

## CHAPTER V

# The Present Situation

AS HAS been pointed out previously, the *Index-Catalogue* and the *Index medicus* were superb tools because they presented so much of the medical literature to the reader of their day. It is a truism in medicine, however, that not all physicians need to have access to every scrap of published information and to have it as soon as it is published. For the general practitioner and the non-research clinician, with whom medicine still remains partly an art, all that is needed is what Matthew Arnold has called, in another connection, "the best that has been thought and said." Nor is it so important to him that he get these ideas promptly. Indeed, in most western countries the law takes cognizance of this by requiring that physicians use only the generally accepted methods of practice of their day, holding them responsible for malpractice only when they do not do so. On the other hand, the law considers them not legally responsible for the consequences of their acts, if these acts are in the generally accepted mode.<sup>1</sup> Thus, the natural cultural lag between

<sup>1</sup> "The legal duty requires that the physician . . . possess and exercise that reasonable and ordinary degree of learning, skill, and care commonly possessed and exercised by reputable physicians practicing in the same locality, or in similar localities, in the care of similar cases. . ." L. Regan. *Doctor and Patient and the Law*. 2nd ed. St. Louis, Mosby, 1949, p. 17.

" . . . The physician is pledged automatically to . . . treat the patient

discovery and acceptance of a discovery is reinforced, rather than weakened, by legal safeguards. Medical research, on the other hand, requires immediate publication and immediate grasp of newly discovered facts and theories; as a result, periods of great increase in scientific information (for example, the times of Robert Boyle or of Pasteur) have also been periods when much attention was paid to the publication and indexing of new information. It should be pointed out, of course, that there are other reasons which bring about an emphasis on the publication and indexing of scientific advances; such economic facts as commercial rivalry and such social situations as wars have tended to increase the importance of knowing what has been discovered by others.

Not only is it true that the average general practitioner does not require the wealth, the detail, nor the speed of publication of the research worker; he may actually be bewildered by finding more than he has time or background to evaluate. For him, the indexing of a few books and journals in his native tongue is sufficient; and this fact explains the usefulness of such partial indexes to the literature as the *Quarterly Review of Medicine* and of sections devoted to "other literature" at the back of many general medical periodicals (for example, the *Journal of the American Medical Association*).

A number of attempts to publish indexes to only a few journals had appeared in the nineteenth century, the most

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with an ordinary or reasonable degree of skill, such as would be expected to exist in the community in which he is practicing." T. A. Gonzales, Morgan Vance, and Milton Helpert. *Legal Medicine and Toxicology*. N. Y., Appleton-Century [1940] p. 433.

important British one probably being Neale's,<sup>2</sup> published by the Sydenham Society, while the most important American one was perhaps Sajous' *Annual of the Universal Medical Sciences*.<sup>3</sup>

In 1916, the American Medical Association started a separate indexing journal, the *Quarterly Cumulative Index to Current Medical Literature* based partly on the "Guide to Medical Literature" section in its *Journal*, which was aimed specifically at the English speaking medical man who did not need to have the extensive coverage of the literature presented to him in the *Index-Catalogue*, and who did not wish to pay the \$25.00 which the *Index medicus* cost to bring him more than he needed. As originally set up, the *Quarterly Cumulative Index* gave the contents of some 157 journals commonly found in American libraries, most of them of a general or clinical nature, and many of them in English. Of these journals, moreover, it indexed only the articles which the editors thought would be useful

<sup>2</sup> Richard Neale (1827-1900) compiled his *Medical Digest* for his own use, to record the articles available to him and save him the time otherwise needed for going over each issue of each journal. It is highly selective, indexing fewer than twenty journals, and is classified according to Neale's own needs. In its various editions, beginning with the first one in 1877, it covered the literature from 1850 to 1899; its usefulness is shown by the fact that it continued to be published, although for practically all of its existence the *Index medicus* was appearing at monthly intervals and covered infinitely more of the literature. For information on Neale, see *Lancet*, 2: 1617, 1900 and *Brit. Med. J.*, 2: 1167-1168, 1900.

<sup>3</sup> For a list of other early American medical abstracting journals, see Myrl Ebert's paper, *Rise and Development of the American Medical Periodical, 1779-1850*. *Bull. M. Library A.*, 40: 243-276, 1952.

to the clinician. Titles of articles in foreign languages were translated into English, and liberties were taken with all titles in order to bring out the main subject of the article.<sup>4</sup>

The *Quarterly Cumulative Index* appeared four times a year and was cumulated at first annually, then semi-annually. It contained, in addition to its main list of articles arranged by authors and by subjects in one long alphabetical array, a list of new medical books, a list of periodicals and their publishers, and a list of new government publications pertinent to the work of the physician.

Even this comparatively simple index became a financial burden, however,<sup>5</sup> and after ten years of publication, negotiations were begun for the amalgamation of this index with the *Index medicus*.

The main mover in this attempt at union was the Carnegie Institution of Washington, which had been underwriting the *Index medicus* since 1904. As pointed out in the previous chapter, the *Index medicus*, after twenty years of aid, was still not able to continue on its own; at the same time, the *Quarterly Cumulative Index* was also having financial difficulties. Since the *Index medicus* was already listing most, if not all, of the articles appearing in the American Medical Association's publication, it seemed logical to unite the two. On the other hand, the Chicago work

<sup>4</sup> Compare this with the German Stichwort and Schlagwort indexes.

<sup>5</sup> "The Chicago index is at present maintained at considerable financial loss per annum, but Dr. Fishbein estimated [sic] that the journal will be as well-nigh self-supporting by 1933 as additional subscriptions can make it. The original subscription list has increased eight-fold during 1927-28." F. H. Garrison. Unpublished memorandum, August 5, 1929.

employed a more up to date method, which actually produced the index on time and in an easily usable form. By the 1920's the backlog of unpublished citations meant to be placed in the *Index-Catalogue* eventually had grown very large; in an attempt to provide these references more promptly, General Noble, who was librarian of the Surgeon General's Office from 1919 to 1924, proposed the publication of an annual volume to keep the *Index-Catalogue* up to date.<sup>6</sup> The publication of a joint *Index medicus-Quarterly Cumulative Index* appeared to solve that problem.<sup>7</sup> Since an amalgamation seemed the obvious answer, the Carnegie Institution agreed to underwrite the new publication until the third series of the *Index-Catalogue* was completed and the matter of the future of this work could again come up.

The Preface to the first volume of the index under its new title (1927) tells the manner in which the editing was done:

In the preparation of this number, some of the staff of the Army Medical Library have indexed and classified books, pamphlets, and articles in periodicals covering practically all the foreign medical literature, to which a condensed English

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<sup>6</sup> Rogers and Adams. *Op. cit.*, and Report of the Surgeon General, U. S. Army, 1923, p. 178. This material is also in the unpublished memorandum in files of the Armed Forces Medical Library presented at the first meeting of Committee of Consultants for a Study of Indexes to Medical Literature Published by the Army Medical Library, 24 Sept., 1948, p. 4-5, which quotes a separate report attached to General Noble's Annual Report to the Surgeon General for the fiscal year 1921.

