

passed Michigan and now ranks third, or if Columbia's extension students be deducted, second, with Columbia third. Michigan occupies fourth place, and then come California, Minnesota, Cornell and Wisconsin in the same relative positions as last year. Northwestern's increase of over 400 has placed her ahead of both Yale and Pennsylvania, which occupy tenth and eleventh places, respectively. Nebraska has passed Indiana, likewise showing an increase of almost 400. Syracuse also has a larger enrolment than Indiana. After Indiana and Missouri comes Leland Stanford, which has passed Princeton.

As far as the different departments are concerned, it will be seen that Harvard still shows by far the largest collegiate enrolment. On the whole there has been a small increase in the total number of college students attending the universities under consideration. The scientific schools show a large general increase all along the line, with the single exception of Missouri. There are fewer law students than there were in 1901, in spite of the fact that Chicago has added a law faculty since last year. The total number of medical students also shows a decrease, which is accounted for largely by the facts that the admission requirements at Columbia have been strengthened, and that the last class admitted at Harvard without the degree requirements graduated in the spring. Michigan has still the largest enrolment in its law faculty, and Columbia still heads the list in the faculty of medicine and in the graduate schools. The grand total of graduate students shows a slight increase over that of last year. There have been no important changes in the relative ranking of the teaching force in the largest institutions, Harvard still leading, with Columbia second. RUDOLF TOMBO, JR.,

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NEW DEPARTURES IN THE BIBLIOGRAPHICAL WORK OF THE CONCILIUM BIBLIOGRAPHICUM.

SINCE an article published in the *American Naturalist* in 1898 no adequate account of the work of the Concilium Bibliographicum has appeared in the scientific press. SCIENCE has regularly reprinted extracts from the 'Annual Statements' of the Concilium, but these notices have necessarily been somewhat disconnected and have not emphasized certain features of the work insufficiently appreciated in America.

The bibliographical references gathered by the Concilium may, for practical purposes, be divided into two great categories, the manuscript cards and the printed cards. The references contained in the former are far more numerous than those recorded in the latter, and in general the bibliography in manuscript form is a very essential part of our task. Although open to subscription, this bibliography is quite unknown in America, not even a sample card ever having been asked for. In regard to the printed bibliography the state of affairs is somewhat better, but our work is, nevertheless, insufficiently understood, as a consultation of our subscription list must show.

The printed card catalogue is supplied according to two entirely different arrangements, each of which has its utility—the alphabetical authors' catalogue and the methodical arrangement, embracing as chief subdivisions: paleontology, general biology, microscopy, zoology, anatomy and physiology. To have an ideally complete bibliography, an institution should have these two arrangements complete.

Such subscriptions have been received from European institutions; none ever reached us from America. The nearest approach to this condition is to be found in the University of Minnesota, where two

subscriptions complete each other, so that everything is present save the authors' catalogue in anatomy and physiology. The same may be said of Harvard University, if we take the Cambridge and Boston departments together. Disregarding the authors' catalogue, a complete methodical arrangement is to be found in Cornell University, in Columbia University, in the City Library in Springfield, Mass., in the State Library in Albany and (excepting physiology) in the John Crerar Library, Chicago. Leaving out of account anatomy and physiology, the complete methodical set of cards is to be found, furthermore, in the University of Michigan, the University of Kansas, the University of Nebraska, the University of Wisconsin, Carleton College and Princeton University. As the above statement shows, there are great scientific centers, including, for example, all points west of Lincoln, Nebr., and south of Princeton, N. J., where our work is not accessible in such form that we should be willing for it to be taken as a test. This point we desire to emphasize, for we have reason to believe that, in every case where our bibliography has proved inefficient, it has been solely due to a complete misconception of the possibilities really offered. Only such persons as have access to the above-mentioned sets of cards will be able to verify the following account.\*

#### I. THE PRINTED CARD CATALOGUE.

In reviewing the progress of the work since 1898, the most salient feature is the

