SCIENCE

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson N. Y.

*ON THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE OF THE ROYAL SOCIETY.**

THE Royal Society of London has already demonstrated its great interest in bibliography and literature by the publication of the 'Catalogue of Scientific Papers.' It proposes to continue its efforts. In the 'International Catalogue of Scientific Literature,' which it has now planned, the Society intends to correct the chief defect of the first undertaking, the absence of a subject index. As is well known, it convened an international conference, which held meetings in London from the 14th to the 17th of July, 1896. The Conference voted to request the Royal Society to appoint a committee to consider all the unsettled questions laid before it by the Conference. The report of the committee, signed by its chairman, Professor H. E. Armstrong, was issued late in March, 1898. As compared with the 'Catalogue of Scientific Papers,' the new work is (1) to be more complete, since it is to include all the literature within the fields under consideration—not alone that 'contained in certain periodicals,' and 'books of definite categories;' (2) to present the works in two methods of arrangement, (*a*) according to the name of the author, and (*b*) according to the contents of the catalogued article or book—and in the two forms, card-catalogue and book-catalogue. But it is to be (3) just as restricted as its predecessor, the 'Catalogue of Scientific Papers,' since it is to take into account only the natural sciences, together with mathematics and astronomy, as well as psychology and anthropology. Finally (4) it is to be very much more voluminous, since the title is to be repeated on cross-reference cards under catch-words taken from the contents.

* Translated from the *Zoologische Anzeiger*, No. 566.

It is the business of bibliography to catalogue all works appearing separately—viz: books, periodicals, publications of societies, monographs, atlases and pamphlets, whether published by dealers, by institutions or privately—with exact statement of the name of the author or authors, if known, the form, the extent (including the number of pages, and, if present, of plates, tables or other additions), the place and time of publication, and where and at what price procurable. This part of the literature, so important for the special workers in different fields, has been collected in separate works of a general nature (like that long since published by *Reuss*) or in reports on the literature of the separate branches. The custom of several societies of giving their separate papers to the dealers as soon as they were printed and of uniting these into a volume only at a later date, as well as the practice of antiquarian book dealers since the middle of the present century, of cutting up the volumes of periodicals and society publications (because treatises on separate subjects are more salable than volumes treating of a great variety of matters), resulted in the incorporation of the titles of such works in bibliographies, often, indeed, without any statement as to their source. In order to protect the special investigator from the mistake of supposing that these were independent works that had escaped his notice, it became necessary to incorporate in bibliographies the contents of periodicals with a statement of the volume and the time of publication. It was in accordance with these principles that I elaborated the Bibliotheca Zoologica.

It is in this way that bibliography, in a somewhat enlarged sense, it must be admitted, can and should be compiled. But the needs of scientific investigators were not fully met by this. In addition to these bibliographies arose the Jahresberichte on the separate sciences. It is the province of the latter to note not only the contents of the publications under consideration, but also the scientific results contained in them. Bibliography may, indeed, meet the needs of the writers of Jahresberichte, first—by giving the contents of the separate works, yet this ought to be restricted to those cases where the contents refer to two or more not immediately connected subjects (*e. g.*, if, in a work on precession and nutation, the special form of a new meridian circle is described, or if a treatise on one class of animals contains communications on an entirely different class); and, secondly, by exceeding the minimum limit for the citation of scientific contributions and incorporating, for example, from periodicals, notices of only 3 or 4 lines, if these contain important or interesting new facts (*e. g.*, the discovery of a definite organ in a group of animals in which it has not hitherto been found, or the presence of a species of animal in a place where it has not been previously observed). This, however, is the utmost limit to which bibliography (*sensu latissimo*) should go.

