stration Work and What Kind should the Experiment Station undertake?' Under the first subject Dr. C. G. Hopkins presented a paper on 'Soil Fertility in Relation to Permanent Agriculture,' in which he outlined the method followed in Illinois in studying the problems of fertility and the fertilizer requirements, summarizing the results obtained and introduced into practise. Dr. A. M. Peter presented 'Some Results of an Old Method for Determining Available Plant Food in Soils,' giving the results upon virgin soil, old field soil and subsoil. He pointed out the weaknesses of the method and recommended a modified method, for which he gave a series of results. Director C. E. Thorne, in a paper on 'Soil Investigation,' pointed out the necessity of supplementing chemical analysis and pot experiments with carefully conducted field experiments, and also of giving more attention to the biological processes of the soil; and Dr. H. J. Wheeler described some of the lines of soil investigation in progress at the Rhode Island Experiment Station, making suggestions regarding profitable lines of research to be undertaken in this field.

The discussion upon the subject of demonstration work developed some difference of opinion as to the advisibility of the experiment stations undertaking such work, although its usefulness was freely acknowledged. A clear distinction was drawn between experimental and demonstration work, and the general opinion was advanced that the demonstration work was more strictly an education phase which might very properly be undertaken by other agencies, leaving the stations free to confine their efforts quite largely to experimentation and research. Considerable demonstration work is now carried on by the experiment stations, and this work is a necessary supplement of the present system of investigation and dissemination.

The association received an invitation to hold its next meeting in California, prior to or following the meeting of the National Educational Association. Considerable interest was manifested in this matter, an objection to the plan being that it might conflict with the proposed graduate school if held during July. The matter was left with the executive committee.

In the election of officers President M. H. Buckham, of Vermont, was chosen president; President C. C. Thach, of Alabama, Dr. E. H. Jenkins, of Connecticut, and Presidents J. H. Worst, of North Dakota, B. I. Wheeler, of California, and Luther Foster, of New Mexico, vice-presidents. Director J. L. Hills, of Vermont, was reelected secretary-treasurer; Dr. A. C. True, of the Department of Agriculture, bibliographer; and Dr. H. C. White, of Georgia, President J. L. Snyder, of Michigan, Dr. W. H. Jordan, of New York, Director C. F. Curtiss, of Iowa, and Director L. H. Bailey, of New York, members of the executive committee. President C. R. Van Hise, of Wisconsin, was chosen chairman, and President H. C. Price, of Ohio, secretary, of the section on college work and administration; and Director B. C. Buffum, of Wyoming, chairman, and Director M. A. Scovell, of Kentucky, secretary, of the section on experiment station work.

E. W. ALLEN.

WASHINGTON, D. C.

SCIENTIFIC BOOKS.

JORDAN'S GUIDE TO THE STUDY OF FISHES.[1]

IN 1880, ten years after completing his great 'Catalogue of the Fishes in the British Museum,' Guenther published his 'Introduction to the Study of Fishes,' a book of 720 pages which gives 'in a concise form an ac-

[1] Jordan, David Starr, 'A Guide to the Study of Fishes,' 2 Vols., small quarto, pp. xxvi + 624 and xxii + 599. 2 colored frontispieces and 899 illustrations. New York, Henry Holt & Co., 1905. $12.00 net.

count of the principal facts relating to the structure, classification, and life history of Fishes' and is 'intended to meet the requirements of those who are desirous of studying the elements of Ichthyology; to serve as a book of reference to zoologists generally; and, finally, to supply those who, like travelers, have frequent opportunity of observing fishes, with a ready means of obtaining information' (preface). Guenther's 'Introduction' has continued the only work of its sort. Indeed, of comprehensive works on fishes, there have appeared, aside from popular natural histories, only Dean's excellent 'Fishes, Living and Fossil' (1895), a strictly morphological work, and the seventh volume of the 'Cambridge Natural History' (1904), containing Bridge and Boulenger's admirable 620 pages on fishes. The latter treatise is almost as extensive as Guenther's 'Introduction' and will largely supersede it.

In 1900 President Jordan (with Dr. Evermann) completed his monumental but strictly systematic 'Fishes of Middle and North America.' In 1902 he (again with Dr. Evermann) published the popular 'American Food and Game Fishes.'