\* At present all the topical cards issued prior to 1898 are out of print. Two sets tolerably complete from the middle of 1898 on are still on hand. When these have been disposed of, nothing will remain of the issues prior to 1899, which itself is nearing exhaustion. Finally, a single copy of the authors' catalogue can still be had complete from 1896. Save for this one set, the authors' catalogue is already entirely out of print up to January, 1902.

far greater completeness of the record. Perfection has not of course yet been attained in this respect; but, since a complete register is kept of every fascicule excerpted, we know precisely where every gap occurs and it will eventually be filled. In any event, our bibliography for zoology is probably to-day more complete than any other in existence. The number of entries in the methodical set of cards already exceeds 92,690, and the individual cards published 11,000,000.

The arrangement of the complete methodical set is such that there is scarcely any limit to its possibilities in matter supplying bibliographical information. That one can at once ascertain the works having as their object a given genus, or a given group of animals, is of course evident. With equal facility, the bibliography of such questions as viviparity, regeneration, flight, spermatogenesis, gastrulation, mechanics of development, structure of the vascular system, songs and cries, hibernation, centrosome, recent and fossil fauna of Kansas, studies on Miocene mammals, etc.

Such groupings existed already in 1898; but since that time a change has taken place in the entries, which constitutes a veritable revolution in bibliographical methods and affords a precision which even those intimately connected with the work at first thought unattainable.

Let us compare the procedure at present followed in the Concilium with the admirable bibliography in the *Zoologischer Anzeiger*, which certainly represents the greatest perfection heretofore attained.

I have taken the pains to look up the entries in the *Anzeiger* recorded under fauna of Rhode Island from 1896 to 1901, and find a single reference to a paper by Eaton on the 'Prehistoric Fauna of Block Island'; Hollick's 'Notes on Block Island' and G. W. Field's 'Plankton Studies' hav-

ing been apparently overlooked. Had the Concilium followed the usual methods of bibliography, there would have been only the advantage of greater completeness and the ease of reference resulting from the use of the card system. The long search would have been replaced by a single glance; that is all. But it is evident that a bibliography of the fauna of Rhode Island must contain references to such works as Carpenter's studies on the 'Shell-bearing Mollusca of Rhode Island.' Hitherto such references had, however, always been simply classed under Mollusca. In 1897, however, the Concilium attempted the innovation of entering such papers also under the appropriate faunistic heading, and so laid the basis for its so-called 'complete series,' which to-day forms the principal *raison d'être* of the bibliography.

Towards the end of 1897 a further step was taken in classifying according to the text and not according to the title. Thus Ehrmann's 'Notes on Eastern North American Cychrus' was classified under Rhode Island, because the text showed that his collections came from that state.

Then in 1899 a very important step was taken, which had at first seemed quite impossible. This was the introduction of multiple exhaustive entries. Till then papers of so general a character that they embraced species from all the various continents were omitted from the special faunistic bibliography. From 1899 on, however, it has been attempted to take account of every feature of the publication to be recorded. Thus a paper on tropical Coleoptera, if it contained references to African, South American and Malayan forms would be classified under Coleoptera, under Africa, under South America and under Malayan Archipelago. If, in addition, there were a section devoted to mimicry and another to myrmecophily, two further editions of the card reference

would be issued classed under these headings. Thus, for example, in Kerremans' third study on Buprestidæ, 96 new species were described, of which one solitary species of *Brachys* came from Florida. Subscribers will find the entry in the appropriate place under fauna of Florida.

This new procedure brought the bibliography to a state of perfection that certainly never was attempted before; but there still remained one difficulty, which, in spite of many experiments, we were unable to overcome until the present year.

The subscriber who desires to receive all references to the fauna of Rhode Island can not depend upon finding all he requires in our division Fauna of Rhode Island, even though our treatment of the section has been so exhaustive. There are papers on the Fauna of New England in general that contain notes on Rhode Island.\* There may be important observations on Rhode Island in papers that we have been forced to classify under fauna of the United States or even of North America in general.

