

Physics Abstracting

By Dwight E. Gray

AMONG the more venerable medical jokes is that one with the punch line, "The operation was a success but the patient died". In the case of ills of organizations, an approximate analogue to this situation occurs when a survey made by a sub-committee or study group with a view to remedying some society malady produces a list of praiseworthy recommendations none of which is ever put into effect. The patient may not die under these circumstances but neither does he get any better. It will be recalled that a year or two ago the American Physical Society and the American Institute of Physics jointly sponsored a study of physics abstracting which was supported under a contract with the Office of Naval Research. This study developed certain information as a result of which the Joint Committee on Science Abstracts of the Physical Society and the Institute made a series of recommendations. Both the results of the study and the recommendations have been reported previously in the *American Journal of Physics* (18, 417-424, October, 1950). The purpose of this article is to discuss the implementation of these recommendations that has been accomplished to date or is under way, with the hope of demonstrating that in this case the patient has shown at least some degree of improvement following, as it were, consultation and an exploratory operation.

First, perhaps, a brief bit of background is appropriate regarding the abstracting study and its aims. The principal objective of the project, it will be recalled, was to obtain answers to three questions: (1) For what purposes do physicists use abstracts? (2) What is their opinion of the abstracting now available to them? (3) What, within reason, would they like to have in the way of physics abstracting? It was hoped that the answers would be sufficiently representative to provide the Joint Committee mentioned above with reliable information upon which sound realistic recommendations for the improvement of physics abstracting could be based.

The recommendations which the Committee drew up following completion of the study fell into three general categories, depending upon the group to whom they were made; these groups were the management and editorial board of *Science Abstracts*, Section A of which is *Physics Abstracts*; the editors of the nine journals published by the American Institute of Physics; and the Council of the American Physical Society. The recommendations and what is being done about them are discussed below in this order.

Recommendations made to the management and editorial board of *Science Abstracts* stemmed primarily from the Abstracting Study results which indicated that physicists rate "wide coverage" first in abstracting importance with "prompt publication", "abstracts written by subject experts", and "extensive indexing" all ap-

preciably lower and approximately tied for second place. The Joint Committee recommended first that there be established a specific list of journals (probably rather small) to which *Physics Abstracts* would always give 100 per cent coverage, except for obviously non-technical items. It was felt that there would be an appreciable value to users in knowing that at least for the periodicals in this list coverage was complete. The Committee on Management of the journal has agreed to this proposal and plans to publish such a list.

The second recommendation listed certain subject areas for which full abstract coverage was urged. The recommendation was accepted by the journal management without reservation for the fields of astrophysics, biophysics, medical physics, and chemical physics. Regarding papers on the teaching of physics, the recommendation was accepted in principle and an exploratory period was suggested during which a selection policy might be evolved for this hitherto unabstracted material. Greatly expanded coverage of applied mechanics, computing methods, electronics, and geophysics, however, was deemed undesirable in view of the existence of well established abstracting journals which specialize in these subjects. Such publications include *Applied Mechanics Reviews*, *Mathematical Reviews*, *Mathematical Tables and Other Aids to Computation*, *Meteorological Abstracts*, and *Electrical Engineering Abstracts* (Section B of *Science Abstracts*). The editors of the physics abstracting journal maintain close and friendly contact with all of these (and, of course, actually are also editors of the last-named periodical) and have always aimed "to provide an adequate overlap with them without wasteful duplication". In these fields, then, they would propose to continue their policy of abstracting (or reprinting, by permission, abstracts of) such articles as are considered to have interest in other branches of physics, but would not attempt to approach complete coverage. This would seem to be a reasonable compromise of the coverage problem and it is hard to see how one can quarrel very violently with the viewpoint that with the term "physics" being interpreted as broadly as it is today, it is not unreasonable to expect workers in the twilight-zone areas to have to consult more than one abstracting journal.

The two principal remaining recommendations made to the publishers and editors of *Physics Abstracts* concerned the annual indexes and were, first, that the number of cross references be increased greatly and, second, that when elements and compounds constitute significant features in a paper they appear in the annual index under their own names (except in the case of extensive tables). Regarding the first of these the journal management pointed out that the subject heading structure now in use in the annual index has been in a process of development during the past two or three years and ex-

pressed the belief that when it is fully extended the ratio of index entries to abstracts will be considerably greater than has been the case in the past. Further increase then probably would require a more detailed breakdown of the headings. The recommendation regarding index listing of element and compound names proved to be entirely in line with the group's own thinking and, in fact, had been adopted for use in the 1950 index before the Joint Committee's communication was received.

