The report of the referee on foods and feeding stuffs, by Thorn Smith, was read by the Secretary, in the absence of the referee and his associate.

The report of the referee on insecticides and fungicides was read by Mr. L. A. Voorhees, the associate referee, and was a very interesting contribution to a branch of chemistry which, so far, has received comparatively little attention.

The report on dairy products was read by the referee, Mr. J. B. Weems, and added much to that branch of agricultural chemistry.

The referee on phosphoric acid, Mr. E. G. Runyan, presented a report summarizing the progress which had been made in the methods of determining phosphoric acid during the fifteen years of the existence of the Association. Especial attention was given to the development of the volumetric method, whereby the processes for estimating phosphoric acid in its usual forms are greatly shortened without any impairment of accuracy.

A similar paper relating to the determination of nitrogen was presented by Mr. F. S. Shiver, the referee on this subject.

The report of the committee on food standards was read by Mr. Frear. The report shows the method in which the work has been divided among the various subcommittees and the character of the subjects assigned to each committee. Great progress has already been made in the study of the data which must be considered in fixing food standards, and, from the amount of work which has already been accomplished, it is evident that in a very short time the Association will be in possession of a series of food standards which are based upon the most reliable data obtainable. The value of such a set of standards, especially from a legal aspect, is extremely great. One great difficulty in the enactment of pure food laws heretofore has been the incompleteness in the standards of purity. The final result of the work of the Association in this respect will be such as to warrant the acceptation and the adoption of these standards in the municipal, State and national legislation enacted in the interest of pure food.

The officers which have been elected for the ensuing year are:

President: Mr. B. W. Kilgore, North Carolina.

Vice-President: Mr. L. D. Van Slyke, New York.

Secretary: Mr. H. W. Wiley, Washington, D. C.

Additional members of the Executive Committee: Messrs. M. E. Jaffa, California; Arthur Goss, New Mexico.

H. W. Wiley.

A CARD CENTRALBLATT OF PHYSIOLOGY.

In Science for September 1, 1899, it is stated "that the Boston Public Library will undertake the printing of a card catalogue of physiology, the cards to contain not only the ordinary bibliographical information, but also brief abstracts of the papers. The plan originated in the physiological department of the Harvard Medical School, and Professor W. T. Porter will be responsible for securing or preparing the abstracts."

This statement is inexact, and if allowed to go uncorrected would be certain to harm a useful undertaking. For this reason it seems best to give at once the details of the proposition now being considered by the Trustees of the Boston Public Library. I am the more concerned to have these details correctly understood, because the proposed method of making the literature of physiology more accessible is not limited to that science, but may be extended to all sciences, the literature of which is sufficiently compact to warrant the publication of a Centralblatt.

The need of rapid and easy access to the stores of science increases daily. The in-

vestigator is much hampered by the difficulty of collecting all the references to the work in hand, scattered as they are through large and diffuse literatures; the university lecturer finds his utterances become more fragmentary every day; and as for the advanced student, he is often dismayed by the mere account of what must be done in order to be certain of the real state of opinion concerning the subject that interests him; in fact, we are likely to be crushed under the pressure of discoveries, old and new. The present *Centralblätter* and the *Jahresberichten*, excellent as they are, afford but scant relief. In every instance the seeker must examine the indexes of a long series of volumes, and these indexes are commonly the not too laborious creation of men uninstructed in cataloguing. Indexes, moreover, are usually put together from the titles of papers, and titles rarely give a sufficient idea of the the whole contents.

But it is not my intention to write of the dark side of productiveness. The danger of swamping in the sea of literature is patent to every one. In several countries relief is being sought by the issue of card indexes. These remedial measures are alike in that they offer the titles of scientific communications, each printed on a single card, intended to be placed in an author's catalogue, *i. e.*, a set of cards arranged alphabetically by the names of authors. This function they might carry out very well, if they were printed and distributed with sufficient promptness.

Besides the author's name, and the title, date, and place of publication, some additional information usually is printed on the card so that duplicate cards may be arranged as a subject catalogue, *i. e.*, filed alphabetically according to subject. The efforts toward a subject catalogue, so far as I am acquainted with them, fall into three groups. In the first, it is proposed to give, besides the data already mentioned, a number of cross-references, in other words, a list of matters treated by the author; this, if I am correctly informed, is essentially the intention of the Royal Society. The second method proposes a few lines of text furnished by the author himself and stating his principal results; this was proposed by Professor H. P. Bowditch. The third consists of a few lines of contents, written by a cataloguer.

Any of these catalogues is undoubtedly much more useful than a bare title. From none of the three, however, can the investigator receive a satisfactory idea of the results of his predecessors. The cross-reference card is a simple index, and nothing more; the others, by reason of too great brevity, are not much better. Of the second and third method, I have some personal experience. The *American Journal of Physiology*, at Dr. Bowditch's suggestion, undertook a practical demonstration of his plan. An 'index slip' was issued with each number of the *Journal*. The slip contained the author's name, date, title and place of publication of each article in the number, and a statement of results of not more than 150 words.

Authors were invited to write their own statements. The slip was printed on thin paper, so that each statement could be cut out and pasted on a library card. In editing the slip for the *Journal*, I found that the results of many investigations could not be stated in the space allowed; in such cases investigators objected with right that the too brief statement was misleading. It appeared further that nearly all the 'copy' received from contributors had to be partially rewritten; the author who had just filled many a broad octavo page could not shrink within the limits of the library card. A number of slips I had to write myself, because the authors failed to send any statement whatever, or sent them after the slip had gone to press. I believe that the

handling of the whole current physiological literature by this method of coöperative authors would hardly be practical for the reasons already hinted; because a proper account of many a research cannot be given in the space of one library card, and an imperfect account wrongs the author and deceives the reader; and because it would be far from easy to persuade each year more than a thousand authors to send in suitable 'copy' with sufficient promptness; certainly many authors would refuse, and thus a considerable number of the cards would after all be written by the editor, who could not have first-hand knowledge of all the subjects of which he wrote.

