



From the index to the single volume or issuances of the year it was but a step to the cumulative index covering a number of volumes of the same periodical. The *Philosophical Transactions* were thus provided by the Royal Society with a cumulative index for the first twelve volumes to Number 136 (1665-77, published in 1678), for Volumes 12 (Number 137)-17 (1678-93, published in 1694), and then for Volumes 1-70 (1665-1780, published in 1787). This tradition soon became so firmly fixed that Daniel C. Haskell, Bibliographer of the New York Public Library, was able in 1942 to list some four thousand cumulative indexes to important periodicals.<sup>2</sup> Haskell does not list *A General Index to the Spectators, Tatlers and Guardians*, since it was not a truly cumulative index, nor was it an index to an individual periodical. This work can, in consequence, be taken as an early representative of the index to several periodicals, the next stage in development after the cumulative index to a single periodical.

We owe one of the milestones in this form of endeavor to Jeremias David Reuss (1780-1834), librarian at Göttingen and an indefatigable bibliographer. From 1801 to 1821 appeared the quarto volumes of his *Repertorium*<sup>3</sup> which laid out, in full author and title entries in a minutely classified arrangement, "according to the order of the disciplines," and with author-indexes, the contents of the proceedings of the various academic societies of letters from their beginnings in the seventeenth century down to Reuss's date, or roughly to 1800. Unfortunately, in spite of the obvious merits of his presentation, Reuss nowhere in the work listed the series which he analyzed or gave any explanation of his method, and his work was to this extent defective.

Reuss is little used today, largely because of the antiquity of his material, but also because the specialized bibliographies of the various disciplines replaced parts of it in a superior presentation and have made reference to him superfluous. Such a specialized bibliography was *Bibliotheca Zoologiae et Geologiae*.<sup>4</sup> But he still provides an important part of the record which should not be overlooked for many kinds of search.

Developments in the indexing of periodical literature in the United States were to have important repercussions upon indexing everywhere. The immediate force behind these developments was the emphasis on rhetoric in liberal education of the time, and the resultant interest in debating. John Edmands, librarian of the Brothers in Unity, a literary society at Yale, prepared, apparently in January 1847, an eight-page printed pamphlet entitled *Subjects for Debate, with References to Authorities*.<sup>5</sup> This presented sixty-three topics, ranging from

### *Indexing and Abstracting Services for Serial Literature*

“Slavery” through “Protective Tariff” to “May an Advocate Defend a Client Known to be Guilty?” with lists of from three to thirty references under each topic, principally to the periodical literature, and in each case a citation of the call number of the copy of the book or periodical in the Brothers’ Library. This little pamphlet must have been extremely useful to the Yale debaters of the time, though no copy is listed in the catalog of the Brothers’ Library for 1851 or 1873. It is an obvious prototype of such compendia as the present *Debaters’ Handbook* series, published by the H. W. Wilson Company, a useful guide to both the periodical and monographic literature on current questions.

In 1848 William Frederick Poole, then in his junior year, became the Brothers’ librarian and proceeded to generalize upon Edmands’ accomplishment. Instead of listing selected references under sixty-three topics, he analyzed the contents of periodicals by the topics of the several contributions. The resulting manuscript appeared to possess such general interest that he took it to George P. Putnam who published it the same year as a 154-page octavo under the title *An Alphabetical Index to Subjects Treated in the Reviews, and Other Periodicals, to Which No Indexes Have Been Published: Prepared for the Library of the Brothers in Unity, Yale College*. It bore a claim of copyright in Poole’s name. It listed the contents, down to January 1848, of thirty-nine general, currently published periodicals in addition to some miscellanea, but restricted itself to those volumes not covered by cumulative indexes issued by the periodicals themselves. Its entries were by subject only. The edition of five-hundred copies, Poole related, was chiefly taken by other colleges and soon exhausted.<sup>6</sup> He immediately set about the preparation of an improved and larger work, and this, with six times the amount of matter contained in the first, was published in 1853.<sup>7</sup> The first Conference of Librarians held in New York in that year passed a resolution of commendation, and the edition of one thousand copies was again soon sold out.<sup>8, 8</sup>