The first objection to be raised to the plan of the Royal Society Catalogue lies in the impracticable though only partial amalgamation of bibliographic work with that of the abstracts and reviews. No. 17 (Resolution No. 6) of the Conference reads: "That, in indexing according to subject-matter, regard shall be had, not only to the title (of a paper or book), but also to the nature of the contents." According to the wording this practically corresponds to my last statement. But the undertaking planned by the Royal Society deviates from this in essential particulars, and, indeed, in a manner that is absolutely impracticable and, at least as far as regards the examples given in the Report, useless. The plan is impracticable because the matter to be indexed is subdivided far too minutely. If, for example, all the new species of animals were to be enumerated under the name o

the genus—whether in the book-catalogue alone, or on the separate cards—or even only the new genera, not only would the work be multiplied twenty-fold or a hundred-fold, but the catalogue would be so increased in size that it would be unmanageable. And, finally, the enumeration of these names without an accompanying description has only a doubtful value for the investigator. This belongs in the Jahresberichte. The noting of new generic names, as I give them in the Bibliography of the *Zool. Anzeiger*, is of value to working zoologists in preventing the use of names already employed. No. 13 (Resolution No. 2) is to the effect that in preparing such a catalogue "regard shall, in the first instance, be had to the requirements of *scientific investigators*." But is it really of special value to *investigators* to have in addition to the title three references (with special indices, while the article itself remains without any index number) to an article like that of E. Wiedemann und E. Ebert: "Leuchterscheinungen in elektrodelosen gasverdünnten Räumen unter dem Einfluss raschwechselnder elektrischer Felder?" Or will a zoologist working on Mammals, or a physiologist looking for communications on the use of separate organs, need three reference cards for de Winton's article 'on the existing forms of Giraffe?' On p. 11 of the Report (under 7) it is expressly stated that "it is not proposed that it [the card or slip] should provide an abstract, in any shape or form, of the communication to which it relates." Apart, then, from this inconsistency (for the noting of all new species and genera, and the noting of the forms referred to in the synonymy [vide Zoology, 35 A.], is in reality an abstract), emphasis is laid on simple bibliography. Why, then, this enormous ballast, which is neither valuable for the investigator nor of use to the librarian or the public? It is self-evident that cross-references must be made use of, but only in so far as is demanded by the nature and form of publication and by the wording of the title.

But, besides this, one of the chief questions is: Who shall abstract this statement of contents and select the necessary catch-word (which is required to be in English!)? Will working, busy physicists, chemists, physiologists, etc., have time and inclination, after having mastered the publications required for their own work, to read through so carefully the publications in the remoter fields of their special sciences, which do not particularly interest them, as to be able to write the necessary reference cards on every chief and accessory subject treated? It will be necessary, then, to have recourse to assistants. But it can scarcely be expected that they, even though they may have a 'literary education,' will be so familiar with all details of the subject that they will select those really important. And even if they were so well educated as to be able to reproduce correctly, *e. g.*, the chief headings from Italian, German, French and English works, would they be familiar with the technical expressions, often so different in the different tongues, that are to be employed as catch-words? The same difficulties would be repeated, if the (moreover quite superfluous) translation of the Italian, German, etc., catch-words were to be done by the Central Committee in London.

According to Resolution No. 2, as I have said, the needs of scientific investigators were to be regarded first. But these are not precisely the same as the needs of libraries. Will the latter be met by a catalogue of the form and extent planned? Hardly! And yet an undertaking involving so great an expenditure of time and money as this 'Catalogue' ought to furnish libraries—a part of whose duty it is to serve as a go-between for science and the public—with other advantages than a voluminous work of reference. But that

will not be the case. The best arranged subject-catalogues cannot embrace references which may be entirely appropriate to technical scientific bibliographies, but do not belong in general reports. The library officials will be overwhelmed by the separate references to articles, a great part of which they do not possess. A survey of that which a given library possesses, and that which is still wanting, must be secured by assorting the cards, and this will require an enormous amount of work, constantly increasing with each additional cross-reference. A library catalogue cannot and ought not to give information about the contents of things which are not in the library, unless it is to increase infinitely the difficulty of determining what new acquisitions are needful. A library is not a repertory of literature. Of course, it should be able to give ample information concerning those things which it does possess; it must, therefore, introduce extensively into its catalogue cross-references, but only such as are of a bibliographic nature.

