life which go to make up the complex of our modern civilization?

This does not mean of course that the engineer as such can pose as an expert in the study of problems in these varied fields remote from his own normal activity. It does mean that his own general grand strategy is equally applicable in such fields as in his own, and therefore to that extent is he qualified to serve effectively with others who may be able to supply the more narrowly technical details, in the study of a wide variety of problems in life and lying outside his own special field. It means, in particular, when such problems involve questions of engineering or when they have an engineering background, as is so frequently the case, that he is especially well qualified to take an important and helpful part in the broad and thorough study of such matters, and that in general, aside from narrow technicalities, he may helpfully join with his fellows from various walks of life in the effective study of a wide and important range of problems which lie outside the immediate limits of his own chosen field.

It is, in fact, perhaps not too much to say that as the engineering method, if we may so term it, is the more applied in our study of public questions, and broadly in that of the problems of life generally, so shall we be able to reach more sure and safe conclusions, and so will the engineer the more fully realize the degree of service which he may render to the cause of human progress.

CONCLUSION

To sum up the whole matter, the engineer, either as an individual or as a collective type, is simply a link in the chain of human progress—a chain the links of which, in one form or another, run back into a past removed from our own time by tens of thousands of years, to go to no higher figures. With the trend of human progress as it now is, he seems, moreover, to be a very necessary link. He has taken upon himself the peculiar function of developing and translating into use for the needs of civilization the constructive materials of the earth and the inorganic energies of nature, and in connection with the exercise of such function he has acquired peculiar and weighty duties and responsibilities.

There are naturally the duties of self-development and improvement, both individually and collectively, as organizations such as our own. This is the duty so well inculcated by the scriptural parable of the talents. Likewise there are the duties of friendship and of cooperation for the realization of larger ends, and again, both individually and collectively as organizations.

And then it is peculiarly the duty of the engineer to see that, so far as in him may lie, these stores of nature, of which he is the custodian, are used frugally, with due regard to their limited supply, and having in mind the needs of future generations. Again, it is his duty to leave behind him some definite increment to that great store of knowledge through which we are able to enter into partnership with nature, and only by means of which we may hope to more effectively align ourselves with her laws and thus maintain an ever-ascending gradient of human progress.

Again we must individually as we may, and collectively with definite purpose, endeavor to cooperate helpfully with agencies charged with the training of recruits for our ranks, to the end that there may be a continued and adequate supply to the younger strata in our guild, whence we may hopefully look for leadership and guidance in the future.

And finally, since in the exercise of his functions as an engineer he must of necessity develop and employ habits of mind and methods of study which may be usefully employed in dealing with problems as they arise in all activities in life, therefore should the engineer stand ready to serve, not only in his chosen sphere, but wherever and whenever his habit of mind, his training and his experience may enable him to contribute a helpful element in this great cooperative enterprise which we call civilization.

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BIOLOGICAL ABSTRACTS

BECAUSE of numerous inquiries concerning the status of plans for *Biological Abstracts*, the following brief statement is presented:

Historical.—It will be recalled that in 1923 the joint publications committee of the Union of American Biological Societies, the division of biology and agriculture of the National Research Council and the American Association for the Advancement of Science made a report[1] on the general status of literature aids in biology and tentatively outlined a project for the establishment of an inclusive abstracting and indexing service for the entire field of theoretical and applied biology. The secretary of the union submitted this report to members of the larger research biological societies with a request that the individual biologists examine the proposal and express themselves frankly concerning it. The joint publications committee has reported[2] on the 4,500 replies received in this "referendum," about 85 per cent. of which favored the project and 65 per cent. expressed tenta-

[1] SCIENCE, September 28, 1923, pp. 236–239.

[2] SCIENCE, November 28, 1924, pp. 485–489.

tive willingness to subscribe individually. Meanwhile, personal conferences with biologists and organizations in other parts of the world disclosed a general sympathetic interest in the possibility of establishing the inclusive service.

