



Medical Periodicals

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"SOME DAY," SAID F. S. HAMMETT IN 1937 in the initial statement of the purposes of the new journal *Growth*, "someone will write an analytical history of the growth of scientific publication in which will be traced the practices, origins, and factors which have produced the present system."¹ Today, a quarter of a century later, those who are concerned with scientific publications are still awaiting this analytical history, for the lack of which it is difficult to obtain a clear view of the present situation.

One reason that the analytical history has not been written is that the basic chronological details of the changes in scientific publication over the centuries have not been studied; another reason is that the present situation has been described only obliquely and from varying points of view, rather than in a comprehensive inquiry. Because of the lack of deep knowledge of either the past history or the present status of scientific publication, it is not surprising that the suggestions made to remedy some of its difficulties have sometimes tended to be superficial, one-sided, naïve, or even likely to produce still more problems.

The history of medical publications, for practical purposes today, can be said to have started with the growth of experimental science during the later Renaissance and beginning Reformation. The excitement of the new studies in anatomy and physiology can be caught by reading the headlong prefaces and descriptions in Vesalius' *De fabrica corporis humani* (1543) or Fabricius of Aquapendente's theorizing on the purpose of the valves of the veins he had discovered (1603). But it was not until the 1670's when the Royal Medical and Philosophical Society of Copenhagen published its *Acta* (edited by Thomas Bartholin, the anatomist), and Nicolas de Blegny of Paris brought out the

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first private medical periodical, *Nouvelles découvertes sur toutes les parties de la médecine*, that medical publishing began to bear the characteristics we associate with it today.

The copying of manuscripts and their circulation to interested parties were the usual ways of publishing new information in the Roman Republic. The works of the great first-century Graeco-Roman physiologist Galen were made available in this form during his lifetime, and authenticated copies of his writings continued to be re-copied for centuries. Lesser scientists resorted to circular letters to their friends and colleagues, and so long as the number of people interested in them and the amount of material to be transmitted remained small, this system sufficed. By the 16th century the bounds of easy communication in letter or manuscript form had been reached; however, the printing press was able at that time to provide a new system for scientists. For the first time, exact copies of scientific works could be furnished easily and comparatively cheaply to all who wished them.

It must not be thought that the old system died out overnight or that the new came into being full-blown. The traditional concept of holding announcements of new discoveries until a substantial amount had been accumulated and a respectable book could be published lasted for over a hundred years after the introduction of printing. Harvey's description of the circulation of the blood (1628), for example, was withheld because medical writers, lacking the periodical as a publishing medium, still had to rely upon book publication. Gradually, however, as discoveries in experimental science became more frequent, the periodical came into its own. It provided a more rapid and exact publication, essential in a field where knowledge is cumulative, and it offered the advantage of an automatic distribution method of periodical subscriptions. It was scarcely two generations after Harvey that Leeuwenhoek announced his findings on the "Little Animals" in the pages of the *Transactions of the Royal Society*.

From the Copenhagen Society's first journal in 1671 to today there has been a great increase in the number of medical periodicals published, in kinds of sponsors and producers of periodicals, in languages used, in subdivisions of the field covered, and in readers, among other things. Indeed, probably no one factor has so powerfully acted for the establishment of medical libraries and the training of medical librarians as the proliferation of medical periodicals, which by the end of the 19th century had made it well-nigh impossible for any

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person to own all the medical periodical literature he needed for research, practice beyond the most superficial, or close study. Today periodicals normally comprise 65 to 80 per cent of medical library collections. Moreover, the enormous increase in the number of medical periodicals necessitated the development of indexes, abstracts, and other secondary tools to find one's way about it, and thus brought into being a new occupational group: the medical librarians.

A recent survey² has given us some fragmentary statistics about medical periodicals today. We know that there are more than 4,500 journals published in medicine throughout the world, defining medicine broadly to include dentistry, nursing, pharmacy, hospital administration, homeopathy, and osteopathy. These 4,500 journals furnish over 220,000 articles a year in twenty languages (although published in 85 countries), with English being the most common (37 per cent of the total), and German, French, Spanish and Italian following in descending order. All together there is comforting knowledge that six languages provide 85 per cent of all the medical periodical literature.

The information in this survey² is merely the building blocks upon which one segment of the total analytical history desired by Hammett can be built. Other aspects of the problem include the effect of numbers of scientists upon medical periodicals, the recent fragmentation of the whole body of medicine, which earlier had been divided by subject disciplines, into small subgroups and their re-synthesis into new problem-oriented groups. Still, other problems concern the cost of periodical publishing in terms of the numbers of people who will share these costs, the place of the institution in this picture, the pressures on the medical scientist to publish, and the effect of the increased nationalization of science upon the forms of publication. Even with all of this, however, the analytical history of medical periodicals remains to be written.