Then, strangely, the subject was dropped for more than a quarter of a century. The 1853 publication possibly represented the ultimate capacity of a single individual for indexing the general periodical literature, and no organization was as yet available to take over the task. Or the time may not have been right. In 1859 the London firm of Sampson, Low, Son and Company, publishers of *The Publishers’ Circular* and *The English Catalogue*, commenced a quarterly *Index to Current Literature*, comprising a reference by author and subject to “every book in the English language, and to original articles in litera-

ture, science, and art, in serial publications." This publication regularly listed, in addition to books, the contents of twenty-six British and American journals plus transactions of learned societies, reports, and parliamentary papers. It ceased after two years.

By 1876 a revival of Poole's *Index* was a principal desideratum of library work in America, and the means for accomplishing it were discussed at the initial meeting of the American Library Association in Philadelphia that same year.<sup>9</sup> It was determined to do the work cooperatively. Poole took over the editing, fifty-one libraries cooperated, and the resultant 1442-page work, indexing the contents of 6,245 volumes of 232 serials from 1802 to 1881, appeared late in 1882.<sup>10</sup> Its immediate usefulness is attested by the fact that the British Museum (which had four copies) had to be given the right, even prior to 1891, to reprint the preliminary pages for replacement as they wore out!<sup>11</sup>

At the same time that this third edition of Poole's *Index* appeared, arrangements were projected for a current indexing service, to be cumulated at five-year intervals. William J. Fletcher, associate editor of the third edition, supervised what was at first a monthly index, prepared cooperatively,<sup>12</sup> and supplements to the 1882 volume appeared in 1888, 1893, 1897, 1903, and 1908.

It was too much to expect that the great cooperative effort which produced the third edition should continue indefinitely. As Poole himself foreboded, "When we begin to pay for service the knights leave the line, and their places are filled with retainers and camp followers."<sup>13</sup> The accomplishment that was economically feasible through unpaid cooperation became an impossibility when these services had to be bought. Fletcher's index declined from a monthly to a quarterly, and then to an annual.

At this point (1900) the program was rescued through the technological, bibliographical, and merchandizing genius of H. W. Wilson, a Minneapolis bookseller. It may be noted that Wilson received suggestions in the development of his bibliographical services from Herbert Putnam, the public librarian of Minneapolis, one of whose father's earliest publishing ventures, under his own name, had been the first edition of Poole's *Index*.<sup>14</sup> More than half a century later, in 1953, Wilson retired from the presidency of the company bearing his name to become chairman of its board. At that time it was issuing some thirty current periodical indexing services and had published, in addition, among many such works, some of the largest bibliographical compilations ever seen.<sup>15, 16</sup>

### *Indexing and Abstracting Services for Serial Literature*

A leading spirit of the first Conference of Librarians, in 1853 was Charles Coffin Jewett, the inventive assistant secretary and librarian of the Smithsonian Institution. It was to Jewett that Poole dedicated his second edition. The conference passed a resolution commending Poole's *Index*, and added, ". . . and we recommend that a similar system of indexing be extended to the transactions and memoirs of learned societies." <sup>17</sup>

Actually, this was already the second step in a campaign. In 1851 Joseph Henry, undoubtedly influenced by Jewett, had inserted into his report as secretary of the Smithsonian Institution a passage calling attention to the need for such an index.<sup>18</sup> As it became apparent that the Smithsonian could not do the job single-handed, Henry conceived the plan of dividing the work. To this end, in 1854, he addressed a letter to the British Association for the Advancement of Science offering the cooperation of the Institution in such a task. This letter was taken up at the Glasgow meeting of the Association the following year, and a committee appointed.<sup>19-21</sup> Although the proffered cooperation of the Smithsonian could not be furnished, the Royal Society of London undertook the entire task itself, later securing a subsidy from the British Treasury to effect publication. The result was the Royal Society's *Catalogue of Scientific Papers, 1800-1914*, the first volume of which, appearing in 1867, gave handsome acknowledgment to Henry for the initiating suggestion.<sup>22</sup> This monumental work, which forms for general purposes the principal index to scientific communications of the nineteenth century, extended to nineteen volumes of author-title entries, arranged alphabetically by authors' names and providing a record of the contents of 1,555 series of periodicals, transactions, reports, etc. In addition, four volumes of a subject index have been published out of a projected seventeen.

