by others in the future[35]), it remained only to store books in libraries in the most economical manner, namely by size. Moreover, he was an outstanding indexer and editor who knew the techniques of indexing and the uses of indexes from firsthand experience, whereas he had never been a librarian and may have thought that one of the catalogs with which he was most familiar (because he used the Zurich

cathedral library frequently), and at that one compiled by his former teacher, must necessarily be a good example. The catalogs of other libraries were probably even less efficacious, as most were at that time nothing more than mere inventory lists.

4. The indexes of the Bibliotheca universalis and the Pandectae

The main sequence of the *Bibliotheca universalis* is arranged by authors' forenames, still following an essentially medieval custom, largely necessitated by the preponderance of authors from classical antiquity and saints, with only a relatively small number of authors who were better known by family names. This part of the work had therefore an index of authors' surnames referring to their given names, but without any other data. Readers who knew only an author's surname had to look it up in that (relatively short) index and would find all or most of his works, arranged chronologically or alphabetically, under his forename.

The *Pandectae*, being a classified list, needed a subject index. This idea which appears to be self-evident today, was also one of Gessner's innovations. Previous classified lists of subjects (and all too many that were compiled during the following four centuries) always assumed that what seemed to be a perfectly logical arrangement to the inventor of the system must necessarily also be self-evident to prospective users. It was Gessner who perceived the necessity of a subject index to a classified bibliography. In the preface to the *Pandectae* he wrote:

"To put in order what has been written is impossible unless the precise location of all knowledge has been established. This must be done, not only because there are so many and diverse kinds of subjects, but also because one and the same subject, if considered from different points of view, may belong to different branches of knowledge. And yet it is necessary that a subject be held together within its own boundaries, so that it does not intrude on others . . ."

In modern terminology, Gessner recognized the need for a relative index, and he compiled the indexes to the *Pandectae* accordingly. They are excellent examples of his proficiency as an indexer who preferred, as he wrote in his "digression" on indexes, to teach by precept rather than having to explain the art of indexing in so many words. The indexes are far superior to most other contemporary indexes of scholarly works and compendia (such as those of the many herbals which were then among the most popular reference books[36]).

The main index of the *Pandectae* was printed as the last part of liber XXI, and was announced on its title page thus: ". . . accedit index alphabeticus praesenti libro & superioribus XIX communis, qui tertii tomi olim promissi vicem explebit"[37]. It occupies 77 columns on 26 folio pages, and contains about 4000 entries[38]. Its title and brief introduction read in translation: "Combined index of the 20 books of C. Gessner's *Pandectae*. The letters *a, b, c, d* indicate the first, second, third, and fourth column of each leaf; the letter *t* indicates the book on theology". (Thus, columns *a* and *b* are on the recto, and *b* and *c* are on the verso of each leaf. Entries pertaining to the theology chapter had to be indicated specially because that volume had its own pagination.)

Intern. Classificat. 8 (1981) No. 1 Wellisch – Gessner on indexes

13

The entries are arranged in strictly alphabetical order, i.e. all letters of a word are taken into consideration in filing, a practice by no means common at that time. While each book is listed in the main part of the work only once, the same subject dealt with by different books and from various aspects is brought together in the subject index, according to the principle laid down by Gessner in his preface. A good example is the array of entries for the subject "index" itself:

Indices bibliothecarum 21 b
Indices celebriores 21ab
Indices in authores 152a
Indices in biblioa 9dt
Indices in epistola & evangelia 10at
Indices Graeci 37a
Indices typographorum 21b
Indices. ut fiunt 19d, 21c

While this is a rather detailed breakdown, and quite typical for many other entries in the general index, it is dwarfed by the wealth of entries to the 19th book of the *Pandectae*, "De iurisprudentia", the only one that has its own very detailed index, occupying 54 folio pages (leaves 348v–374v) and containing about 4,300 entries to both the civil and the canon law "in one single alphabetical sequence" as its title announces. This separate index to a single branch of knowledge (with more entries than the index to the entire work) gives us an idea what the planned full index to the *Pandectae* would have been like, had Gessner been given the opportunity to complete it on the scale he envisaged. But this was not to be, and soon afterwards he turned his energy from bibliography to the compilation of his zoological encyclopedia on which his fame as one of the outstanding scientists of the Renaissance rests. Both for this work and for many of his other books in the fields of botany, pharmacology, surgery, and linguistics he continued to provide detailed indexes which still command our admiration because, although they were compiled at a time when the art of indexing was still in its infancy, they combine erudition with exhaustiveness, accuracy and exact order – qualities not always achieved even by many modern indexes.