Reflection on the problems and needs of libraries and on the possibility of the general acceptance and introduction of their plans should have protected the Royal Society from another important mistake, from the limitation of their plans to the natural sciences in the broad sense. In the case of so gigantic an undertaking as the creation not only of an alphabetic authors' catalogue, but also of an alphabetically arranged subject catalogue, it is useful to limit the plan at first to the inauguration of a part of the scientific literature. But the whole plan—the general scheme—ought under all circumstances to have been extended to the whole realm of knowledge; first, in order to facilitate—even to render possible—the same arrangement of parts in the literature of other sciences; secondly, so that the necessity of uniformity might be grasped by the framers of the scheme. But the Royal Society purposely avoids uniformity even within the limits which it has drawn. "No attempt has been made to use similar numbers in a similar way in two or more sciences [one must, therefore, learn the scheme and the signification of the characters employed for each science by itself], the only instance in which agreement is met with being in the opening section, which in most cases [therefore, not in all] includes the general bibliography of the science" [p. 10 of Report]. But how is it carried out? Let us take the first scheme of classification: *A. Pure Mathematics.* The first division contains the heading '*Bibliography*' (without number or other designation of the rubric); then follow:

"0000 Philosophy,
0010 History,
0020 Biography,
0030 Dictionaries and text-books,
0040 Pedagogy,
0050 Addresses, lectures, essays,
0060 Works on methods."

What place, what number, does Bibliography receive here? In the case of '*C. Meteorology*' history is 0020 and Bibliography 0040, in that of '*J. Geography*' Bibliography is 0400. Elsewhere the things which are grouped together under 'Pedagogy' recieve, generally, the index 0040, but under '*J. Geography*' it bears the number 0500. If, further, one compares with these '*L. Zoology*,' he finds here a Table with 297 sub-divisions (namely, 33 systematic and nine times these from various standpoints), beginning with '02 General Zoology' '(comprehensive: 0203).' The wonderful division '31' '*Pedagogic and Economic*' embraces: "Special text-books and manuals. Preservation of specimens; Museums; Zoological Gardens and Aquaria. Relations to plants, injurious insects, etc. Galls. Special products: wax, silk, honey. Animals injurious to man. *Bibliographical,*

including Historical. Biographical." Can one imagine anything less distinct, less connected, less natural? (Museums and honey, the San José scale insect and the biography of Huxley in one group!). But how is this applied? The previously mentioned article by de Winton on the forms of giraffe receives the index L0000, which, according to analogy with all the other sciences, would be 'Philosophy,' not, indeed, in relation to Mammals or any form of Ruminant, but to Zoology in general!

The chief ground of this want of uniformity and naturalness, of these inconsistencies, lies in the system of classification and indexing adopted by the Committee of the Royal Society. This is essentially an imitation of the decimal system of Melville Dewey. But, instead of simply adopting this system, developed and tested by twenty years' of work and extensive experience in numerous libraries, the Committee has thought best to employ in the separate divisions other numbers for the same rubrics, and also another sequence for the sub-divisions, as well as other and changeable significations for these. One must unqualifiedly agree with M. Ch. Richet in his derogatory and harsh judgment upon this procedure (*v. Revue scientif.*, sér. 4, T. 9, No. 24, p. 751). While M. Richet is decidedly right in pointing out with severe criticism that the Committee simply ignores previous classifications and methods of indexing, and has only aimed to produce something different from what already existed, one may go further and affirm that, from the form in which the Committee has drawn up a kind of decimal system, it is evident that the Committee either did not perceive the main advantages of the Dewey system or that it did not wish to recognize them. It adheres to the externals, but misunderstands their significance. Thus, according to Dewey, the formal index 07 in all cases refers to the method of study and its aids, such as the establishment of collections, etc. Under 'Sociology' Dewey calls this 'Education' (307). In order not to adopt one of Dewey's expressions, the Committee introduces the term 'Pedagogic,' which in such a connection is misleading. But the way in which this is interpreted is shown by the example of the division '31 ' of Zoology, cited above, and by the placing of computing machines, models, etc., under separate indices coordinate with 'Pedagogy.'

