Lecture.

METHODS OF RESEARCH IN MEDICAL LITERATURE.¹

BY JOHN S. BILLINGS, M.D.,
Surgeon, United States Army, Washington, D. C.

WHEN I promised to speak briefly at this meeting on medical bibliography, it was not because I had anything new to say on this subject, but because it seemed possible that a few remarks might start a discussion by the medical writers and teachers of this Association as to the methods which they have found useful, and as to what they think can and should be done here to facilitate this kind of research. From the days of Galen to the middle of the seventeenth century, bibliographical work was the most important business of the medical teacher. The great majority of the writers of the Middle Ages busied themselves, not so much with observation of facts, or with experimental inquiry, as with seeking to find out what Hippocrates, Galen, Avicenna, and other old masters had said about the matter. When the discovery was made that, in order to determine the precise anatomy of a part, the function of an organ, or the results produced by a disease, it was best to look for one's self, instead of consulting the fathers, and when this discovery had become popularized, bibliographical and historical research fell for a time into neglect. Within the last fifty years, however, there has been a revival in interest in the collection of medical libraries and in historical research, which last has become a necessity in many cases, if one would avoid doing useless work. Attempts to learn what has been done, or said, or thought, by our predecessors are due to widely different needs, and may be pursued by widely different methods.

As specimens of subjects with regard to which bibliographical work is most frequently called for, I give the following:

(1) To gather and compare the records of all reported cases of particular forms of abnormality, disease, or injury. The rarer and more anomalous the abnormality or the disease, the more important it is to find the widely-scattered records.

(2) To obtain statistical data with regard to the circumstances affecting the prevalence of a certain disease, the relative frequency of particular symptoms, and the comparative merits of different modes of treatment, or the results of special operations.

(3) To obtain information as to details of methods which have been tried in experimental physiology, pathology, or pharmacology, and as to the results; in order to avoid waste of time in devising apparatus, or in trying methods, which have been already found worthless, or to obtain suggestions as to new modes of experimentation.

(4) To trace the origin and development of medical organization in a particular city or country, or to gather materials for a biographical sketch of some celebrated physician, or for the history of a medical society.

(5) To obtain data for a comparison of the laws and customs of different countries affecting medical education, or the right to practice, or the care of the insane, or public hygiene, etc.

In literary research for biographical purposes, or to trace the development of theories or institutions, the

work must be done mainly by the writer himself; and, while at the commencement he may be greatly helped by systematic works of medical bibliography, he will soon find himself wandering off into all sorts of curious by-paths and out-of-the-way corners, into which he is led by obeying the golden rule for this kind of work, namely, to "verify your references." In the first book which he consults he will probably find two or three references, which will indicate to him as many different books or articles which he will wish to consult. When he gets these, each of them will probably give a few more references, to be hunted up in like manner.

Meantime, it will not be an unprecedented or very remarkable occurrence if, in the course of his reading, he stumbles over several interesting points not precisely connected with his original quest, but still having some relation to it, and which it seems a pity not to look up while he is about it, so he makes note of these, and of the references connected with them, and sends for a fresh lot of books. He finds, also, that some of his quotations are erroneous, that "some one has blundered or plagiarized," and proceeds with a sense of refreshment and satisfaction to hunt down the culprit. And so the work expands, for, as Teufelsdröckh remarks, "any road will lead you to the end of the world." To those who like this sort of literary work it has a great fascination, and there are few educated men who do not enjoy a short hunt of this kind, if they have time and facilities for it. From a strictly utilitarian and merely pecuniary point of view, the results of such bibliographical excursions are not usually very remunerative, but they afford capital mental exercise, and occasionally result in the production of some really interesting and valuable additions to medical literature.

Men engaged in this line of research do not usually, except just at first, care much about subject catalogues or indexes. They know what books they want to see, and the catalogue which interests them most frequently is a catalogue of authors in alphabetical order. The questions which they ask of the librarian are something like the following: Have you got such a book in the library? Who is the author of a book having such a title? John Smith published a book about such a date—what is its title? I want to see all the books that Peter Brown wrote or edited. How many editions were published of "Jones's Surgery," and what translations were made of it? When did the *Ohio Medical Repository* begin and end, and who were its editors? These are all simple questions, which almost any physician can answer for himself by the aid of good, ordinary author-catalogues.