Notes:

1 In English bibliographies and catalogs his name is spelled Gesner (with one *s*) but this is incorrect. Like most Renaissance scholars, he latinized his name to Gesnerus, and in this form, according to Latin spelling rules, only one *s* should be written (although he used the spelling Gessnerus in his private correspondence and in legal documents, and it also occurs in some imprints of books published by his cousins Andreas and Jacob Gessner). The German form must however be spelled with two *s*. The works of the descendants of his family, some of whom became famous scholars and poets, are listed also in English catalogs as Gessner, presumably because they did not write in Latin. See also Schwerz, – "Gesner oder Gessner?" *Mitteilungen zur Geschichte der Medizin* 38 (1939), p. 231, and the introduction to my "Conrad Gessner: a bio-bibliography", *Journal of the Society for the Bibliography of Natural History* 7 (1975), p. 151–247. References to Gessner's works, followed by a letter and number in brackets, refer to the relevant item in this bibliography. A second revised and enlarged edition of the bibliography is due to appear as a monograph in 1981; this edition will also serve as the key to a comprehensive edition of Gessner's major works on microfiche, to be published by Inter Documentation Co. in Zug, Switzerland.

2 Bay, J. Christian, "Gesner, the father of bibliography". *Papers of the Bibliographical Society of America*, 10(1916) p. 53–88.

3 The first post-medieval bibliography was *De scriptoribus ecclesiasticis* (Basileae: Amerbach, 1494) compiled by the abbot of the monastery of Sponheim, Johannes Trithemius (Trit-

heim). It was, however, limited to authors of theological works and lacked bibliographical data. Gessner used Tritheim's work (with full acknowledgment) as one of the sources for his *Partitiones theologicae* see below, note 10).

4 The concept of Universal Bibliographic Control (UBC) is one of the principal concerns of the International Federation of Library Associations and Institutions (IFLA). IFLA maintains an UBC office in London to develop and promote Bibliographic tools that serve the purposes of UBC. For details, see Dorothy Anderson, *Universal Bibliographic Control: a long-term policy*. London: IFLA, 1974.

5 Escher, Hermann. ,,Konrad Gessner über die Aufstellung und Katalogisierung von Bibliotheken." (In Mélanges offerts à M. Marcel Godet . . . Neuchatel: Attinger, 1937, p. 119–127.)

6 *Bibliotheca universalis* ... Tiguri: Apud Christophorum Froschoverum, 1545. [18], 631 leaves. 2⁰. [A 16.1.a]

7 Whenever Gessner was not quite sure about a bibliographical detail he said so. For example, when listing the works of the German humanist Heinrich Bebel, he wrote "libri impressi in 4 in Germania, Tubingae, opinor" (leaf 303v). In the introduction to the *Bibliotheca* he says that the entries in some library catalogs and in booksellers' trade lists are often faulty and garbled, and mentions that he did not list the title of a Greek work whose entry in a library catalog was illegible (and which apparently he had not been able to inspect) (leaf 5r).

8 *Pandectarum . . . libri XXI*. Tiguri: Excudebat Christophorus Froschoverus, 1548. [6], 374 leaves. 2⁰. [A16.1.b]

9 Gessner was a physician by profession, and practiced during most of his life in his hometown, Zurich, where he became City Physician (Archiater) in 1554. The material on medical treatises which he had collected for the *Pandectae* was probably more voluminous than that of any of the other parts, and would have filled a substantial volume. But the printer was eager to publish the *Pandectae* as soon as possible to recover his considerable expenses, and so the medical bibliography was put off for publication at a later date. This work never materialized but some of Gessner's later works contained extensive bibliographies of medical and botanical works (the latter then also considered chiefly as medical sources). Foremost among these are the anthology *De chirurgia* (Tiguri: Gessneri fratres, 1555) [A 36] with a bibliography of the works of 110 surgeons, and Gessner's definitive edition of Galen's works (Basileae: Frobenius, 1562) [A53] which contained a complete list of all editions, translations and commentaries written up to that time.

10 *Partitiones theologicae . . . Accedit index alphabeticus praesenti libro & superioribus XIX. communis . . .* Tiguri: Excudit Christophorus Froschoverus, 1549. [8], 157, [14] leaves. 2⁰. [A 16.1.c]

11 A discussion of this scheme is beyond the limits of this paper. A brief evaluation can be found in W.C.B. Sayers's *A manual of classification* (3rd ed. rev. London: A. Deutsch, 1959), p. 105–106. Much more detailed appreciations are J. Mayerhöfer "Conrad Gessner als Bibliograph and Enzyklopädist: der Zusammenbruch der mittelalterlichen artes liberales", *Gesnerus* 22 (1965), p. 176–194, and "Die Klassifikation Konrad Gesners" in E.I. Shamurin's *Geschichte der bibliographisch-bibliothekarischen Klassifikation* (München: Verlag Dokumentation, 1967), Bd. 1, p. 115–127.