The English boast of being an eminently practical people. In this case they have not shown it to be true. There is scarcely anything less practical than the 'Schedules of Classification' and the numerical indices employed in them. Equally unpractical is the method of citation of sources. In 'Chemistry' what is the meaning of 'B.,' 'Bl.,' 'Soc.;' what (under 'Crystallography') is 'ZsK.?' The catalogue ought not to be produced for chemists alone; but the power to interpret such hieroglyphics is not to be expected of other educated people. Alphabetic catalogues of the abbreviations should be furnished; and there should be two of them—one, for the use of cataloguers, arranged according to the titles of the periodicals; another, for those using the catalogue, according to the initial letters of the abbreviation. The space that is perhaps saved is not worth the cost—the constant trouble of looking up references. One may abbreviate, but only so far as is compatible with certain recognition of the source intended. But this must be given accurately. 'Mémoires des Sav. Étrang' is ambiguous. Is Paris or is Brussels meant? The cards relating to the contents of works ('secondary slips') must contain abbreviated statements; thus 'Teeth, histology of those of Notoryctes, Tomes, etc.,' is correct. But to convert the title into another form is not permissible. Thus Beddard's paper, 'Notes on the Anatomy of a Manatee (*Manatus inunguis*), lately living in the

Society's gardens,' appears on the 'secondary slip,' under the form 'Various points of anatomy of *Manatus inunguis* and *latirostris*.' Such an example misleads, resulting in inaccurate citations, and sanctions the loose manner in which, unfortunately, citations of literature are much too frequently made. Instead of adopting the most direct and natural method, there has been an attempt to introduce a certain 'Schematismus,' which is impractical, however, because it is not rigidly adhered to. But the new 'Catalogue' *is to be in English*, in contrast to the plans elaborated by the Office international de bibliographie in Brussels and by the Congrès international de bibliographie held at the same place in the year 1895, which the Committee of the Royal Society has regarded simply as non-existent. This use of English (ignoring of the work of others) extends even to the specification of the size of the cards (which, of course, differs from that of the cards now in use) in English inches and lines, not in the metric scale, which is more and more extensively used even in the scientific circles of England (v. Report, p. [15], 22). It is a great satisfaction that Professor W. E. Hoyle, who has attained high scientific eminence and possesses experience in bibliographic and library matters, criticises the proceedings of the Royal Society quite as harshly as M. Richet (v. his communication in *Natural Science*, Vol. IX., July, 1896, p. 43, and the addendum of the editor of the periodical, p. 48–52).

It would be going too far to go into details; certain points, however, may be of interest. Under the Division L (Zoology) 35, 'Taxonomy and Systematic,' it is expressly stated that the book-edition of the catalogue is to present a complete systematic record of the literature of the year, "similar to that which is at present carried out in the 'sytematic' sections of the *Zoological Record*." Therefore, there are to be added to the cards, with the names of new genera and species, statements as to the families and orders to which they belong, and as to the locality where they are found; valuable information about genera and species already known is also to be given. Fossil species are to be treated in the same way (notwithstanding that there is likewise an elaborated system of Paleozoology). The Book Catalogue in this respect differs from the Card Catalogue. The latter contains only the General, the Taxonomic and the Phylogenetic; it is to contain the names of new families, sub-families and other important groups, as well as synonymic remarks. The separation of the two editions —one of which is to be issued in card form, whereas the other, giving details of the new genera and species, is to be employed only in the preparation of the book-edition —is very artificial and arbitrary. The arrangement of other divisions of 'Zoology' is also extremely unnatural and wanting in comprehensiveness. Under L 11, 'Physiology,' are found in motley array: "Parthenogenesis, Pædogenesis, Dissogony, Hermaphroditism, Function of the Sense Organs, Function of Special Structures, *e. g.*, of Glands, Environmental Effects, Regeneration, Change of Function." This is cited as an example of what in Zoology may come under the heading 'Physiology.' If one compares with this 'N Physiology,' which receives the qualification '(animal),' the latter (animal) is found to contradict the adopted classification; for the whole division is essentially human or vertebrate physiology, with everywhere additions concerning the pathological conditions of the organs and the effects of drugs, and only a few chapters, rather as appendices, on lower animals. The existence of an elaborated scheme for Physiology by Ch. Richet is passed by with the same silence as is the zoological scheme worked out by me in the *Zoologischer Anzeiger*. Whether the branches embraced