If the question is as to a collection of laws regulating medical practice in Brussels, or the number of supplements to the "Catalogue of the New York Hospital," some physicians might be troubled a little to find the desired information in an author catalogue, not knowing the rule that a government or corporation is considered to be the author of its laws, reports, etc., and that, therefore, Belgium is the author of the first book, and the New York Hospital of the second.

But while a simple alphabetical catalogue of authors will serve many purposes in bibliographical research, and is, perhaps, the one most used by the librarian, there are many points on which it fails to give the desired information, and for which bibliographical lists or subject-catalogues are desirable; and just here

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a few definitions may be useful. By a bibliography I mean a list of titles of books, and of references to articles or paragraphs which relate to the subject in hand. By a critical bibliography I mean a list in which shall be indicated those books or articles which are of real value, as containing some addition to knowledge. In many, perhaps most, cases, such lists are best published in chronological form, thus indicating the successive dates on which new information was given; but, in making them, the use of separate slips or cards, arranged in alphabetical order, is the most convenient. The more complete such lists can be made, the more valuable they are, but often too much time is wasted in attempts to make them absolutely perfect. The great thing to be kept in view is to make them accurate as far as they go, and one of the best means of doing this is to indicate distinctly for each title quoted as to whether you yourself have or have not seen and examined the book. It should be constantly borne in mind that the proper object in giving bibliographical lists is not to impress the reader with the extent and variety of the author's research, but to give him the means of verifying the author's statements, and of pushing the research further. It is analogous to giving details of methods used in an experiment in physiology. Hence the references given should not be too condensed. They should be so clear, that from them it shall be easy to find the books, and for this reason I ask your attention to the desirability of using a uniform system of abbreviations of titles of journals and transactions in referring to them, and venture to suggest that the set of such abbreviations given at the beginning of Vol. VII of the Index Catalogue may be found useful for this purpose.

I have elsewhere called attention to the essential differences between medical bibliography, properly so called, and subject-catalogues of particular libraries. No matter how large and complete a medical library may be, its subject-catalogue can never form anything like a satisfactory medical bibliography; it only makes a good foundation for one.

On the other hand, when you wish to use bibliographical lists prepared by others, you have usually much difficulty in finding some of the books referred to, while the references which you do find in a subject-catalogue of a given library, can at all events be verified by visiting that library. The labor of preparing bibliographical lists, and of research, after one has been furnished with such a list, is in many cases very considerable, and such work can usually only be carried on to advantage in a large library. As this is preëminently an age of division of labor, it is natural to apply this principle also to bibliographical research. There are many cases in which what may be called mechanical bibliography and literary research may be used to excellent advantage, and the field for this kind of work will expand in the future. It is especially applicable in those cases, indicated in a preceding part of this paper, in which it is desired to compare the records of cases and operations, and to prepare statistics. It is often much better for the busy practitioner to have this work done for him than to attempt to do it himself, and especially is this the case if he does not easily read other languages besides his own. It is true that by employing others to do such work, he loses both pleasure and instruction, but the field of professional work and study is now so wide that it is impossible for any one man to cover it all, and he

must be content with coöperative effort. It is also true that such work is not only sometimes expensive, but that it is often difficult to tell beforehand what it will cost. There are several physicians in Washington who are willing to undertake work of this kind in the library of the Surgeon-General's Office, for physicians at a distance who cannot conveniently visit this city, and their charge for such work, hunting up references, making abstracts, translations, etc., is one dollar per hour. You can readily see that there can be no very definite relation between the time occupied and results produced: a half-page abstract may require two hours to prepare, or it may be done in ten minutes, and sometimes it may cost less to purchase a pamphlet than to obtain an abstract of it in this way. Nevertheless the demand for this kind of work is steadily increasing, and a supply will arise to meet the demand.