The two earliest scientific periodicals, the *Journal des sçavans* and the *Transactions of the Royal Society*, represent two of the main types of journal literature to be found even today. The *Journal des sçavans*, like the *Nouvelles découvertes . . .*, was a private publication of one man interested in providing news items about a rapidly changing scene in exchange for a reasonable return on his investment. On the other hand, the *Transactions of the Royal Society*, like the *Acta medica et philosophica Hafniensia*, was published by a learned society to acquaint its members and any other interested parties with the details of the experiments which were then enriching scientific knowl-

edge. These two journals are the prototypes of scores of similar magazines now published (*Nature* and the *Transactions of the New York Academy of Sciences*, for example), and yet the present situation is not as simple as that statement would imply. The scientific society has taken to publishing news bulletins, e.g., the American Medical Association's *News Bulletin* or *Science*, published by the American Association for the Advancement of Science; and commercial publishers now publish journals which give detailed experimental data, such as the *American Journal of Medicine*. Moreover, the high cost of publishing has led to many alliances between commercial publishers and scientific societies, resulting in such journals as *Surgery*, where the transactions of a specialized society are printed in a commercially produced periodical at less cost to the society.

Nor is this printing alliance the only result of the increasing cost of publication and distribution. Smaller societies have combined to obtain the advantages of a common redactional office, increased purchasing power, and savings brought about by standardization of format and prorated distribution costs. Prime examples are the American Institute of Biological Societies and the Federation of American Societies for Experimental Biology, which publish such journals as the *AIBS Newsletter* and *Federation Proceedings*.

Many periodicals have found even these measures insufficient to solve their economic difficulties, which are partly derived from some historical developments in medicine itself. The unity of medicine, so easily achieved when information was meager and so earnestly desired by the medieval and early Renaissance philosophers, was lost as more information about nature became available. As medical data grew, so also did specialism in the different areas in which the data were being accumulated. Thus medicine has divided and subdivided into a number of specialties, some with very few specialists in them. Many of these groups, however, feel the need of some means of communicating on a formal basis with others in the group. Although recent unpublished studies by R. Orr indicate that delays in publication are frequently due to the author's own procrastination in reporting his findings, the older journals are generally swamped with more papers than they can publish speedily. Each dynamic new group, therefore, has attempted its own publication; but since the number of potential subscribers is usually small, the cost per reader is high. To meet this challenge, some scientific societies (for example, the American Wildlife Society) have advocated publication in cheaper, nonprint forms, such as the microcard, and a variety of other solu-

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tions have been proposed, including the distribution of individual papers (separates) rather than complete journals.³

Widespread attempts to obtain outside support for the publication of the smaller scholarly journals have also been made. For a time the various eleemosynary foundations were solicited to make good the operating deficits for medical journals; of late the growth in the size of the problem, caused by a sudden tremendous increase in grant-supported research, has led to still another proposal for support of publications. It has been argued that research is not complete until the results are published and distributed to the scientific community. If this view is accepted, then it follows that the cost of publication is a bona fide expense to the research grant. As Hammett pointed out as far back as 1937, ". . . it is necessary that the records of scientific work be published in adequate completeness; that they be published promptly on completion of the work; and that they be made available through wide dissemination. That these vital functions are not being expressed as they might be is obvious. There is but one solution. And that is to put the cost of publication of scientific work where it belongs and that is on the institutions sponsoring the work."¹ So-called "page charges," that is, printing charges to the author or institution he represents, have been proposed and in some cases accepted.^{4, 5}

The general fact that research and publication go hand in hand has, unfortunately, sometimes led to the acceptance of publication as convincing evidence of acceptable research. Since such evidence may be used as the basis for economic and status decisions in universities and research institutes, the pressures (yielded to consciously and unconsciously) upon scientists to publish more and more have resulted in fragmentation of some individual research reports into several publications. The team approach to modern research has also given impetus to producing a number of papers in place of one, so that each researcher may appear as senior author in some article. Publication of aspects of the work in journals reporting to different groups—e.g., clinical journals, biochemical journals, statistical journals, and journals meant for the educated layman—have also not been uncommon. (Such "scattering" has importance in medical communication and is not deprecated here.) A series of still-undigested "preliminary" reports may be presented, sometimes with no final report, if the later results do not bear out the preliminary expectations. The result of all of this is hurried writing and a great proliferation of articles to be published.

When faced with this mass of manuscripts, editors of scientific

journals have resorted to a referee system for selection of works to be printed. The manuscripts are distributed to specialists in the field represented by the paper, who determine for the editor the scientific validity of the work reported and the general quality of the paper. Referees and editors generally work without compensation, as a contribution to the advancement of their field of knowledge; and the high caliber of most medical periodicals bears witness to the altruism and fair-mindedness of the volunteer referees, as well as to the importance attached to such work.