under 'Physiology'—certainly important for zoologists too—are to be contained in the Annual Report is not stated.

But Analytical Reports (Jahresberichte) and Bibliography are, as already emphasized, two different things, the combination of which is injurious to both. Forty or fifty years ago a single person might possibly have been able to meet the requirements of both successfully and accurately, but that is no longer possible. In the Analytical Report many things must be mentioned of which the Bibliography cannot make note.

The explanations of the other main divisions (in the Report of the Committee) nowhere state whether Analytical Reports are to be issued for them, or whether Zoology alone is thus to be provided for. It looks as though there was a desire to make use of the existing machinery of the Zoological Record, but not to the advantage of all parts of the undertaking. Moreover, for an Analytical Report a special system of registration would be more or less superfluous, especially in the form here selected, inasmuch as the systematic arrangement, together with the alphabetical, would furnish an adequate means of orientation. But, nevertheless, there is introduced a scheme of arrangement going into the minutest details and even impossibilities. What sense or purpose is there in creating a separate rubric for '*Lower Palæozoic and Upper Palæozoic Mammals and Birds*?'! But how, for example, a work 'On the History of Entomology in England' would be designated and assigned a place is not discoverable. Likewise, difficulties are encountered in attempting to index such a paper as 'On Fossil Molluscs of Sicily.' For the letters which are, unfortunately, introduced for geographical groups give a designation, 'dh,' only for 'Italy, with Sicily and Sardinia' (Corsica is left with France), and concerning its possible further sub-division nothing is stated. There is no explanation whatever about the significance of the *position* of the separate characters in the series constituting an index; '35,' it is true, indicates everywhere the General; and yet this is influenced by the the registration letters and by its position. 'Fossil Molluscs of England' are 'K 35, 42 de.' 'K 35, 02' is Paleozoology in general. 'L 0235 (just the reverse order) is general Zoology, while 'L 0035' is used for the names of new genera and new groups. That a system of notation should allow the possibility of its being afterwards extended to other branches of knowledge has been disregarded. As it now stands, this is excluded; for, since the natural sciences already use up as registration symbols the letters A to Q, the incorporation of other departments of knowledge appears to be practically impossible.

Thus it becomes evident how perilous it was for the Committee of the Royal Society to endeavor to discover a new system analogous to, and in imitation of, the Dewey decimal system, instead of simply adopting that. Certain modifications which, indeed, Dewey himself holds to be possible or permissible could have been adopted, if only the chief numbers and the main features of their employment had been retained. It can scarcely be maintained that combinations of letters are more easily remembered than groups of figures. It is a matter of habit, and certainly Dewey taxes the memory less, since his numbers have mutual relations, and especially since certain important groups of ideas retain throughout the whole system the same designation, and because, moreover, the figures follow a fixed sequence. It has been objected to the decimal system that it is too detailed, since already twelve-place numbers have been reached. This objection is in part well founded, in so far as the expanders of the system, almost from the beginning of their employment of it, have given an index to

