terial aid to the construction of his right-handed and left-handed molecules! It is strange that more use has not been made of the ordinary stereoscope for purposes of scientific illustration; instead of having expensive models of the forms of higher mathematics, every purpose would be subserved if a set of stereoscopic views of them were provided. With this new and more simple device there is every reason to hope that representation in the solid, requiring merely that a person should take his red and green glasses out of his pocket, will become nearly as much a matter of course as plain, or rather plane, diagrams are now.

Another field for the application of this principle is in illustrations thrown on the screen for large audiences. There would be no difficulty whatever in projecting one picture of a stereoscopic pair through a red glass on to the screen, and the other through a green glass, and providing the onlookers with the corresponding spectacles; this, in fact, is the special form of the process which is already in use in other countries. For this form, as well as that on a card for individual use, stereoscopic pictures already made need only to be reproduced in the proper colors to answer the requirements of this new method.

As regards the painter of pictures in the artistic sense, it is perhaps prophetic that he has already furnished his paintings strong purple shadows; he has only to intensify the greens on the *other side* of his trunks of trees, and to provide the necessary green and purple glasses for his critics, in order to show them a picture of reality, such as he has before only dreamed of producing.

The process ought, therefore, to have an important future. The present publisher in the Redheffer Art Publishing Co., Baltimore Building, Chicago.

C. Ladd Franklin.

THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

BOTANY.

It is manifestly quite impossible to-day to make a satisfactory schedule of the classification of botanical books and papers for use in libraries, since, to be satisfactory to the botanists, it should represent the present development of the science, while, on the other hand, such a representation would be far beyond the technical botanical knowledge of the librarians. It is the misfortune of Science that much of its administration must be entrusted to persons who have, at the best, only a general knowledge of the subject, and this very often representing an old phase of the science, long since abandoned in the laboratory and lecture-room. It is, perhaps, impossible to have it otherwise, at least for a long time to come; we cannot require librarians to know as much in regard to the progress of Science as the workers themselves. It is inevitable, therefore, that any scheme of the classification of botanical books which can be used by librarians must fall considerably short of representing the present condition of the science. On the other hand, as revisions of library schemes are made from time to time, it is desirable that the classification should be brought forward somewhat nearer the present condition of Science, as far, at least, as can be done with safety, since no library, by its inertia, should become, to a marked degree, the conservator of abandoned scientific views.

The International Catalogue Committee apparently have kept in mind something like the foregoing, and have wrought out a scheme which will no doubt be workable by librarians and those whose knowledge of Botany is general rather than specific. Probably few, if any, objections will be brought against it by the librarians and general students of plants, at least in so far as the general plan is concerned. We may,

however, look for objections from the specialists whose work has carried them far beyond the somewhat old-fashioned grouping of subjects here adopted, and it becomes our duty to inquire whether or not it is advisable at this time to still further modernize the classification proposed.

The primary divisions made by the committee are as follows:

I.—Bibliography (including philosophy, history, biography, dictionaries, text-books, pedagogy, addresses, lectures, essays and works on method.

II.—External Morphology and Organogeny (including this consideration of the vegetative and reproductive organs, alternation of generations, and teratology).

III.—Anatomy, Development and Cytology (including this consideration of the vegetative and reproductive organs, embryology, anatomy and development of tissues and cytology).

IV.—Physiology (including the physiology of (*a*) the vegetative organs and (*b*) the physiology of reproduction).

V.—Pathology (including diseases due to malnutrition, to other plants, to animals, to other or unknown causes, wounds, reparative processes, galls, treatment of diseases).

VI.—Evolution (including heredity, variation, natural and artificial selection, degeneration, phylogeny).

VII.—Taxonomy (including general works on systematic botany, nomenclature, etc., and those relating to plants falling under any of the great plant groups from Dicotyledons down to Bacteria and Mycetozoa).

VIII.—Geographic Distribution (including general works, local floras grouped by countries, and plankton botany grouped into temperature zones).

When we attentively consider the foregoing we note that:

1. The first division is made to include much more than bibliography; in fact, one may well wonder why Philosophy is included here rather than under Evolution; why Text-books are not entered in one or more places under the 'General Works,' for which provision is made in each division; and why Lectures and Essays should not be similarly distributed according to the subjects of which they treat.

2. The use of 'Anatomy' in the sense of Histology in the third division will lead to confusion. Anatomy as generally understood refers to the gross structure, as contrasted with minute structure, with which Histology concerns itself, and since the treatment in the third division is evidently intended to be histological it will be better to use the more appropriate term—Histology.

3. In practice there will be much confusion between Taxonomy and Geographic Distribution. The latter, in spite of its name, appears not to include what we now call Phytogeography or Geophytography; on the contrary, it is rather the geographic distribution of the books and papers; thus Gray's Manual would appear under the subhead 'North America,' while Hooker's Student's Flora would appear under 'Europe,' etc. One is puzzled to know what to do with Ellis and Everhart's 'North American Pyrenomycetes' under this scheme; is it to be put under Taxonomy, or under Geographic Distribution, with other North American floras?