From 1867 events in the field of periodical indexing began to multiply so rapidly that it is almost impossible to record even those which would be acknowledged to have major importance. One of these, however, was John Shaw Billings' *Index-Catalogue of the Library of the Surgeon General's Office* of the U.S. Army, inaugurated in 1876, just previous to the meeting of librarians in Philadelphia which clamored for a third edition of Poole.<sup>23</sup> The *Index-Catalogue*, which has now reached its sixtieth volume, was intended to make everything in the library easily accessible to the reader, including all principal original papers in journals or transactions as well as books. These were listed in a single alphabet combining authors and subjects, and by 1948 the *Index-Catalogue* had listed 2,457,693 papers under

its subject headings, and 407,508 monographs. It became a major resource of research in the medical literature because of the comprehensiveness of the Army Medical Library's collections. Because the *Index-Catalogue* could appear only at an interval after the publications which it indexed, Billings also, in 1879, launched the *Index Medicus*, a monthly record of current medical literature. The *Index Medicus* has since become the *Quarterly Cumulative Index Medicus*, published by the American Medical Association, which aims to analyze quarterly, with annual cumulations, about 1,200 medical journals in a dictionary-catalog arrangement, while the *Index-Catalogue* has given way to the *Current List of Medical Literature* of the Armed Forces Medical Library, a monthly current listing, in table of contents order and with author and subject indexes, cumulative annually, of the contents of 1,350 journals, amounting to 104,909 separate articles last year. These two indexing services are engaged in an unequal and not well coordinated struggle, and with the use of very different bibliographical techniques, to provide a key to the ever rising tide of periodical publication in the medical field.

Though Poole, in the preface to his third edition was able to speak of Billings' *Index-Catalogue* as in some degree unique in meeting the needs of specialists, and to urge that the same kind of thing "ought to be done by other specialists for law, botany, geology, astronomy, and every other profession and science,"<sup>24</sup> the floodgates of specialized indexing were actually opening while he wrote.

The *Engineering Index* commenced in 1892 (with references from 1884), the *Astronomische Berichte* in 1893, and *Physics Abstracts* in 1898. The *Zoological Record* had commenced in 1864, furnishing a continuation to Agassiz, just as in Germany the *Zoologischer Jahresbericht* from 1879 formed a current continuation of Engelmann. *L'Année Biologique* started in 1895, and in 1896 the *Concilium Bibliographicum* initiated an indexing service for zoology and related studies both on cards and in journal form.

At the turn of the century the Royal Society of London perceived the possibility of so organizing the annual record of scientific production that a single series—the *International Catalogue of Scientific Literature*, in 17 sub-series—might eliminate the necessity for many competing and diverse publications. The attempt was heroic; it continued until the first World War, by which time it had produced nearly 250 volumes; but lack of money and international cooperation have prevented its re-creation.

After 1900 the services continued to multiply. The *Geologisches*

### *Indexing and Abstracting Services for Serial Literature*

*Zentralblatt* was established in 1901, the *Bibliography of North American Geology* in 1931, and the *Bibliography and Index of Geology Exclusive of North America* in 1933. American chemists, not satisfied with the *Chemisches Zentralblatt*, which had been going since 1830, established *Chemical Abstracts* in 1907; and *British Chemical Abstracts* was founded in 1923. *Biological Abstracts* was established in 1926; and *Excerpta Medica*, a general medical abstracting service, has appeared since 1946.

Philology had seen the rise of important services at an earlier date: the *Jahrbuch für romanische und englische Sprach und Literatur* in 1859, *Bibliotheca Philologica Classica* in 1874, and the *Jahresbericht über der Erscheinungen auf dem Gebiete der germanischen Philologie* in 1879. The Modern Language Association's *American Bibliography* commenced in 1921, and *L'Année Philologique* in 1928.

