SCIENCE

VOL. LXVII MAY 18, 1928 No. 1742

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SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal

Lancaster, Pa. Garrison, N. Y.

Annual Subscription, $6.00. Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

THE BERTHELOT CENTENARY AND THE RESULTING INTERNATIONAL EFFORTS TO ADVANCE CHEMISTRY[1]

IN January last I had the pleasure of describing before the Chemical Society of Washington the celebration of the centenary of Marcelin Berthelot held in Paris from October 24 to 26 of last year. These remarks have been published in SCIENCE (Feb. 17, 1928) and possibly have been read by some of you.

Through the kindness of the French ambassador and M. Maurice Léon I am able to show you to-night a photographic record of the event, which will certainly give you a more vivid impression of it than I was able to convey by words alone to the chemists of Washington. Thanks to this pictorial presentation it will not be necessary for me to review again the details of the various ceremonies and more attention can be given to other aspects of the event.

Considering the celebration in its entirety there is no question but that it was the most magnificent tribute to chemistry but has ever been organized. More than fifty nations of the world sent distinguished chemists or governmental representatives. The president and entire government of France as well as the ministers and ambassadors of many other nations participated. Chemistry was extolled more highly than ever before. Judging by the space devoted to it by the newspapers the celebration attracted the attention of the general public to an extraordinary degree.

The gathering was noteworthy in being the first since the great war at which the chemists of the enemy nations have met together under such amicable circumstances. An especial effort was made to re-establish cordial relations between all, and the evidence of success in this direction was unmistakable.

The assemblage was unusual in that no other attraction than friendly regard drew the participants together. It is true that in the preceding week a program of chemical interest was provided by the Société de Chimie Industrielle, but at the Berthelot celebration nothing was presented other than discourses on Berthelot and the plan to perpetuate his ideals in regard to cooperation among scientists.

[1] Address delivered before the joint meeting of chemical societies at the Chemists' Club, New York, April 6, 1928.

As expressed by Berthelot science is a collective endeavor and owes its progress to the efforts of workers in all countries. It is truly international, and of all men scientists should be most interested in promoting friendly international relations. This was undoubtedly the keynote of the celebration and in emphasizing it French chemists demonstrated their outstanding interest in cooperative efforts to advance chemistry.

The desirability of intimate contact between those engaged in chemistry does not need to be emphasized. It is true that we may become acquainted with other chemists through their publications, and to many this is sufficient, but to others there is nothing so stimulating as personal intercourse with those interested in like problems. Any means which facilitates this contact may be expected to advance chemistry. This is believed by its sponsors to be one of the missions of La Maison de la Chimie.

The Chemists' Club of New York, although a local undertaking, has become a most powerful agency for the advancement of chemistry. It offers membership to chemists outside of New York and thus extends its field of usefulness. The Maison de la Chimie which will be erected in Paris will serve primarily those in its immediate vicinity, but it will also do for the chemists of the adjoining and other countries what the Chemists' Club of New York does for those of us who reside in other parts of the United States.

There is this difference between the two undertakings—whereas those who founded the Chemists' Club probably did not realize what an important factor for the advancement of chemistry they were inaugurating, the sponsors of La Maison de la Chimie are knowingly setting out to establish an international center for this purpose. Thus they have the advantage of a predetermined plan and a definite goal.

It can not be denied that such a center located in Paris will be of great service to the chemists of a large group of European countries. It is of course not so certain that many American chemists will be directly benefited by it. This, however, should not be a reason for the indifference with which the project has been received in our country. A more correct explanation of the attitude of American chemists is undoubtedly the great distance which separates us from Europe and the huge task in hand of developing chemistry in this country. We are captivated by our own affairs and will not allow our attention to be distracted by circumstances which we believe do not directly concern us.

There is, however, another reason which accounts for some of the criticism expressed by our society at Detroit. It was the solicitation by the French government of collaboration in the undertaking. We naturally question any governmental participation in scientific matters because we feel that anything having a political flavor can not be above suspicion. This, however, is an attitude which is peculiar to our country. In practically all others, it is the government which directly supports science. In France, for example, all the leading men of science in their capacity as professors in the universities or directors of institutions are government employees and every action they take in international affairs is with the financial and moral support of their government.

The movement for an international Maison de la Chimie was initiated by the chemists of France, but its realization would have been impossible without governmental aid. The reason it obtained such full support from the French government was that the prime minister and many of his associates are themselves scientists of the highest standing and have the very fullest appreciation of the benefits resulting from the progress of science. Berthelot was in his time minister of public instruction and Herriot, the present minister, occupied a prominent place in the ceremonies planned in honor of his predecessor in office. The close relation which exists between the governments and science in other countries was also shown by the number of ministers from other nations who participated in the Berthelot celebration. Finally, the small countries and colonies which contributed to the movement could have done so only through their governments. As with all other countries, the appeal to the United States to join in this movement was addressed to our government. It was the natural method, and if an exception had been made in our case and the request addressed directly to our society the action would have been considered, from their point of view, as one of disrespect to the United States government.

