Winthrop John Van Leuven Osterhout: Observations on Spindle-formation and Chromosome-reduction in Plants.

Milicent Washburn Shinn: A Study of the Development of Sense Activity in the first three years of Childhood, with Pedagogical Conclusions.

UNIVERSITY OF MICHIGAN.

John Black Johnston: Zoology, The Structure of the Brain of Acipenser Rubicundus.

Paul Ingold Murrill: Chemistry, Halides and Perhalides of the Picolines.

Edwin DeBarr: Chemistry, The Decomposition of Alpha, Beta, and Gamma, Halogen-substituted Acids by Water.

PRINCETON UNIVERSITY.

William Foster, Jr.: Chemistry, The Conductivity and Dissociation of some Electrolytes.

Stanley Chester Reese: Astronomy, The Jupiter Perturbations of Minor Plant 367, with an ephemeris.

Alexander Hamilton Phillips: Mineralogy, The Geological and Mineralogical Characteristics of the Rocky Hill Trap.

BRYN MAWR COLLEGE.

Helen Dean King: Morphology, The Maturation and Fertilization of the egg of Bufo Lentiginosus.

Emilie Norton Martin: Mathematics; Determination of the Non-primitive Substitution Groups of Degree Fifteen and of the Primitive Substitution Groups of Degree Eighteen.

CORNELL UNIVERSITY.

Patrick Beveridge Kennedy: The Fruits of Grasses, with Reference to their Structure, Morphology and Taxonomy.

Darwin Abbot Morton: Anethol and its Isomers.

UNIVERSITY OF VIRGINIA.

Hillary L. Roberts: Mathematics, On the Geometry of a certain Group of Transformations.

John E. Williams: On the Geometry of a certain Group of Transformations.

WASHINGTON UNIVERSITY.

Hermann von Schrenk: Botany, A Disease of Taxodium known as Peckiness, also a Similar Disease of Libocedrus Decurrens.

Louis Herman Pammel: Botany, Anatomical Characters of the seeds of Leguminosæ, Chiefly Genera of Gray's Manual.

UNIVERSITY OF COLORADO.

Arthur John Fynn: Pedagogy, The Pueblo Indian as a Product of Environment.

UNIVERSITY OF MINNESOTA.

Alice J. Mott: The tenth year of a deaf child's life.

UNIVERSITY OF KANSAS.

Joshua W. Beede: Paleontology.

UNIVERSITY OF MISSOURI.

Chas. Thom: Botany, Morphology and Physiology of Reproductive Organs in the Archegoniatæ.

UNIVERSITY OF NEBRASKA.

Carl Christian Engberg: 1, The Cartesian Oval; 2, An Extension in the Theory of the Characteristics of Evolutes.

NEW YORK UNIVERSITY.

William C. Alpero: The Oils and Terpenes of Arabia Indicautis.

THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

IN a recent number of SCIENCE, Professor Carus has presented most serious objections to the bibliographical methods proposed by the Royal Society's Committee. For the professional zoologist such a verdict needs no criticism. For no one else can possibly claim to have such a wealth of experience at his disposal as this Nestor of scientific bibliography.

Severe as the criticisms of Professor Carus are, they may be supplemented by others which will make the case against the proposed schedules still stronger. Book bibliographies may entirely dispense with arbitrary symbols; the real test of a numerical system is to be sought in the application of the system to cards. Since I have been the pioneer in the publication of an extensive card catalogue of scientific literature, it was natural that the editors of SCIENCE should invite me to express in their columns a judgment upon the new proposals; but my criticisms, if frankly expressed, would have to be so severe that I was loath to take a position which would seem to place me in opposition to an enterprise to which I had already pledged allegiance. I feel, however, that I cannot withhold the following statement:

No one without extensive experience can possibly foresee the complications that arise

in practice; nor can the matter be easily explained. A simple statement may, however, serve as an illustration. Thus far the Concilium Bibliographicum has issued more than 3,000,000 cards. During the past year we made a trifling modification in the typography, which surely passed unnoticed by nearly all our subscribers. This discovery leads to a minute saving on each card, but in view of the enormous number of cards the saving is great enough to modify considerably the balance sheet.

