

SCIENCE

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FRIDAY, AUGUST 6, 1897.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

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MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Prof. J. McKeen Cattell, Garrison-on-Hudson, N. Y.

THE meetings of the American Association for the Advancement of Science at Detroit next week and of the British Association at Toronto on the following week are events of more than ordinary moment. The visit of the British Association to Montreal in 1884 gave a considerable impulse to science in America. The meeting of our own Association in that year was attended by three hundred British men of science, the total attendance, 1249, being the largest in its history. In the thirteen years that have since elapsed science in America has made a great forward movement. The scientific research accomplished at our universities now surpasses that of the British universities; the work done under our government is greater than in any other country; our scientific journals have doubled in number and increased in influence. If our Association has scarcely kept abreast of the great progress of science, this is the proper time to give it a due place in the scientific economy.

It is certainly the duty as well as the privilege of every American man of science to try to attend the meetings at Detroit and

Toronto. The places and times have been arranged so that this can be done conveniently. The scientific programs and social arrangements for both meetings promise ample reward for those who are able to be present. We must not fail to give British men of science a cordial welcome, and we have much to learn from their meeting. Our own Association deserves support. Every motive of public spirit and self-interest should lead us to make the meeting at Detroit worthy of the present position of science in America and a stepping-stone in its progress.

We do not at all sympathize with the idea sometimes expressed that National Associations for the Advancement of Science have outlived their usefulness. There is nothing more typical of modern social conditions than combinations and trade-unions. Human development depends less than formerly on natural selection of the individual and more on competition between groups. It will fare ill with men of science if they cannot unite to maintain and forward their common interests. With them not only selfish instincts of self-preservation are concerned, but also moral sentiments, for they believe that the interests of science are in large measure conterminous with the interests of civilization.

The objects of the American Association for the Advancement of Science "by periodical and migratory meetings, to promote intercourse between those who are cultivating science in different parts of America, to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the

labors of scientific men increased facilities and a wider usefulness," are as valid and as important now as they were when the constitution was adopted fifty years ago. Indeed, as the magnitude of the interests increases, the need of caring for them becomes more urgent. With the growth of specialization and the scattering of men of science over the whole area of America, the need of cultivating intercourse between them becomes more pressing. The greater popular interest in science requires direction into proper channels. As science grows, it needs more workers and more money. The workers must be secured from students at school and college, the money from private gifts and from the State. The magnitude of scientific work is now such that in many cases it can only be accomplished by united effort continuing for years. Witness what the Royal Society has accomplished in inaugurating international cooperation in the cataloguing of scientific literature; the Zoologische Gesellschaft in the publication of 'Das Tierreich,' the British Association in the work of its committees. The American Association should not only maintain its present position, but should make itself a still more important factor in the advancement of science.

It must not be forgotten that as the environment alters, the organization that will survive must accommodate itself to the new conditions. Science in America is very different to-day from what it was fifty years ago. There is reason to doubt whether the Association has in like measure enlarged its range and increased the nicety of its adjustments. Methods suitable to a small gath-

ering from a limited area, representing sciences undeveloped and undifferentiated, may have been outgrown.

It seems evident that the permanent organization of the Association, both at and between the meetings, should be strengthened. Even a congress or legislature whose professed object it is to legislate must leave the real work to committees. The democratic character of a scientific association is sufficiently guarded by the election of representatives who will carefully consider and decide questions of policy. It is, indeed, possible that the present Council of the Association is too cumbersome. Then there is need of a strong interim organization, and we think that this should be extended to the sections. A permanent secretary and a committee or council for each section would give greater continuity and efficiency.

It is not possible to divide the field of science into nine sections, each homogeneous and independent of the others. Section A is for mathematics and astronomy, but there are portions of astronomy less closely related to mathematics than are portions of physics, of chemistry and of engineering. The International Congress of Mathematicians meeting this summer will be divided into six sections. On the other hand, there are subjects that would naturally fall in or between two or more sections, and others that would include several sections. Modern science is marked by great specialization, and this itself gives rise to nearly all possible combinations of the sciences and leads us back to the ultimate unity of science.

The solution for the Association seems to be that there should be, on the one hand, sub-sections—consisting perhaps of societies with separate organizations—for the reading and discussion of papers, important only for a limited group of students; and, on the other hand, joint meetings of two or more sections or of the whole Association for the consideration of subjects of general scientific interest, and to promote the organization and advancement of science as a whole.

For example, during the past year two of the most important contributions made to the theory of evolution for a long time have come from America. These are that individual variations set the line of organic evolution and that variations and heredity, respectively, have been confused by attributing the former to the environment and the latter to the organism. These advances have been proposed by a psychologist, a zoologist, a botanist and a geologist. They are not yet acknowledged nor understood by men of science abroad, and would have been a suitable subject for a session of the whole or a large part of the Association.

Taking next an example of desirable specialization, it may be noted that there meet during the Christmas holidays four societies for which there are no places in the Association; these are the American Physiological Society, The Association of American Anatomists, The Society of Morphologists and The American Psychological Association. Each of these societies is composed exclusively of those devoted to research in the sciences represented. At the last meetings an aggregate of over 100 papers was presented, representing one-half

as many papers as are annually read before the Association. It is evident that the Association cannot represent the whole of American science while such important developments are ignored. Only a small percentage of the members of these societies are fellows of the Association.

Indeed, we must admit that a large proportion of those most actively engaged in advancing science in America do not attend the annual meetings, and many are not even fellows of the Association. We may appeal to the public spirit of these men of science and probably with success. It would, however, be far better to make the meetings so fruitful that each would like to attend, and, if possible, to give those unable to attend some return for membership in addition to the annual volume of proceedings. Election as fellow should be an honor that no one would decline. The fellows should not be elected exclusively from the members, but those who are doing the most for the advancement of science in America should be the fellows of the Association. It would probably be desirable to limit the number of fellows to one thousand and to fill vacancies each year as they occur. As soon as the fellows of the Association were acknowledged to be the thousand leading men of science in America, election would be an honor only less in degree than election to membership in the National Academy of Sciences. In this case an added interest would be given to the annual meetings. With the National Academy as the 'upper house' and the American Association the 'lower house' of American science a great improvement

in organization would be effected. It would be a natural courtesy for the Academy to elect its members from the Association and for the Association to elect its President from the Academy. We may view with great satisfaction the fact that the President of the National Academy is this year President of the Association.

In conclusion, we may once more urge the importance of attending the Detroit meeting of the Association and of proceeding thence to Toronto. Those taking part in these meetings will receive a stimulus in scientific activity, and by making the meetings noteworthy will contribute greatly to the advancement of science in America. Questions affecting the future of the Association will be considered at Detroit, and arrangements will be made for adequately celebrating the fiftieth anniversary of the Association. There is no doubt but that during the next fifty years science will be the leading factor in the progress of the world, and probably more depends on America than on any other country. The American Association for the Advancement of Science has great opportunities and great responsibilities.

THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE.

THE International Bibliographical Conference held in London, July 14-17, 1896, was the most important step ever taken toward international cooperation in scientific and bibliographical work. This account of the meeting is derived, unfortunately, not from personal knowledge, as I was not present. I have had, to aid me in its preparation, the two official publications