University, has been appointed a member of the Advisory Board on Maps and Surveys by the New York State Planning Council.

DR. FLOYD K. RICHTMYER, professor of physics at Cornell University and dean of the Graduate School, has been elected secretary of the Association of American Universities for a five-year term. Heretofore, the officers of the association have been assigned to universities and not to individuals.

DR. ARNO VIEHOEVER, research professor of biology at the Philadelphia College of Pharmacy and Science, has been made scientific adviser to the Government of Siam. While there he will be affiliated with the Ministry of Economic Affairs and with Dr. Toa Labanukrom, director general of the Department of Science. He will organize and direct a special research unit, to explore and utilize domestic curative and nutritional agents.

DR. HARRY PLOTZ, of the Pasteur Institute, Paris, has been appointed chief of service in charge of virus research.

SIR RICHARD GREGORY, retiring editor of *Nature*, who has been visiting the United States at the invitation of the Carnegie Institution of Washington, sailed for England on January 5. Sir Richard delivered the Elihu Root lecture at the institution on December 8 on "Cultural Contacts of Science." While in the United States he gave addresses before a general session of the American Association for the Advancement of Science at Richmond, at Harvard, Columbia and the Johns Hopkins Universities, and elsewhere.

DR. G. C. ANDERSON, secretary of the British Medical Association, sailed on December 28 for a tour of the West Indian branches of the association. He will visit Barbadoes, Grenada, Trinidad and Jamaica, and will return to England about the beginning of March. Dr. Anderson's visit, it is stated, is in conformity with the policy of the association of maintaining personal contact as opportunity offers with its branches overseas.

DR. C. P. MCMEEKIN, of Mercer Agricultural College, New Zealand, recently inspected experimental work being done at the Agricultural College at Davis of the University of California and lectured to staff members of the division of animal husbandry. Dr. McMeekin has been working at the University of Cambridge during the past year.

FORMER PRESIDENT HERBERT HOOVER and Dr. Harvey N. Davis, president of the Stevens Institute of Technology, will be guest speakers at the thirty-sixth annual reunion dinner of the Alumni Association of the institute, which will be held on January 30 at the Hotel Astor, New York City.

DR. EDWIN J. COHN, professor of biological chemistry at the Harvard Medical School, will deliver the fourth Harvey Society lecture of the current series at the New York Academy of Medicine on January 19. Dr. Cohn will speak on "Proteins as Chemical Substances and Biological Components."

DE LAMAR LECTURES of the School of Hygiene and Public Health of the Johns Hopkins University will be given on February 14 by Dr. G. R. Minot, professor of medicine at Harvard University, on "Anemia," and in April by Dr. Edward Stuart Russell, director of Fishery Investigations, Ministry of Agriculture and Fisheries, London, honorary lecturer in animal behavior at University College, on "Fish Populations and the Effect of Fishing." Previous lectures in the present series were given by Dr. Rupert B. Vance, research professor, Institute for Research in Social Science, University of North Carolina; Dr. Carl Ten Broeck, The Rockefeller Institute for Medical Research; and Dr. Martha Eliot, assistant chief of the Children's Bureau, U. S. Department of Labor.

THE annual joint meeting of the Institute of Radio Engineers and the International Scientific Radio Union (American section) will be held at Washington, D. C., on April 28 and 29. Other scientific societies meeting in Washington during the same week include the National Academy of Sciences, the American Physical Society and the American Geophysical Union. Papers on the more fundamental and scientific aspects of radio will be presented. The program will be published in the April issue of the *Proceedings* of the Institute of Radio Engineers. Titles of papers available for presentation should be submitted to the committee not later than February 21. It is desirable that abstracts of not over 200 words be submitted with the titles. Correspondence should be addressed to S. S. Kirby, National Bureau of Standards, Washington, D. C.

DISCUSSION

THE UTILIZATION OF MICROFILMS IN SCIENTIFIC RESEARCH

THE procedure usually followed by research workers in collecting information upon a given subject is to peruse first the abstract journals and, having obtained references to previous work, to consult the original papers. Since scientific periodicals can usually be found only in libraries and must be read there or borrowed only for brief periods, it is necessary to make extensive notes or copy as much of each paper as may be desired for future use.