Recommendations directed to the editors of the several Institute journals concerned principally—either directly or indirectly—adequacy and promptness of publication of abstracts. An ideal situation, as far as abstracting service is concerned, might be defined as one such that an abstract written by a subject expert would be available free at the instant of completion of the paper abstracted. Consideration of the results of the Physics Abstracting Study, together with the trend of the thinking at both the 1948 Royal Society Conference (London) and the 1949 Unesco Conference on Science Abstracting (Paris), led the Joint Committee to conclude that the most promising approach to a practical approximation of this ideal lay in exploiting the possibilities of the frequently abused author abstract. An author abstract is cheap; if the journal of publication requires abstracts with its articles, it is available along with the paper; and, assuming the author is competent to write the paper, can be said to be the work of a subject expert. (The commonly cited weaknesses of author abstracts are based upon alleged lack of objectivity, perspective, ability to judge significance, and abstracting skill rather than upon charges of technical "inexpertness".) To minimize the effects of the possible shortcomings of author abstracts while at the same time taking advantage of their obvious good points, the Committee made two basic recommendations to the editors of Institute journals: First, that for all journals except *Physics Today* abstracts be required of all papers accepted for publication and, second, that the editors take the same degree of responsibility for the adequacy of the abstract that they now regularly take for the quality of the paper itself. The latter condition would mean, for example, that an editor might very well return a manuscript to the author and inform him that the paper was acceptable but that the abstract would have to be re-written. Both of these recommendations have been approved by the editors of Institute journals.

Two corollary recommendations were made to the Institute editors. The first of these urged the issuance of standardized rules for the guidance of an author in his preparation of an abstract that would be suitable both for publication along with his paper and for subsequent use by an abstracting journal. Such guiding principles were drawn up and appear in the new Institute Style Manual under the heading "Preparation of the Abstract". The second associated recommendation was that a mechanism be worked out for supplying *Physics Abstracts* with these abstracts of Institute journal papers at the page proof stage of primary publication. This was

implemented first on an experimental basis, with the *Journal of Applied Physics* being used for the test. Over a period of approximately 18 months, during which page proof of abstracts has been sent air mail to the abstracting journal in London, it has been found that the average time lag between primary and secondary publication is reduced from what it previously had been by between one and two months. This savings is accomplished because advantage is taken (a) of the interval between page proof and final publication, (b) of the difference in time between air mail and regular mail to London, and (c) of the fact that fewer of the journal's papers have to be farmed out for abstracting. All Institute journals are now following this practice of air mailing page proof to *Physics Abstracts*.

Recommendations made to the Council of the American Physical Society have concerned the extent and nature of the financial support to be supplied the abstracting journal by the Society. That the cost of publishing *Physics Abstracts* had increased appreciably at the time the recommendations were being discussed and would rise still farther was quite clear. The portion of such increase that has been simply the natural accompaniment of generally rising costs of labor and materials is too well-known to need emphasis here. In this case, however, there were the additional factors of the enormous expansion in physics research, and also, therefore, in the number of papers to be abstracted, and the recommendations discussed previously that the journal extend its scope of coverage and enlarge its indexes. A few comparative figures are of interest in this connection. During the period 1945 to 1950 inclusive, the subscription price of *Physics Abstracts* was raised by about 17 per cent; in the same period, the number of abstracts published increased 190 per cent, the pages in the abstracting journal 210 per cent, and the pages in the annual index almost 300 per cent. It is true that a further rise in subscription price was avoided in 1950 only because of devaluation of the pound but even this proposed increase would have made the total 1945-1950 price boost but about 33 per cent. Also the time lag between primary and secondary publication has been reduced and the annual index is being issued considerably more promptly. The 1950 Index, for example, was distributed with the February issue of the journal.

