exceptionally favorable aid in effecting that breadth of view and perfection of co-ordination which we have seen to be the keystone in the arch of scientific achievement.

It is a source of congratulation to us, the members of this laboratory, that these liberal principles are clearly at the foundation of our present organization. Our director has made it very plain, not only by word of mouth, but much more forcibly in practical ways, that it is to be the policy of our laboratory to secure the widest co-operation among all the men of science of our state. To this, as the representative of organized science in Ohio, I have pleasure in responding with equal cordiality that it will be our purpose to share in the great work here established to the full extent of our ability, by attendance when possible, and by sympathetic interest at all times. While we are the gainers by this liberal hospitality offered by the laboratory, it is certain that the laboratory in thus casting its bread upon the waters will find it again after many days.

Permit me in closing to quote a paragraph from the article recently published in the special Christmas number of *Mind!* entitled, 'Specimens of the Critique of Pure Rot, from the remains of a Philosopher, by I. Cant.' "Let us begin by inquiring into the possibility of Rot in general. That Rot exists you may take my word. And there are two kinds of it: damp rot and dry rot, besides certain fungoid growths." To which of these categories this effort of mine belongs, I leave you to judge—whether it is damp rot or dry rot, or merely a relatively innocuous fungoid growth which will deliquesce with the rise of to-morrow's sun.

C. Judson Herrick.
Denison University.

*THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.**

It may be well to briefly outline the history of the International Catalogue of Scientific Literature before recounting the condition of the work at present.

The original suggestion of an international catalogue came from Professor Joseph Henry, first secretary of the Smithsonian Institution, who in 1855 called the attention of the British Association for the Advancement of Science to the great need of a work of this kind. The idea was in advance of the times, and not until 1867 did it bear fruit in the publication by the Royal Society of the well known 'Catalogue of Scientific Papers.' In this publication Professor Henry was given due credit as the originator of the idea, but the work itself was only in part the realization of his plan, dealing as it did with serial publications only and indexing them by authors' names alone. However, with this start the plan lived and progressed until 1894, when the Royal Society, feeling that the time had come to improve the plan of their catalogue, and assured that this could be effected only by international cooperation, addressed a circular to the learned societies of the world, bringing the matter to their notice. By the advice of the societies responding to this circular the Royal Society through the British Foreign Office invited the governments of the world to send delegates to a conference to be held in London in 1896. At this and the two following conferences of 1898 and of 1900 the plan took shape and it was decided to start the work with a classified subject and author catalogue of all original scientific literature beginning with January 1, 1901. The following named sciences were to be included within the scope of the catalogue, one volume a year being devoted to each of

* Read before the Bibliographical Society of Chicago.

the following seventeen sciences: Mathematics, mechanics, physics, chemistry, astronomy, meteorology (including terrestrial magnetism), mineralogy (including petrology and crystallography), geology, geography (mathematical and physical), paleontology, general biology, botany, zoology, human anatomy, physical anthropology, physiology (including experimental psychology, pharmacology and experimental pathology) and bacteriology.

The organization was to consist of a central bureau in London to edit and publish classified references to the current world's literature furnished by regional bureaus established in and supported by the principal countries of the world. After much discussion a system of classification was adopted which divided each science into specific, numbered subdivisions under one or more of which it is possible to classify any paper on any subject within the domain of science. Conversely, when any subject is to be investigated the plan is first to find the subject-heading in the classification schedule and to use the number there given instead of a page number in looking up the grouped references in the body of the catalogue, the pages of which bear the schedule numbers in addition to page numbers. As, with the exception of additions, these subdivisions and numbers are the same from year to year, this method will materially aid in investigations covering a term of years.

Full histories of the conferences have been published by the Royal Society in three pamphlets entitled, respectively, Reports of the proceedings at the first, second and third international conferences on a catalogue of scientific literature. Brief accounts by the writer of this paper covering the history of the enterprise from its beginning through the second conference have been published in SCIENCE, August 6, 1897, and June 2, 9, 1899.