The present work, the first large work on fishes to be independently undertaken by the writer, is of nearly twice the extent of Guenther's 'Introduction' or of the 'Cambridge Natural History' and like them "treats of the fish from all the varied points of view. * * * The writer has hoped to make a book valuable to technical students, interesting to anglers and nature lovers, and instructive to all who open its pages" (preface). In scope and in the circumstances leading up to its writing Jordan's book suggests comparison with Guenther's. Like its predecessors, it falls into two parts. The first twenty-four chapters (459 pages) form an introductory or general treatise on fishes while the remainder of the work deals descriptively with the various subdivisions of the group. The following chapter headings indicate the scope of the general part: I., The Life of the Fish; II., The Exterior of the Fish; III., The Dissection of the Fish; IV., Skeleton; V., Morphology of the Fins; VI., Organs of Respiration; VII., Nervous System; VIII., Organs of Sense; IX., Organs of Reproduction; X., Embryology and Growth; XI., Instincts, Habits, and Adaptations; XII., Adaptations; XIII., Colors; XIV., Geographical Distribution; XV., Isthmus Barriers Separating Fish Faunas; XVI., Dispersion of Fresh-water Fishes; XVII., Dispersion of Fresh-water Fishes, continued; XVIII., Fishes as Food for Man; XIX., Diseases of Fishes; XX., Mythology of Fishes; XXI., Classification; XXII., History of Ichthyology; XXIII., The Collection of Fishes; XXIV., The Evolution of Fishes (paleontological).

The author's interests as a taxonomist and student of geographical distribution seem to be reflected in his allotment of space. Thus in chapters I. to V. and XII. and XIII., about 134 pages, or nearly one third of the general portion, are devoted chiefly to the external morphology and the skeleton, the structures most used by the systematist. Geographical distribution occupies 83 pages and the history of ichthyology 42. The subjects mentioned thus take up more than one half of the introductory part of the book. On the other hand, respiration is dismissed with 18 pages, the nervous system and sense organs with 15 and the reproductive organs with 7, while five lines are given to the kidneys and they are not referred to in the index. The 'Cambridge Natural History,' with but half the space of the present work, gives 36 pages to respiration, 30 to the nervous system and sense organs and 24 to the urinogenital organs. While it is true that external features and particularly external adaptive features are of peculiar interest to the general reader, yet much that President Jordan has included on the skeleton and external morphology is not treated from the point of view of adaptation and is probably of less general interest than much that might have been added on internal structures.

In writing that the book is meant for technical students, anglers and nature lovers, the author clearly does not wish us to understand that all parts of it have been so written as to be useful to each of these classes of readers, but

rather that each will find in it much of interest and value. In truth the style is very unequal. The first three or four chapters and chapter sixteen, as well as many other portions, are models of clearness and simplicity and are of use to the general reader as well as to the specialist, while portions of the chapter on the morphology of the fins and of other chapters will hardly attract the nature lover. This inequality of matter arises largely from the fact that while a part has been prepared especially for this book and with reference to all the classes of readers mentioned, much of it has been quoted from more or less technical sources. Thus much of the chapter on the morphology of the fins is quoted from technical papers of Ryder, Kerr and Gill. The chapters on geographical distribution and on the history of ichthyology are, with little modification, reprinted from earlier papers of the author, some of them published in this journal. The chapter on color is from a paper of the author in the *American Naturalist* and that on collecting from a paper in the *Popular Science Monthly*. Most of the chapter on diseases is quoted from American authors, but Hofer's valuable 'Handbuch' is ignored.

So on the first page we read:

> If we would understand a fish, we must first go and catch one. This is not very hard to do, for there are plenty of them in the little rushing brook or among the lilies of the pond. Let us take a small hook, put on it an angle worm—no need to seek an elaborate artificial fly—and we will go to the old 'swimming hole' or the deep eddy at the root of the old stump where the stream has gnawed away the bank in changing its course.

This may savor of the nature-study leaflet but is clear withal and meaty. On the other hand, we have this quotation from Gill:

> The two elements of the arch, named by Parker, in *Lepidosiren*, 'supra-clavicle' (scapula) and 'clavicle' (ectocoracoid) seem to be comparable together, and as a whole, with the single element carrying the humerus and pectoral fin in the Crossopterygians (*Polypterus* and *Calomoichthys*) and other fishes, and therefore not identical respectively with the 'supraclavicle' and 'clavicle' (except in part) recognized by him in other fishes. (I., p. 89.)

Would not the book have been more readable for all had the author adhered to the plan with which he seems to have set out, that of presenting the whole subject in non-technical form and in his own clear and forceful language?