<sup>7</sup> "Ideally, the present Quarterly Cumulative Index Medicus ought to serve all the purposes of the Annual Year Book proposed as a successor to the Index-Catalogue, as a Surgeon General's Office publication." Garrison, Unpub. memo. *Op. cit.*

abstract of the actual content of each article (without reference to the title) has been added whenever necessary or desirable. The same personnel have indexed and classified titles in English and American periodicals not covered by the American Medical Association. These cards have been sent to the library of the American Medical Association, the cards covering the remaining English and American medical literature added to them, and this material edited and brought into uniform style by the library staff and the indexing service of the American Medical Association. The redaction, printing, proof-reading, and distribution are carried out by the various departments of the American Medical Association. The relation of the Army Medical Library staff to the redaction of the INDEX [sic] is advisory.<sup>8</sup>

This division into foreign and English language journals, with the Army Medical Library being responsible generally for the foreign material and the American Medical Association for the English language works, was to come up again, as we will see later, in the discussion on the *Current List of Medical Literature*.

With the cessation of the old *Index medicus*, the last large-scale general medical index in semi-classified form came to an end.<sup>9</sup> As an explanation of this trend away from classification schemes in bibliography, it might be pointed out that at first bibliography followed the lead of scientific thought which tends to go from the particular to the universal, in a more or less inductive fashion. Such thought has generally looked for relationships and patterns to ex-

<sup>8</sup> Quarterly Cumulative Index Medicus, Preface, 1: [3], 1927.

<sup>9</sup> Although the last series of the *Index medicus* printed its subjects in alphabetical order, authors still had to be sought for in a separate author index. More properly, therefore, these volumes were neither classed nor dictionary in form.

plain what might otherwise seem to be planless and chaotic.<sup>10</sup> Sciences which can easily find orderly relations, such as mathematics or astronomy, have thus been prominent early in mankind's history; and it is probably no accident that the eighteenth century's Age of Reason should also have been an age of classifications, encyclopedias, and nosologies.<sup>11</sup>

Together with the interest in classification in science, there grew up an interest in classification of the derivatives of science, especially its literature. Unfortunately, however, the literature did not easily fit into any self-evident scheme, and almost as many classifications were developed as there were people developing them. As a

<sup>10</sup> "In the first place, there can be no living science unless there is a widespread instinctive conviction in the existence of an *Order of Things*, and, in particular, of an *Order of Nature*. . . Certainly from the classical Greek civilization onwards there have been men, and indeed groups of men, who have placed themselves beyond [the] acceptance of an ultimate irrationality. Such men have endeavoured to explain all phenomena as the outcome of an order of things which extends to every detail. Geniuses such as Aristotle, or Archimedes, or Roger Bacon, must have been endowed with the full scientific mentality, which instinctively holds that all things great and small are conceivable as exemplifications of general principles which reign throughout the natural order." Alfred North Whitehead. *Science and the Modern World*; Lowell Lectures, 1925. N. Y., Mentor Books [c1925] p. 4-5.

<sup>11</sup> "Classification is one method, probably the simplest method, of discovering order in the world. By noting similarities between numerous distinct individuals, and thinking of these individuals as forming one class or kind, the many are in a sense reduced to one, and to that extent simplicity and order are introduced into the bewildering multiplicity of Nature." A. Wolf. *Classification*. (In: *Encyclopaedia Britannica*, 14th ed. Chicago, Encyclopaedia Britannica [c1930] v. 5: 778)

result, a debate has raged for many years on the value of classification schemes for medical bibliographies as opposed to their arrangement by some non-logical sequence such as the alphabet. The earliest printed bibliographies were frequently arranged as the books listed in them had been shelved in the monastic libraries in which the compilers worked; they were thus often in broad subject groupings. Gesner chose to arrange his great work according to the divisions of higher education of his time, the trivium and the quadrivium. Later works used some other frame of reference clearly apparent to the bibliographer, if not always to the user of the work. Yet the simultaneous appearance of alphabetically arranged bibliographies of medicine, such as that of Ploucquet, showed that the non-logical arrangement sometimes appeared to have intrinsic advantages over classification schemes.

A fairly large portion of the history of the *Index medicus* was a struggle to find the best classification scheme to fit the literature appearing each month.<sup>12</sup> The scheme originally chosen was a modification by the Royal College of Physicians of the (British) Registrar General's Nomenclature for mortality and morbidity reports, which was also the classification of the medical department of the U. S. Army and Marine Hospital Service; but it was soon found necessary to modify the modifications. As Billings put it,<sup>13</sup> "Medical bibliography requires a more compre-

<sup>12</sup> Historical Outline of Indexing Publications in the Army Medical Library; Unpublished Memorandum to the Committee of Consultants for the Study of Indexes to Medical Literature Published by the Army Medical Library, 24 September, 1948, Part II, p. 4.

<sup>13</sup> *Index medicus*, v. 6, p. 1 (Preface), 1884.

hensive arrangement than is needed for returns of death and disease only." The original plan of the *Index medicus*, for example, had called for a copious annual subject index; this proved to be so difficult to construct that the annual indexes consistently appeared late. During the three-year period of the French publication of the *Bibliographia medica*, the Universal Decimal Classification was used, but this proved no more helpful than the original scheme. When the publication was again taken over by the Americans, an attempt was made for a time to have the numbers "index themselves" by subdividing the subjects in the main monthly lists, but after a while this was abandoned and the annual subject indexes reverted to. Later, as we have seen, under the aegis of the Carnegie Institution, the *Index medicus* in 1921 adopted an alphabetical arrangement of its subject headings in imitation of the *Quarterly Cumulative Index*, and provided only an annual author index.

Although Garrison, who was then editor of the *Index medicus*, said that the new arrangement was the preference of a majority of the subscribers to the journal, and that the classification used was obsolete and "little more than a scientific curiosity,"<sup>14</sup> there was enough protest about the innovation to cause him to make some concessions. By inverting and renaming headings, he tried to bring allied material into juxtaposition alphabetically, with the result that almost no one was satisfied.

In the *Quarterly Cumulative Index*, an index was pre-

<sup>14</sup> Unpublished Memorandum 1948. *Op. cit.*, Part II, p. 7. See also another discussion on the same subject: Seidell, A. Classified Index to the Current List of Medical Literature. *Curr. List Med. Lit.*, 2: Preface to no. 27, June 30, 1942.

sented which did away with a logical classification entirely and arranged its entries by the alphabet only; at the same time it interfiled authors and subjects into one long alphabetical array. This system had also been used for *Reader's Guide*, the great general literary index, and other American bibliographies prepared in the Cutter-H. W. Wilson tradition. Although this method made necessary the reprinting of citations in several places—under author and under all subjects—the number of journals and consequently the number of articles handled by the *Quarterly Cumulative Index* was so small, it was an entirely feasible arrangement. Such an arrangement made unnecessary, also, the preparation of extra indexes, which naturally speeded up the appearance and use of the primary lists.

An index which does away with a classification scheme and replaces it with an alphabetical one finds that it has a new set of problems to solve in denoting the subjects it encompasses. Where a classification system is, in a way, partly independent of the name of subjects, the alphabetical system stands or falls on its choice of names. All classification systems are, by their very nature, based on some logical method of arrangement, and once that arrangement is understood by the user of the system, it is theoretically possible to find any subdivision of the subject without recourse to words. In actual practice, of course, an alphabetical subject index to the classification scheme has always proved to be desirable, but it is not a necessary condition to its use. An alphabetical subject arrangement, on the other hand, has the problems of determining what terms are to be used, how the user is to be led from terms

which are not used to similar terms which are used, and how the relationship of one subject to other subjects is to be indicated. These are the questions of subject headings, see references, and see also references.