I have given the schedules proposed by the Royal Society's Committee a fair trial, with more than 3,000 different zoological cards. Indeed, I have worked so much with this classification that I once knew it quite by heart. It is my firm conviction that our organization would have long since failed utterly had we been obliged to use it for our work. It is also significant that the faults of the new schedules are merely exaggerations of those that I should have made when I first began working out the details of our own undertaking. I have recently passed in review some of my own notes, dating from February, 1894, and I am surprised to see there the same insufficiencies in what I then considered a completely adequate plan.

It is difficult to criticise, in the definite way that one would desire, a work which probably scarcely a dozen of the readers of SCIENCE can ever have seen. For this reason I shall refer rather to a Memorandum published by the Committee subsequent to Professor Carus's article, and which is intended to justify the course followed. In one respect this Memorandum resembles its predecessors in a way that is most regrettable. It is that of ignoring all that others have done or said in regard to the matter under consideration. Professor Carus had brought direct, definite and undeniable charges of insufficiency against the schedules of the Committee. Not one of these charges has been answered nor even alluded to. Surely this refusal to accept debate and the avoidance of publicity cannot be indefinitely maintained. The scientific world has the right to know why no account is to be taken of the opinions of those best qualified to judge of the merits of the case.

The methods of those who use the decimal system are condemned in this Memorandum with a few words, which I shall transcribe: "The Committee prefers to designate the sciences by letters rather than by numbers." In my opinion, this is a small matter; it is a mere matter of convention, like signals at sea. Uniformity alone is essential. The Concilium Bibliographicum will soon have 5,000,000 cards where a number is used for this purpose; this number is the same that is used for the same division in all libraries using the decimal system; it also corresponds with the numbers used for 2,500,000 different cards in Brussels, and with a larger collection in Paris. Such use has been advocated by the French Association for the Advancement of Science, by the Société de Biologie, by the Société Zoologique, by the corresponding Swiss organizations and by numerous Italian and Belgian societies. Indeed, the Decimal Classification has had a marvellous development. Unknown in Europe a few years ago, it has spread over the whole of Europe; it has been carried to Australia and to South America; indeed, I recently heard of an application that was being made of it in Japan and another in Hawaii. It has not, of course, yet gained the confidence of the majority of bibliographers. That would be too much to expect of it, but we may be assured that a short experience with *cards* would convince even those now opposed. In the future, if the will of the Committee prevails, two systems will struggle for mastery. The new symbols can only be introduced by destroying the accord that has already been attained. In a word, in 'preferring' to

use letters rather than numbers, the Committee calls upon the scientific world to aid it in crushing out the work that has already been done. For this it must have weighty reasons, or it would be wrong for any government to favor such action.

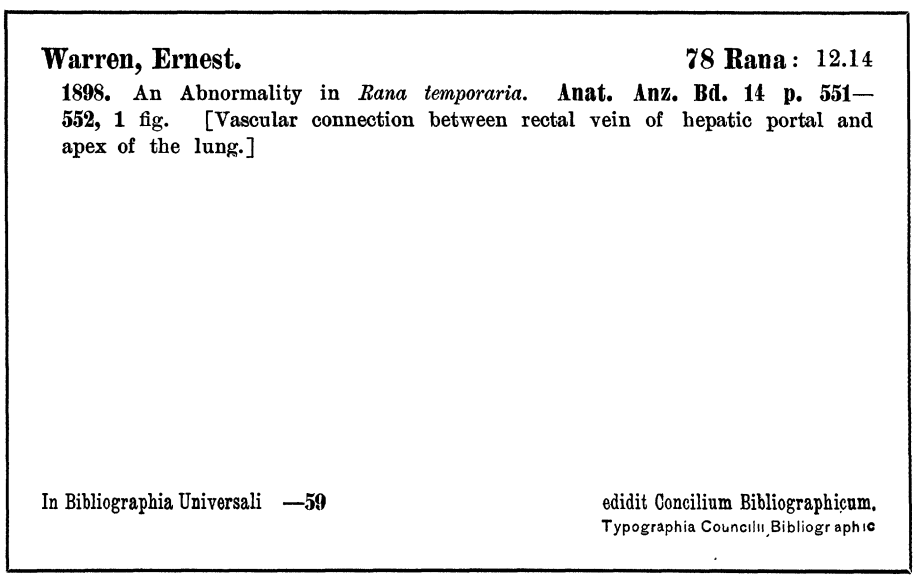
The Committee writes: "As between a letter and a number no single final reason can be alleged, but there are a number of considerations which led the Committee to prefer the letter. In the first place, the Committee divided Science into more than two principal parts, and the tendency of the recent Conference was to add to the number of divisions. Hence a decimal system is inapplicable to the Primary Divisions, unless by grouping together several of the Principal Divisions under one or more heads. Science is arbitrarily made to fit a system which does not naturally fit it. In the second place, it is convenient to have a single symbol for each Principal Science, whereas, if numbers were employed, two figures would be required, owing to the number of divisions. Lastly, the Committee believe that fewer mistakes would be made in sorting the slips and cards if attention had to be paid to a letter and number rather than to a single but longer number. On the whole, then, the Committee, decided to represent the Principal Sciences by arbitrary letters."