When the third conference had finally decided to begin the work, many of the delegates attending were empowered by their governments to promise official aid to the undertaking, but although Congress had been petitioned to aid in the matter, no action had been taken and the United States, therefore, was unrepresented.

Regional bureaus were established in the following countries: Austria, Belgium, Canada, Cape Colony, Denmark, Egypt, France, Great Britain and Ireland, Germany, Greece, Holland, Hungary, Italy, India and Ceylon, Japan, Mexico, New Zealand, New South Wales, Norway, Portugal, Poland, Queensland, Russia, South Australia, Sweden, Switzerland, Victoria, Western Australia and Finland. Authority over all questions of methods and administration is vested in an international convention to be held in London in 1905, 1910 and every tenth year following.

Failing in governmental appropriation, the Smithsonian Institution felt obliged to render its fostering aid to the project in the United States, otherwise the whole enterprise might have been abandoned. The Institution was at the time enabled to devote a sum of money to carry on the work here provisionally, which, together with gratuitous aid, rendered it possible to make a start. Up to the present time the very limited means at the disposal of the Institution has greatly hampered the work here. However, beginning with July 1, 1903, the force employed will be increased, as it has been possible for the Institution to devote a sum of money to this purpose which has heretofore been otherwise employed. This will not only enable the Institution to deal properly with the current publications in the United States, but will render it possible to make good the omissions occurring from January 1, 1901, to the present time.

Congress has been approached on several occasions in the endeavor to have the

United States officially take its place with the other great nations in this work, but though the Department of State has on four occasions strongly recommended to Congress the advisability of making a suitable appropriation for the work, to be expended under the direction of the secretary of the Smithsonian Institution, no appropriation has as yet been made and it is feared that, owing to the growing disposition on the part of some members to oppose all grants for purely scientific work, the hope of future aid from this source is not encouraging.

On account of the necessary delays attending the beginning of a work of this kind, only the index of part of the first year's literature has so far been published. To be more exact, nine complete and three part volumes of 1901 are now published, besides a list of journals.

It was at first hoped that valuable aid could be obtained from existing card indexes in the different scientific branches of the government, but experience has shown that, owing to the dissimilar methods used, it is practically as difficult to transpose, verify and properly classify the references obtained in this manner as it is to obtain the data at first hand. The Geological Survey, however, has aided greatly in the preparation of the volumes on mineralogy, geology and paleontology, and much valuable aid has been had from the Library of Congress and the Hydrographic Office, besides the bureaus immediately under the Smithsonian Institution. Especial recognition is due to Dr. Theodore Gill, whose ever-ready advice in all mooted questions relating to zoological taxonomy has rendered aid such as could only be had from an authority whose decisions are beyond question.

To give some idea of the extent of the work in this country I may say that approximately twenty thousand classified reference cards have been forwarded by the Smithsonian Institution to the London Central Bureau. Of these over thirteen thousand dealt with the literature of 1901.

The method here employed is briefly this: A numbered card record file is kept of the titles of the periodicals published in the United States which are likely to contain matter on scientific subjects; this record is systematically gone over at regular intervals and the periodicals called for from the Smithsonian Library which aims to receive all such publications. The contents of the publications themselves are indexed separately on cards, and each card duplicated as many times as necessary in order to send to the Central Bureau (besides the regular reference by authors' names) one card for each of the subjects into which the paper is classified. Duplicate author reference cards on which are noted the assigned classification are kept for file, and a record kept of the entire publication on the periodical cards already referred to. By this method it is possible not only to duplicate the work at any time but to check and make good any omissions.

Separate publications and books are treated in like manner in regard to classification, although the methods of obtaining notice of their appearance is necessarily different.