Occasionally it will be possible to obtain reprints of some of the original papers, hence the research worker may assemble upon a given subject quite a variety of

printed papers and hand-written notes. To these it is now becoming necessary to add the new and entirely different microfilm records which are becoming available in increasing quantities.

Microfilms are photographs in reduced size upon 35 mm moving picture film, of the printed pages of bound and unbound volumes. They have been made since November, 1934, by Bibliofilm Service of Washington. This non-profit organization is conducted by cooperative agreement in the libraries of the U. S. Department of Agriculture, Army Medical, Geological Survey and Bureau of Standards. The price is 1 cent per page plus 20 cents service charge for each article copied. They can be read by means of a small hand magnifier obtainable from Science Service of Washington for $1.50 or with the aid of a highly perfected desk projector, which was developed by cooperation between Science Service, the Chemical Foundation, the U. S. Navy and others, and is now available commercially at about the price of a typewriter.

The greater part of original scientific research is published in the form of brief accounts, not exceeding ten pages in length. Such reports may usually be copied upon less than five microfilm spaces of a total length of about 8 inches. Thus one obtains relatively short lengths of film which it is necessary to file with a variety of printed and written records.

Since the text reproduced upon microfilms can not be read with the naked eye, it is necessary to provide classifying information or notes in regard to each film, in characters which can be read directly. If this information is written upon sheets of paper and the film itself fastened to these sheets, they may be filed with similar records in whatever manner is most convenient, without loss or displacement of the film. In those cases where the length of the film is greater than that of the paper, it may be cut in two or more pieces. The reading magnifiers and projectors now available have film holders in which even very short lengths of film may be inserted, and the perforations along their edges provide convenient holes for fastening the several short pieces to their classifying sheet.

By this method microfilm can conveniently be filed and kept in exactly the same manner employed for other such records. They therefore not only offer no unusual difficulties in respect to their use and conservation, but provide far more complete and compact records than can be assembled in any other way.

One of the principal advantages of microfilms is that they relieve the research worker of the task of making transcriptions of the original literature. The inconvenience arising from errors or incompleteness in such records is entirely avoided. With a microfilm copy at hand it is never necessary to make a second trip to the library or borrow the periodical for completing the notes previously made.

Another very great advantage is that they permit one to make the detailed study of each paper in connection with all the others collected upon the same subject, instead of requiring that this study be made at the time the paper is available for preparing the digest or transcript of it for future use.

By means of microfilms one is relieved of the fatigue incident to assembling and handling large numbers of heavy and unwieldy volumes. Furthermore, since these volumes do not leave the library, no one who desires to consult them there is ever deprived of their use. With a complete collection of microfilm copies of all available papers upon a given subject, one is independent of further library service. Since, unlike books, they do not have to be returned, it is never necessary to hurry or slight one's examination of any paper, especially those which it is necessary to study with unusual care.

The compact form of microfilms makes it possible to take them, together with a small microfilm viewer, wherever one goes and consult them at whatever time or place is found most convenient. Thus one may profitably make use of spare moments which otherwise could not be devoted to the research problem upon which he happens to be engaged.

Microfilms offer the best possible method for making extensive compilations of scientific literature. They permit the complete assemblage of all pertinent reports before their critical study and arrangement of the facts in the logical order required for their presentation. It was only through their use that the writer found it possible to undertake a fourth revision of his compilation of "Solubilities of Inorganic and Organic Compounds." The literature on this subject is so extensive that its collection, classification and editing would have been a task beyond his power without the aid of microfilms.

Finally, not the least of the advantages of microfilms is their very modest cost to the individual. In fact, up to the present, those who have made use of the Bibliofilm Service operating in the library of the U. S. Department of Agriculture, have received microfilms at considerably less than their actual cost. Fortunately for the progress of research, the Chemical Foundation and both the Rockefeller and Carnegie Foundations have recognized the advantages of microfilms to the advancement of science, and have generously contributed to the expenses of developing and operating Bibliofilm Service. It is expected that with the continued expansion of the Service the present low price will be sufficient to cover the actual cost of furnishing microfilms to research workers.