The fact that the leaders of our government are not men of science and that there is not a closer relation between science and government in the United States is regrettable. It is to be hoped that the organized effort to popularize science, being made by Science Service and the American Chemical Society (A. C. S.) News Service, may eventually arouse our government to greater interest in its benefits.

In another respect, however, we are particularly fortunate. It is that in the United States we have a single language and no political barriers between different sections of our great country. These handicaps exist in Europe, and the cooperation of the smaller groups of chemists in the various countries can be effected only by overcoming much greater resistance than oppose our efforts in America. It is this situation which makes desirable the concerted effort represented by La Maison de la Chimie. Aside from the countries in which the English and German

languages are used there are many in which French is either the native or preferred language. These Latin countries are sorely in need of coordination of their efforts in respect to the dissemination of chemical literature. A central clearing house which can serve them in the way chemists are served by the organizations in Germany, England and America may be expected to facilitate greatly their contribution to the advancement of science. The International Office of Chemistry which will be given shelter in La Maison de la Chimie will undoubtedly perform an incalculable service to a large number of chemists in many different countries.

There is, however, a very difficult problem which confronts those interested in the establishment of this new project. Beginning now after such an extensive literature of chemistry has accumulated, the collection of a considerable part of it is a costly and laborious task. Even to establish a comprehensive French abstract journal for current contributions is a great undertaking, and with the present acceleration in the output of chemical publications necessarily becomes more and more difficult.

While talking to M. Gerard some months ago he told me of these problems and gave me a hint of a possible means to solve them. Although the solution he contemplated would necessarily be an experiment it would be one which the rapid increase in scientific literature is certain to make necessary sooner or later. Any improvement in the distribution of scientific literature is certainly desirable and the results of the experiment to be made by the International Office of Chemistry will be awaited with the greatest interest.

The plan contemplates the reproduction of printed chemical articles by a cinematographic process. The pages will be photographed upon a film and this sent to the user who will project it page by page before him on his desk and to such an enlargement as best suits his vision. The disadvantages to some resulting from the use of small type by certain journals will thus be avoided. Abstracts which attempt to give the substance of a paper will not be necessary, since the entire article may be sent out for a cost which it is expected will be no greater than that now required for preparing, editing, printing and distributing an abstract journal.

In order to acquaint chemists with the current articles as they appear a card catalogue system will be employed. The cards will be efficiently classified and describe only the scope of the paper. Each member will receive cards for the particular branches of chemistry in which he is interested and will select from these the papers of which he desires photographic copies.

This will be in effect a new kind of bibliographic service, and its success will of course depend upon the ingenuity displayed in perfecting the photographic apparatus required and the efficiency attained in the preparation and classification of the cards covering the current chemical literature.

The service which such a system will render to chemists of those countries in which the general distribution of chemical literature has not yet been developed may easily be imagined. The necessity for maintaining large libraries of chemical periodicals in each country will be greatly diminished and more money can be spent for compendia and text-books. The waste due to requiring those who subscribe to chemical journals to purchase a great quantity of material which they do not use and the necessity for condensing papers to an excessive degree will be largely eliminated. Each worker under the new plan will accumulate only that which directly concerns his own research activities.

This is the germ of an idea which will no doubt be considered by many to be fantastic, especially since it is contrary to the principle of mass production developed in our own society. Our three journals can be distributed to all our members cheaper than a smaller edition of each could be sent to those who would select only one of the three. What, then, would happen if eventually the edition of our publications should be reduced to the small number of copies required to supply libraries and distributing centers? It is difficult to predict, but it is easy to imagine that multigraphing processes will be so highly developed by that time that the printing of journals devoted solely to research will not be necessary.

The project of La Maison de la Chimie and of the International Office of Chemistry must be looked upon as an experiment in the cooperative advancement of world chemistry. The exact method by which this is to be accomplished can not be predicted, but that this is the sole aim of the sponsors of the movements no fair-minded person can doubt.

American good-will has made itself felt throughout the world. Our great philanthropists who have founded such international projects as those connected with the name of Rockefeller desire to improve conditions universally, both as regards health and learning. A larger portion of their funds are expended outside of this country than within it. Surely the chemists of the United States are not less magnanimous in regard to the advancement of our science and have nothing but good wishes for the earnest efforts of every one who desires to make chemistry a more powerful factor in world progress.

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