every possible idea. It appears to me, therefore, that, *e.g.*, the scheme elaborated by Richet for Physiology is not practical. There are few writings that could not be put with equal propriety in two or more places in the system of sciences. Consequently one ought to establish rules as in the framing of statutes, indicate general points of view, and not lose oneself in casuistics. But the going into details is carried further in parts of some other systems of classification than in Dewey's. Thus, in the Schema des Realkatalogs der Kgl., Universitätsbibliothek zu Halle a.S.,' Eschatology is designated by *Ig* VI. g. *F.* a. to *Ig* VI. g. F. 1, polemics on eschatologic subjects in the *preceding* division by *If* IV. 6. tl$\chi\chi$ o *If* IV. 6. l.$\tau\tau$. Dewey employs for these the indices 236 and 237 with the divisions 236. 1–9 and 237. 1–7. Hartwig devotes about 800 alphabetically arranged catch-words to Roman Law, 138 to Feudal Law and 91 to Commercial Law, Maritime Law, etc. Which classification goes the further, and which symbol is the easier to remember?

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By placing side by side the method of arrangement and indexing of the Halle Catalogue, the Dewey system and the recommendation of the Royal Society in a special case, the character of each is recognized.

Halle Catalogue.	Dewey.	Royal Society.
Fauna of Naples *Sc.* II. 2 6. N(eapel)	591.(457)	L 0227, dh(*i. e.* Italy)
Paleontology " *Sa.* I. 8. C. N (eapel)	560.(457)	K 35, dh(*i. e.* Italy)
Mollusks " *Sc.* III. 9. B. a. (. .)	594.(457)	L 4227, dh(*i. e.* Italy)
Fossil " *Sa.* IV. 3. B. f. (*Sa.* I. 8. C. ?)	564.(457)	K 3542, dh(*i. e.* Italy)
Tertiary " " ? ?	564.(t : 457)	K 7542, dh(*i. e.* Italy)
Fishes " " *Sc.* III. 13. C. (?)	597.(457)	L 1427, dh(*i. e.* Italy)
Fossil " " *Sa.* IV. 3. B. i. β (?)	567.(457)	K 35, 14, dh(*i. e.* Italy)

It is the opinion of many that the Dewey system is best adapted to the Natural Sciences. According to the preceding examples from the Halle Catalogue and the recommendations of the Royal Society, the indexing of the literature of these sciences does, indeed, need to be altered in the direction of the decimal system. But examples from other branches of science were cited above which prove not only the applicability, but the great usefulness, of the Dewey system. The main disadvantage of the Hartwig plan lies in this, that the schedules have been elaborated separately and without regard to one another. They have, in part, been drawn up by able specialists, and may, indeed, be excellent as such, but are not, from the library point of view, suitable. The Committee of the Royal Society desired to avoid all analogy with the Dewey system, and, instead of adopting the simple and already existing system that had proved its usefulness, the Committe has created a system which is impracticable because illogical and artificial.

It is, however, not my purpose to especially recommend here the Dewey decimal system. The aim of every bibliographic system of classification is not so much to produce a scientific system carried out to the last details as to present a scheme according to which the writings of all periods can be arranged in a comprehensive and easily recognizable way. The plan must, therefore, be kept so flexible that, on the one hand, any desired amount of space may be easily had for every new branch of a science that may arise, and that, on the other, it can be adopted without difficulty to every requirement of the scientific worker who