An examination of the general part of the book as to its scientific quality shows the same unevenness as in style and in the distribution of space. The chapters dealing with the internal organs (exclusive of the skeleton) omit much. Brüning's fundamental work on the physiology of the circulation of fishes has not been made use of. The account of the nervous system (chapter VII.) does not mention the thalamencephalon as one of the subdivisions of the brain, does not call attention to the distinctive features of the brain which result from the presence of the nervus lateralis and does not mention the lateralis. The account of the nervous system is then that of the elementary text-book of comparative anatomy of ten years ago, and includes nothing of the important and accessible recent work of Herrick, Johnston and other Americans.

The account of the eye does not discuss its most striking peculiarities worked out ten years ago by Beer,[2] and perpetuates an old error of Plateau, found in nearly all text-books, in the statement that the cornea is 'little convex,' though Beer showed that this is not the case.

One is left with a hazy impression of the sense of hearing in fishes after reading the contradictory statements on pages 115, 121 and 122; and this in spite of references to Parker's recent work. The sense of taste is dismissed with a paragraph and Herrick's important and most interesting work is not mentioned, nor are his results utilized.

A good deal of space is given to the subject of color, and yet the reader is likely to be left with an indefinite and in some respects erroneous notion of the cause of colors and the

[2] Beer, Th., 'Die Accommodation des Fischauges,' *Pflüger's Archiv*, LVIII., 523–650.

mechanism of color changes in fishes. We are told (I., p. 8) that changes in the position of the scales produce color changes; 'when they rise a little the color seems to change.' 'Fine lines and concentric striæ on the scales' are said to produce a bluish luster, although there is 'no real blue pigment' under them (I., p. 9). Again (I., p. 226) 'certain metallic shades, silvery blue or iridescent, are produced, not by actual pigment, but, as among insects, by the deflection of light from the polished skin or the striated surfaces of the scales.' And yet there are several references to blue pigment (I., pp. 8, 9, 129, 155). Pouchet[3] showed more than thirty years ago that the blue colors of fishes were due, not to the structure of the scales, but to a layer of cells containing guanin crystals, and to these cells he gave the name of iridocytes. Cunningham and McMunn,[4] though differing from Pouchet in details, reached the same conclusion. The pigments of fishes are lipochromes (red, orange, yellow) and melanin (black), not blue. All this is accurately and fully set forth in the 'Cambridge Natural History.' Moreover, Camichel and Mandaul[5] have recently made the general statement that in vertebrates all blue skins contain no pigment but black, and all green skins no pigment but black and yellow.

These are, to be sure, in a sense errors of omission, but there are other errors not of this sort. Thus we are told (I., p. 91) that the labyrinthine apparatus of *Anabas scandens* is a 'contrivance for holding water above the gills,' though Zograff[6] showed the apparatus to be for the purpose of holding air for respiration. Here again the 'Cambridge Natural History' would have furnished accurate information. On page 107 arterial bulb and conus arteriosus are used as synonyms. One of the strangest errors is in the statement (I., p. 118) that in the deep sea form *Ipnops* 'the eyes are spread out to cover the whole upper surface of the head, being modified as luminous organs.' This was Moseley's original opinion, but, as he states in his final paper,[7] it arose from the fact that among the sections of *Ipnops* given him for examination there was an unlabeled slide 'containing a section of the retina of some ordinary teleostean fish.' His final examination showed him that the 'peculiar organs have in reality no connection with organs of vision. The eyes as well as the optic nerves are entirely aborted in the fish.'

These instances from the general part of the book show that it can not be uniformly depended upon to present a full, accurate and modern account. On the other hand, the chapters on distribution, classification and the history of ichthyology do not appear to err in any of these directions. These subjects are treated with so great fullness and knowledge that nothing equal to them is to be found elsewhere. The chapters on distribution have the rare merit of relating the distribution to the topography and recent geological history of the regions discussed and are to be commended for their wise conservatism. The chapters dealing with the external structural features and that on paleontological history, though less technical, are usually clear and well suited to various classes of readers.

The descriptive portion of the book (somewhat more than one half) follows the method long familiar to American zoologists in Packard's 'Guide to the Study of Insects.' The salient characters of each family or larger group are given and are followed by a running and often gossipy comment on its commoner or more interesting representatives. There are no keys or specific descriptions, so that for determining species President Jordan's other books should be used. There is much difference of opinion among naturalists as to the value of this mode of treatment. While it affords much of interest to the technical student, it commonly fails him when he is in search of information about particular species.