Although we have noted how these problems were encountered from the 17th century on, when the size of the bibliographies began to demand such guides (see the discussions of Linden and Lipenius), it was not until modern times that they assumed the serious proportions they now have. Many factors were at work here; probably the most important were the substitution of vernacular languages for Latin at the same time that certain Latin terms were retained in medicine, the changes in medical theories beginning with the 17th century, the speed of change in terminology which came with increased research and progress in medicine, and the increase in numbers and types of users of medical indexes. These were not only physicians, but also laymen of various degrees of scientific training; where Billings could say that he was preparing the *Index-Catalogue* for the American physician, his successors in medical indexing could make no such claim.

The four most commonly-used lists of subject headings in the field of medicine in the past twenty-five years have been those of the Library of Congress, the *Quarterly Cumulative Index Medicus*, the *Index-Catalogue*, and the *Current List of Medical Literature*. The *Current List* headings, however, are based upon those of the *Quarterly Cumulative Index Medicus* and then modified.<sup>15</sup> A discussion of the

<sup>15</sup> Taine, Seymour I. Subject Heading Authority List of the *Current List of Medical Literature*. Bull. M. Library A., 41: 41-43, Jan. 1953.

other systems can be found in the report of the Symposium on Medical Subject Headings held in the Pentagon in December, 1947.<sup>16</sup> One of the problems has been to compile a list of subject headings which could be used for either books or journal articles; up to now the feeling has been that subject headings for books must be different from those for journal articles, in that the latter are written on more minute subjects than the former. Recently, however, papers by Lt. Col. F. B. Rogers and Dr. Mortimer Taube have recognized the point that one set of subject headings is adequate for both books and journals, since journal articles are on smaller topics than books only in the sense that they describe one thing as modified by one or more other things—for example, an article on treatment of fractures of the patella by streptomycin. The subjects *patella*, *fractures*, and *streptomycin* are all subjects of books and journal articles indiscriminately.<sup>16a</sup>

The publication of a medical bibliography which included authors and subjects in one alphabetical array and required no further index to use it, was hailed with joy by the medical community in the early twentieth century. Why should this innovation have been received so thankfully at this time? Had some new factor or factors entered into the picture of medical literature which would, as it were, demand this change? A study of the period does,

<sup>16</sup> Doe, Janet. Critical Review of Existing Medical Subject Heading Lists. *Bull. M. Library A.*, 36: 86-93, 1948.

<sup>16a</sup> Rogers, Frank B. Applications and Limitations of Subject Headings; The Pure and Applied Sciences. (In: Tauber, Maurice, ed. *Subject Analysis of Library Materials*. N. Y., School of Library Service, Columbia University [c1953] p. 73-82.)

indeed, show changes in two particulars: the growth of the "public" medical library, that is, the medical library open to groups of readers as opposed to the medical library maintained by the physician for his own exclusive use, and the appearance of the non-medically trained librarian.

The history of public medical libraries in Europe has not yet been written. A few pages appear in the *Handbook of Medical Library Practice*<sup>17</sup> and in Thornton's work,<sup>18</sup> but on the whole there is little except a few articles on the history of individual medical libraries.<sup>19</sup> In Appendix 2 of Thornton's work, however,<sup>20</sup> there is a list of the larger medical libraries in the United States, England, and some continental countries arranged chronologically by the date of their founding. The earliest library listed there is the Bibliothèque Nationale, which began collecting medical literature in 1518; if the earliest entirely medical library is sought, it is found to be the Bibliothèque de l'Ecole Supérieure de Pharmacie, which was founded in 1570. Earlier medical collections also existed in monastic and other libraries, of course. From 1600 until 1900, the newly founded medical libraries take three and a half pages to list; from 1900 to 1941, when the list ceases, there are

<sup>17</sup> Doe. *Handbook . . . Op. cit.*, p. 1-6.

<sup>18</sup> Thornton. *Op. cit.*, Chapter 12: Medical libraries of today, p. 203-217.

<sup>19</sup> See, for example, André Hahn's work, *La Bibliothèque de la Faculté de Médecine de Paris*. Paris, Librairie le Française, 1929, p. 32, which shows that the books in that library were chained in 1519. Another non-monastic, sixteenth century medical library was connected with the Royal College of Physicians in London.

<sup>20</sup> Thornton. *Op. cit.*, p. 244-249.

enough medical libraries to fill two more pages. If this proportion is fairly accurate, it would appear that medical libraries grew much more rapidly in the twentieth century than at any previous time in history.

This growth of public medical libraries was probably due, in part, at least, to the growth of the medical literature itself. When few books and journals were published, it was possible for the physician to obtain them all personally; it was also possible for him to house them in his own home or office. And finally, a smaller literature made it possible for the physician to read a large portion of what was being issued as it appeared and to use his own memory to locate pertinent items later when wanted. Under such a system the indexes to the literature could cover fewer works; moreover they would appeal more to the user if they were arranged by some classification scheme which showed not only what was exactly pertinent to the question in hand, but what was closely related. Since the user of the index was also the scholar in the field, he knew the relationships between its parts and could locate peripheral material of value to his investigation.

As the literature became larger, however, the financial burden of obtaining and housing it became too great for the individual physician, who then proceeded to "club" together with other physicians in his neighborhood to obtain the material jointly. The growth of libraries of local societies and academies of medicine in the United States in the nineteenth century can easily be explained on these grounds. At first there was probably nothing more than a physical pooling of resources; as the number of volumes

in these academy libraries increased, it was found necessary to make better provision for their care and use. A reading of some of the early reports of these libraries shows that this provision was frequently in the person of one of the physicians, or of a retired or handicapped physician, who looked after the books physically, often made some kind of catalog of them, and, for the few hours the library was open, helped the other physicians in locating the material they wished to consult. Two things usually took place soon after the turn of the twentieth century which broke this cycle: either the physician who had acted as librarian died and it was found impossible to locate another one who would take on the task as a volunteer or at the meager salary offered by the local society; or else the collection got so large it was necessary to provide the librarian with one or more assistants. Sometimes, indeed, the two things took place at the same time in the same place.

The obvious answer to the inability to get a physician-librarian at the salary the local medical society would pay was to get a woman to do the work. This economic fact was strengthened by the emergence of schools of librarianship, the first of which was founded in 1887, whose graduates were able to bring more order and efficiency into the library than their predecessors had been able to do.<sup>21</sup> The

<sup>21</sup> The lack of interest of men in entering the indexing field was noted by many people. Garrison pointed out in his memorandum of August 5, 1929, that "as an eminent authority (Mr. Herbert Putnam, Librarian of Congress) observed to Col. Ashburn, enthusiastic workers of this kind are no longer to be found among the male sex. The obvious solution was the Chicago idea—a large and efficient female personnel." It should be pointed out, however, that he was referring to library indexers.

fact that these trained librarians did not know the field of medicine, however, had serious implications for medical indexes. As pointed out earlier, the literature of medicine had grown to the point where the average physician could not read it as it appeared. It had also become so voluminous that finding one's way around it was becoming a specialized undertaking hardly possible for the amateur. More and more the physician began to ask the librarian to "work up the literature." In delegating this responsibility to another, the physician was acknowledging that he would not or could not find what he needed to know. It is not surprising, therefore, that the user of the medical indexes gradually became not the physician but the librarian untrained in medicine. But it was difficult for a person untrained in medicine to make the most effective use of an index requiring a knowledge of the subdivisions of the subject and their relationships. Where it might be obvious to the physician that tumors of the jejunum could be found in works on diseases of the gastrointestinal tract, for example, it would not be *a priori* knowledge of the librarian without the medical background.