12 "Margaritae" (pearls) was a term applied to smaller compendia which summarized the contents of large encyclopedic works. One of the most popular works of this kind was Gregor Reisch's *Margarita philosophica*, first published in 1496, which was reprinted in several editions until the end of the 16th century.

13 This passage seems to indicate that subject indexes to books were at that time considered by some scholars as inferior "crutches" for lazy people, and a debasement of the books to which they were appended, because some hack writers apparently relied on indexes alone without checking the text itself.

14 A picture of a page in the book or ledger for the arrangement of index slips, based on Gessner's description, is shown in Figure 3. The technique of using slips for indexing is apparently as old as the earliest indexes. What has changed is the ease with which modern indexers can obtain ready-made slips or cards, boxes and alphabetical dividers, without having to manufacture them at home in the laborious and time-con-

14

Intern. Classificat. 8 (1981) No. 1 Wellisch – Gessner on indexes

suming manner described here. No doubt Gessner used this method himself for the compilation of the many excellent indexes which he compiled both for his own works and for those of his many friends. Considering how much time he must have spent on such mindless drudgery, it is the more remarkable that he managed to write so much in his short lifetime.

15 The reference is to the famous *Narratio prima* by Joachim Rheticus, the work in which Copernicus' heliocentric theory was first published in summarized form. The index to the second edition (Basileae: R. Winter, 1541) which Gessner lists in the *Bibliotheca* (leaf 296v) is only 4 pages long and is not a very good example of indexing technique, even by the standards of that time: page references are repeated as often as a name appears on any page, e.g. Ptolemy (who is of course frequently referred to in the book) has 62 page references, of which however only 36 are to individual pages because the locators are given as "Ptolemaeus 12, 13, 13, 13, 13, 14, 14, 15, 15, 16 . . ." While it is thus not clear why Gessner singled out this work (and implicitly its index) for special mention, this shows that he was well acquainted with the Copernican theory, published only a few years before the compilation of the *Pandectae* (where *De revolutionibus* is listed in liber VIII, "De astronomia", titulus 2 "Doctrina de motibus syderarum", with a brief annotation "in which it is asserted that the earth moves around the sun"). When he became a teacher several years later, he expounded however the Ptolemaic theory, probably because his employers, the Zurich city council, would not have tolerated any deviations from accepted doctrine, but also because the Copernican theory was too new to be incorporated into the undergraduate curriculum. It is well to remember that Einstein's theory of relativity was not immediately accepted by all scientists, and was not made part of the college curriculum until about a quarter of a century after it had been published.

16 Gessner (and probably many other scholars of his time) must have used this method extensively, because it is difficult to understand how he could otherwise have found the time to quote hundreds of authors in his many works, sometimes at great length. It seems that this was the nearest equivalent to a copying machine to which we have such easy recourse today. It is also an indication of the abundance and the relatively low price of books at that time. If the editions of the classics and of contemporary authors had been rare and expensive, Gessner who had a meagre salary and suffered from chronic lack of money throughout his life, could not have afforded to cut up books just to save the labor of copying.

17 Gessner knew what he was talking about: both then and later he was almost always engaged in writing, editing or translating "two or more books" at the same time. Apparently one ledger of index slips had to serve in a multiple capacity, the slips being arranged and rearranged to serve for the writing and indexing of more than one work.

18 The question "one index or several?" is evidently also as old as indexing itself. Gessner generally compiled two separate indexes for Greek and Latin words, and for his *Historia animalium* [A 23–30] he compiled indexes to the names of animals in as many as 16 languages, printed in four scripts (roman, blackletter, Greek, and Hebrew). He also used to make separate indexes for names of persons and things (e.g. plants, animals, minerals) and for subjects.

19 This is a slip of the pen. Guillaume Budé did not compile an index to the works of Julius Pollux, a Greek lexicographer (fl. 2nd c. A.D.). The reference is more probably to *Iulii Pollucis onomasticon . . . Rodolpho Gualthero . . . interprete* (Basileae: R. Winter, 1541–42), the second volume of which contains an index.