In order to obviate this difficulty our bibliographers now, in reading a paper, jot down each item as they come to it; thus, if they find species from Ontario, from all of the New England States, from New Mexico and from California, they will have recorded every single state; if the paper have notes on the structure of the eyes, the heart, and the kidneys, this will have been recorded; finally, if the paper be on Mollusca of the families Unionidæ, Helicidæ and Cyclostomidæ, evidence of this will be found in the notes taken. Three editions only of the card will be issued under anatomy, North American fauna and Mollusca; but the edition appearing in the division anatomy will have

\* Thus King's 'Further Notes on New England Formicidæ' deals with Vermont, Massachusetts and Rhode Island forms.

subsidiary symbols stating that only the eyes, the heart and the kidney are treated, that classed under Fauna of North America will enumerate all the states concerned, while finally the card intended for entry under Mollusca will state that Lamellibranchs, Prosobranchs and Pulmonates are included.

Such a card would have the following appearance:

Doe, John. 4 (7)

1902. New Land and Fresh-water Molluscs, with Notes on Anatomy. Proc. Townville Nat. Hist. Soc., Vol. 4, p. 3-24, 3 figs. [6 nn. spp. in *Roeina* n. g. 2, *Helix* 4]

4.1., 32., 38 (71.3, 74.1-6, 78.9, 79.4)

Such notices are given in terms of the decimal classification. Thus the main card would appear under 4 Mollusca, and at the end of the text the sorters would find in inconspicuous type the instructions 4.1 (Lamellibranchs), 4.32 (Prosobranchs) and 4.38 (Pulmonates), or, as it is abbreviated, 4.1., 32., 38. These check numbers are of course useful to any subscriber who has taken the pains to study our system of classification, but the main purpose is to guide the sorters in dividing up the cards classified under general headings. Each subscriber then to the fauna of Rhode Island would receive notices of papers treating Rhode Island quite incidentally.

Since 1899 record has been kept of every new species, etc., even though thirty or more lines of print may have been necessary to give the citation. Repeatedly an entire day has been devoted to excerpting a single monograph. In regard to this, however, we can be more explicit in the second part of this communication.

Before terminating this first article attention should be frankly drawn to the defective state of our anatomical and phys-

iological bibliographies. Financial difficulties have here alone stood in the way; each year we have hoped to be able to make these two sections worthy of the undertaking; but as often have we been obliged to postpone such action. Practical reasons make it wiser to apply the most approved methods to the excerpting of the zoological articles rather than to ever do this work in a less perfect manner. Delay in publishing the anatomical and physiological parts can eventually be made good. Hasty, incomplete work in reading and classifying a zoological memoir leaves no outwardly visible trace, but is a lasting blemish.

The Concilium has a right to expect from America subsidies, similar to those offered to it in Europe. It never can be self-supporting without raising its prices, so as to place it at the service of the privileged few instead of being open to all. Nevertheless, the present state of its subscription list can only be explained by an extraordinary ignorance of the facilities offered. Is it possible that there is not a person in Rhode Island, not a library, not a laboratory, willing to purchase (for ten cents) the bibliography of the fauna of this state during seven years? I should have supposed there would be fifty in Providence alone. We have separate special bibliographies for each state in the Union. Not one of them has yet found a subscriber! For completeness we must continue them, no matter how great the loss. And so it is with every other department. Personally I can scarcely conceive that there is a serious worker in zoology who would not find it to his advantage to enter into relations with the Concilium. The institution has solved the bibliographical problems that stood before it in a most satisfactory fashion. All that remains is for workers the world over,

and especially in America, where the enterprise had its origin, to obtain full profit from its work. If there be any difficulties in the way we should be glad to know of them. It would be of the greatest service to us for us to be informed of any bibliographical need which we can not fill. The system is so elastic that past experience warrants us in saying that no legitimate demand that can be made on a bibliography need remain unfilled.

