suming the position of acting principal of McGill University.

At McGill University Captain S. E. Whitnall, demonstrator of human anatomy, Oxford, has been appointed professor of anatomy, and John Tait, lecturer in experimental physiology in the University of Edinburgh, professor of physiology.

DISCUSSION AND CORRESPONDENCE

THE HISTORY OF SCIENCE AND THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

To the Editor of Science: From the discussions taking place concerning the history of science, and from the opening up of other unexplored fields of thought and research, it is happily only too evident that this country is once more approaching peace conditions and looking forward to greater things—among them, a fundamental position in education and science.

The letters in Science, April 4, by Dr. Felix Neumann, and May 9 by Dr. George A. Miller, have simply expressed a phase of the current of thought passing through our revision of ideas concerning the importance of science, study and research—all tending to a broader cultured type of scientific learning. It is not so much as emphasizing a national characteristic in the great international unification of learning, but as developing a new epoch in the history of science itself. In the words of Dr. George Sarton—we must try to reconcile idealism and knowledge, science and art, truth and beauty—the ability of every one to do so is the real measure of his education. In the last analysis it is the message of the New Humanism.

For this reason, if for no other, the study of the history of Science is to be encouraged, and no greater impetus can be given to it than by a full recognition of this new Section "K" by the American Association for the Advancement of Science.

This matter was broached during 1915 in an article in Science[1] which resulted in a number of letters giving encouragement, but like all such advancing ideals, not pertaining to the war, it made no progress.

The writer wrote to Dr. J. McKeen Cattell, editor of Science, concerning this proposed Section in the American Association for the Advancement of Science and in reply the following statement was received.

> I should think that there would be a good deal to be said for a section of the American Association for the Advancement of Science devoted to the history and methods of science. It might be best to begin with a sub-section under the section of anthropology and psychology, and it could be seen whether enough interest were taken to justify the establishment of a section. The best plan would doubtless be to correspond with those interested and then present a statement to the council of the association.

In another letter, quoting from Dr. Lynn Thorndike, Department of History, Western Reserve University, a proposition was advanced for the same purpose—namely, to call together a group of interested persons (no matter from what field of research) to discuss plans for an organization to be affiliated with the American Association for the Advancement of Science. Therefore, it might be said that the time is propitious for such an organization, especially as we will note further from other facts.

Dr. Neumann's plan for Section "K" would attract not alone scientists, but also historians of the social, economic and political science groups. Philosophers too, would no doubt be interested. This, then, would tend to make the American Association for the Advancement of Science an "encyclopedic" organization.

In Dr. Neumann's letter to Dr. Howard, he emphasizes the principle of "nationalism" by making the purpose of the section to the study of the history and progress of science in America alone. Much valuable work can be done here, to be sure, "but can we afford to neglect the centuries gone before?" Nor has Dr. Neumann mentioned what historical work has been done in the United States already. These attempts are worthy of mention, since they form a beginning and stepping stones as well as examples for other fields

[1] Science, N. S., Vol. XLI., No. 1053, March 5, 1915, pp. 358-360.

to follow. The pioneer work of George Brown Goode shows what is possible, brief as his studies were. The following titles will show the best that has as yet been accomplished, especially in the specific sciences.

In chemistry we have Dr. E. F. Smith, "Chemistry in America," and his "Life of Robert Hare"; G. P. Merrill's "Contribution of the History of American Geology," published by Smithsonian Institution, 1906, and Florian Cajori's "The Teaching of History of Mathematics in the United States," published by the U. S. Bureau of Education, 1890. Cajori's treatise is somewhat old, but still an excellent text, both in mathematics and astronomy for the period it covers.

In astronomy no definite history has yet been written. A number of addresses and papers have attempted to outline its history, and a number of biographical sketches give a good cross-section of a period. A history of astronomical progress in this country is urgently needed, since for the last decade we have attained the most prominent position, and the war will leave us undisturbed for generations to come.

Brief mention should be made of a very recent work entitled "A Century of Science in America, 1818–1919" by E. S. Dana. This, however, only covers the field of geology, mineralogy, physics and biology during this period.

A forecast of the possibilities of research and study, may be made by observing what has gone on before. In the matter of resources for research in the great libraries of the country, one library whose efforts have been fairly well directed towards this end is the John Crerar Library. The publications entitled "List of Books upon the History of Science and the History of Industry" serve as excellent bibliographical aid for the student in the history of science. For the study in the history of mathematics, undoubtedly Columbia University, under the leadership of Dr. E. D. Smith, offers good sources. In chemistry and physics, Pennsylvania, Yale and Harvard universities have excellent material. For astronomy, Harvard University library offers riches untold in the Colonial period, and Harvard Observatory for the material beginning in the early nineteenth century.