There have always been physicians who have found the alphabetical arrangement easier to use than the classified one, however, as Billings learned when he examined comments on the *Specimen fasciculus*; and it is generally true today in American medical libraries that the librarian can use a classified bibliography more expertly than the physician. Another fact which bears on this problem is that Americans have always seemed to prefer alphabetical indexes, while Europeans seem to prefer a classified arrange-

ment. As the publication of important medical bibliographies shifted from Europe to America, alphabetically arranged lists became more common, and because more common, more easily used. Perhaps a final reason for the preference of American physicians for the alphabetical arrangement in the second half of the nineteenth century was their experience in using the *Reader's Guide* and the *Annual Library Index*, both arranged alphabetically.

For these reasons then—that scientific literature did not lend itself easily to classification, that periodical literature had become too large for the physician to cope with it himself, that salaries in most medical libraries were too poor to attract medically trained librarians, and that Americans supplanted Europeans in the publication of important medical indexes—the value of classified medical bibliographies became less and the value of alphabetically arranged dictionary bibliographies greater. It seems to follow that as long as these conditions continue, the alphabetical arrangement will be preferred.

Because the form used by the *Quarterly Cumulative Index Medicus* made it easy to use, both for the physician and the non-medically trained librarian, it was an immediate success. Moreover, the Army Medical Library was relieved of its responsibilities for producing a current index and the American Medical Association was able to utilize much of the literature collected in the greater library in Washington without itself having to acquire it. Theoretically, therefore, the union was a symbiotic one; in actual practice it was soon found impossible to edit successfully in Chicago material to be seen only in Washington. In 1931, therefore, the agreement between the two

libraries came to an end, with the understanding that the American Medical Association would continue to publish the enlarged *Quarterly Cumulative Index Medicus*.

The new series of the *Quarterly Cumulative Index Medicus*, a series entirely under the aegis of the American Medical Association, started up in 1932 and continued without major alterations in style, format, or indeed fundamentals, until the outbreak of the second World War. At that point it became more and more difficult for the American Medical Association to publish its index on time. A printers' strike and other technical and personnel difficulties appeared from the 1940's on. At first the quarterly features of the work were dropped so that it appeared semi-annually only. Even this schedule had to be abandoned after a year or two, however, until, at its worst (in 1950 and 1951), the *Quarterly Cumulative Index Medicus* was more than two years behind its publication date. In an effort to help, the Association decided to abandon its publication schedule, omit at least one volume entirely for the time being, and present the more modern materials first. The period January-June, 1949, has up to 1954 never been covered by the *Quarterly Cumulative Index Medicus*, and there is some question whether this bibliographic gap will ever be closed.

With the cessation, for all practical purposes, of the *Quarterly Cumulative Index Medicus* during the war years, the medical public had to look elsewhere for its indexes. Although some issues of the German *Berichte* and *Zentralblätter* were available in the United States through the Office of the Alien Property Custodian and its reprint program, American holdings were rather spotty, particularly

after 1944; the British and American indexing and abstracting tools, many of them begun at this period in an attempt to fill the vacuum left by the non-appearance of the usual German tools, compared unfavorably in scope, coverage, or tone with the earlier works. Again the bibliographic world turned to the Army Medical Library for aid.

In 1941, an enthusiastic research chemist and philanthropist, Dr. Atherton Seidell, who wished to popularize the use of microfilms by scholars at a distance from adequate libraries, presented some photoduplicating equipment to the Army Medical Library and paid much of the incidental expense for preparing free microfilms of articles in the collections of the Army Medical Library. This service was geared especially to the needs of medical officers outside continental United States, but it was also available to many others. It was soon realized, however, that in order to make the service popular, it was necessary to inform potential users of what could be obtained on microfilm. For that reason, as founder of a Friends of the Army Medical Library group, Dr. Seidell arranged to have some of the cards of the *Index-Catalogue* copied each evening after the Library was closed and published by photo-offset in a weekly list of the contents of some of the more useful journals received in the Library. This was called the *Current List of Medical Literature*. According to Dr. Seidell, it was purposely made small to fit into a man's pocket and flimsy so that readers would have no qualms about marking it up or discarding it when its usefulness had passed. The list had no author or subject index, although a rough grouping of the journals into fifty broad subjects was fol-

lowed. The plan on which the *Current List of Medical Literature* was based can be traced back as far as the eighteenth century.<sup>22</sup> Among others, two modern predecessors were the Japanese index, *Index universalis dissertationum originalium artis medicinae e libellis periodicis extractus* (*Igaku Gentyo Sakuin*) (Mukden, Manchurian Medical College, 1920) and the American journal, *Current Titles from Biological Journals . . .* volume 1, numbers 1-3 (May-July 1937). It appears, however, that Dr. Seidell was not aware at the time of these earlier indexes.

The *Current List of Medical Literature* continued on its way for several years without being of more than secondary interest to most librarians or to physicians with access to medical collections. In 1945 costs exceeded private means and the journal was taken over by the Army Medical Library as a government publication. When the *Quarterly Cumulative Index Medicus* ceased to appear regularly, however, a greater degree of interest was shown in this publication, especially since its coverage was probably greater than that of any other current medical index available for general distribution. As a result it was put to uses for which it had never been designed, and immediately its weakness in its role of ranking index to medical literature became apparent. The Army Medical Library considered that the publication of a periodical index was a responsibility of the national medical library; therefore, it at-

<sup>22</sup> See, for example, the *Commentarien der neuern Arzneykunde*. Tübingen, v. 1-6, 1793-1800; for modern counterparts, see also the *Indice medico progressivo de la literatura Española*. Barcelona, v. 1, 1945/46.

tempted to do away with the most glaring deficiencies. A monthly subject index (made from the cards originally prepared for the *Index-Catalogue*, and never from the articles themselves) was added in July 1945, a list of the journals indexed was placed on the back cover of the issues, and finally an author index was attached. However, it was clear that the fundamental structure of the work was wrong for the use to which it was being put, and the very necessary complete overhauling was finally made for the issue of July, 1950, which appeared almost simultaneously with the cessation of indexing for the *Index-Catalogue*.

The cessation of the *Index-Catalogue* at this time was brought about by several causes. Although the cost of publishing the *Index-Catalogue* was one reason for discontinuing it, a more important consideration was the fact that it was lagging further and further behind in presenting the medical literature to the medical community and it was felt that an entirely new system was needed to answer modern needs. For that reason, the Committee of Consultants for the Study of the Indexes to Medical Literature Published by the Army Medical Library (which is discussed in more detail later) appointed a Subcommittee to make recommendations on the *Index-Catalogue*. This Subcommittee consisted of Dr. Basil G. Bibby, Dr. Sanford V. Larkey, Dr. Mortimer Taube, and Dr. Eugene W. Scott as chairman. It met several times and on October 20, 1949, it made a report to the whole committee. The entire committee then drafted its recommendations and sent them to the Surgeon General of the Army through the Director of the Army Medical Library:

*Recommendation No. 1*

The *Index-Catalogue* should be stopped as soon as it is administratively possible to do so. This means that the Subcommittee feels that the publication of the present series should not be completed and that the volume now in preparation should be the last volume of the *Index-Catalogue*.

*Recommendation No. 2*

The Army Medical Library should continue to develop an indexing program of its current receipts of current material. Initially the publication from this indexing program could probably best follow the general pattern of the *Bibliography of Agriculture*, and might be developed from the *Current List*.