In the social sciences, the *Bibliographie der Staats und Wirtschaftswissenschaften* commenced in 1905, and *Public Affairs Information Service* in 1915. *Social Science Abstracts* ran from 1929 to 1933 and has not been resuscitated, while the *London Bibliography of the Social Sciences* has provided, from 1931, a recurrent retrospective view. *International Political Science Abstracts* started in 1951.

*Writings in American History* has attempted to provide a current record since 1906, and the *International Bibliography of Historical Sciences* since 1926. The *Répertoire d'Art et d'Archaeologie* dates from 1910, *Bibliographie de la Philosophie* from 1937, *L'Année Psychologique* from 1894, and *Psychological Abstracts* from 1927. *Palmer's Index to the Times Newspaper* commenced in 1868, and the *New York Tribune* published indexes for a few years from 1875. In 1907 the *London Times* commenced its own *Official Index*, the *Monatliches Verzeichniss* was established in 1909, and the *New York Times Index* started in 1913.

Finally, the *Index to Legal Periodical Literature*, filling a gap in the extensive panoply of legal indexing, was established in 1909.

In summary, there were available on a world-wide basis in 1951, according to a recent and demonstrably imperfect census, the *Index Bibliographicus*,<sup>25</sup> some 3,300 current periodical abstracting and indexing services "useful for retrospective searching." Of these, 1,300 were in the fields of science and technology, and 2,000 in those of the social sciences, education, and humanistic studies. A recent census by Dwight E. Gray and Robert Bray of the Library of Congress is showing that there are about 250 abstracting services in science and technology alone published in the United States.

The *Index Bibliographicus* figures refer to published indexing services exclusively, without discriminating among them. They include great comprehensive specialized services, universal in scope and coverage with respect to their specialities, as well as services which are selective within wide ranges of scope and criteria of choice. They include weekly journals which give rapid reporting and annuals which are greatly delayed, journals with an enormous range of variation in manner of presentation as well as services in card format (there are at least six of these in the United States). They do not include the important unpublished indexes which are maintained in many places and which are often the primary bases around which special research libraries are built, or which may perform primary service for research in the field. Such is the anthropological index at the Peabody Museum at Harvard.<sup>26</sup> It is in the nature of such indexes to become retrospective, though they quickly lose their value if not maintained currently. A list of them in American libraries, contained in *Local Indexes in American Libraries*,<sup>27</sup> could be extended greatly. Sometimes these indexes are retrospective from the beginning, like the index to early American periodical literature, 1727-1870, at New York University.<sup>28</sup> It is also in the nature of such indexes, if they are important to a sufficiently wide group, to be published, as the *Virginia Gazette Index*.<sup>29</sup> And they evolve into comprehensive bibliographic compendia, such as Beilstein's *Handbuch der organischen Chemie* or the *Cambridge Bibliography of English Literature*.

No library can afford to subscribe to and display all the periodical indexing services. The searcher who would make use of all the services that were possibly appropriate to a particular search would be long coming to the actual commencement of his work. Even possession of all published indexes would fail to provide a complete key to all the periodical literature in any but the smallest library. Indexing services are so varied in presentation that they cannot be displayed or made known to the searcher in any simple arrangement. They provide him with neither certitude of comprehensiveness nor the mechanisms for selectiveness, and at the same time they aggravate him with a great deal of overlapping and duplication. Gray and Bray found that 47 per cent of the articles abstracted in *Physics Abstracts* during the first six months of 1948 were also abstracted in *Chemical Abstracts*.<sup>30</sup> Barbara Cowles, for the American Library Association's Committee on Indexing and Abstracting Services, found in 1937 that a principal American indexing service in a broad field covered only 7 per cent of the known American and Canadian periodicals in this

### *Indexing and Abstracting Services for Serial Literature*

field, while at the same time 67 per cent of the periodicals which it did index were also included in another closely related index.<sup>31</sup> One of the publishers concerned promptly retorted that there would be no point in indexing all the known periodicals, since files of most of them were rarely found in American libraries. Librarians had neither asked that they be indexed nor shown a willingness to pay for such a service.<sup>32</sup> Henry Black, at about the same time, questioned whether matters of this kind should be left solely in the discretion of librarians, showing that the principal indexing services, all together, indexed only three trade union organs.<sup>33</sup> He started with the premises that there is not enough indexing but that it is yet impossible to index everything, and suggested a permanent body, on which all producing, consuming, and intermediary groups would be represented, to prescribe what should be indexed.<sup>34</sup> Mrs. Cowles similarly arrived at a proposal that there should be a coordinated and federally supported system for providing indexing and abstracting services in all major fields of research.<sup>35</sup>