In order to obtain satisfactory results from bibliographical work done in this way it is necessary that the points to be looked up shall be stated as concisely, and as precisely, as possible; in other words that the person who requests the search shall know clearly what he wants. I have elsewhere called attention to this by quoting the warning which is printed on the title-page of the Washington City Directory, namely, "If you want to find a name in this directory, you must know how to spell it," which is the same as the old Latin proverb, "qui nihil affert, nihil refert." When I receive a letter stating that the writer is about to prepare a paper for his county medical society; that he has selected for his subject, tumors of the liver, or locomotor ataxy, or the causes of insanity in modern times; and that he would be glad to have as complete a list of references as possible to all articles, reports of cases, or statistics connected with these subjects,—and that his paper must be prepared in two weeks,—I know of course that what he wants is one of the recent encyclopædias of medicine, and advise accordingly. The problem is not always so simple, however, and I must confess that I am sometimes very much puzzled as to what to reply to some of the queries which I receive. Nevertheless, we are all learning gradually how to use medical libraries, and in a few years more I predict that the wonder will be how we ever got on without them.

I have here a few of the books which are most used in this library for subject-references, a list of which is appended to this paper. I include in this list the catalogues of certain libraries for reasons already given. For other valuable works consult in the index-catalogue the headings, Bibliography Medical, Biography Medical, and Medicine, History of. With regard to the index-catalogue of this library, with which you are all more or less familiar, I may say that its most important defects are those of omission, that is, the failure to give under subject-headings all the references to books and articles actually in the library which really belong there, and it requires a little practice to enable one to get the best results from it.

There are many books and journal articles which different men would classify under different heads, and in most cases when one consults the index for a particular subject he finds more references than he cares to be bothered with, although the list is almost always incomplete owing to the fact that we have not yet obtained all the medical books which have been printed. We are, however, making fair progress in this direc-

tion; I think we now have over three-fourths of all medical books which have any special value or interest, and at least two-thirds of all the medical literature which has been printed.

In consulting the index on any given subject it will usually be found possible to select from the rather formidably large mass of titles those which are most likely to be of interest by giving a little attention to author's names, to the place and date of publication and to the number of pages and plates, if it is a journal article. The cross-references should be consulted, and under the headings to which these will guide you will often be found new cross-references which should also be looked up.

Since the year 1800, about one-half of the medical literature which has been published, consists of medical journals and transactions. Nine-tenths of the demands made on this library are based on references to this class of literature, and it is therefore of the greatest importance in medical bibliography. The number of medical journals and transactions now received by this library, excluding those devoted to pharmacy and dentistry, is over seven hundred, and it has been steadily increasing for the last five years.

If we take Ploucquet's *literatura medica digesta* to be as complete an index of the medical literature in existence at the beginning of this century as the index catalogue is of the medical literature now in existence, it is evident that the number of references has more than quadrupled during the present century. Nine-tenths at least, of it, becomes worthless, and of no interest within ten years after the date of its publication, and much of it is so when it first appears. Of that which is really new and good a large part is pretty promptly made use of by systematizers and compilers, but there is also a considerable portion which we cannot use in our present state of knowledge but which become valuable building material hereafter. To get this roughly sorted out, classified and labelled, so that it can be found when wanted, is the object of indexing; to bring it into use is the object of bibliography.

One of the most useful pieces of work which could now be undertaken for the benefit of medical writers and investigators would be the preparation of a dictionary of critical bibliography of medical bibliography, in which should be indicated for each subject in alphabetical order a reference to where the best bibliography relating to that subject can be found. This could only be well done by a coöperation of a number of writers, each taking a special field.

I have not attempted in this brief paper to eulogize bibliography or to comment on the desirability that there should always be a few men interested in the study of the history and literature of medicine. I think that you will all agree with me that they may be sources of much pleasure, and that this alone is a fairly good reason for giving them some attention, and for exerting the influence of the profession to make it possible in at least one place in this country to carry out such studies with a full supply of material.

And while the librarian is in one respect only a sort of hod-carrier, who brings together the bricks made by one set of men in order that another set of men may build therewith—he is apt to take quite as much pride and satisfaction in the resulting structure, provided it be a good one, as if he had built it himself; and he has constantly unrolling before him a

panorama which, though at times a little monotonous, contains as much wisdom, humor, and pathos, as any other product of the human intellect with which I am acquainted.

LIST OF BOOKS MOST USEFUL FOR REFERENCE.