To classify properly into minute subdivisions, such as are employed in this work, the vast amount of scientific matter appearing in this country is a difficult task, but every effort is used to make the references exact, and where there is any intricate question involved the advice of a specialist is asked. I desire to acknowledge the valuable services of Mr. L. C. Gunnell and Miss Rose A. Palmer, who have brought intelligence, enthusiasm and industry to the work of indexing and classification. At the central bureau a corps of referees

are employed, a specialist for each science, who, to guard against error, review each reference before publication.

It is a matter of congratulation that this country leads in the number of subscribers to the catalogue, the number being 96, equivalent to over 70 complete sets. The individual volumes may be subscribed to for a sum *pro rata* to the cost of the full set. As the yearly subscription to the full set of seventeen volumes is $85, this is an encouraging showing. Although this catalogue has not been free from the defects and consequent criticism attending all new enterprises, the work itself is being done in a way to furnish a helping hand to both librarians and students who have long needed a concise subject index to the great and ever-increasing scientific literature of the day. This field the International Catalogue of Scientific Literature aims to cover.

CYRUS ADLER.

SMITHSONIAN INSTITUTION,
June 19, 1903.

SCIENTIFIC BOOKS.

NEW TEXT-BOOKS IN PHYSICS.

A Laboratory Manual of Physics. By HENRY C. CHESTON, PHILIP R. DEAN and CHARLES E. TIMMERMAN. New York, American Book Company. 1903. Pp. 128.

Laboratory Exercises in Physics. By GEORGE R. TWISS. New York, The Macmillan Company. 1902. Pp. 193.

A Manual of Elementary Practical Physics. By JULIUS HORTVET. Minneapolis, H. W. Wilson. 1902. Pp. 276.

Practical Physics for Students of Science and Engineering. By ERVIN S. FERRY. LaFayette, Ind., Burt-Terry-Wilson Co. 1903. Part I. Pp. 146.

Mechanics, Molecular Physics and Heat. By ROBERT A. MILLIKAN. Chicago, Scott, Foresman & Co. 1902. Pp. 242.

Elements of Physics. By FERNANDO SANFORD. New York, Henry Holt & Co. 1902. Pp. 426.

Elements of Physics. By ERNEST J. ANDREWS and H. N. HOWLAND. New York, The Macmillan Company. 1903. Pp. 386.

Introduction to Physical Science. By ALFRED PAYSON GAGE. Boston, Ginn & Co. 1902. Pp. 359.

Text-Book of Physics. By R. A. LEHFELDT. London, Edward Arnold. 1902. Pp. 304.

Light, for Students. By EDWIN EDSER. London, Macmillan & Co. 1902. Pp. 571.

Lehrbuch der Physik; Erster Band, Mechanik. Von O. D. CHWOLSON, St. Petersburg; übersetzt von H. PFLAUM. Braunschweig, Friedrich Vieweg und Sohn. 1902. Pp. 791.

The annual crop of new text-books of physics is becoming so large that the bewildered reviewer is scarcely able any longer to discuss them distributively; or, if so, it has to be by some system of grouping with comparison of the members of each group. A threefold division may perhaps be made according to the apparent aims of the authors. The first group consists of those which are intended for use chiefly or entirely in the laboratory. The second is made up of those adapted for class-room use in connection with oral exposition. The third includes books intended neither for the laboratory nor for the class-room primarily, but as systematic presentations of principle, to be mastered by private reading in courses of parallel study accompanying the formal lectures or in preparation for formal examinations.

To the first group distinctly belong the first four books of the present list. In the preparation of an elementary laboratory manual there is no longer much range for great originality or for adaptation to a large clientage. The first volume is a little book of 128 pages, prepared by three authors, who frankly begin by saying: "The reason for adding this book to the large number of laboratory manuals is that those now in use either contain too much matter to be successfully covered by a pupil in one year, or elaborate the principles chosen without regard to economy in time." The authors of the other manuals may perhaps differ with these authors as to what constitutes too much matter and in regard