These same objections apply also to the third method mentioned above, that of a card written by a cataloguer. The lack of space and the impossibility of really expert knowledge of all chapters in so wide a science are fatal to the best results.

These difficulties led me naturally to the idea of a Centralblatt printed on cards. In a properly organized centralblatt, the abstracts are as long as may be necessary to do justice to the author's results, and each abstract is written by an expert in the field in which the original investigation lies. The advantage of having such abstracts printed on library cards is plain. The original set, arranged alphabetically by authors' names and chronologically under each author, would give the principal results of each investigator throughout his whole career. Duplicates arranged according to cross-references printed in the upper and lower margin of each card would furnish not only a chronological list of the investigations on any particular subject, for example, on the chemical reaction of the gastric juice, but would without further search set forth the fruits of the studies mentioned. Certainly none of the methods already described approaches this one in usefulness, and its wide adoption should follow quickly on the demonstration of its practicability. This demonstration was furnished in the proposition made by me to the Trustees of the Boston Public Library.

By this proposition the Library would print on cards a Centralblatt of Physiology to be issued under the direction of a professional physiologist. The actual cost of printing is guaranteed. Thus the Library, secured from loss, would allow the manufacture on its premises of an apparatus devised to make knowledge more accessible—the end for which the Library itself was created. This permission would be valuable, because the Boston Public Library is at present better equipped for such an undertaking than any other library,* here or abroad, and because the cost of manufacture by such an institution includes neither commercial risk nor commercial profit.†

It is agreed that this card Centralblatt shall contain abstracts of original communications in physiology, including physiological chemistry, invertebrate physiology and the physiological action of drugs. Each abstract is to be written by a physiologist specially learned in the field in which the original belongs. Wherever possible the abstract is to be the work of the author himself, following the admirable suggestion of Dr. Bowditch. Abstracts are to be mailed to subscribers about three weeks after the appearance of the original in this country, and in six weeks in the case of communications published abroad. Taking an average of the abstracts in a volume of the *Centralblatt für Physiologie* and the *Jahresbreicht über die Fortschritte der Physiologie* as a guide, it is expected that 1,500 to 1,700 abstracts, requiring in all

*The most valuable part of this equipment is the skill of Mr. Francis Watts Lee, the accomplished head of the Printing Department. I am indebted to Mr. Lee for much practical information.

†The cost of issue by a commercial house not specially equipped for such work would be between $3,200 and $3,500.

about 2,000 cards of standard library size would be printed annually. The issue would be fortnightly. Each card would contain the author's name; the title; the date and place of publication; the abstract; the name of the expert writing the abstract; two cross-references, each with reference numbers according to the Dewey system; and, finally, the special data required by the mailing law. Composed in linotype brevier, a clear, easily read type, the space available for the text of the abstract would hold about 225 words. The average length of abstracts in the *Centralblatt für Physiologie* is about 200 words. Where the abstract is too long to be printed on one card, a second, or a third, would be used. A thousand cards will "bulk" nine inches.

The regular issue would consist of an original and two duplicate sets. The original set could be arranged alphabetically by the names of authors. The duplicates could be arranged by subjects, with the aid of the cross-references or the Dewey numbers. Suitably printed guide cards, and filing boxes of stout cardboard, the corners strengthened with metal, would be furnished. The price per year, *i. e.*, for about 6,000 cards, with sufficient printed guides and filing boxes, would be ten dollars, postage free, to subscribers in the United States and Canada, and twelve dollars and a half to foreign subscribers, the additional charge being the excess of foreign over domestic postage.

It is agreed that no charge would be made for editorial and business management, that the remuneration of the writers of abstracts would be merely nominal, and that any excess of receipts over expenditures would be applied toward increasing the value or diminishing the price of the publication to the subscriber. Scientists are obliged to collect all the literature of their special subjects. It is believed that the additional labor of putting these gleanings in shape for publication will be repayed in large part by the general saving of time and trouble which the new publication would undoubtedly effect. Besides, the work is a public service.

It has already been said that the Trustees of the Boston Public Library have not yet acted finally upon this proposition. In the event of their deciding that the Library shall not increase its usefulness in this particular direction, it is hoped that means will be found of printing elsewhere. The success of this undertaking in physiology would mean the issue of similar publications in other sciences and the saving of much valuable time now wasted in unprofitable rummaging.

WILLIAM TOWNSEND PORTER.
HARVARD MEDICAL SCHOOL, September 7th.

SCIENTIFIC BOOKS.

The Soluble Ferments and Fermentation. By J. REYNOLDS GREEN. Cambridge. 1899. Pp. 438. [From the Biological Series of Cambridge Natural Science Manuals.]

Enzymology, or the science of the soluble ferments, is a rapidly growing branch of physiological science. Numerous observations bearing upon it are so widely scattered through chemical, botanical, bacteriological, physiological and other journals that it is somewhat difficult to follow its progress and make a systematic summary of the subject. The books thus far published do not treat the entire subject from a physiological aspect. The work of Gamgee, published in 1893, on the chemistry of digestion, is intended especially for the *physician* and treats very ably the enzymes of the animal body, while the work of Effront, *Les enzymes et leur applications*, published in 1896, has especially the *technical* side in view, although it does not neglect the purely chemical details of recent investigations. Reynolds's book attempts more; it undertakes not only to give a detailed description of the enzymes and their actions, but also to bring before us all the physiological relations in plants and animals. It is divided into twenty-four chapters. The first treats of the nature of fermentation and