*Recommendation No. 3*

Consideration should be given to publication of a catalogue of selected monographic material from the backlog, including theses and dissertations in a dictionary arrangement by author and subject.

*Recommendation No. 4*

The present backlog of cards intended for use in future volumes of the *Index-Catalogue*, minus the cards for the monographic material already provided for, possesses values that should not be lost. Methods of utilizing these cards should be developed by the Army Medical Library.

*Recommendation No. 5*

Selected non-current monographic material to be received in the future should be included either in the current index or in some other catalogue of monographic material. Non-current serial publications should be carefully recorded as to whether or not they have been analytically indexed.

After studying the recommendations of the Committee, and consulting with others, the Surgeon General approved the recommendations, and indexing for the *Index-Catalogue* stopped as of April 1950. Plans have been made for publishing one final volume (series 4, volume 11, MI-MZ), which is expected from the printers about June 1955, and for printing the lists of monographs, as suggested by the Committee. In addition, the unpublished portion of the *Index-Catalogue* is available to users through the Armed Forces Medical Library's photo-duplication service, which will make microfilm and photostat copies of the cards for a small fee; however, the estimate of the cost of reproducing the entire file has been so great it has not been possible to consider that.

In the light of the Committee's recommendations that a new current indexing scheme be developed by the Army Medical Library, the *Current List of Medical Literature* was expanded. Under the new set-up, it changed from a weekly to a monthly publication, and it was divided into two parts in each issue: the register, consisting of a list of the tables of contents of each journal, with the journals listed alphabetically without regard to their subject interest; and the index, containing the author and the sub-

ject entries. By the use of this arrangement, it is possible to locate articles by author, by subject, or by journal issue. Cumulations of the index portion were planned for: the first cumulation for the six-month period, July-December 1950, the second cumulation embracing the entire year 1951, with subsequent cumulations planned on a semi-yearly basis. Several changes have been made in the subject headings used, the most far-reaching of which appeared in the January 1952 issue. This group of changes was in the direction of a semi-classed index, and was based on the belief that users of a medical index must bring some knowledge of the subject to the work.<sup>23</sup>

In 1953, as in 1926, there were two American indexes to medical literature, each covering some of the same ground as the other. In 1953, the *Quarterly Cumulative Index Medicus* and the *Current List* between them indexed about 2000 journals. Of this total, approximately a third were covered in both indexes, while two thirds appeared in one or the other only. (In general, the *Current List* has had more Slavic publications and more in such fields as pharmacy and dentistry than has the *Quarterly Cumulative Index Medicus*.) Under these circumstances, it is not surprising that suggestions have once again been made for the amalgamation of the two tools, or for the division of the entire field between them so that less overlapping would occur. It is argued that the money spent in indexing a third of the journals twice could be better used for adding titles to the total indexed. For this reason two different solutions are usually offered: one that the two indexes jointly

<sup>23</sup> Taine. *Op. cit.*

prepare a single tool, and the other that certain journals be indexed by one of them and others by the other.

With the experiences of the earlier attempted amalgamation still vivid, it has seemed difficult, if not impossible, for one index to be prepared jointly, although this might be considered the logical course by all concerned. Another suggestion, that the American Medical Association turn over to the Army Medical Library its annual outlay for the *Quarterly Cumulative Index Medicus* and let Washington publish the one index in its own way, has understandably met with a cool reception.

The second suggestion has fallen on the barren ground of lack of clear-cut criteria for division of the field. If the *Current List* is to publish an index to one group of journals, which group should it be? Language, country of origin, and subdivision of the subject of medicine have been the three most often suggested break-downs. Any one of these, however, is likely to result in one index which contains the popular journals, thus making that index a success from the point of view of subscriptions; and another index with the less used magazines read by a comparative handful of people. For these reasons, consequently, although both the Armed Forces Medical Library and the American Medical Association agree that some form of cooperation should be worked out, no concrete plans have been approved as yet.

#### OTHER TOOLS

In order to fill in some of the background of medical indexing in the first half of the twentieth century, some mention should be made of 1) *Excerpta medica* and 2) the

efforts of UNESCO to bring about adequate but not overlapping indexing. *Excerpta medica* is an attempt to use the techniques worked out for the less voluminous literature of the nineteenth century (especially by the *Berichte* and *Zentralblätter*) in a twentieth century situation. UNESCO, which started with such enthusiasm and high hopes for the future, has not been in existence long enough to produce much that is tangible in the field of planning for medical indexing.

*Excerpta medica* is an abstracting journal published in Holland but in the English language. It is divided into sixteen subject sections, such as Anatomy and Physiology, Tuberculosis, or Radiology, each of which can be purchased separately if desired. Within these sections the articles, abstracted by specialists in the field, are arranged according to a broad classification scheme reminiscent of the German tools of which *Excerpta medica* can be said to be the descendant. An alphabetical author index appears with each issue; but there is no subject index until the appearance of the annual author and subject index for each section which is sent to all subscribers as much as one year late. Beginning in 1951, *Excerpta medica* appeared in photo-offset form to allow it to appear more quickly and more cheaply.

Although *Excerpta medica* was advertised to include *all* medical literature, its coverage only approaches that of the *Quarterly Cumulative Index Medicus*, or the *Current List*, as was shown by a recent study at the Armed Forces Medical Library. It is also more selective within these journals, but the fact that it presents English abstracts of articles in foreign languages has made it useful to the many American

physicians who read nothing but English. Many small libraries find *Excerpta medica* especially useful because it brings them knowledge of material which they can then obtain from larger libraries. Its coverage and methodology have grown noticeably better since its founding. Under the general guidance of UNESCO it has recently collaborated with other European indexing tools in joint publication of some of its abstracts; and as a by-product of its central work, it has attempted to sell its services to groups, such as the National Foundation for Infantile Paralysis, which are interested in specific subject bibliographies.<sup>24</sup>

Since it was felt after World War II had ended that the void left by the discontinuance of the German indexing and abstracting tools had to be filled, a number of attempts were made to launch new works, of which *Excerpta medica* was just one.<sup>25</sup> The large number of such publications made duplication of effort inevitable; yet none of these tools (nor indeed all of them put together) was able to present a comprehensive coverage of the world's medical literature. Under these circumstances the aid of UNESCO as a unifying force was sought, and a series of conferences of editors, librarians, and others interested in indexing

<sup>24</sup> Fishbein, Morris. Recent Developments in Medical Indexing' Bull. M. Library A., 40: 116-121, 1952.