4. In regard to minor matters one is compelled to object to the treatment of the reproductive organs. Under 'External Morphology and Organogeny' we have the following titles, viz.: Reproductive Organs, Flower and Inflorescence, Fruit, Seed, Sporangia, Vegetative Organs of Propagation, and under 'Anatomy, Development, and Cytology' we find these heads, viz., Reproductive Organs, Flower and Inflorescence, Perianth, Andrœcium, Gynœcium, Fruit, Seed, Sporangia (Cryptogamic), Sexual Organs (Cryptogamic), Vegetative Organs of Propagation. With such a schedule what can we do with papers treating of the prothallia of Pteridophyta, the uredospores of the Uredineæ, or the bosidiospores of the mushrooms and puff-balls? The trouble here is that the schedule is either not full enough of particulars or too full in certain lines, thus emphasizing the want of particularity in others.

5. The insertion of Botanical Gardens, Museums and Herbaria in the division 'Taxonomy' is, to say the least, quite unexpected. Why we should regard these illustrative collections of plants as taxonomic is impossible to make out. These constitute and are as much a part of Morphology, Anatomy, Physiology, Pathology and Geographic Distribution as they are of Taxonomy. They should be given separate place or be introduced under each of the foregoing heads.

As we run over the schedule prepared by the International Committee we cannot help wishing that they had had access to the as-yet-unpublished address by Dr. Wm. Trelease on 'The Classification of a Botanical Library' given before the Botanical Seminar of the University of Nebraska in May, 1898, embodying the results of years of study of the problem. This is not the place in which to discuss Dr. Trelease's classification, especially since it has not yet appeared in print, but it may not be out of place to call the attention of the International Committee to it, as we understand that it is to appear within a few months.

It is evident that we must look to some one like Dr. Trelease for the solution of the problem. The librarians cannot solve it, nor can the botanists themselves; the former know too little of botany, and the latter know too little about library technique. We must look to the men who are modern, working botanists, and who at the same time have charge of large botanical libraries, as they alone are able to see the botanical needs, on the one hand, and the library limitations, on the other.

Charles E. Bessey.
The University of Nebraska.

ANTHROPOLOGY.

The International Catalogue Committee naturally encountered special difficulties in dealing with the subject of anthropology, for the reason that this youngest of the sciences is not yet organized in a manner acceptable to the entire body of students. It is doubtless for this reason (at least in considerable measure) that the scheme proposed is not classific in any proper sense, but rather a nearly random assortment of catchwords of two degrees of magnitude. Thus, while the first major division, 'Museums and Collections,' is a fairly logical and convenient one, and its subdivisions are clearly defined and acceptable, the other major and minor divisions form a curious medley. The remaining major divisions are 'Archæology,' 'Anthropometry,' 'Races,' 'Industrial Occupations and Appliances,' 'Arts of Pleasure,' 'Communication of Ideas,' 'Science (chiefly of primitive races),' 'Superstition, Religion, Customs,' 'Administration' and 'Sociology (chiefly of primitive races).' The first of these divisions is based on individual objects defined by a time limitation; the second is based on laboratory procedure and apparatus; the third has a material objective basis, but the units are collective and not all individual; the fourth and fifth divisions are based on activities and not on objects, and there is an implied time limitation growing out of the separate arrangement under 'Archæology;' while the remaining divisions are partly objective yet chiefly activital, partly individual yet chiefly collective in basis. The heterogeneity in the divisions, both primary and secondary, suggests studied avoidance of attempt to classify the Science of Man in any comprehensive way.

By reason of the diversity in basis, considerable overlapping of even the major divisions is occasioned; *e. g.*, 'Archæology' overlaps the fourth and fifth divisions in a manner peculiarly inconvenient to students who interpret prehistoric artifacts through study of the handicraft of living savages and barbarians, while 'Administration' and 'Sociology' mean so nearly the

same thing that these divisions practically overlap throughout. For the same reason, certain divisions are unduly restricted; *e. g.*, 'Customs' is used in a narrow sense, while the term is commonly extended over nearly the whole range of the human activities. Perhaps for a similar reason, there are serious lacunæ in the scheme; 'Prehistoric human remains' (a subdivision of "Archæology") and several subdivisions of 'Anthropometry' have place, yet there is no place in the scheme for the important subject of somatology; so also 'Superstition' and primitive 'Science' (whatever that may mean) receive ample space, while there is no philosophy (or mythology), which constitutes a leading subject of anthropologic inquiry. Possibly somatology and philosophy are relegated to other primary categories not included in Anthropology; but, if so, the confusion in the mind of the anthropologist desiring to use the catalogue will be only the greater. On passing to the subdivisions, both the overlapping and the lacunæ become still more conspicuous; indeed, the instances are too many for citation without practically rewriting the list.