With these assurances of cooperation and support, the project has finally become possible of execution through the generous action of the Rockefeller Foundation pledging $350,000 in support of the editorial conduct of the service, the funds being available over a ten-year period. Although the support is pledged to the Union of American Biological Societies, the funds are appropriated through the National Research Council.

The new journal, *Biological Abstracts,* will begin its work with the literature of 1926; the first issue may, therefore, be expected about May or June, 1926. For 1925, however, some funds were made available to carry on necessary organization activities and to support the editorial work in *Botanical Abstracts* and *Abstracts of Bacteriology,* both of which will merge into *Biological Abstracts.*

General Organization.—Except during its first year, the journal will be issued in twelve monthly abstract numbers, the annual volumes, which will coincide with the calendar year, closing with an index issue. The abstracts will be printed in English, but all authors' names, titles and citations in so far as they appear in Latin- or Slavic-letter languages will be printed in the original. The abstracts appearing in the issues will be grouped into convenient and reasonably homogeneous subject-matter sections, each in charge of a specialist who will act as section editor. A small central editorial office and staff will be charged with the responsibility of securing all necessary abstracts, distributing these periodically to section editors, and exercising general editorial supervision; preparing provisional manuscript of all indexes; attending to proof reading and seeing all issues through the press; arranging for detailed business management of the journal, etc. Some aspects of the plans and work merit a fuller statement.

Cooperation from Biological Groups.—The small central editorial staff is evidently unable to pass competently on all policies and detailed procedure affecting special interests. Many of the larger research biological societies, whether they happened to be members of the union or not, were therefore invited to name advisory committees to cooperate with the editors in dividing the biological field into suitable subject-matter sections and choosing section editors, preparing lists of possible collaborators (abstractors), determining indexing policies, etc. In this way it is hoped that throughout the broad field to be covered and the extensive constituency to be served reasonable competence will be brought to bear on the problems involved. Fourteen such advisory committees have been appointed and are actively cooperating.

Preparation of Abstracts.—With few exceptions no abstracts will be prepared by the section editors or in the central editorial office, though the latter will issue all requests for abstracts and administer any necessary follow-up. It is hoped to secure, if possible, virtually all abstracts from collaborators resident in the countries in which the various publications, especially serials, are published, each collaborator, however, being invited to assume only a very moderate and non-burdensome responsibility. It is therefore the plan to produce the journal through cooperation coextensive with productive activity in biological science. More specifically, it is the plan to secure abstracts mainly in the following three ways:

(1) Through authors, who will be invited by the central editorial office to submit abstracts of specifically designated articles of their own authorship.

(2) Through collaborators responsible for furnishing all necessary abstracts and titles from one or a limited number of specifically designated and assigned serial publications. This procedure will be followed only in those journals which confine themselves to a limited special field and the contents of which therefore readily fall within the competence of a single specialist.

(3) Through collaborators who will be invited to abstract individually designated papers falling within their special interests and linguistic equipment. This procedure will be followed in cases in which it is not possible or practicable to secure the abstracts by one of the first two methods.

In addition, abstracts will in some cases be secured from other abstracting journals with which cooperative relations have or may be established.

The abstracts will not attempt to evaluate contributions. No arbitrary limit is placed on the length of abstracts; it is the policy to have them as long as necessary to fulfill their primary functions—permit adequate and accurate indexing of the corresponding original articles and acquaint the reader with the more important new information authors believe that they have contributed. Collaborators and authors will be free to prepare abstracts in any one of five or six languages, depending entirely upon their convenience; any necessary translations will be arranged for by the central editorial office.