<sup>25</sup> Bloch, Maxene Hubbard. New Abstracting Tools in the Field of Medicine. Bull. M. Library A., 36: 53-58, 1948, and International Federation for Documentation List of Current Specialized Abstracting and Indexing Services . . . (International Federation for Documentation. Publication No. 235, 1949). This list, however, contains many journals which are not really abstract journals, but which have abstracting sections.

and abstracting in the field of biology was held under UNESCO's auspices.<sup>26</sup> A meeting on a similar subject was also called by the Royal Society in London.<sup>27</sup> These conferences all came to the conclusions that 1) more information was needed about the use made of indexes and abstracts and 2) cooperation might do away with some of the overlapping of present services or even make it possible to extend the coverage of the world's literature. Although several minor schemes of cooperation have been worked out as a result of the meetings, no large-scale change in the methods of indexing medical literature has resulted from UNESCO's conferences on bibliography in the sciences. As a preliminary, an attempt has been made to learn the boundaries of the problem by determining how many medical periodicals exist to be indexed currently; a UNESCO publication *World Medical Periodicals*, a list of all medical periodicals known to the compiler, the Information Officer of the *British Medical Journal*,<sup>28</sup>

<sup>26</sup> Many reports of these meetings have been published. UNESCO. Co-ordinating Committee on Abstracting and Indexing in the Medical and Biological Sciences. Report. Paris, 1950. (Pub. no. 580) and International Conference on Science Abstracting, Convened in Paris by the UNESCO during June 20-25, 1949. Final Report. Paris, UNESCO, 1951. Cunningham, Eileen R. Report on United Nations Educational, Scientific, and Cultural Organization Conference on Co-ordination of Medical Abstracting Services. Bull. M. Library A., 36: 38-45, 1948; Medical and Science Abstracting: Conclusions and Recommendation from Two International Conferences. *Ibid.*, 38: 125-134, 1950, and *Ibid.*, 40: 474-478, 1952. Report of the Committee on Bibliography, Medical Library Association. *Ibid.*, 40: 462-464, 1952.

<sup>27</sup> Royal Society's Scientific Information Conference. *Op. cit.*

<sup>28</sup> Morton, Leslie T., comp. *World Medical Periodicals*. Paris, UNESCO, 1952.

was scheduled to appear in 1952, but was held up by legal difficulties and finally appeared in 1953.

Attempts at international cooperation in scientific bibliography have tended to go from a first enthusiastic response to a more cautious one and finally to be discarded with more or less fanfare. This has been the fate of the *International Catalogue of Scientific Papers*,<sup>29</sup> the Universal Decimal Classification, and the Brussels Institute's *Concilium bibliographicum*.<sup>30</sup> While it is too early to write of UNESCO's present ventures as another in a series of international failures in bibliography, it is unfortunately true that little has yet been done to maintain the high hopes of five years ago.<sup>31</sup>

There were probably a number of reasons contributing to the lack of success of UNESCO's efforts, but perhaps the most important was that those meeting under the sponsorship of UNESCO have not really concerned themselves with the fundamental problem of bibliography in the mid-twentieth century: which is that for a number of reasons the systems worked out for listing the smaller literature of the nineteenth century are now inadequate. For one thing, the literature has grown so large that

<sup>29</sup> See the reports of meetings on the subject in *Science* from 1898 to 1914. A good summary of the history of this tool is given in: Murra. *Op. cit.*, p. 24-53.

<sup>30</sup> See *ibid.*, and Richardson, Ernest C. *The Brussels Institute Again!* Lib. J., 52: 795-801, 1927.

<sup>31</sup> It must not be forgotten that the role of UNESCO is to act as a coordinator and to encourage groups working together toward the same goal. UNESCO itself is not organized to carry on projects of its own; even should it wish to do so, its funds would be inadequate for any such task.

methods requiring individual handling for coding and retrieving of the information take too long. For another thing, useful medical literature is now being published in places and in languages where previously it had been unknown; the task merely of learning about the existence of this literature has become enormous, to say nothing of the problems of obtaining or storing it. Third, science itself has shown a tendency to retreat from its most advanced international position to publish more national bibliographies.<sup>32</sup> And fourth, there has emerged on the medical scene the separately published report, such as the reports of government projects concerned with medical contracts, many of them restricted in circulation because of their bearing on military security. To none of these problems did the conferees seem to pay the same attention they did to the problem of joint international cooperation (especially through national bibliographies, which is UNESCO's recommended pattern). What is needed is not something to persuade the groups to work together, but some new plan on which they can all work with some chance of success.<sup>33</sup> What is needed are entirely new methods to handle the large group of items (books, journal articles,

<sup>32</sup> Adams, Scott. National Medical Indexes. Bull. M. Library A., 38: 238-245, 1950. UNESCO has also encouraged this tendency, as leading eventually to a universal bibliography.

<sup>33</sup> "The position had been reached where almost every scientist and technician agreed that something should be done but nobody could decide on the exact course of action or, if they agreed on the course of action, they could not put forth concrete proposals for implementing it." E. M. B. Ditmas. Co-ordination of Information: A Survey of Schemes Put Forward in the Last Fifty Years. J. Documentation, 3: 209-221, 1948, especially p. 220.

or near-printed reports) with ease and dispatch, and these no one so far has been able to determine, in spite of the large number of people in all fields working on the problem.

One problem, which has already been discussed in passing in this chapter, has begun to be studied in more detail, however: that of learning who uses the bibliographies and indexes to the medical literature and in what way they use them. The answers to these questions would obviously give some indication of the most useful form for medical bibliographies, and several attempts have been made to come to grips with the problem; unfortunately few investigations have yet emerged which could stand any examination of their methodology. On one hand, the universe in such a study is extremely large; on the other, the variables are not sufficiently well known to make sampling an accurate technique. As a result there have been several reports of answers obtained by questionnaires or interviews with limited groups of scientists and librarians, which leave many doubts as to the validity of their conclusions. Many have resorted to random samples; in some cases the questions have not been standardized; and in other cases the questions have actually been "stacked," whether consciously or unconsciously, so that answers have inevitable biases. Many of the findings have never been published.<sup>34</sup>

<sup>34</sup> For some of these see: Bernal, J. D. Preliminary Analysis of Pilot Questionnaire on the Use of Scientific Literature. (In: Royal Society's Scientific Information Conference, *op. cit.*, p. 589-637); Bray, Robert S. Physics Abstracting Study of the American Institute of Physics. *Spec. Lib.*, 40: 248-250, 1949; Armed Forces Medical Library Research Project. Unpublished reports; Cunningham-Morgan-UNESCO—Personal communication, and Herner. *Op. cit.*

Since different groups use medical indexes in different ways and with different backgrounds, it is imperative to find the answer to this question. In 1876 this was easy; Billings remarked that he was preparing the *Index-Catalogue* for the English speaking physician. Today, however, so clear-cut an idea of the ultimate user of the indexes now being compiled is lacking.

Faced with "this appalling post-war bibliographic chaos"<sup>35</sup> those concerned with bibliographic problems in medicine have reacted in one of three ways: they have concluded that nothing can be done to better the situation and have given up trying, or they have retreated into the comfortable psychological position of saying that what is unindexed is unimportant,<sup>36</sup> or else they have looked to the development of a machine to do some of the work which has proved too great for the human population to undertake. Although over-enthusiasm and wishful thinking have caused some people to expect more from machines than any

<sup>35</sup> Murra. *Op. cit.*, p. 47.

<sup>36</sup> "Two universal characteristics of those in this group are that they rule out the great uncounted masses of material which they have not mastered (without having seen it, and thus without having any idea of what is in it) by indicating that it is probably sour stuff anyway, and by the fact that the material referred to is always written by someone writing in some ungodly tongue, or some ungodly style, or, as a least common denominator, by someone other than the one who happens at the moment to be decrying the low quality of the mass of material excoriated." Ralph R. Shaw. *Machines and the Bibliographical Problems of the Twentieth Century*. (In: *Bibliography in an Age of Science*; Windsor Lecture, Presented at the University of Illinois, March 1950. Urbana, University of Illinois Press, 1951.)

of them can perform,<sup>37</sup>:<sup>38</sup> they do represent the twentieth century's attempt to find a new solution for its new problem and as such are a hopeful sign of flexibility of mind.