These are the arguments, but I refuse to believe that it will be generally felt that they justify the work of destruction which is proposed. But even the little weight these arguments may seem to have disappears when they are closely examined. The letters required for the sciences thus far selected for treatment run from A to R, thus permitting for the time being, it is true, the use of a single symbol; but it is evident that this is possible simply because the proposed catalogue is to contain only certain sciences. Professor Carus has already pointed out the dangers of thus disregarding a general system of notation compatible with the adjunction of new branches. With the addition of a few subjects, the 26 letters of the alphabet will be exhausted, just as the ten digits would be. This eventuality destroys the whole value of the first two arguments. The difficulty contemplated in the third argument has long since been met in the Concilium Bibliographicum by separating the two figures indicating a Principal Science from those representing sub-divisions of that science, and by printing these figures by themselves as 'the signature' of the set. The sample card given below will illustrate this feature.

This is the entire argument relating to the Principal Sciences. For the subdivisions of a science the Committee proposed the use of numbers, but preferred other numbers than those already employed. "As to the system by which these numbers should be chosen, the Committee had before them the deliberate decision of the Conference of 1896, that the Conference was 'unable to accept any of the systems of classification recently proposed,' among which the decimal system was, of course, included. This system had, therefore, not been accepted, and the Committee agreed, after further discussion, that it was not desirable again in any way to propose a decimal system. Such a system is open to two objections. In the first place, it assumes that each subject is to be divided into not more than ten divisions, each of which may be divided into not more than ten, and so on. This arbitrary use of the number ten is in practice extremely inconvenient, since it has no relation to the rational divisions of the sciences; and, in so far as it assumes that the subjects indicated by the figures in a certain place of decimals are subordinate to those which occur in a higher place, it involves theoretical considerations, the validity of which may not in all cases be admitted in the future. In the second

place, the decimal system is quite inapplicable to sciences which need a double system of registration, such as Geology (in which reference has to be made both to the order of the strata and to their geographical distribution), Geography, Zoology and Botany."

about is dealt with under 242, or whatever the number may be, and under that number he finds the desired cards. When I turn to a time-table to learn when a train leaves I do not need to study out why that train leaves when it does rather than ten minutes later or earlier. The time-table satisfies me



Warren, Ernest. **78 Rana**: 12.14

1898. An Abnormality in *Rana temporaria*. **Anat. Anz. Bd. 14 p. 551—552, 1** fig. [Vascular connection between rectal vein of hepatic portal and apex of the lung.]

In Bibliographia Universali —59

edidit Concilium Bibliographicum.
Typographia Concilii Bibliographici

Specimen Card of the Concilium Bibliographicum.