- Haller (Albertus). *Bibliotheca botanica, qua scripta ad rem herbariam facientia a rerum initiis recensentur*. 2 v. 4°. Figuri, apud Orell, Gessner, Fuessli, et soc., 1751.
- Heffter (Joh. Carolus). *Museum disputatorium physico-medici tripartitum*. Ed. nova. 4 pts in 2 v. 4°. Zittavie lusat. sumt. Schoepsianis, 1763-4.
- Haller (Albertus). *Bibliotheca chirurgica, qua scripta ad artem chirurgicam facientia a rerum initiis recensentur*. 2 v. 8°. Bernæ et Basileæ, Haller et Schweighauser, 1774-5.
- Haller (Albertus). *Bibliotheca anatomica qua scripta ad anatomicam et physiologiam facientia a rerum initiis recensentur*. 2 v. 4°. Figuri, apud Orell, Gessner, Fuessli et soc. 1774-7.
- Haller (Albertus). *Bibliotheca medicinarum practicarum qua scripta ad partem medicinarum practicarum facientia a rerum initiis ad a. 1775 recensentur*. 4 v. 4°. Basileæ, Joh. Schweighauser; Bernæ, apud Em. Haller, 1776-8. Tome IV. Ex ejus schedis restituit auxit et edidit Joachim Diterich Brandis ab anno 1686 ad a. 1707.
- de Ploucquet (Guilielmus Godofredus). *Literatura medica digesta sive repertorium medicinarum practicarum, chirurgicarum atque rei obstetriciarum*. 4 v. in 2. 4°. Tubingæ, J. G. Cotta, 1808-9.
- Watt (Robert). *Bibliotheca Britannica; or a general index to British and foreign literature*. 4 v. 4°. Edinburgh, A. Constable & Co., 1824.
- Jourdan (A. J. L.). *Dictionnaire des sciences médicales. Biographie médicale*. 7 v. 8°. Paris, Panckoucke, 1820-25.
- Dezeimeris (J. E.). *Ollivier et Raige-Delorme. Dictionnaire historique de la médecine ancienne et moderne, ou précis de l'histoire générale, technologique et littéraire de la médecine, suivi de la bibliographie médicale du dix-neuvième siècle, et d'un répertoire bibliographique par ordre de matières*. 4 v. in 7. 8°. Paris, Béchet jeune, 1828-39.
- à Roy (Cornelius Henricus). *Catalogus bibliothecæ medicæ*. 5 v. 8°. Amstelodami, L. van Es, 1830.
- Forbes (John). *A manual of select medical bibliography in which the books are arranged chronologically according to the subjects, etc.* 8°. London, Sherwood, Gilbert & Piper, 1835.
- Callisen (A. C. P.). *Medicinisches Schriftsteller-Lexicon der jetzt lebenden Aerzte, Wundärzte, Geburtshülfer, Apotheker und Naturforscher aller gebildeten Völker*. 33 v. 8°. Copenhagen u. Altona, 1830-45.
- Choulant (Ludwig). *Handbuch der Bücherkunde für die ältere Medicin zur Kenntniss der griechischen, lateinischen und arabischen Schriften im ärztlichen Fache und zur bibliographischen Unterscheidung ihrer verschiedenen Ausgaben, Übersetzungen und Erläuterungen*. 2. Aufl. 8°. Leipzig, L. Voss, 1841.
- Bibliotheca medico-historica sive catalogus librorum historicorum de re medica et scientia naturali systematicus*. 8°. Lipsiæ, sumpt. G. Engelmann, 1842.
- Holtrop (Leonardus Stephanus Augustus). *Bibliotheca medico-chirurgica et pharmaceutico-chemica, sive catalogus alphabeticus omnium librorum, dissertationum, etc., ad anatomicam, artem medicam chirurgicam, obstetriciam, pharmaceuticam, chemicam, botanicam, physico-mediam et veterinariam pertinentium, et in Belgio ab anno 1790, ad annum 1840 editorum*. Hagæ-Comitis, C. Fuhr, 1842.
- Royal College of Surgeons in London. *A classed catalogue of the books contained in the library of the*, 8°. London, J. Scott, 1843.
- Jahrbücher der in und ausländischen gesammten Medicin*. v. 1-40, 1834-43. roy. 8°. Leipzig, O. Wigand. Continued as: Schmidt's Jahrbücher. v. 41-213, 1844-87. roy. 8°. Leipzig.
- Bibliotheca medico-chirurgica pharmaceutico-chemica et veterinaria oder geordnete Uebersicht aller in Deutschland neu erschienenen medicinisch-chirurgisch-geburtshülfflichen pharmaceutisch-chemischen und veterinär-wissenschaftlichen Bücher*. 8°. Göttingen, 1847-86.
- Engelmann (W.). *Bibliotheca medico-chirurgica et anatomico-physiologica. Alphabetisches Verzeichniss der medicinischen, chirurgischen, geburtshülfflichen, anatomischen und physiologischen Bücher, welche vom Jahre 1750 bis zu Ende des Jahres 1867 in Deutschland erschienen sind*. 2 v. 8°. Leipzig, W. Engelmann, 1848-68.
- Fischer (Emil). *Catalogue raisonné of the Medical Library of the Pennsylvania Hospital*. 8°. Philadelphia, T. K. & F. G. Collins, 1857.
- Bibliothèque nationale. Département des imprimés. Catalogue des sciences médicales*. 2 v. 4°. Paris, Didot frères, 1857, 1873.
- Dictionnaire encyclopédique des sciences médicales. Directeur: A. Dechambre. Collaborateurs: MM. les docteurs Archambault, Arnould (J.), Axenfeld, Baillarger [et al.]* 1