Although there has been much discussion about machine methods in bibliography, all the machines suggested for this purpose appear to be of one or two basic types: they either store the material compactly or else they scan and sort the material very rapidly, with special emphasis on interrelationships between parts of subjects. The most advanced machines, indeed, appear to do both at once.<sup>39</sup>

Storing of information can again be broken down into two main divisions: either the original is stored photographically (as in microfilm, microprint, or memex) or information about the original is coded and the coded portion stored as a pointer to the original. (The marginally punched card, the Hollerith punched card, and the magnetized tape are examples of the latter method.) Sorting, whether of punched cards or of microfilm in the Rapid Selector, has generally consisted of matching a pattern

<sup>37</sup> "Machines do not now, nor will they in the foreseeable future, handle the intellectual aspects of bibliography." Ralph R. Shaw. *Management, Machines, and the Bibliographic Problems of the Twentieth Century*. (In: Shera and Egan. *Op. cit.*, p. 202.)

<sup>38</sup> "Nevertheless the central problem remains; no machine can by itself, make the initial record and classification . . ." Ditmas. *Op. cit.*, p. 220.

<sup>39</sup> According to Shaw, there are five main classes of machines used for bibliographic purposes: storage devices, mechanical sorters, mechanical sorting and addressing devices, electrical sorting and reproducing devices, and electronic sorting and reproducing devices. Shaw, R. R. *Machines and the Bibliographical Problems of the Twentieth Century*. *Op. cit.*, p. 45. See also his: *The Future of the Serious Book*. *Stechert-Hafner Book News*, 6: 68, January 1952.

of blank spaces, dots, holes, sounds, etc., with a master pattern representing the coded information desired. In this discussion only the problems of locating the information contained in the literature will be considered; while the storage of literature physically is an extremely important matter, especially considering its exponential growth, it is outside the limits of this work. We are concerned here only with the problem of making the existence of the information known to the user of medical literature.

### PUNCHED CARDS

Punched cards used for bibliographical work are of two main kinds: those in which the punches appear only on the periphery of the card, and those in which the punches appear at any point on the card. (See Figure 7.) The marginally punched cards are generally used for shorter compilations (usually not over 10,000 items)<sup>40</sup> or where information must be added to the cards frequently, while the interior-punched cards (known as Hollerith or IBM cards) are used more frequently for larger series and where relationships are particularly important. Since in the first system only the edges of the cards are punched, the rest of the card can be used to indicate the bibliographic citation by words, by an abstract or microfilm of the work, or by any other pertinent information. Indeed, this is the great advantage of marginally punched cards; that they

<sup>40</sup> Zeising, H. C., Jr., and Martin, P. T. Commercially Available Punched-Card Systems, Equipment, and Supplies. (In: Casey, Robert S. and Perry, James W., eds. *Punched Cards; Their Application to Science and Industry*. N. Y., Reinhold, 1951, p. 39-75.)



can be read directly after they have been sorted, while the IBM cards must be run through a machine which "interprets" the pattern of punches.

Another difference between the two kinds of cards has been the detail which can be coded into the cards. Because the number of notches which can be cut into the marginally punched card is not so large as the number of holes which can be made in the IBM card, the fineness of subdivision of coding in the latter has usually been far greater than that in the former system. In general there are eight punches per inch in the peripherally punched card; in a card eight by ten inches there are thus 288 possible punches. In the standard IBM card, on the other hand, there are eighty vertical columns usually divided into twelve punching positions, for a total of 960 possible punches,<sup>41</sup> although new devices have raised this number greatly, and new methods of random punching have made this less important than previously.

A third major difference between the two methods of using punched cards is that the peripherally punched card can be entirely hand operated, while the IBM card is always dependent upon machines for coding, for sorting, and for decoding ("interpreting").

Since there has been much published in the last few years on punched cards,<sup>42</sup> it seems unnecessary to describe

<sup>41</sup> *Ibid.*

<sup>42</sup> See, for example, Casey, Robert S. and Perry, James W., eds. *Punched Cards; Their Application to Science and Industry*. N. Y., Reinhold, 1951, which contains a long bibliography and a review of previous work; and also Mooers, Calvin J. *Zator Technical Bulletin*, no. 30, 31, 51, 55, and 57 [mimeo.]

here the techniques of coding, punching, or sorting punched cards. What will be discussed instead is the impact of such methods upon bibliographic work in the medical sciences.

In using punched cards for medicine, the first thing that must be done is to determine the items to be coded and punched. Most commonly this is the subject or subjects treated in the work, especially the interrelationships between them. Occasionally the authors of the work, the publication in which the title appeared, or other factors may be punched. Up to this point the work has been no different from that of older methods of indexing medical literature, which is, indeed, the reason why punched cards have not solved the problems of medical bibliography. (A further discussion of this point is given below.) The advantages of the new system, on the other hand, are that more concepts can be coded than was economically feasible under the old system, and that no set verbal list of subjects (subject headings) need be used on the card itself. This coded information must, of course, be punched onto the card, checked for accuracy, and filed.

A further disadvantage in the use of these coded cards is that it is not possible to go to one section of the compilation and immediately pull out the desired information, as is true of the more conventional indexes and catalogs. It is said that one of the advantages of punched cards is that they can be kept in random order; but this advantage has the accompanying disadvantage of making it necessary to sort the entire collection of cards each time an item coded onto them is desired. Since in a collection of any size this is an important disadvantage, many punched

card systems have reverted to some system of filing the cards, which in itself is an added expense. The delay in use caused by the need to "interpret" IBM cards before use has already been mentioned.

Punched cards have not cut the cost of indexing medical literature because the most expensive part of this in the past has been the adding of a subject designation for each item to be listed (books, journal articles, reports, etc.) and this cost still remains. The reproduction of subject information, once determined by the indexer, has been standardized and made relatively inexpensive by such devices as the use of clerical help to type the main portion of the citation, or the distribution of information widely by means of photo-offset, micro-photography, and the like. The new method of bibliography by punched cards has not in any way done away with the main cost, the indexing of each item separately by a skilled worker; in addition the results are not so easy to use, the file cannot be used by several people at one time, the cards cannot be "published" in the normal sense of the word without much re-arrangement and editorial work. In addition, the interpolation of costly electrical devices and machines between the IBM punched cards and the user has raised the total cost of indexing by IBM cards to more than the cost of the older methods.

For all these reasons, punched cards have not been accepted for any large-scale indexing of the medical literature, which publishes more than 100,000 journal articles yearly,<sup>43</sup> although punched cards can certainly be used in

<sup>43</sup> The Current List of Medical Literature for 1953, for example.

this way. In general they have been employed for indexing smaller segments of the total literature, usually by one person for his own use.<sup>44</sup>

#### ARMY MEDICAL LIBRARY—JOHNS HOPKINS PROJECT

An attempt to study bibliographic methods scientifically was made by the Army Medical Library in 1948. By this time it was apparent that there was no current index to a large segment of the medical literature, for the *Quarterly Cumulative Index Medicus* was suspended and the *Current List* had not yet changed to become the real index it was later to be; the British Medical Association's *Abstracts of World Medicine* and *Abstracts of World Surgery* were handling only small portions of the total literature, and the German indexes were largely unpublished from the war years on. Even the *Index-Catalogue*, which could only be of partial assistance for locating current literature, was unable to keep up its previous publishing schedule. As the group most intimately connected with publishing medical indexes over long periods of time and with receiving requests for bibliographic aid from those who had tried other sources unsuccessfully before approaching them, the Army Medical Library was naturally particularly concerned with the situation. At the suggestion of Colonel J. H. McNinch, then Director of the Library, the Surgeon General of the Army in 1948 appointed a Committee of Consultants for the Study of Indexes to Medical Literature Published by the Army Medical Li-

<sup>44</sup> For a list of some of these projects, see Casey and Perry. *Op. cit.*, p. 460-488, especially p. 471-473.

brary, and arranged for a Research Project at Johns Hopkins University to undertake fundamental investigations into the problems of medical indexing. The Committee originally consisted of: Drs. John F. Fulton, Morris Fishbein, Ebbe C. Hoff, Sanford V. Larkey, Chauncey D. Leake, William S. Middleton, Eugene W. Scott, Ralph R. Shaw, Lewis H. Weed, and Miss Janet Doe.<sup>45</sup> The Office Order which set up the Committee also authorized the Research Project "to study . . . problems, gather factual data, analyze such data and explore the possibility of using mechanical aids in the preparation of indexes." Results of these studies were to be made available to the Committee, which in spite of its name, was charged with examining "the indexing requirements of modern medical science" as well as the place of the Army Medical Library in the scheme of medical bibliographic control.