Subject-matter Sections.—With the invaluable and generous cooperation of the various advisory committees and many individual biologists, the field to be covered by the service has been divided into some eighty sections to which the abstracts are to be allocated by the central editorial office. No scheme

of sections can meet fully the special desires of all; this is generally recognized and the editors have encountered only the most generous spirit of give-and-take between groups as these have collaborated in arriving at a tentative division which gives promise of approximating greatest convenience to the greatest number. It is to be remembered that the grouping of abstracts into sections serves a useful purpose chiefly during current reading; the indexes, the only effective avenues of approach when abstracting journals are later used, are prepared without reference to the sections in which the abstracts were printed, and any inconvenience growing out of misallocation of abstracts or unwise delimitation of sections is thus only temporary. Since the sections are intended to serve the convenience of the greatest number, they are subject to change as experience may dictate. A further provision which will aid in reducing the inconvenience growing out of the necessity for sections and the printing of but a single abstract of any one paper (in the interests of economy), is the system of cross references; this will be within the complete control of each section editor and is discussed in more detail below.

Indexes.—The indexes give to an abstracting service permanent reference value; special attention has, therefore, been given to this aspect of the organization work. The concluding (thirteenth) number of each annual volume will be devoted to the indexes, of which three have been definitely planned, as follows:

(1) Authors' index.
(2) Detailed analytical alphabetic subject index.
(3) Subject index arranged by systematic groups.

An index to new genera, and other special aids, can be added if this is deemed necessary.

It is recognized that the limited indexing staff in the central editorial office will not be thoroughly competent to pass finally on all entries to appear in the two subject indexes. On the other hand, the section editors can not be expected to do the laborious mechanical work of preparing the subject-index entries for the abstracts appearing in their sections. A procedure has, therefore, been worked out whereby the manuscript of the alphabetic and systematic indexes for each abstract is prepared in the central office and attached to the corresponding abstract before this is sent to the section editor. By this plan the various specialists (section editors) will have full opportunity to edit critically not only the abstracts, but the individual index entries as well, without, however, being burdened with detailed mechanical preparation. In this way it is hoped that all index material will have adequate editorial attention; also, index entries will be completely prepared before the corresponding abstracts go to press, thus reducing to the minimum the delay in the appearance of the annual indexes.

Section Editors.—Section editors will be clothed with full editorial prerogatives. At regular intervals, probably once a month, all accumulated abstracts, with attached index manuscript, will be distributed to the section editors from the central office. Wherever possible, the corresponding original articles will also be furnished; in the measure that this can be done section editors will have all necessary facilities for adequate editorial supervision of both abstracts and indexes.

Since but one abstract of any one article is to be printed (in view of the great economy effected), material of interest to the readers of a given section will often appear in other sections. In order that practically all material germane to any one section may be represented in that section, editors will be provided with galley proof of as much of each issue as they may request from which they may gather all cross references deemed desirable for insertion in their respective sections. Each editor will thus have complete control also of the cross references appearing in his section.

It is obvious that section editors occupy key positions and have the opportunity to render a fundamental service to their colleagues the world over. The endeavor of the central editorial staff will be to take from the shoulders of section editors as much detail and drudgery as possible and leave them reasonably free for those functions that are editorial in the best sense of the term. Under these conditions it is expected that there will be a sufficient number of biologists with the requisite equipment willing to man these very important posts.

Physical Make-up of the Journal.—In this direction the effort has been to keep down bulk without sacrificing legibility. A double-column page similar to that in SCIENCE and set in eight-point solid type has been adopted. This page has a capacity 88 per cent. greater than that of *Botanical Abstracts,* though the size of the page is only very slightly larger; also, the legibility is generally conceded to be greater than in *Botanical Abstracts* with its 5-inch single column, though the size of the type is the same. By this arrangement the original estimate of the number of pages annually necessary to cover the biological literature in abstracts and indexes is nearly halved.

With the cooperation of the Bureau of Standards and paper manufacturers, a rather exhaustive study

has been made of available high-grade, thin, opaque papers. The one selected for the journal bulks 1,030 pages to the inch and meets with very general approval.