The aftermath of the second World War has brought us a new round of proposals, this time based on the separate. Separates, in the form of unpublished but multifolded research reports, have become a commonplace in scientific and technological research. They have produced their own indexing and abstracting services, such as the monthly *Bibliography of Technical Reports* issued by the U.S. Department of Commerce. It has been proposed that if all articles could be printed as separates, and their distribution centralized, arrangements could be readily made by which everyone could receive publications in his field, in accordance with previously registered expressions of interest.<sup>36, 37</sup> Such systems might lead to, but would not, however, effect, a solution of the indexing problem.

The root of this problem is that indexes and abstracting services serve very different ends for different users. The librarian would like them to index, cheaply but efficiently, the contents of his library, yet provide references to material not in his library to the extent that that might be desired. He would like indexing services to be exhaustive, at least for particular journals. The professional worker, however, needs indexes, first, to keep him easily abreast of the literature of his field, and second, to serve for retrospective searches of all the literature appropriate to his subject, without regard to the limitations of one library. He is anxious, not for the exhaustion of particular periodicals but rather of articles on a particular subject, no matter where found. To both groups duplication or overlapping is

important, but in opposite directions—the librarian would prefer not to have to pay for the same material indexed several times over; the professional worker is not satisfied unless all the material of his interest is indexed in a single service. Multiplicity of services is to both an abomination, but each party would resolve the problem of multiplication in different ways.

What happens is that the professional worker tends to rely on a few services which, experience has shown him, provide the materials of his craft. Occasionally he will join with his fellow workers to launch a new service (if the common interest and the prospect of financing can be found) more nearly adapted to his immediate needs than existing services, and with little regard to overlapping with others. All these the librarian must purchase in order to facilitate the work of his clientèle, and he is shocked at the price which he is paying for duplication, yet without securing full coverage.

The professions, worried by bibliographic problems, establish literature groups or launch surveys or research projects, such as the Medical Indexing Project at the Welch Medical Library,<sup>38</sup> the Study of Physics Abstracting of the American Institute of Physics,<sup>39</sup> or the Symposium on Searching the Chemical Literature of the American Chemical Society.<sup>40</sup> At the international level, Unesco, after receiving almost unanimous complaints from the representatives of all disciplines, established an Advisory Committee for Documentation in the Natural Sciences, a Committee for the Coordination of Documentation in the Social Sciences, a committee on bibliography of the International Council for Philosophy and Humanistic Studies, and an International Advisory Committee on Bibliography.<sup>41, 42</sup> The International Council of Scientific Unions has established an International Abstracting Service.<sup>43</sup> AGARD (Advisory Group for Aeronautical Research and Development of the North Atlantic Treaty Organization) has a Documentation Committee which attempts, among other things, to coordinate abstracting services in its field.<sup>44</sup>

All of these groups, and others, have in the postwar period shown some progress, either in the improvement of existing indexing services, or even—but to a much less degree—in coordination of services in the same field. Coordination across subject areas is virtually unknown.

Where the need is so pressing and activity so prevalent, it may be supposed that improvement will eventuate. An economic crisis in the affairs of the indexing services might conceivably precipitate coordination overnight. It is hoped that this need not happen, but that services may gradually be so rationalized as to provide much better

## *Indexing and Abstracting Services for Serial Literature*

than now the characteristics of comprehensiveness, selectivity, and intercoordination with which they could render more efficient service. For such a rationalization there are a great many prerequisites, not the least of which is a general understanding and appreciation of the importance of the periodical indexing services to research and respect for them in economic support. A recent estimate, by a responsible agency, that the national expenditure for literature-searching is in the order of \$300,000,000 per year would seem to justify such respect.<sup>45</sup>

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VERNER W. CLAPP

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*Indexing and Abstracting Services for Serial Literature*

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