- s., v. 1-34; 2. s., v. 1-22; 3. s., v. 1-16; 4. s., v. 1-12; 5. s., v. 1. Paris, 1864-87.
- Royal Society of London. Catalogue of scientific papers compiled and published by the, 8 v. 8°. London, G. E. Eyre & W. Spottiswoode, 1867-79.
- Catalogue of the Library of the Royal College of Physicians of Edinburgh. 4°. Edinburgh, R. and R. Clark, 1863. Supplement, 1863-70. 4°. Edinburgh, Crawford and McCabe, 1870.
- Nouveau dictionnaire de médecine et de chirurgie pratique. Rédigé par Anger, Bailly [et al.] Directeur de la rédaction, le docteur Jaccoud. 40 v. and suppl. 8°. Paris, 1864-86.
- Jahresbericht über die Leistungen und Fortschritte der gesamten Medicin (Fortsetzung von Canstatt's Jahresbericht). Unter Mitwirkung zahlreicher Gelehrten hrsg. von Rud. Virchow und Aug. Hirsch. Jahrg. 1-20, 1866-85. 39 v. 8°. Berlin A. Hirschwald, 1867-86.
- Manchester Medical Society. Alphabetical Catalogue of the Library of the, 8°. Manchester, W. Alcock, 1866. Supplementary Catalogue of the Library of, 8°. Manchester, W. Alcock, 1872.
- Papily (Alphonse). Bibliographie des sciences médicales; bibliographie, biographie, histoire, épidémies, topographies, endémies. 8°. Paris, Tross, 1872-74.
- Jahresbericht über die Leistungen und Fortschritte in der Anatomie und Physiologie. 10 v. 8°. Berlin, A. Hirschwald, 1874-85.
- Waring (Edward John). Bibliotheca therapeutica, or bibliography of therapeutics, chiefly in reference to articles of the materia medica, with numerous critical, historical and therapeutical annotations, and an appendix containing the bibliography of British mineral waters. 2 v. 8°. London, New Sydenham Soc., 1878.
- Haeser (Heinrich). Lehrbuch der Geschichte der Medicin und der epidemischen Krankheiten. 3. Aufl. 3 v. 8°. Jena, H. Dufft, 1875-82.
- Royal Medical and Chirurgical Society of London. Catalogue of the Library of the, 3 v. 8°. London, 1879.
- Index Medicus. A monthly classified record of the current medical literature of the world. v. 1-9. 8°. New York, Boston, Mass., and Detroit, Mich., 1879-87.
- Bibliotheca medica Davidsoniana. Catalogue de la bibliothèque précieuse médicale de feu. M. le docteur Auceline Davidson. 8°. Breslau, G. Paetz, 1880.
- United States. War Department. Surgeon-General's Office. Index-Catalogue of the Library of the Surgeon-General's Office, United States Army. I-VIII. A-Medicine (Naval) 8 v. roy. 8°. Washington, 1880-87.
- Neale (Richard). The medical digest, or busy practitioner's vade-mecum. Being a means of readily acquiring information upon the principal contributions to medical science during the last thirty-five years. 2 ed. 8°. London, Ledger, Smith & Co., 1882.
- Hirsch (A.). Biographisches Lexikon der hervorragenden Aerzte aller Zeiten und Völker. Unter Mitwirkung der Herren A. Anagnostakis, E. Albert [et al.] und unter Special-Redaction von A. Wernich, und E. Gurlt. 8°. Wien u. Leipzig, Urban & Schwarzenberg, 1884-87.
- Faculty of Physicians and Surgeons of Glasgow. Alphabetical catalogue of the Library of the . . . 4°. Glasgow, R. Maclehose, 1885.
- Neale (Richard). The first appendix to the medical digest, including the years 1882-3-4-5, and early part of 1886. 8°. London, Ledger, Smith & Co., 1886.