With this advantageous combination of format, typography and paper an inch of shelf room occupied by *Biological Abstracts* will accommodate about five times as much material as one occupied by *Botanical Abstracts*. It is now reasonably certain that for some years to come annual volumes of *Biological Abstracts* will not occupy more than three to four inches of linear shelf space, which is less than the space now occupied by a year's issues of *Botanical Abstracts* alone.

Central Editorial Staff and Office.—Members thus far appointed are: J. A. Detlefsen and F. V. Rand, associate editors; and J. R. Schramm, editor-in-chief.

From among several extended, it has been decided to accept the generous invitation of the University of Pennsylvania to house the office in the zoology building. The exceptional current library facilities in Philadelphia itself and its strategic position among the great library centers of the east were dominant factors in the decision.

Business Management and Subscriptions.—For the present at least, the business management of *Biological Abstracts,* including subscriptions and advertising, will be conducted in the central editorial office. Subscription rates have not been finally determined, but it is reasonably certain that they will be within the estimates originally made by the joint publications committee.[3] Early in the coming year announcements will be made and communications sent to individuals and institutions regarding subscriptions. Inquiries relative to subscriptions and advertising should be sent to *Biological Abstracts,* University of Pennsylvania, Philadelphia.

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HAROLD WILLIAM NICHOLS

DR. HAROLD W. NICHOLS, a radio research engineer of the Bell Telephone Laboratories, died on November 14 at his home in Maplewood, New Jersey. He was born in Iowa on February 23, 1886, and received his education at Armour Institute of Technology, Chicago, receiving a B.S. degree in 1908 and E.E. in 1911; and at the University of Chicago from which he received the degree of M.S. and Ph.D.

In July, 1914, he joined the Bell Telephone Laboratories in New York City. He rapidly achieved distinction in the radio research activities of that organization, and during the world war he was in charge of its radio work. During recent years he has been identified prominently with the investigations of ship-to-shore radio telephone service and of short waves in radio communication. He is recognized as an authority on "fading"; his papers on this phase of radio are distinct contributions to the art. He took a leading part in the transatlantic radio telephone tests in 1923, and for a lecture on this subject received the Radio Premium from the British Institution of Electrical Engineers. He had twenty inventions pertaining to the radio art to his credit and nine applications are now pending.

Dr. Nichols was a member of the American Institute of Electrical Engineers; the American Mathematical Society; the American Physical Society; the Institute of Radio Engineers; and the Sigma Xi and Eta Kappa Nu fraternities.

His associates in the Bell Telephone Laboratories regard his death as a distinct loss to the profession as well as a great personal loss to themselves. He was a man of pleasing personality; an efficient and untiring worker, noted for his judgment and insight into all phases of the art of radio.

Dr. Nichols is survived by his widow, formerly Miss Lois Boardman, and two children.

SCIENTIFIC EVENTS

THE AMERICAN-HUNGARIAN FOUNDATION LIBRARY

THREE or four years ago the American-Hungarian Foundation was organized by a group of men, chiefly in Lansing and East Lansing, Michigan, but including others from Chicago, New York, Detroit, Cleveland and other parts of the country, for the purpose of furthering the mutual educational interests of Hungary and America.

One of the objects accomplished was the exchange of professors between the two countries. In the fall of 1924, Professor Geza Doby, professor of biochemistry in the economic faculty of the University of Budapest, and Professor Alexander Kotlan, of the Royal Veterinary College of Budapest, were brought to Michigan State College as visiting professors for the college year. This current year Professor H. J. Stafseth, of the department of bacteriology, Michigan State College, is an exchange professor at Budapest at the Royal Veterinary College.

One of the important things brought out by this exchange is the great interest expressed by the Hungarian scientists for American scientific work. Owing, however, to the very unfavorable rate of exchange for Hungarian money, it is practically impossible for

[3] SCIENCE, September 28, 1923, pp. 236–239.