#### SOCIETIES AND ACADEMIES.

##### THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE fifty-second annual meeting of the American Association for the Advancement of Science, and the first of the Convocation Week meetings, will be held in Washington, D. C., December 27, 1902, to January 3, 1903. The retiring president is Professor Asaph Hall, U.S.N., and the president elect, President Ira Remsen, Johns Hopkins University. The permanent secretary is Dr. L. O. Howard, Cosmos Club, Washington, D. C., and the local secretary, Dr. Marcus Benjamin, Columbian University, Washington, D. C. President Roosevelt is honorary president of the local committee. The preliminary program with information in regard to hotel headquarters, railway rates, etc., will be found in the issue of SCIENCE for November 21. The following scientific societies will meet at Washington in affiliation with the Association:

*The American Anthropological Association* will hold its first regular meeting during Convocation Week in affiliation with Section H of the A. A. A. S. President, W. J. McGee; secretary George A. Dorsey, Field Columbian Museum, Chicago, Ill.

*The American Chemical Society* will meet on December 29 and 30. President, Ira Remsen; secretary, A. C. Hale, 352A Hancock street, Brooklyn, N. Y.

*The American Folk-lore Society* will meet in affiliation with Section H of the A. A. A. S. President, George A. Dorsey; vice-presidents, J. Walter Fewkes, James Mooney; secretary, W. W. Newell, Cambridge, Mass.

*The American Microscopical Society* will hold

a meeting on January 1. President, E. A. Birge, Madison, Wis.; secretary, H. B. Ward, University of Nebraska, Lincoln Nebr.

*The American Morphological Society* will meet on December 30 and 31. President, H. C. Bumpus; vice-president, G. H. Parker; secretary and treasurer, M. M. Metcalf, Woman's College, Baltimore, Md.

*The American Philosophical Association* will meet on December 30 and 31 and January 1. Secretary, H. N. Gardiner, Northampton, Mass.

*The American Physical Society* will meet in affiliation with Section B of the A. A. A. S. President, Albert A. Michelson; secretary, Ernest Merritt, Cornell University, Ithaca, N. Y.

*The American Physiological Society* will meet on December 30 and 31. President, R. H. Chittenden; secretary, F. S. Lee, Columbia University, New York, N. Y.

*The American Psychological Association* will meet on December 30 and 31 and January 1. President, E. A. Sanford; secretary and treasurer, Livingston Farrand, Columbia University, New York, N. Y.

*The American Society of Naturalists* will meet on December 30 and 31. President, J. McK. Cattell; vice-presidents, C. D. Walcott, L. O. Howard, D. P. Penhallow; secretary, R. G. Harrison, Johns Hopkins University, Baltimore, Md.

*The Association of American Anatomists* will meet on December 30 and 31. President, G. S. Huntington; vice-president, D. S. Lamb; secretary and treasurer, G. Carl Huber, University of Michigan, Ann Arbor, Mich.

*The Association of Economic Entomologists* will meet on December 26 and 27. President, E. P. Felt; secretary, A. L. Quaintance, College Park, Md.

*The Astronomical and Astrophysical Society of America* will meet during Convocation Week, in affiliation with Section A of the A. A. A. S. President, Simon Newcomb; secretary, George C. Comstock, University of Wisconsin, Madison, Wis.

*The Botanical Society of America* will meet on December 31 and January 1. President, B. T. Galloway; secretary, D. T. MacDougal, New York City.

*The Botanists of the Central and Western States* will meet on December 30. Committee in charge of the meeting, John M. Coulter, University of Chicago; D. M. Mottier, University of Indiana, Bloomington, Ind.; Conway MacMillan, University of Minnesota, Minneapolis, Minn.

*The Geological Society of America* will meet on December 29, 30 and 31. President, N. H. Win-