needs a convenient survey of the literature in question, as well as to the peculiarities of libraries, whether large or small, public or private. There is no doubt that, sooner or later, some system like Dewey's must be adopted; in the interest of unity it is to be desired and hoped that it will be Dewey's system itself. That the Committee of the Royal Society has come to an analogous system is significant. What was said against Dewey's system by some persons at the London Conference in July, 1896, can only be regarded as having resulted from a misconception of it. It was said, *e. g.*, that it would be difficult with the decimal system to introduce new discoveries in Physics; but I should like to ask with what other system this would be easier without alteration of the scheme itself? No part of science is tied down by it, is rigidly hemmed in, firmly restricted by it [certainly not more firmly than by other systems, in which there is in certain sciences such an unlimited extension of sub-divisions (compare Roman Law, Dogmatics, etc., of the Halle Catalogue)]. On the contrary, the decimal system is the most elastic and adaptable that can be imagined, since it everywhere presents the possibility of making additions and extensions; it even lends itself, under certain conditions, to the introduction of modifications to suit the needs of the individual investigator or of special libraries. The system of the Committee of the Royal Society, on the contrary, is the most rigid and inelastic of all. Let one attempt to make an intercalation into Zoology, for example! Everything is, indeed, tied down, but not in the desirable sense that the same thing always bears the same number. Further, it has been said, that it is a very weak side of the decimal system that numbers 1, 2, etc., have to serve at the same time for a *general* system of science and as the tokens of the *separate* books. But this is not the case. Nowhere has this been said, either by Dewey himself or by any of his followers. The separate numbers can, and are intended to, give nothing further than the rubrics into which the separate writings are to be grouped, exactly as do the combinations of letters and figures in the Halle Catalogue. Handbooks of Zoology are 590.2 according to Dewey, *Sc.* II. 1, according to Hartwig; but the arrangement and designation of the numerous works belonging in this category must, of course, be carried out, according to some other fixed method conformable to the custom prevailing in each individual library, just as in the case of monographs, etc., it is left to each library and to each private person to arrange the writings bearing the same indices according to pleasure. For a general bibliography, in book form or in cards (slips), this question does not arise at all, since in these cases each user and each library is at liberty to arrange the cards according to preference.

The procedure of the Committee of the Royal Society as regards the introduction of the system of classification and indexing drawn up by them leaves a singular impression. After the question of classification had been designated in the words used by Professor Armstrong at the opening of the Congress in July, 1896, as a burning one, and after the agreement of the aims of the Royal Society with those of the Congrès international de bibliographie in Brussels (1895) had been mentioned, it would have been of the greatest value to all who are interested in the further development of this international undertaking if the Committee had stated, even in the briefest manner, what position their undertaking (in imitation of that of Brussels) was intended to assume toward this model, which pursued absolutely the same object and was already in active operation. For, although the Royal Society limits itself to the Natural Sciences, the idea, the plan is identical in

both. Moreover, after the Dewey system had been thoroughly discussed in the deliberations concerning 'Resolution 17'—although this resulted in the cancellation of the words relating to this system and in the adoption of a wording which designates as unacceptable all recently recommended systems of classification and transfers the elaboration of a new system to the Committee of Organization—it would have been appropriate for the Committee, inasmuch as it was pledged to give a 'Report' on the work entrusted to it, to have explained how it came to construct a system essentially in imitation of Dewey's, and differing from this only by its unsuitableness and inconsistency. There should also have been given an explanation to serve in using it. Finally, it might reasonably have been expected that the Committee of the Royal Society would have had knowledge of the existence of a Committee of the British Association, which, appointed for zoological bibliography, might perhaps have had influence upon the determinations of the Royal Society's Committee of Zoology, in view of the exceptional position which this Committee assumes. Instead of this, the paper called 'Report of the Committee, etc.,' gives the incomplete sketch of a system of classification and indexing devised by the Committee, which completely ignores all similar previous labors and all that had been formerly accomplished in the direction of this great undertaking, all of which, taken in connection with the report of the Conference of July, 1896, seems almost a betrayal of trust.

The particulars of the organization of the whole machinery cannot be gone into here. However, it is necessary to give warning on two points—against the far too great centralization, by which all titles are to be sent to the Central Bureau in London, where they are to be revised by suitable experts; and against too great confidence in the 'Regional Bureaux.' In regard to the first point, should a certain uniformity of execution appear to be secured, nevertheless it must be pointed out that it is quite inconceivable how the 'expert,' without having the works themselves before him, could make use of the subject cards and cross-reference cards (compare the examples cited above). So far as regards the activity of the Regional Bureaux, I will call attention to only one fact. In the year 1895 the Société Zoologique de France formed an organization elaborated according to a definite plan for the purpose of securing the most complete collection of the zoological bibliography of France possible, with committees and sub-committees, all represented by experts and men zealous in the cause. And what has this organization accomplished? Next to nothing! The chief part of the labor will in the present case also be left to that individual industry which, without continually meditating on 'Organization,' accomplishes the real work.