Soon after the Research Project was set up at Johns Hopkins University, its director, Dr. Sanford V. Larkey, presented three major aspects of the work to be undertaken.<sup>46</sup> These were: "1.—Evaluation and study of our present indexes. 2.—The detailed study of subject headings. 3.—Study of the possibility of using machine methods." Dr. Larkey also reported on the project at each annual meeting of the Honorary Consultants to the

<sup>45</sup> Bull. M. Library A., 37: 92-94, 1949, and Office Order No. 47, Office of the Surgeon General of the Army, 7 July 1948. See also the Committee's Final Summary Report, 1948-1952. Amer. Documentation, 3: 219-222, Fall 1952.

<sup>46</sup> Larkey, Sanford V. The Army Medical Library Research Project at the Welch Medical Library. Bull. M. Library A., 37: 121-124, 1949.

Army Medical Library from 1949 to 1952. Much preliminary work has been done by this Project and although it has not been possible so far to reach any very important conclusions, several useful by-products have come about through the efforts of this group: notably a categorization of subject headings used in the preparation of the 1950 and 1951 *Current List*, and an IBM punched card list of medical journal titles. With more time and money, more rigorous planning, a more stable research staff, and a more easily defined subject than was available to the Research Project, more might have been expected. It must not be forgotten, however, that this Project represents the first large-scale attempt to use the methods of experimental science in bibliographic problems; as such it can obviously be incomplete and inconclusive and still be the most important modern development in medical bibliography.

#### PRESENT STATUS

Although the successful solution of the problems of medical bibliography appear to depend upon some system or method which will be worked out in the future, the need for a knowledge of what is being published is present at the moment, and a picture of how this problem is being met *at the moment* is needed to round out the story.

There appear to be at least three different approaches to the problem in use today. For the average physician, the literature is adequately enough covered by one or several indexing and abstracting tools which make no attempt to be exhaustive. Chief among these are the *Current List of Medical Literature*, *Quarterly Cumulative*

*Index Medicus* (late as it is in appearing), *Excerpta medica*, and specialty journals and abstracting tools (for example, *Cancer Current Literature*, *Psychological Abstracts*, or the *International Abstracts of Surgery*). For the research worker, there has also been a dependence upon indexes and bibliographies which are not purely medical in nature but which do include large sections of medical information; the title most used in this connection is *Chemical Abstracts*, with *Biological Abstracts* a runner-up. Since most journals of this nature exclude clinical material (with varying degrees of completeness), they are of little use to the clinician; however, their fairly prompt appearance and generally workmanlike contents may make them especially useful to those working in medical fields which are covered by these works. (For example, pharmacologists find *Chemical Abstracts* valuable, and those working in tropical diseases find the entomological sections of *Biological Abstracts* helpful.)

The third approach to modern literature is taken by those who are librarians, editors, bibliographic assistants, historians, and the like. These people must go to a large number of sources to obtain the material they are seeking; consequently they must be aware of many works in the field, know the advantages and shortcomings of each, and be prepared to use each in its most appropriate place. These are the people who must understand the law of the diminishing return in bibliographic work, who must realize that a large per cent of all the citations found on any subject can be obtained in a certain small number of indexes (varying, of course, with the subject), but that the culling

of the remainder may make it necessary to scan a large number of tools.<sup>47</sup> These are the people most aware of the shortcomings of modern medical bibliography, and most aware, too, of both the large number of tools which attempt to solve some of the problems and the theories and research being done now on new methods in the field. Both their training and their daily experience make them more aware of the gaps in the medical indexes than any other group.

#### THE FUTURE OF MEDICAL BIBLIOGRAPHY

What of the future of medical bibliography? It would indeed be a rash person who would make any predictions about the future. As shown in the earlier pages of this work the schemes of the past have one by one been found to be inadequate to the present situation; at the same time medical bibliography has not yet discovered a new method which can handle the task it must perform if medicine is to continue to advance.

Indeed, it might be said that medical literature and the indexes to it have engaged in a never-ending game of leap-frog; each time medical bibliography has seemed to solve the problem of making available the information in the literature, that literature has grown in size or complexity or has developed new forms, which has again required new methods for its listing. Unfortunately, we have not

<sup>47</sup> Brodman, Estelle. *Methods of Choosing Physiology Journals*. Master's Essay. N. Y., Columbia University, 1943, and Lancaster-Jones, E. *Evaluation of Scientific and Technical Periodicals*. Rept. 15th Conference ASLIB, 1938; p. 72-81, 1939.

yet devised a system which will make the total literature published today available to those who need it; at the same time the earlier systems have not been able to absorb today's literature. The present, indeed, is like the condition described in Isaiah, a time between the times, when the old world has died and the new world has not the strength to be born.<sup>48</sup>

In such a situation there are only two possibilities: either the world of medicine must learn to be content with circumscribed goals and a return to a more haphazard knowledge of what has been reported in the total literature, or else an entirely new system of bibliographic control must be evolved, a system which is able to accept exponential growth of the literature without dislocation. For the latter there must be first a determined effort to decide what is necessary and desirable in medical bibliography, and second, long-term work of a rigidly scientific nature to examine and experiment with possible solutions of the problem. This work must be conceived in the same terms as similar work in industrial laboratories, as an investment for possible future rewards, critically reviewed for its methodology at intervals, and using "teams" of all the pertinent scientists to discover and test its proposed solutions. It must have money and the time to grow. But above all it must have the interest of really good thinkers and the cooperation of the physicians using the literature.

The great problems which have beset medical bibliography in the past have thus been the size of the literature, the inability to obtain all of it or information about

<sup>48</sup> Isaiah, 37: 3; II Kings, 19: 3.

it, the forms in which it has appeared, and the difficulty of classifying it. These problems still exist; only their quantity, not their quality, has changed. Just as in the past all the problems have never been solved at any one time, so it is questionable whether they ever will be solved entirely. Yet while the ideal solution is sought, which will bring at a moment's notice all the medical literature published anywhere and at any time, it is important to realize that not only must the present methods do for some time to come, but that they have not entirely broken down for everyday life. It is thus necessary to work pragmatically at keeping those methods going as well as possible. Like the philosopher who insists there is no world of reality but lives his everyday life as if there were, medical bibliography is now in the position of crying that lack of control of the literature is disastrous, yet continuing to make refinements in the obsolete system. Medical bibliography in a sense must work simultaneously on two tracks: the long-range ideal solution, and the present-day pragmatic answer.