Microfilm copying such as has been developed by

Bibliofilm Service now operating in four Washington libraries puts at the disposal of every one doing serious research the resources of the most complete collections of scientific literature in the United States. From the standpoint of original literature microfilms places those doing research in the most isolated institutions on an equality with those working in immediate proximity to complete collections of scientific periodicals. It may be expected therefore that many who have hitherto been prevented from undertaking research for want of proper library facilities, will now find it possible to devote themselves to the numberless scientific and technical problems awaiting solution.

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IMPROVEMENT OF SCIENCE INSTRUCTION

THE American Association for the Advancement of Science Committee on the Improvement of Science in General Education[1] held a meeting at Chicago on December 3 and 4, on one aspect of which a preliminary report has already been made.[2] Some of its findings may be of interest to readers of SCIENCE.

Of 2,565 inquiries sent out last May, seeking information on what college and university teachers of science were thinking and doing about adapting their offerings to the requirements of *general education,* in distinction from *specialist education,* more than 1,200 replies had been received. Eleven hundred of these had been analyzed to date, yielding, among other things, the following information.

Of those replying, 64 per cent. were doubtful or more than doubtful about the value of the conventional introductory college courses in the various sciences to non-majors. 70 per cent., however, feared that attempts so to modify first-year courses as to make them of greater value to non-majors might be attended by the danger of making the courses superficial.

There seemed, nevertheless, to be little disposition to maintain the *status quo,* for 86 per cent. had made changes in their introductory courses within the last five years, of sufficient extent to justify report.

Insufficient motivation for a study of teaching problems seemed to be regarded as a handicap, for 62 per cent. felt that the disproportionate emphasis placed on publication of results of "pure research" as a basis for professional recognition and advancement had retarded the development of a real concern about and research upon teaching problems in the introductory courses in the sciences.

77 per cent. expressed the need for a discussion and clarification of the issue of the place of science in general education at the college and university level.

[1] SCIENCE, 87: 454, 1938.
[2] SCIENCE, 88: 588, 1938.

The fact that only a little over one third of a mature group of college teachers of the sciences possesses unqualified confidence in the value of the traditional first-year courses to non-majors raises several questions. What do they think is wrong with these courses? Along what lines would they undertake improvement? What has brought about their impression of the inadequacy of the first-year science courses to the purposes of general education? These are not easy questions to answer, but the committee is deeply concerned with ways and means of trying to answer them.

Questionnaires are notoriously "slippery" ways of acquiring information, and it was only after some hesitation that a questionnaire was utilized as a first probe, primarily because it was the quickest way of getting started. Other channels of information are being opened up. Special visits have been made by representatives of the committee to 115 science departments where significant experimentation on teaching methods seemed to be under way. An extended bibliography of publications on the relation of the sciences to general education, indexed and annotated, will be prepared for the use of the committee. In addition, as indicated in previous communications, the committee solicits correspondence with any who have teaching experiments under way or who are contemplating such.

Perhaps it should be emphasized that this committee's primary responsibility is to chart the field; only secondarily, if at all, to try directly to solve the problems therein. Some of the problems which loom are, in fact, beyond the ability of any one group to cope with. Hence the wisdom of the founding committee of the American Association for the Advancement of Science, which provided, among other things, that this committee should clarify and define the problems involved in teaching the sciences as a part of the program of general education; serve as a clearing house for coordinating the activities of the several agencies now at work on parts of the whole problem as well as new agencies which may be initiated for the improvement of science teaching; act in an advisory capacity on any studies approved by it and supported through it; require and coordinate reports of such studies and provide for publication of the findings.

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THE BENLD METEORITE, ILLINOIS NO. 2

ON September 29, 1938, between the hours of 9:00 and 9:10 A.M. occurred the second meteorite fall ever to be recorded within the state of Illinois. This important event took place in the south edge of the town of Benld, Macoupin County, near the southeast corner of the S W ¼; S W ¼; Section 31, Township 8 North; Range 6 West of the 3rd P.M. (89° 48′ 52″ ± W. Long.; 39° 05′ 14″ ± North Lat.)