Original Article.

OBSERVATIONS ON THE USE OF ANTIPYRINE AND THALLIN IN THE TREATMENT OF TYPHOID FEVER.¹

BY FRANCIS MINOT, M.D.,
Hersey Professor of the Theory and Practice of Physic in Harvard University; Consulting Physician to Massachusetts General Hospital.

IN the autumn and winter of 1885-86, and in those of 1886-87, I ordered antipyrine and thallin in twenty-four cases of typhoid fever in the Massachusetts General Hospital, with the object of ascertaining, as far as possible, to what extent they could be relied upon as remedies of positive value in the treatment of that disease. An abstract of each case was made, and compared with the temperature-chart, the latter including, in a considerable number of cases, the hourly varia-

tions after each dose, as well as the regular morning and evening range. The main points for investigation included:

- (1) The dose of each drug required to produce a depression of two or three degrees of temperature.
- (2) Conditions affecting the action of the drugs.
- (3) Effects on the condition of the patient.
- (4) Effects of the drugs in fatal cases.
- (5) Effects of antipyrine and thallin when given in continuous doses.
- (6) Comparative effects of antipyrine and thallin.

The twenty-four cases include all the typhoids that were submitted to the action of these drugs in the wards under my charge during these two terms of service.

The regular treatment of typhoid fever in these wards was expectant. A considerable proportion of the cases required no special interference. The patients were carefully fed, chiefly with milk, plain or peptonized, and occasionally with animal broths. All were regularly sponged several times daily with plain water, either cold or tepid. In cases where there was much prostration, brandy or whiskey was given, in doses ranging from one to two drachms, every three or four hours, to one ounce every hour. The patients were very lightly covered, often with only a sheet. Very few required opiates.

Antipyrine or thallin were given only when the temperature rose above 102.5° (Fahr.).

DOSE.

The doses employed varied according to the age of the patient, and the degree of pyrexia. From twenty to thirty grains of antipyrine were generally given to an adult, eight grains to a child of twelve years, and five grains to a child of three years, whenever the temperature reached three-and-one-half degrees (Fahr.) above the normal standard. If retained by the patient, this invariably had the effect of reducing the temperature two or three degrees, and sometimes more, in the course of one or two hours; the mercury then rose during the same length of time, till it reached its original level, or a degree below that. The same results followed the use of thallin in much smaller doses. In one case (an adult), two grains reduced the temperature from 105.7° to 101.2°. In general, four grains of thallin were given to an adult. When given in continuous doses, every three or four hours, for example, it was found, in some cases, that after one full dose, much smaller subsequent ones were sufficient to maintain the temperature at a given level. In the case of a patient twelve years old, after one dose of two grains of thallin, a single grain, given from twice to six times daily, was sufficient to keep the temperature at a moderate level.

CONDITIONS AFFECTING THE ACTION OF THE DRUGS.

It was observed that antipyrine and thallin acted most promptly, and with most permanent effect, when given at, or just before the end of the fastigium, thus giving rise to the suspicion that the improvement would have taken place had the medicine not been given. There is no doubt that this suspicion is just, so far as a permanent reaction is concerned. Inspection of the charts shows that, in general, antipyrine and thallin given during the fastigium reduced the temperature promptly, but only temporarily, except when they were given shortly before the lysis began (Susan Hamblet). In one case, however, that of a child three years old (J.

¹ Read before the Association of American Physicians, Washington, June 2, 1887.