a number of closely related types have been dissected; and in the meantime the student is endeavoring to assimilate a classification without a knowledge of the chief practical means of establishing a system of taxonomy. Nor is taxonomy itself necessarily excluded when types are abandoned. An exercise in which the principles of taxonomy are made clear by illustrative material from the whole animal kingdom gives the student a better conception both of classification and of the groups of animals than anything less than a very long type course could be expected to do. And finally, the argument that a type course exhibits a splendid evolutionary series loses its force when types may be supplanted by much better evidence from vertebrate and invertebrate fossils, from geographical distribution, and other sources. Moreover, certain phyla, as the echinoderms, never did have much evolutionary significance, when taken in connection with other phyla, yet the usual type course includes at least one echinoderm.

The objection is sometimes raised that a course based on principles instead of types gives a full knowledge of not a single animal. This objection, however, comes only from those to whom zoology has a special interest, and who will go on for advanced work in the same field; and in their second course they will get that complete information about some one animal which they desire. An elementary course based on principles should therefore be the best foundation for students of all grades of interest. To him who will never pursue another course in biology it gives the very things that will be of interest or value. To him who will specialize in the subject, it affords the best possible framework into which the details subsequently acquired can be fitted.

Unlike courses in elementary botany, if Profesor Davis's paper is correctly interpreted, the course in zoology based on principles does not await the future for its realization. In at least one institution such a course is now in operation. In the University of Michigan the first course in zoology is of the kind described. Dissection of types is no longer practised, the entire laboratory work being collected around principles. It is a truly general course; first hand knowledge of the elementary facts from each of the main divisions of zoology is gained in the laboratory and from these facts fundamental principles are derived. It has been in operation for several years, and has more than justified its introduction. Such a course makes new demands on the text-book and on the mode of teaching, but these difficulties can be removed. It is likely to be a little more expensive to install than the type course, but its current expenses may well be less.

The sponsors of this course regard it as the best kind of course, whether after the war, during the war, or any other time. Whatever of practical or applied biology it contains is there, not for any benefit that may accrue to the nation in times of stress, but because of its general interest and importance. For it is clear that the amount of applied biology that could be included in a beginning course would not enable any one save his country, unless increased by practical courses to follow.

In pedagogical method the course on principles need not differ from the type course. The inductive method may be as consistently employed. Accuracy in observation is just as necessary. Correctness of interpretation is quite as essential. But this difference exists: the thing observed is itself of interest, or the interpretation is important. Features of an animal which are not of interest or are not important are omitted.

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INTERNATIONAL ORGANIZATION OF SCIENCE

TO THE EDITOR OF SCIENCE: The statement adopted by the Inter-Allied Conference held in London under the auspices of the Royal Society, SCIENCE, November 22, page 509, as a preamble to certain resolutions which are to be made public later, directs attention to the serious difficulties which the recent war has imposed on the international scientific projects already inaugurated and on those under consideration. As these projects are of common interest it can scarcely be expected that a

certain set of resolutions adopted before the close of the war will furnish a final solution of these difficulties, notwithstanding the eminence of those directly concerned in drafting or in adopting the resolutions.

The great scientific progress since the Middle Ages has been largely due to the separation, mental or statutory, of concepts or institutions of fundamental human interests. As instances, we may refer to the separation of church and state, of knowledge and superstition. It would seem very unfortunate if we should now allow moral and ethical questions to becloud our vision as regards scientific merits or demerits. We all welcome exposures of unfair scientific dealings practised persistently by such large numbers as to constitute national characteristics, but if these exposures are to be really effective they should bear evidence of the fact that the accused had a fair chance to defend themselves. Hence the need of open international scientific conferences seems to be greater now than before the war.

G. A. Miller

QUOTATIONS

A NATIONAL LABORATORY FOR THE STUDY OF NUTRITION

A resolution of the Inter-Allied Scientific Food Commission, which does not appear to have attracted as much notice as it deserves, dealt with the need of establishing national laboratories for the study of human nutrition. The commission pointed out that, as at least one quarter of the whole income of a nation was devoted to the purchase of food by its individual citizens, it was a matter of the highest importance for the welfare and prosperity of a country that the methods of utilizing its food resources in the best way should be explored and definitely established on the basis of scientific data. The commission therefore adopted a resolution urging the allied governments to establish national laboratories to be devoted to the task. There is no doubt that the want of such a laboratory will be especially felt in the United Kingdom, where the husbanding of our food resources is likely to remain imperative longer than in countries which are normally nearly self-supporting.

The contrast between the extent to which the study of human metabolism has been fostered by the state or left to private enterprise in England and the United States is little to the credit of our rulers. Nor can it be pleaded in extenuation of the neglect that English men of science have shown no signs of being attracted by the problems of nutrition and metabolism. On the contrary, without any depreciation of the labors of such Americans as Atwater and Benedict, or such Germans as Rubner, we can justly claim that the present generation of English physiologists has made contributions to the science of nutrition equal in value to anything which has been achieved elsewhere. We need merely cite the brilliant researches into the chemical mechanisms of digestion which we owe to Starling and Bayliss, the work of Hopkins and his pupils on protein metabolism, and the succession of important contributions to the study of deficiency diseases which have come from the laboratories of the Lister Institute, culminating in the recent work of Dr. Chick and her collaborators.

Since the war the Royal Society, by the agency of its food (war) committee, has, with little official aid and, at times, in spite of official indifference or neglect, done much to bring the subject of national dietetics under proper scientific guidance, but we are of opinion that its work will not be extended and made of permanent value to the nation unless effect is given to the Inter-Allied Commission's proposal.

We shall endeavor to make the reason plain by considering one only of the topics within the scope of nutritional research. The Inter-Allied Commission mentioned the need of determining the amount of food required to maintain the health and strength of persons engaged in different occupations. As we had to point out some time since, when the policy of the food controller received less inspiration from scientific sources than has happily been the case during the past twelve months, the broad distinctions between class and class, the