The first of these objections seems again insufficient to justify the destructive and revolutionary measures proposed. On critical examination, indeed, it proves itself utterly groundless, being based upon a complete misconception of the decimal system as applied to a purely practical problem. This system does not attempt to force science into an artificial mould. It merely assigns an arbitrary number to each topic, so that the cards, when arranged according to these numbers, fall into their proper places. These numbers are so chosen that the framers of the system can expand it *ad libitum*, without ever altering the signification of the numbers previously used. How this latter feature can be reached the user of the catalogue does not need to know. He merely finds in the key that the topic he desires information if I can find out when my train leaves. So it is with the Decimal System; one word of frank criticism, one single instance in which by its use one would be prevented from finding the answer to a question of bibliography would have more value than these theoretical considerations of coordination and subordination, which have nothing to do with the case. The best proof, however, that the Committee's argument is not serious is the fact that in framing the new schedules, in spite of the entire freedom of action that was enjoyed, the Committee involuntarily built up a decimal system, a new one, for all sciences save Chemistry and Mathematics, and even here the deviations from a decimal arrangement are not greater than Dewey himself allows. A new decimal system has been created, the numbers being

lengthened to four places, so as to remove the outward form of a decimal system; but, from want of experience in such matters, numerous pitfalls have not been avoided.

The second objection contained in the Committee's statements is one of extreme gravity; but it is a mere assertion, which a single glance at the Bibliography of the Concilium Bibliographicum would show to be utterly false. The Committee asserts that the decimal system is 'quite inapplicable' to sciences which need a double system of registration, such as Geology, Zoology, etc. It is well known, however, that the system is being applied to Zoology by Professor Carus, by myself and by others with entire success. Indeed, were I to select a single feature to show the paramount superiority of the decimal system it would be this facility of double registration. The Swiss Zoological Society voted warm approval of this method. The Executive Committee of the Swiss Society, corresponding to the British and American Associations for the Advancement of Science, was convened to a special session for the sole purpose of arriving at a definite conclusion as to the merits of this system. The Committee examined carefully the work of the Concilium Bibliographicum and pronounced the system vastly superior to that proposed by the Royal Society, and petitioned the federal government to oppose the proposed modification. A technical commission consulted by the federal authorities expressed the same opinion, as did also the Swiss Library Committee and the delegates appointed to attend the London Conference. This all took place after the government felt that it was committed to supporting the scheme of the Royal Society. Finally, a last conference was held under the presidency of the Minister of Interior and voted unanimously to make the adhesion of Switzerland absolutely dependent upon the decimal system being adopted. Such testimony from those who know the working of the system best is surely worth more than a simple assertion to the contrary by persons who evidently do not know the system condemned. Not merely is there abundant internal evidence that the statements made by the Committee must have been made in ignorance of the methods which it so severely condemns, but it can be proved by the books of the Concilium that they could not have studied the matter by examining our cards. Not merely has the Royal Society never subscribed to the cards issued by the Concilium, but there is only a single subscriber in all England who receives a set of cards sufficiently complete for it to be regarded as a fair sample. This subscriber has written that he is greatly impressed with the success of the methods followed by the Concilium, especially in the matter of the double system of registration. He states that the cards have never been examined by anyone connected with the Royal Society's undertaking. There is evidence, therefore, that this condemnation has been passed without knowledge of the thing condemned, for a final judgment with regard to the merits of such a bibliographical system cannot be reached, save by knowing it in its application to cards

Having met all the objections raised against the decimal system, I shall now say a word on the system which is proposed to replace it. Having, as already stated, tried this latter on several thousand cards, I can state, without fear of contradiction, that it fails utterly, as far at least as Zoology is concerned.

The zoological schedule proposed by the Royal Societies comprises two distinct parts, each designated by 2 figures. One part consists of what we should term the systematic classification and comprises 33 heads designated by the series of even numbers from 2 (or 02, as this is written, so as always to have two figures) to 66. The other

part, or topical classification, comprises 9 heads designated by odd numbers extending from 3 (or 03) to 35, the numbers 05, 09, 13, 17, 21, 15, 29 and 33 being left vacant. The entire symbol consists of four figures, the first two being taken from the systematic, the latter two from the topical classification.