20 Ludovicus Coelius Rhodiginus. *Lectionum antiquarum libri XXX*. Basileae, 1542.

21 Most indexes in Gessner's time indicated not only the page or leaf but also the place of each topic on a page by indicating the exact line or (as is still being done in some encyclopedias) by assigning letters to parts of a page. Generally, each paragraph was given a letter designation, and when a book was numbered by leaves, the letters were always assigned consecutively to both sides of a leaf. Another method, used by Gessner for the index to the *Pandectae*, indicated the columns of a page or leaf by letters.

22 Gessner uses the terms "liber" and "caput", these being equivalent to our modern terms "chapter" and "paragraph" respectively.

23 *G. Plynii Secundi naturae historiarum libri XXXVII . . . additus est . . . index Joannis Camertis . . .* (Hagenoae: T. Anshelmus, 1518). This index to Pliny's encyclopedia had been published earlier as a separate work (Viennae: H. Victor, 1514).

24 This edition of Aristotle's works in the original Greek (Basileae: Isingrin, 1550) [A 21] was edited by Erasmus, based on Gessner's own annotated copy.

25 A Latin edition of Galen's works (Basileae: H. Frobenius & N. Episcopus, 1549 [A 20], arranged by Gessner into chapters and paragraphs in a new numbered sequence for easier reference, appeared only one year after he had finished the manuscript of the *Pandectae*.

26 The Latin word "textus", when used by classical writers in a metaphorical sense pertaining to a piece of writing, meant the style or structure. Gessner endeavored to write pure classical Latin, and apparently looked askance at the "modern" use of the word in the sense in which we use it today.

27 Many "tables" to scholarly works consisted merely of brief summaries of chapters and paragraphs. They were intended to serve both as a table of contents and as a substitute for an index, a practice deprecated by Gessner who provided most of his works with separate tables of contents and indexes. The subject index of the *Pandectae* is printed as the last section of the volume which was rather unusual at that time. Most indexes were inserted between the preface of a book and its text, while the "back-of-the-book" index became popular only towards the end of the 16th and in the early 17th century.

28 *Omnia Cl. Galeni opera . . . Duplex praeterea adiectus est index totius operis . . .* (Basileae: H. Frobenius & N. Episcopus, 1542). The general editor and compiler of the index was Hieronymus Gemusaeus.

29 *P. Vergilii Maronis Bucolica, Georgia & Aeneis, nunc demum Nicolai Erythraei opera in pristinam lectionem restituta & ad rationem eius indicis digesta . . .* (Venetiis: J. A. Sabius, 1539.) The index is issued as a separate volume of 392 pages.

30 Nizolius, Marius. *Observationes omnia in M. T. Ciceronis verba complectens . . .* (Basileae: R. Winter, 1536.)

31 Zanchius, Basilius. *Verborum latinorum ex variis authoribus epitome.* (Romae: A. B. Asulanus, 1541.)

32 Among these were the Bibliotheca Marciana in Venice, the Laurentiana in Florence, the Vaticana in Rome, and the library of the church of San Salvatore in Bologna.

33 The first printed library catalog, that of the Bodleian library, appeared exactly 60 years later, in 1605.

34 That catalog, compiled in 1532, which listed about 700 volumes (a number quite characteristic for the holdings of a theological library at that time) consisted of four parts: an alphabetical list of authors (with alphabetization by first letter only); a shelf list arranged by running numbers, with brief listings of authors' names and titles; a classified subject catalog with 21 classes (but not the same as Gessner's 21 classes in the *Pandectae*); and a subject index arranged by keywords, for some of which however no corresponding books were listed. (This description is based on one in reference 5.)

35 The *Bibliotheca universalis* was indeed revised and supplemented, as well as abridged, both in Gessner's own lifetime [A 16.2.a, A 16.3.a] and for a long time after his death, until well into the 18th century [A 16.6–13]. A combined and revised index to both the *Bibliotheca* and the *Pandectae* was compiled by one of Gessner's friends, Robert Constantin, in 1555 [A 16.5.a–d].

36 See Wellisch, Hans H., "Early multilingual and multiscript indexes in herbals." *Indexer* 11 (1978), p. 81–102.

37 "Accompanied by an alphabetical index to the present book, combined with one to the preceding 19 books, instead of the third volume earlier promised."

38 The number of "nearly 25,000" entries cited in Theodore Besterman's *The beginnings of systematic bibliography* (London: 1940; reprinted New York: B. Franklin, 1968), p. 18 is incorrect: there would have to be almost 1,000 entries per page which is obviously impossible. The actual number of entries per page is about 150.

Intern. Classificat. 8 (1981) No. 1   Wellisch – Gessner on indexes

15