As a further indication of the times, our universities and colleges have recognized to an encouraging extent the great worth of courses pertaining to the development and evolution of the sciences.[2] The courses thus established are varied and numerous, as well as the methods of instruction and text used.

In view of what has been said concerning the subject of astronomy, it is interesting and worthy of note to call attention to the fact that courses in the history of astronomy in America have been established. Also within the last two years the University of California has established a chair devoted entirely to the history of mathematics.

Again attention should be drawn to the matter of text and treatise published in the country. Within the last two years there have appeared two books, "The History of Science," by Dr. W. Libby, and a second by Sedgwick and Tyler, entitled, "A Short History of Science."

We have also within our borders to-day the greatest authority in the field of history of science, Dr. George Sarton, of Ghent, Belgium. Dr. Sarton has lectured upon this subject in nearly all of the universities of the eastern and middle western states, and has been lecturer for two years in the department of History of Science at Harvard University, and is now research scholar in the Carnegie Institution.

We are well aware of a movement to establish in the United States an institute devoted entirely to the research and advancement of the history of science and civilization.[3] Also, recently we have been informed that *Isis*, the international journal of history of science[4] is to resume publication in all probability in this country.

[2] SCIENCE, N. S., Vol. XLII., No. 1091, November 26, 1915, pp. 746–760.

[3] SCIENCE, N. S., Vol. XLV., No. 1160, March 23, 1917, pp. 284–286. See also Vol. XLVI., No. 1191, October 26, 1917, pp. 399–402.

[4] SCIENCE, N. S., Vol. XLIX., No. 1259, February 14, 1919, pp. 170–171.

One of the great significant facts for the future to consider, and which will appeal to our patriotic spirit of attainment, is that the history of the great war must be written in terms of scientific discoveries and research. What part is the history of science to take in this achievement? What is the spirit of philosophy to bring forth from such a study? One fact is certain of emphasis, that the progress of science, national and international, must be cooperative. Not alone has the war taught us this, but the spirit of idealism, which we have fought to maintain, must be carried on.

All these facts are mentioned to show the spirit of the times, and now that this country has attained such a position of worth, the American Association for the Advancement of Science can give no greater encouragement to this idealism, to the philosophy of science, to the final meaning of education and culture, then by placing its approval upon the adoption of Section "K" to be known as the History of Science Section. Frederick E. Brasch

John Crerar Library,
Chicago

THE NEEDS OF PALEOBOTANY

What paleobotany most needs is men. The dearth of men conversant with fossil plants, not merely in America, but taking the world over, is to be deplored. Nathorst, the eminent Swedish paleobotanist, in a recent letter emphasizes this fact. Thin as it has been at all times, the paleobotanic rank and file has been all but decimated. The war seems to have hastened the end for three of the older men who adorned everything they touched—Zeiller and Lignier, of France, and Solms, of Strasburg. The career of the young and promising Fernan Pelourdé closed on the field of battle; and as heroic was the end for Ruth Holden in Russia. We lament too E. A. Newell-Arber, the course of whose life was also shortened by the war. To offset these great losses there have been no accessions abroad and the only younger worker who has definitely joined the paleobotanic ranks in this country during the past dozen years is Harvey Bassler. The American contributors in paleobotany, older and younger, are Hollick, Knowlton, David White, Jeffrey, Berry, and Sellards. All first came into notice twenty or more years ago, and both Sellards and White seem wholly lost to other interests, or to survey or executive duties.

Let any one think for himself what such a slender margin means to a great subject of growing and world-wide interest. What a lack there is of timely papers, of exploration in the field in a hundred horizons and a thousand important localities in both North and South America. Consider too, where the workers are so few and the field continent wide, what a lack of healthy criticism there must be. Without vigorous and knowing criticism small facts pass for great ones, and great principles and facts of far reaching import, whole categories of evidence, are left for long years unnoted. This is not the way to do the world's meed of work. Furthermore, progress in paleobotany peculiarly depends on the examination as far as practicable of the world's forests and fossils. Restriction is, more than in any other subject, fatal because of the exceedingly variable types of fossil plant conservation.

It is not within the present limits to go into any detailed account of the greater climatic and geologic problems, the solution of which awaits the work yet to come in the broader field of paleobotany. A suggestive account of the relations of paleobotany to botany was given by Professor Coulter in an address a few years ago.[1]

It is, however, well to recall several of the limits to the investigations of past floras as they stand to-day. Firstly, there can be no question that the indices of phytological form are many and valuable when properly combined. Yet not merely the paleobotanists, but the *botanists* have left the fine "nature prints" (better than the leaves themselves for comparison) just where the work of Ettingshausen closed about sixty years ago. And this, notwithstanding the fact that for years those

[1] Reprinted in *American Naturalist*, 1912, pp. 215–225.