The Committee states: "The numbers used to designate the subjects are scattered over a series extending from 203 [0,203] to 6,635 in such a way that any branch or any subject may be in future completely divided and numbers applied to the divisions without deranging the system previously in use." This statement shows clearly that the Committee not merely has failed to study the decimal system, which they condemn; but has not even examined critically their own system; for I believe that every attentive reader has already detected, in the course of my brief exposition, that no modifications nor interpolations are possible, for the simple reason that all the numbers are occupied. There are, it is true, eight vacant numbers, but these are, indeed, 'scattered,' so that no new sub-divisions can be introduced, for at least 2 places are needed to sub-divide. How necessary new divisions are may be gathered from the fact that one single division 0,407 would receive according to our experience, about 2,000 cards, annually. In ten years there would be twenty Library Bureau drawers filled with cards, all with the some identical symbol. No one, of course, consults a bibliography to know what has been published in regard to the Morphology of Vertebrates; he wishes to know what has appeared on the liver, the teeth, the skull; he desires information regarding Sphingidæ, not a rambling list of 8,000 papers on Lepidoptera (in 10 years there would be 8,000). We have at present on stock 400,000 cards dealing with Morphology (which is not sub-divided by the committee); several times a day we have occasion to seek out a relatively small number of cards from this great collection. Thus, if anyone desires to receive the cards relating to the liver 14 cards would be gathered together for him and he would be charged 14 cents, including postage and packing. The entire internal organization of the Bureau depends upon a precision of registration, such as an outsider can scarcely conceive to be necessary. Constantly one has to turn to the stock to replace a torn or soiled card, to return a duplicate to its place, or for some similar operation. Were we to try to use the Royal Society's schedules we should have to double our staff, and should even then live in a state of confusion that would be intolerable.

It seems astounding that the Committee should propose a system which admits of no modification, since Professor Armstrong stated at the first Conference that the "whole question resolves itself into whether we can adopt an inelastic system." But never was a system so inelastic as that proposed by the Committee. The Dewey System, the Cutter System and the Halle System may all be regarded as rivals. That of the Royal Society has not attained to this eminence, for it cannot claim to have even attempted to solve the initial problem, that of combining permanence with expansibility. Indeed, the Committee seriously proposes that their system might be revised and modified at intervals of five years! So far, then, from the great problem having been solved, it has not been even discovered what the nature of the problem is.

Quite as important as expansibility is the quality of *adaptability to special needs.* We have seen that the new schedules require that the systematic portion of the symbol should always be placed first. In other words, the symbols can not be adapted to the needs of those who wish to use topical divisions as their primary classification.

Thus a person interested in Cytology would be obliged to seek through all the groups of animals from Protozoa to Mammals in order to find the cards that he would require. It would have been extremely easy, with a little experience, to have arranged the *same divisions* so that the immense advantage which the Decimal System presents in this regard could have been obtained for the new schedules; but, here again, the Committee failed to grasp the problem, and consequently made no attempt to solve it. Nearly one-fourth of our subscribers require an arrangement which the Royal Society's schedules cannot give them. This is only one, however, of the special adaptations possible with the Decimal System. At present we have 7 such arrangements, each of which corresponds to certain definite needs. It is a significant fact that our arrangement, corresponding most closely to that absolutely prescribed by the Royal Society's schedules, has been offered for sale for two years and has found no subscribers.

Of course, a prime necessity in such a system of classification is that there should be a *place for everything*. It is also one of the most difficult features to attain. In elaborating the system employed in the Concilium Bibliographicum months were entirely devoted to studying the topics dealt with in the publications of a period of ten years, so as to properly proportion the divisions to the rate of publication and, above all, to be sure that no important topic was omitted. The after-trial showed that this had been done so successfully that there was little to add, the only serious omission being 'phosphorescence,' and this omission was due to an error in copying. A certain number of unusual topics do, indeed, appear each year which it is difficult to classify, as, for example, Ebner's papers on the electrical qualities of hair and feathers. On the other hand, scarcely a week passes when we do not meet with a dozen papers that the new schedules could not cope with, save, perhaps, by frequent repetition. What, for example, could be done with a lecture on Scientific Methods? Where would one classify a paper on the Advance of Natural Science during the Victorian Era? There is no place for Sir. Wm. Flower's book on museums, or rather there are many places for it. Then the science of microscopy with special text-books, with special journals, has no place assigned to it either as a primary science or as an aid to such sciences as Zoology or Botany.