It is only fair to ascribe much of the chaotic character of the scheme to the ill-organized state of the science; yet no extension of fairness can conceal the conspicuous fact that the scheme *is* chaotic, and to such an extent as to incommode seriously the anthropologist who may seek to apply it.

The applicability of the scheme may easily be tested by an example or two. Suppose Dr. Boas' rather special memoir on 'The Social Organization and the Secret Societies of the Kwakiutl Indians' be selected, and suppose it be catalogued by actual content: In the first place, it is based primarily on collections in the National Museum, and its illustrations are largely representations of Museum specimens indicated by Museum numbers, which would place it in the first major division of the scheme, with the subdivision number 0030. Then some of the objects and traditions described are essentially prehistoric, so that it would seem to require entry under the second major division, perhaps in number 0650; while there is sufficient reference to racial characteristics to suggest entry under the fourth division, say in number 1950. Certainly, too, the work would have to be entered in each of the next three major divisions, probably under numbers 2000, 2050, 2370, 2400, 2500, 2510, 2520, 2600, 2700, 3000, 3050, 3100, 3400, 3550, 3600 and 4100; while it would also find necessary place under each of the remaining major divisions, and in at least a dozen more numbers. All this for a single moderately special memoir! Another example, taken at random, is Dr. Carus' recent pamphlet on 'Chinese Philosophy,' a memoir of special scope and of particular significance to museum workers as well as to general anthropologists. In the absence of an appropriate general division, it would require introduction probably under 'Arts of Pleasure,' and certainly under 'Communication of Ideas,' 'Science,' and 'Superstition, Religion, Customs,' and ought to be entered under 3100, 3550, 3600, 4100, 5100, 5400, 5500, and possibly three or four other numbers. These examples suffice to illustrate the difficulties in the way of cataloguing anthropologic literature under the scheme proposed; indeed, it would be a wise anthropologist who could, without burdensome repetition, catalogue under the scheme any considerable mass of literature, even for his own use, in such manner as to give him much aid in scanning the literature a few years later; while the uncertainty of cataloguing for others, or of depending on the cataloguing of others, would seem to outweigh any advantage attending the proposed schematic arrangement. The difficulties of cataloguing would naturally be greatly diminished if the cataloguer con-

fined attention to the titles; but they would not disappear, as the examples show, while the value of the catalogue would be greatly reduced. Of course, the difficulties are due largely to the unorganized condition of the science; yet it does seem practically certain that any single anthropologist, well abreast of the science and working constructively, might have evolved a homogeneous and consistent scheme, by which anthropologic cataloguing would be facilitated rather than burdened.

Inspection of the scheme raises the question whether it is designed primarily for the use of librarians, or for the convenience of scientific workers; and the arbitrary features at once suggest that the users contemplated cannot be investigators, of whom the great majority are accustomed to methods of gaining and maintaining acquaintance with scientific literature quite unlike those embodied in the scheme. These usage-honored methods are epitomized in the systematic lists of contents and (more especially) the indexes with which respectable scientific books are provided. Now the character of current indexes of anthropologic books (particularly those prepared by authors themselves) indicates that the ideas of investigators are crystallized about certain nuclei, which are essentially denotive—names of men, names of books, names of races or nations or tribes, names of places, etc.; there is relatively slight attempt, so far as the indexes show, to crystallize ideas about necessarily vague connotive nuclei. It is true that the typical list of contents is much more largely connotive than the typical index; but even here there is a strong tendency toward arrangement in terms of trenchant concepts, *i. e.*, in denotive terms. What is true of anthropologic literature is measurably true of the literature of other branches of science, though most or all of the other branches are so well organized as to yield larger series of specific terms habitually used in denotive sense. The scientific makers and users of indexes are concerned with the essentials of scientific literature, rather than with the mere externals which appeal to the librarian *per se;* and the weakness of the scheme herein noted would seem to lie in the fact that it gives no promise of guiding or aiding the investigator in any useful way, howsoever convenient it may be as a guide to book-handlers concerned only with the external aspects of anthropologic publications.

The final test of the value of any catalogue is found in the practical operation of the law of supply and demand, with respect to both raw material and finished product. As bearing on this test, it may be observed that no working anthropologist in the Bureau of American Ethnology would seriously undertake the cataloguing of anthropologic literature, or any branch thereof, in accordance with the extravagantly complex scheme of the Royal Society Committee, and that the library of the Bureau could not be arranged under it; also that, while the office would probably subscribe for author cards and the lustral book-catalogue, the subscription for the latter would be made much more freely if it were a simple author list. And the arbitrary symbols on cards and pages would be regarded merely as trivial blemishes, unsightly but not necessarily mischievous.

W J McGee.

THE ROYAL SOCIETY OF CANADA.

The eighteenth annual meeting of the Royal Society of Canada was held at Ottawa from May 22d to 26th. Fellows from the provinces of Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia were present. The Council met in the office of Sir John Bourinot, House of Commons on Monday, and Tuesday morning the regular work of the Sections began. The readers of Science will recall to mind that