[3] Pouchet, G., *Comptes Rendus*, LXXIV., 1341–1343 (1872).

[4] Cunningham and McMunn, *Phil. Trans. Roy. Soc. Lond.*, Vol. 184B, p. 765.

[5] Camichel and Mandaul, *Comptes Rendus*, CIII., 826 (1901).

[6] Zograff, *Quar. Jour. Micr. Sci.*, XXVIII., 501 (1888).

[7] Moseley, 'Challenger Reports,' XXII., 269.

On the other hand, for the non-technical student it makes a readable account, but makes it necessary for him to search long if he desires to place his specimen. Whatever one may think of the method, President Jordan has used it with skill, and the result is an account probably as attractive as such an account can well be made. Though it does not ignore foreign fishes, it is of particular interest to Americans, since it properly gives preference to American forms. The author has given us the cream of his long experience and wide knowledge of American fishes and has made it full and attractive. There is no other account of the sort for American readers. He has wisely treated the fossil fishes in their proper sequence along with living fishes. Many systematists will not agree with President Jordan concerning the general scheme of classification adopted and in minor details, but that is unavoidable and immaterial in a book of this kind.

The book is profusely illustrated with halftones of uniform excellence and with two striking colored plates. Ichthyologists should be especially grateful to Dr. Jordan for the admirable portraits of their colleagues, past and present. There is a valuable index, but the intentional omission of all but a very few references to the literature is to be regretted. Such selected foot-note references as are to be found in the 'Cambridge Natural History' occupy but little space and are of distinct value, even to the expert.

The publishers have given us a sightly page with large clear type and serviceable binding. The proof-reader has been sometimes at fault, though fortunately not often in the technical terms. There may be noted only 'construction' for contraction (p. 28); 'mallets' for mullets (p. 32); 'himera' for Chimera (p. 43); 'neutral' for neural (p. 56); 'ethnoid' for ethmoid (p. 113); 'Acanocephala' for Acanthocephala (p. 344). Other errors will be readily detected by the reader. In his chapter on mythology President Jordan has, apparently by the omission of a decimal point, added a new myth in making the 'sea-serpent' *Regalecus* 225 feet long (p. 361), but the measurement is correctly given in another place.

The book as a whole impresses the reader as the work of a busy man. Where the author has wandered from the narrower field of systematic ichthyology, with its attendant problems of distribution and external morphology, he has sometimes fallen into vagueness or error. Where he has depended on compilation he appears usually to have used only the more accessible and older English compendious sources and has thus helped to a longer currency some errors that others had corrected. Where, on the other hand, he has traversed his own familiar ground he has supplied a real need and supplied it admirably. In view of the great merits of his work, as he has himself said of the work of another, we may well 'pass by its faults with the leniency which we may hope that posterity may bestow on our own.'

JACOB REIGHARD.

Lectures on the Calculus of Variations. By OSKAR BOLZA. (The University of Chicago Decennial Publications, Second Series, Volume XIV.) Chicago, The University of Chicago Press. 1904. 8vo. Pp. xv + 271.

It is to be the function of the present generation of mathematical scholars in America to set a standard in mathematical memoirs and treatises which has been almost totally lacking in this country. The mathematical books which have heretofore appeared in America have been with few exceptions of text-book rank; it would be a generous estimate which would allow the fingers of both hands upon which to count books which would not be within the range of college students in undergraduate classes among the total mathematical production of the United States. There are several books in English, published in England, which are available; but the English school of mathematics has labored under such a handicap of lax reasoning and so-called 'general' statement that many of these can not be used with safety by one who is not already a master of the subject treated.

It is, therefore, a very notable occurrence when a mathematical work of really advanced

grade appears in America. Its standards of rigor, its terminologies, even its styles of typography, are destined to leave a relatively lasting influence upon future treatises of the same class. Such an influential book is Bolza's 'Lectures on the Calculus of Variations.' It will appear from what follows that this influence is to be great in many a subject besides the 'Calculus of Variations,' and that the quality of its influence is excellent in practically every particular.