In the choice of divisions the Committee has been not less unfortunate. For instance, there is a general division Arthropoda, but none for insects. A preliminary statistical study would have revealed to the framers of the tables that for every 20 papers appropriately placed under Arthropoda there are about 375 which deal exclusively with insects in general. One further instance may suffice. The Concilium Bibliographicum has experienced great difficulty with one of its divisions, namely, 07. This division, which is used for Museums, Laboratories, Stations, Technical Methods and Methods of Study, proves in practice utterly unwieldy. The diversity of these topics makes the search for a trifling matter a work of great labor. We had just begun to realize this when criticisms began coming in from our subscribers stating that they, too, found this group unwieldy. It was with interest, then, that I turned to the new schedules to see how the matter had there been treated. Far, however, from breaking up this division, the new schedules add to the diversified topics already mentioned the following special text-books and manuals: Relations to Plants; Injurious Animals; Special Products, Wax, Silk, Honey; Bibliographical, including Historical, Biographical. Could anything be less practical than this? It is, of course, no answer to state that it is proposed to use the system of

significant or predominant words for purposes of more minute sub-division. The Committee surely does not suppose that the sorting clerks and the libraries arranging the cards can attain, by significant words, a logical arrangement of the matter, such as is shown on the next to the last page of the zoological schedules, involving, as it does, the knowledge that the 'retina' goes with the sense organs, while 'Ears of Man and other Primaries' is a mere question of external facial morphology. The new system would, as we have seen, require a much larger staff of employees than would be necessary with the decimal system; this peculiar use of catch-words would make it, furthermore, necessary to employ trained zoologists for mere mechanical sorting. Moreover, I venture to state that the Committee would be astounded with the results of the simple experiment of classifying a few thousand cards, as proposed in the introduction to the zoological schedules. This matter is extremely difficult to explain in words, but the experiment is most convincing. It would be found notably that there would be a conflict between the systematic and the topical catch-words and that the bibliography would be rendered useless for a vast number of questions that it might otherwise answer.

Uniformity is regarded as no virtue by the Committee. This again proves how impossible it is for one to form a just *a priori* conception of the actual work in a Bureau publishing a card bibliography. In the tables of the Concilium, Embryology is treated somewhat differently in the zoological and in the anatomical bibliographies. This error was committed before the full value of uniformity had been grasped. It has proved to be a persistent source of confusion and delay. Indeed, such misconceptions abound in the report of the Committee. To cite one further example, the Committee speaks incidentally of sorting the cards into pigeon holes, as in a post-office. I, too, once believed that to be possible and blundered for many months before devising the multiple check system, which at once precludes errors of sorting and more than doubles the rapidity of the work.

It is not my purpose to discuss matters of *organization* in detail, but there are certain decisions in this regard that could not be passed over in silence. Regional bureaux organized by various countries are to prepare the manuscript, which is to be finally edited in London. Now a decision of the Congress says that the text, and not the titles, of the papers is to form the basis of classification. Therefore, one of two things must occur: Either the regional bureaux must maintain a fully competent staff of specialists, and themselves attend to the classifying, or the specialists in London must consult the works a second time, thus rendering the operations of the regional bureaus useless. The Concilium Bibliographicum follows strictly this principle of classifying according to the text and not to the title. I could cite papers which took many hours to classify, and numerous zoologists can bear evidence that we have not hesitated in cases of doubt to write to them personally before publishing. To show the constant difficulties, let me mention a few cases that have occurred *in the past week*: Firstly, we have had three papers describing new species, in which the fact that they were new could only be ascertained by the context, and one in which the symbol n. sp. was appended to a species already described elsewhere by the same author. Secondly, there is a paper by Alcock and Henderson, published in the *Annals and Magazine of Natural History* (7) Vol. 3, p. 1–27. In this paper 92 species are mentioned, of which 31 are new *and provided with new specific names.* There are, however, only 21 descriptions given. It is, furthermore, stated