Consequently, when late in 1950 the Committee of Management of *Science Abstracts* found it would be necessary to raise the subscription price of both sections of the journal effective with 1951, and so notified the American Physical Society, there was no doubt in the minds either of the Society's Council or of the Joint Committee on Abstracting but that the increase was justified. The only question was what could and should be done about meeting it. Increasing the dues for this purpose not only was impossible as far as 1951 was concerned, because bills already had been sent to members, but was believed to be inadvisable in any case. It seemed necessary, therefore, to re-examine the Society's system of supplying *Physics Abstracts* automatically to all members at no cost above dues. This is a practice

which has been abandoned in almost all other scientific fields in favor of an arrangement whereby members of the professional society do not receive personal copies of the abstracting journal automatically but can obtain them at a reduced subscription rate. Also, a substantial portion of the physicists questioned during the Abstracting Study had indicated their approval of such an arrangement if the price of the journal over and above dues were reasonable. While the physics abstracting study was in progress the Joint Committee on Abstracting had discussed this matter at some length and in March 1950 had reported to the Council that in its judgment the existing basis of distribution of *Physics Abstracts* to Society members would have to be modified eventually. The way was opened for such modification when, at the Business Meeting of the Society, held in February 1951, the organization by-laws were changed so as to free it from a constitutional requirement to maintain the "included with the dues" arrangement. Further study of this question, following receipt of notice of the increase in subscription rates and the delegation of the problem it raised to the Joint Committee, convinced this group that the time had arrived to make the change. Consequently, the following recommendations were made to the Council of the American Physical Society:

1. That the practice of automatic distribution of one section of *Science Abstracts* to members of the Society be discontinued;
2. That the American Physical Society provide direct support to the journal in an amount equivalent to its appropriate share of the fixed costs of publication—such as editing, typesetting, make-ready, and so forth;
3. That members who wish to receive personal copies be charged an additional amount based upon the variable costs of publication—such as paper, binding, mailing, and so forth.

It was estimated that on this basis the cost to Society members of a personal subscription to *Physics Abstracts* would run in the neighborhood of \$2.00 to \$2.50 per year. These recommendations have been accepted in principle by the Council of the American Physical Society and, by the time this discussion is published, action along the lines suggested may have been announced to the membership.

The above information brings essentially up to date the developments in physics abstracting that stemmed more or less directly from the recommendations of the Joint Committee which, in turn, were based on the results of the Study of Physics Abstracting. Also of interest—and perhaps of greater long-range significance to physics abstracting—is the work being done by an international committee in the field which was set up following the 1949 Unesco Conference on Abstracting mentioned previously. Among the numerous recommendations included in the final report of this meeting was one which recommended a single, international physics abstracting journal. It was the sense of the Conference's

thinking, however, that such a journal should evolve from existing services rather than that a completely new publication should be established. To study this and other Conference recommendations in the field of physics a Unesco Committee on Physics was formed with a membership made up of representatives of the International Council of Scientific Unions, of the management committee of *Science Abstracts*, of the agency which publishes *Bulletin Analytique*, and of Unesco. The ICSU member for the United States is Dr. Elmer Hutchisson who also has served as chairman of the Joint Committee on Science Abstracts of the American Physical Society and the American Institute of Physics during and following the period covered by the abstracting study. The Unesco committee has held several meetings, the first in September 1950, and the most recent in June of this year.

Early in its deliberations this group recognized that to be really international a physics abstracting journal either would have to carry a mixture of languages with no abstract appearing in more than one or it would have to publish duplicate abstracts in two or more languages. The first alternative, it was felt, would greatly limit the value of the journal while the second would give every subscriber a considerable amount of unnecessary material and thereby increase the cost to him. The Committee decided, therefore, that an international abstracting "service" in physics would make better and more practical sense than would a single abstracting journal. Such an international service was visualized as including several editions each in a separate language with, wherever possible, existing journals constituting the official editions in their languages. Thus, for example, *Physics Abstracts* would be considered the English edition and *Bulletin Analytique* the French edition. Under this proposal each journal would retain a measure of its own individuality but would also be a part of the international scheme. It was suggested also that the international service be established under the general sponsorship of either the International Conference of Scientific Unions or the International Union of Pure and Applied Physics. Work of the Unesco committee has continued along lines designed to lead to such an international physics abstracting service as the ultimate major goal; associated objectives for which the group is working include general acceptance of the idea that every published original paper should be accompanied by an author abstract suitable for use in an abstracting journal, extension of the practice of sending page proof of author abstracts by air mail to the appropriate abstracting editor or journal, greater exchange of abstracts between editors of abstract journals, and increased cooperation among editors with regard to classification and indexing methods.

In the meantime actual implementation has been accomplished to the extent that the editors of *Physics Abstracts* and *Bulletin Analytique* are collaborating and thereby facilitating the editorial work and improving the efficiency of both services without changing their respective internal structures.