As noted earlier, six languages comprise the overwhelming amount of medical periodical literature being published today. This fact is partly due to the tendency of journals in countries with lesser-used languages (such as Czechoslovakian or Polish) to publish their articles in more widely read languages, say French or German. More and more the medical scientist is becoming a monolingual creature, and material in the five remaining languages is as effectively closed to him as if it were published in 500 different languages. Three main methods have evolved to aid this situation; no one of them is able to handle the total situation, nor are all three together the answer to the problem. Moreover, in attempting to solve one problem, they have introduced another one, which may in the long run prove at least as troublesome as the one initially posed.

The methods which have been used to cope with this problem are these: (1) summaries in foreign languages at the ends of the original articles, including summaries in the artificial universal language *Interlingua*; (2) collections of abstracts in a target language (for example, *Excerpta Medica*, which annually publishes thousands of English language abstracts which represent articles in many diverse languages); and (3) word-for-word translation, either of individual articles (sometimes stored and indexed as separates as in the National Science Foundation-Office of Technical Services-Library of Congress-John Crerar scheme), or cover-to-cover translations of entire journals, as in the case of the nine biomedical journals whose translation and distribution are underwritten by the Russian Scientific Translation Service of the Public Health Service.

The English language journals have been most reluctant to try the first method, and some Russian editors have complained of American editors that their "cooperation" is one-sided; American editors seem to believe that Russian articles should have English summaries but that the English articles do not need Russian résumés.

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The second method, the publication of separate abstract journals, requires access to still another large and fairly expensive periodical (*Excerpta Medica* costs about \$250 per year at the moment) and does not, of course, give many of the details of the original work. On the whole, however, it is probably the most efficient and least expensive way so far developed for presenting the substance of information in one language to readers of another language. When it blends in, sometimes almost imperceptibly, with reviews of the subject regardless of language, it probably comes nearest to the re-synthesis of knowledge on a worldwide basis which was possible when Latin was the universal language.

Cover-to-cover translations are expensive to produce, take much effort and time after the original has been published before they appear, and require the storage of two sets of journals in extensive libraries—the original and the translation. It may be argued that the publication of the translation makes unnecessary the retention of the original in all but libraries of record, but medical libraries have generally reported that there is enough demand for both the original and the translation to require retention of both sets. The whole question of the value of word-for-word translation of entire periodicals is much debated at the moment; the Public Health Service has contracted with an outside firm to investigate the effectiveness of such publications. Meanwhile libraries and readers of medical journals try all methods to circumvent nationalistic and linguistic barriers.

Up to now we have been discussing the medical periodical in terms of those which are set up to report research findings to other research workers. Most medical journals fall into this category, and it is their bulk and the uses to which they are put which cause most of the difficulties described above. A certain kind of homogeneity pervades them, however, and measures taken to alleviate the difficulties they produce can therefore also be homogeneous. They are not the only medical periodicals published, and the introduction into the picture of another kind compounds the difficulties of solution.

Medical periodicals intended for the practitioner have certain characteristics not so often found in medical research journals. Their main purpose is didactic: they transmit already-known facts arranged in a form to make them immediately applicable to existing situations. Such periodicals must use what is known as "the shotgun technique," repeating over and over again in the same article, and in different articles in different periodicals, the facts being presented. Only in this

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way can blanket coverage on a fairly large scale be brought about. Their theoretical discussions are generally brief, but the how-to-do-it, cookbook approach is more highly developed than in research journals. They are the spoken lecture in solidified form.

The social value of such publications cannot be overestimated. Of the two purposes of medical research, additions to our knowledge of the universe and the alleviation of disease, the journal for the practitioner is addressed primarily to the second purpose, although there are few "pure" forms. And which human among us is uninterested in the second purpose? But the publication of such journals, automatically received by most practitioners as members of local, state, or national medical societies, raises problems of the cost of primary publication and difficulties in integrating their contents with those of the research journals in secondary tools (indexes and abstracts). Even this problem would be easier to solve, however, if such periodicals were homogeneous within the group. They range from magazines which are mostly news media, such as the *Jackson County Medical Society Bulletin*, to the *New England Journal of Medicine*, a great clinical periodical with many research reports. And even within the issues of the same journal the variations among articles are so great as to defy any single solution. As Niebuhr noted, "There is no solution; there are only solutions."

Summary

This paper has attempted to present some of the known data about medical periodicals today and to discuss their problems on the basis of historical development, economics, social forces, and medical research and practice. Since medical periodicals are international, American ones have not been singled out. No efforts have been made to discuss in depth the problems of secondary publication in medicine, new methods of storage and retrieval of information, or the impact of present-day medical journalism upon libraries.

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