that the figures will be given in connection with a work to be published, we believe, in India. Of all these facts memoranda were taken and a careful outlook was kept till this week, when an unexpected continuation appeared in the *Annals and Magazine* for April, where the remaining ten pieces were described three months after the first paper. We have still memoranda filed under the author's name and under publications arriving from India, so that the figures may be referred to in connection with the descriptions, and have written to the authors for more precise data. A third instance is in the last volume of the Mémoires of the Société Paléontologique Suisse. Here the new species are distinguished by the addition of the year 1898 to the author's name. In this case I do not believe an inexperienced person could discover that they were new species. Finally, in the last number of the Proceedings of the Zoological Society of of London, p. 586, is the description of a new species of monkey, contained in a statement of the additions to the menagerie. These are but a few instances taken from the proof-sheets now before me. Were I to go further back I might mention utterly confusing cases, such as the paper by Schuchert in the Proceedings of the United States National Museum, No. 1117, where the context shows that the new species described as *Dipeltis Carri* is really *Diplodiscus Carri*. Does the Royal Society really suppose that a reliable work can be framed, dependent upon the contributions of a score or more of workers scattered all over the globe? Does it suppose that all these countries will maintain a staff of trained specialists to do this work? In such work it is of prime importance that the work should be centralized; any other course is extravagant, leads to inaccuracies and confusion, and tends to delay the publication.

Turning, now, to the central bureau in London, let me point out a suggestive contrast: The Committee believe that, on the average, the experts editing the bibliography of each science will have about three or four hours' work per week. In the Concilium, although the experts lose almost no time for mechanically copying titles (this being done for them), it is found necessary to devote about 68 hours to this work. This does not include the time of the proof-reader.

The financial statement is also open to criticism. In the first place, it is to be noted that the estimates are based upon the use of the linotype, while all the examples involve ordinary type-setting. With the linotype only one kind of type can be used. In order to obtain a differential card, such as the Concilium issues, no less than six kinds of type, not to mention the Russian, Polish, Bohemian, Spanish, Hungarian, Scandanavian and Portuguese alphabets, which must frequently be drawn upon. Considering, now, the specimen set of slips, I may call attention to the fact that, according to the tariff in use on the Continent, at least, the type-setting would cost 35 per cent. more than it would according to our usages; the missing pages could not be estimated by the tariff, but the most favorable calculation for the Royal Society would make the expense three times as great as ours. When we turn, however, to the preparation of the secondary slips the expense becomes at least twelve times greater than that incurred by the Concilium. These facts are particularly significant, since the additional expense is primarily due to the non-adoption of the decimal system. That the sorting is thereby rendered much more expensive I have already shown. Finally, Professor Carus has pointed out the fact that the financial statement is based upon a great underestimate of the number of titles published. For Zoology the number should be tripled. The greatest discrepancy is to be found, however, in the estimated sale of the catalogue. For the authors' catalogue the Com-

mittee states that even under the most favorable circumstances 130 subscribers would be needed. The Concilium has seven subscribers to its authors' catalogue. Can it be that the Royal Society will be nearly twenty times as successful? For the 'complete catalogue' the Royal Society must find 286 subscribers. The Concilium has 18; but the price of its complete set is only about one-third that proposed by the Royal Society for the corresponding cards, and the bulk corresponding less. How many institutions will care to receive 90 or more cards a day, knowing that the entire expense will not fall far short of $500 a year?

To summarize, then, the project of the Royal Society can be shown to be utterly impractical, whether viewed from the technical side or from that of its finances. It has been elaborated by distinguished scientists, who have made the primordial error of supposing that experience was superfluous in dealing with such problems. It is a natural error to have made. It is one which I once also made without having the excuse of scientific eminence. I can frankly confess that 5 years ago my ideas on this subject were utterly immature and that it was my inexperience that made the first years of our work so unsuccessful. The Royal Society schedules might, of course, be applied to a book bibliography. Most of the objections which I have made would not exist, but *for the special needs of a card bibliography the zoological part is a complete failure and many other parts inspire grave objections.*

The most serious aspect of the case remains yet to be considered. The new enterprise is being organized without any consideration being taken of existing work. To succeed, the Royal Society must destroy all that exists, and it asks for a guarantee fund of $200,000, in addition to an annual expenditure in individual countries, which has been estimated at $20,000 as a minimum. The Committee, however, states that the work is to be regarded as an experiment and should be abandoned unless it should prove self-supporting. It will be evident to any one who has read attentively this note that the work can not be self-supporting if conducted as contemplated, and if given up nothing but devastation will have resulted from the action of the Royal Society. It was this perspective that caused Professor Carus to express the fervent wish that science might be spared this calamity.

