

ment should be regarded not so much in terms of practice as in relation to the specific physiological processes to be affected. Much work must be done before specific measures to influence these different processes in the desired direction are found. Many practices that have not proved generally efficacious in the past may be shown to have great value for specific conditions. Pomologists must think in terms of limiting factors, and not merely in terms of the soil elements that may limit plant growth but also in terms of the physiological processes that may be limiting fruit production. For all this work, an accurate knowledge of the chemical changes associated with different physiological processes is of the utmost value because a thorough understanding of the conditions desired may suggest means for their accomplishment.

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A SUGGESTION AS TO METHOD OF PUBLICATION OF SCIENTIFIC PAPERS

THE processes of scientific publication are admittedly in an unhealthy state. Various influences contribute to the acuteness of this condition, but it is likely that a time of stress has merely emphasized weaknesses inherent in the ordinary procedure for printing scientific papers. The "jammed" plight of the periodicals is slowing the vital current of new results. It becomes desirable to consider alternative methods of printing, perhaps better adapted to the present character of our needs. In this country and abroad several suggestions have already been offered; the most drastic of these has urged the publication of abstracts only, completed manuscripts to be deposited for reference in some central place—a scheme having so many unfavorable features as to merit little serious attention; it is not merely *results* we wish, but also some at least of the steps in their derivation.

I have in mind more especially the field of zoology. To-day this subject is specifically served by a fine group of journals, and by an

"advance" bibliographic service of filing cards bearing author-abstracts. This system of publication is maintained through the cooperation of the Wistar Institute. These journals were founded some years ago, and each was designed to cover a particular group of zoological interests. They do not now correspond, in titles or in any individuality of contents, to major aspects of zoological development. Their fields of service overlap, sometimes to an embarrassing degree.

Investigators acquire separata of papers of particular concern to them. There is thus brought about a quite unnecessary duplication in the distribution of published work, and a proportionate waste of paper. Subscriptions for support of the journals are drawn from membership dues of the Zoological and Anatomical societies. Members therefore receive most or all of the journals, in this way accumulating a mass of unused, largely unusable, material; while still necessarily relying upon the convenient "reprint" for actual reference and use.

I believe that these difficulties may be obviated, and the course of publication simplified and expedited. With the hope of attracting discussion of this matter, I outline here a plan regarded as practicable and to the point. The foundation of new journals has little to recommend it; these are likely soon to suffer the fate of the older ones. Save in some special fields, the journal method of publication has become measurably antiquated.

The journals should be abolished. They do not represent rational subdivisions of zoological activity. There is no real reason why papers accepted for publication should be grouped to make up a "number." It is certainly more desirable that a paper be printed when it is ready for printing. If issued and originally distributed as a "separate," unnecessary duplication of distribution can readily be avoided. This plan requires some central agency, such as we now have, for handling the mechanical details of publication. Serial numbers could be assigned to papers as issued. An entire series might then be bound by libraries, though the more sensible way would

be to have them filed alphabetically by authors.

In some essentials this procedure is already followed by the *Archives de zoologie expérimental et général*, by the Royal Society in its *Transactions*, by the Museum of Comparative Zoology, and by the University of California *Publications*. My suggestion, however, involves an important additional element. Society subscriptions continuing as at present, it would be a simple matter to have each member receive a certain number of published papers, more or less equivalent in total bulk to the journals now obtained. But it would be possible for the subscriber to select, through the Advance Abstract Bibliographic Cards, those papers specifically desired. Additional papers, not regularly obtained in this way or from the authors, could then be purchased at small extra outlay. The American Anatomical Memoirs and the few special reprints issued by the Wistar Institute have made a beginning in this direction.

The actual working of this plan would perhaps require that at, say quarterly, intervals there be issued Bibliographic Cards carrying the serial numbers assigned to the individual papers about to be printed. An accompanying order blank, by which articles desired could be requested by number, would give a simple, quick method of indicating one's needs. It would at the same time serve to show the printer the size of the issue to be prepared, after allowance had been made for reserve stock and for blanket subscriptions. The three-months' period mentioned is sufficiently long. The experience of the *Journal of General Physiology* shows that with efficient management it is possible to print accepted articles within less than that time, even under present conditions.

Authors should by this scheme be in some degree relieved from the expense of purchasing separata for extensive private distribution. One's library shelves, moreover, would no longer be encumbered with journal numbers which must be bound at ruinous expense or else remain unsightly.

Any working plan of this type must be conceived as applying chiefly to contributions of

the character and average length now appearing in the journals. Incidentally, this scheme may show the way out of the difficulties sometimes made in connection with the rather arbitrary rule now enforced by the journals as to the maximal length of acceptable contributions. Although sometimes abrogated for reasons obscure, it has tended to be avoided by authors splitting the material of an essentially unitary piece of work into a number of articles. While the length rule has perhaps acted to restrain some wordiness, it is hardly a rational rule; one could wish it supplanted by editorial persuasion!

It may be suspected, as a conceivable result of the plan outlined, that the quality of the papers might be automatically improved. A paper which from the first is to "stand alone," rather than be supported fore and aft by comfortable neighbors, is likely to be more carefully written, perhaps even more carefully thought out.

There will remain, however, distinct and obvious need for the continuance of the journal form for the publication of short notes; perhaps also for periodicals in which the general results of investigation may be summarized and discussed; and certainly for at least one periodical such as the *Proceedings of the National Academy of Sciences*. It is my belief that under the operation of the plan I have suggested such journals would have a distinctly higher value than at present.

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CHARLES W. WAIDNER

DR. CHARLES W. WAIDNER, chief physicist and head of the Division of Heat and Thermometry of the Bureau of Standards, who died on March 10, 1922, is the fourth leader this bureau has lost by death since last May. The others are E. B. Rosa, chief of the Electrical Division; L. A. Fischer, chief of Division of Weights and Measures, and S. S. Voorhees, engineer-chemist. Waidner, Rosa and Fischer were of the original group gathered together in 1901 at the time the Bureau of Standards