The calculus of variations is one of the very first of the old (or formal) developments of the infinitesimal calculus; it is one of the newest conquests of the modern (or critical) school. The history of the older calculus of variations is almost trite from reiteration; to select among many, the works of Moigno-Lindelöf, Diegner, Todhunter, Caroll, Jordan and (more recently and more perfectly) Pascal, have made known the achievements of the old school from Newton to Jacobi to mathematicians throughout the world. The modern theory—the critical revision of the older theory—has appeared so recently that its existence is still unknown to many scientific men. Since the book under discussion is practically the first exponent of this newer work which is reasonably easy to follow, it seems fitting to state here the characteristic differences between the older theory and the new.

The essential problem may be stated here as follows: Given an integral of the form

$$I=\int_{x_0}^{x_1} f(x, y, y')dx,$$

where

$$y'=\frac{dy}{dx}$$

that integral will take on a fixed numerical value whenever a curve C is given by an equation of the form $y=\phi(x)$. It is proposed to find that curve C for which this numerical value is at a minimum (or maximum). The *finesse* of the whole modern theory, and the exquisite exactness of the present treatment, lies in so refining this crude statement that an accurate solution of the problem becomes possible. Thus the first question which arises is the following: Taking a supposed solution $y=\phi(x)$, are we to presume that the corresponding integral value is less than (or greater than) the integral value which corresponds to absolutely *any* other curve?—or to those which lie reasonably near to the supposed solution?—or to those which lie reasonably near and also have reasonably small difference in inclination? Are the 'comparison' curves to be reasonably continuous and have a respectable number of derivatives, or are we to admit all kinds of outlandish curves to our considerations—curves with corners—curves with no tangents—curves with no radius of curvature—curves which misbehave themselves in the variety of ways which are now known to be possible? If not, then in what sense may we say that the supposed solution really gives the integral a smaller value than any other curve near it? These questions are fundamentally important; their consideration gives to the modern theory an exactness which the older theory lacked completely; it is this attitude which renders Bolza's book a modern work.

The results of the modern theory are very satisfying in their evident accuracy, and they are none the less satisfactory in the simplicity of the conclusions reached. From a practical standpoint, it may be said that any curve which is a true solution of the problem must satisfy the very same conditions which were derived in the older books, viz., (1) the condition discovered by Euler (sometimes known as Lagrange's condition), (2) that discovered by Legendre, (3) that discovered by Jacobi. In so far there is no change, save for a greater accuracy in statement and a very material advance in the exactness of the proofs. These considerations practically exhaust the first two chapters of the book, and their presentation here can not fail to arouse lively enthusiasm in the intelligent reader on account of irresistible force of the precise reasoning and the consequent indisputable truth of the conclusions.

A curve may satisfy the preceding conditions, however, and still fail to render the integral a minimum (or maximum). This fact was discovered by Weierstrass, who succeeded

in setting up a *fourth* necessary condition. These statements apply, however, only when we admit as 'comparison curves' curves which, although they lie reasonably near the supposed solution, differ greatly from the supposed solution in inclination. For some physical applications it is evident from the nature of the problem that such comparison curves may be neglected. For example, in the famous problem of the 'Surface of Rotation of Least Resistance to a Moving Fluid,' which is due to Newton, there exist no solutions whatever in the sense just explained. That is to say, there exists no surface of revolution whatever which does not offer more resistance than some other surface of rotation, under the Newtonian assumptions regarding resistance. The possibility of such a result was entirely overlooked even within the lifetime of scientists now living, it being assumed as an *a priori* fact that some solution surely existed in this and many other similar problems. On the other hand, it is probable that any physicist would hold that the extreme *wavyness*—the krinklyness, to use a term invented by Professor Moore—which the surfaces of less resistance than the formal 'solution' must have, is really an objection to their consideration from a physicist's standpoint, in that the saw-like edges of the surface would cause a local eruption in the moving fluid which was not contemplated when the original assumptions regarding the nature and amount of the resistance were made. To meet such reasonable objection, a distinction is made between *strong* minimizing curves, *i. e.*, curves which render the integral of the problem under consideration absolutely *less* than *any* other curve *whatever* in their neighborhood, and, on the other hand, *weak* minimizing curves, *i. e.*, curves which render the integral less than any other curve which lies in the neighborhood and whose slope differs only slightly from that of the 'solution.' To clinch the point it may be stated that while there exists no solution of Newton's famous problem, there are 'weak' solutions, and these are precisely the stock solutions of the older books; the difference is that the newer theory demonstrates that there are curves which give a less resistance than the stock solution, whereas the older books would have led one to believe that such was not the case.