The subscription to all departments amounts to £66 ($330.00); that of the separate sciences from £4 5s. 0d. to £8 5s. 0d. ($21.25 to $41.25). Zoology belongs to the most voluminous, and will, therefore, demand the last-named price. These calculations are, of course, only preliminary, and, so far as regards Zoology, for example, rest on total absence of knowledge of the subject. 'Experts' have estimated the number of zoological articles (including the whole of Anatomy!) at 5,000. I have catalogued yearly during the last three years, *without* Anatomy and with omissions unfortunately not wholly avoidable, about 8,000 zoological titles. If one reckons for Anatomy only half as many additional titles, these two branches furnish nearly one-third of the 40,000 estimated as the yearly number for all the sciences. If this is compared with the scheme of classification in Zoology, Paleontology, Physiology, etc., there is in-

contestable evidence that it was the intention to produce in this something which, with sovereign disdain for all that now exists, was to flow forth from the Royal Society's well of wisdom. But the Royal Society has not thereby erected a *monumentum aere perennius*, for if the plan should actually be carried out—from which sad result may the good fates spare science—it is unquestionable that in a very short time the whole scheme, together with numbers and everything else, will have to be changed. However thankfully the news might be received that a body like the Royal Society —to whose esteemed position in the scientific world so general a participation in this plan is to be attributed—finds itself impelled to continue the plan of a bibliographic repertory conceived by the 'Office international bibliographique de Bruxelles,' still the question must be raised: Does the uncertain and precarious condition of this undertaking, calculated entirely upon English conditions, warrant the granting of the great cost of its cumbersome organization from the public means?

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SOME COMMON SOURCES OF ERROR IN RECENT WORK ON COCCIDÆ.

No group of insects has excited more interest nor attracted more new students perhaps in the last few years than the scale insects, or Coccidæ. Entomological magazines, and, in fact, journals of all sorts and descriptions, and in the most unexpected and unusual quarters, have been heavily charged with literature of new species, sub-species, etc. The great number of such new species has struck the attention even of non-workers in this group, and particularly has the designation of an astonishing percentage of sub-species, physiological species, varieties, etc., been calculated to arouse the gravest suspicion as to the reliability of the work done and the validity of the forms characterized, especially when the characters on which the new species, sub-species, etc., are based are at all carefully investigated. That with all the enthusiasm manifested in working up new material and describing new forms many good species are found and characterized cannot be doubted, and it is, therefore, the more to be regretted that the authors responsible for much good work have been led by a surplus of zeal to be guilty also of much that must be a positive detriment to the knowledge of this group of insects. For the benefit of future students, and with the intention merely to bring about, if possible, a much needed reform in the interest of the scientific value of the work done, it may not be out of place to call attention to some of the common sources of error and questionable work. The criticisms to follow apply more particularly to the scale insects belonging to the Diaspinæ, with which the writer is most familiar, and especially to the genus *Aspidiotus* in its old and broader sense.

In the first place, it does not seem to have been sufficiently impressed on most writers that the scale covering, though an important adjunct of the insect, is not the insect itself, and still less the extraneous matter, such as sooty mold, epidermis of bark or leaf, etc., with which the scale may be covered. Many of the Diaspinæ—in fact, almost any of them—at times may assume a slight or marked so-called 'mining' habit. In other words, the female insect in revolving from side to side in the formation of the covering scale, and in making additions to it, is very apt, with her flat chitinous lobes, to cut under the superficial and more or less loosened layers of the bark, with its covering of mold or other extraneous matter, and this loosened material slides up over the scale and adheres closely to it, much modifying and changing its color and