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Conference on Spectroscopy

Introduction to the Conference*

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IN recent years, a number of very successful conferences have been held which have been devoted primarily to the practically very important field of the application of spectroscopy in spectrochemical analysis. Less attention has been given lately to spectroscopy as pure science. Since pure science, aside from its own intrinsic interest and importance, is in the long run the fountain-head for future practical developments, it seemed to us that the time was ripe for a Conference on Spectroscopy to present the broad picture of spectroscopy as pure science.† As we all know, spectroscopy is a very large subject, with ramifications in many directions in physics, astronomy, chemistry, and biology. The data of modern astrophysics, for example, are obtained very largely through the use of the spectroscope.

It seemed to us, then, first, that the pure science aspects of spectroscopy deserved new emphasis. Second, we thought it would be worth while to try to further better acquaintance and a stronger consciousness of underlying unity among those using spectroscopy in different fields of pure science. We, therefore, planned a conference to

consist of a number of symposia, each in a special field connected with or based on spectroscopy, in such a way as to show something of the breadth of the subject. In arranging the program, the different symposia were then so mingled as to cover each day a considerable range of subjects. In this way, we hoped that a visitor coming, say, for two or three selected days, would find some familiar things and also other less familiar things which might interest him and bring him into stimulating contact with others in different fields. For example the astrophysicists might exchange ideas with the pure spectroscopists or with those interested in the structure of atoms or molecules; the ultraviolet spectroscopists with the infra-red spectroscopists; or the chemical physicists with the organic chemists interested in spectra.

Last winter we were for a time in doubt as to whether we ought to go ahead with our plans. There were two questions. With so many scientists going into war research and other war activities, it might be that so few could find the time to come that the objective of a widespread interchange of ideas would not be fulfilled. The second question was that of the relative importance of pure science in wartime as compared with science applied directly to winning the war.

So far as speakers were concerned, we soon found that most of those whom we approached were willing and able to come. This to a large extent answered the first question. It also helped

* In this issue we publish in full or in abstract the majority of the papers given at the Conference on Spectroscopy held at the University of Chicago, June 22-25, 1942. Some of the articles are reviews, others present new material, and a number serve as reviews and at the same time describe unpublished results of recent research. Prepared discussions are also included. *Editor*.

† The Committee on the Conference consisted of O. Struve (astronomy), J. Franck and W. G. Brown (chemistry), and R. S. Mulliken (physics).

in answering the second. The fact that a large proportion of the speakers are engaged in war work, some of them very extensively, indicated that they agreed with us as to the importance of maintaining the development of pure science where possible.

I think we are all convinced that pure science research is a matter of very great long-run value to the nation. If we grant this, there are two reasons why it is important to try to keep it going. In the first place, we do not know how long the war will last; there is enough of a probability that it will last for a long time, so that weight should be given to activities of long-run importance even for their possible value in winning the war. In the second place, weight also

should clearly be given to pure science so that the nation's scientific foundations will be strong when peace finally comes.

There are some fields of pure science that are so fortunate as to have had their development greatly accelerated as a direct part of the war program. Here the path is clear. In other fields, however, which are no less important for the progress of science in the long run, the effect is reversed. Although, in general, priority must be given to the fields of direct short-term value, nevertheless I am convinced that workers in the long-term fields should feel that they too are making an important contribution to the national effort in carrying on their work as effectively as possible.