While this is merely a typical example, it illustrates in an essential manner the tendencies of the modern thought. The development, not of this example, but of the general theory of Weierstrass's condition and that of the *sufficient* conditions both for 'weak' and for 'strong' minimizing (or maximizing) curves forms the subject matter of the third chapter. It may be that such a precise theory is too far advanced for really practical application, but the writer is among those who believe that mechanics, physics and a few other sciences are upon the eve of the same reformation which has characterized the progress of mathematics during the past century, by which mathematics has become more really an 'exact science.' The fact that errors in conception and errors in proof have been made in that science which has been misnamed 'exact,' and that these errors have been at least partially removed through impartial and accurate investigation may be surprising to many who are not specialists in mathematics, but it would seem to suggest at the same time the possibility of similar investigation in sciences which have hitherto been classed as 'inexact,' in that it demonstrates that the difference is, after all, not so fundamental. Especially when the subject treated is as closely allied to mechanics and physics as is the calculus of variations, the possibility of rendering those subjects just as rigorously exact in certain chapters as are a few of the present branches of mathematics begins to appear less visionary. Possibly a confession in such a general scientific organ as is SCIENCE, that there are portions of mathematics—notably the theory of curves and surfaces—which are still open to fundamental criticism and objection, will tend to further the impression that there is no radical characteristic difference in exactness between mathematics and certain other sciences.

The next chapters will be of especial interest chiefly to those who are specialists in mathematics. Suffice it to say here that they treat other less specialized cases than the one

fundamental case mentioned above, and that they introduce a slightly more general form of notation, which is necessary in the last analysis for the solution of certain problems. An adequate account of these chapters can be omitted here with more grace since the writer has shown his appreciation of them in a manner more befitting their real importance in a review of a more technical character in the *Bulletin of the American Mathematical Society* (November, 1905), which will be accessible to a reader whose interest is professional.

It would be misleading to leave an impression that Bolza's book is elementary or that it can be read without special mathematical training. It is highly technical even in comparison with most of the extant *English* works on mathematics. Its standards are not higher than they should be, however; they are unusual in a book printed in English; they are not higher than the average standard of the classical foreign mathematical treatises; they *are* beyond question a step in the right direction.

This book is not primarily a text-book; it will not share the speedy oblivion of that class; and there are many evidences that this and a few other extremely recent mathematical books published in America are merely the first of a considerable volume of mathematical productions of like grade, which, if the average standards remain equal to those set by this book, will indeed deserve to be called an American mathematical literature.

E. R. Hedrick.

Columbia, Mo.,
December 1, 1905.

SOCIETIES AND ACADEMIES.

The Washington Academy of Sciences.

At a meeting of the academy on November 28, Professor Wilhelm Ostwald, of Leipzig, who is now lecturing at Harvard University, gave an interesting address upon the proposed 'Universal Auxiliary Language.' The substance of his address was as follows:

In our time, when international congresses of all kinds, scientific, commercial, political, etc., are gathering almost every day, the necessity of a general means of mutual understanding is felt more keenly than at any former time. Small wonder therefore, that at one of these congresses, that of philosophy, held at Paris, 1900, the question was earnestly discussed, whether it was possible to overcome this insufferable obstacle to the common work of mankind. As a result, an international committee was elected to consider the matter and to propagate the general idea. This committee came to the conclusion that the selection or creation of a general auxiliary language was necessary, which should not supplant the existing languages, but should be learned by everybody besides his native speech for the purpose of international intercourse. This language must satisfy the following three conditions:

1. It must fulfill the needs of ordinary intercourse of social life, of commercial communications and of scientific and philosophic relations.

2. It must be easily acquired by every person of average elementary education, and especially by persons of European (and American) civilization.

3. It must not be one of the national languages.

Upon this program a widespread and effective propaganda has been developed. About 800 scientists of various countries, all university professors or members of scientific academies, and besides these about 200 societies of the most various kinds: scientific societies, chambers of commerce, touring clubs, etc., representing many thousand members, have joined the general movement. The purpose is, to ask after due time the Association des Academies, which represents the most important academies all over the world and is, therefore, the highest scientific corporation existing in our days, to take over this work of the international auxiliary language as its own, to appoint a working committee for the selection and introduction of such a language and to form a lasting and effective center for its culture and development. In case the association should decline this noble and important task, such a working committee will be selected by the above named international committee, formed by the representatives of