Under such circumstances one may well ask one's self what should be the attitude of the Concilium Bibliographicum, which has been built up through thoroughgoing self-sacrifice. It was after the preparations for its foundation had been largely completed that the intentions of the Royal Society were first made known. Concerned lest the task that I had undertaken might be robbed of its utility by this greater enterprise, I applied for further information. No definite answer could be given, save the assurance that it was intended "to make use of all fitting existing institutions, certainly not to rival them." This answer was, however, regarded as sufficient by myself and my advisors, and it was decided to continue the work. Later a subsidy was granted to us with the distinct understanding that our mission was to be that of solving the technical difficulties involved in a great scientific card bibliography, and of forming a nucleus for the larger organization. It was thus that in our prospectus we freely pledged allegiance to the Royal Society's project, and our course has been uniformly directed to this end. To-day the conditions are strangely changed. The promoters of the new bibliography did not subscribe to the cards, nor has the slightest attempt been made to profit by our experience. The Concilium Bibliographicum has not been consulted regarding a single decision that has been taken. Indeed, the existence of an organization publishing one-third the

number of cards contemplated was not even alluded to in the Conferences, while the methods that have given such strikingly successful results have been condemned without consideration. In their place, methods similar to those which the Concilium tried and discarded are now proposed, and plans are elaborated that forebode a complete catastrophe. In the meantime, other organizations have tried methods similar to our own and have reached valuable results. So much has been done, indeed, and so much money and labor have been expended, that an abandonment of the work is out of the question. If the new bibliography rejects these methods there is no other course possible than for the governments that have been convinced of the value of these methods to maintain a second parallel bibliography. The decision of the Conference, held under the presidency of the Swiss Minister of Interior, is clear in this regard: It makes the participation of Switzerland definitely dependent upon the acceptation of these tried methods, and gives the government freedom of action in case its conditions are not accepted. For my part, I feel that I should belie the entire character of our enterprise were I to hold aloof from the Royal Society from motives of personal interest. But it seems equally certain that I should betray the trust that was given to me were I to consent, through motives of personal interest, to render useless the work which has been so zealously built up. We owe it to the world that the work of five years should not be labor in vain.

But what necessity exists for such drastic measures? We are still ready to rally under the banner of the Royal Society. The only condition is one that will preserve the Royal Society's undertaking from catastrophe.

HERBERT HAVILAND FIELD.

ZURICH.

*THE AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.**

I NEED hardly remind you that the Australasian Association held its first meeting in Sidney, from 27th August to 5th September, of the Centennial year, 1888, under the presidency of Mr. H. C. Russell, C.M.G., F.R.S., with a roll of 850 full members. Meetings have since been held in Melbourne in 1890, with 1,162 full members, when the late Baron von Mueller, K. C.M.G., F.R.S., M.D. and Ph.D., was President; at Christchurch, N. Z., in 1891—President, Sir James Hector, K.C.M.G., M.D., F.R.S.; at Hobart, in 1892—President, His Excellency Sir Robert Hamilton, K.C.B., LL.D.; at Adelaide, in 1893—President, Professor Ralph Tate, F.G.S., F.L.S.; and at Brisbane, in 1895, when the Hon. A. C. Gregory, C.M.G., M.L.C., F.R.G.S., was President.

The government of New South Wales provided for the printing of the first volume, and the governments of Victoria, Tasmania, New Zealand, South Australia and Queensland have each in turn given liberal assistance, both by money grants and in other ways towards the expenses of the session, and by printing the volume of reports and papers.

The Association has up to the present published 6 volumes of reports, each of about 1,000 pages, containing much important matter; it has appointed committees for the investigation of the following subjects; all have furnished reports, which, being of permanent value, have been printed, viz:

1. The Establishment and Endowment of a Biological Station for Australasia.

2. Certain points in the Construction and Hygienic Requirements of Places of Amusement in Sydney.

3. A Census of Australasian Minerals.

4. Glacial Evidence in Australasia, £20 granted towards the expenses.

* From the address of the President at the Seventh Meeting, held at Sydney, 1898.