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Concerning the Division of Electron and Ion Optics of the American Physical Society

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PRIOR to the inaugural meeting of the new Division of Electron and Ion Optics, held at Pittsburgh on April 29 of this year, the members of the Division were invited to express their particular interests in the field and to seek and to contribute to clarification of the aims of the Division. I believe that the questions raised may be of interest to non-members as well as present members of the Division. Several general questions were raised and these perhaps deserve first attention.

Generally, the aims and purposes of the Division are stated in the by-laws to be "the advancement of knowledge of electron and ion optics. To achieve this, the Division shall arrange for the presentation, at meetings of the Society or meetings of its own, of papers and discussions lying within its scope." Such activities may well be supplemented by encouragement of publication and other dissemination of information through correspondence and other activity on the part of the membership and officers. The Division plans no special publications. When meetings are held concurrently with general meetings of the American Physical Society, abstracts will appear in the Bulletin and be reprinted in *The Physical Review*.

The scope of the Division is such as to include both theoretical and practical aspects of pro-

duction and utilization of ion and molecular beams. It should certainly include consideration of both low frequency and high frequency aspects of electron flow, whether that flow occurs in a wholly new device, a mass spectrograph, or a vacuum tube. Many members of the Division will be interested in new developments and techniques in the use of the electron microscope. However, the particular field which no other organization seems to include so directly is the internal physics of electronic and ionic devices.

One member wants to know whether the aims and purposes of the Division are beneficial to the parent society. I certainly hope so. Another is concerned with the social import of this branch of physics, of which I can say little. One is interested in management of research and development, a very concrete and vitally important problem of no little difficulty.

Turning to specific technical matters, by far the greatest number of replies indicated a primary interest in what might be termed general electron and ion optics. Interest was expressed in the primarily mathematical aspects of electron optics and in mathematics from the point of view of design, in electric and magnetic lenses and focusing means, in relativistic electron optics, especially in connection with magnetic analyzers for beta-particle spectra, in electron and ion

sources, in beams with low energy spread, and in molecular beams.

More specifically, the electron microscope and electron diffraction were very frequently mentioned. Other members expressed particular interest in the mass spectrograph, the cyclotron, x-ray tubes, and the electron optics of radio tubes.

One member showed a particular interest in oxide-coated cathodes. I do not know whether this puzzling subject, together with the general study of thermionic emission, is naturally within the scope of the Division; I believe that it well may be. It is certainly a field in which much remains to be done.

As examples of how the activities of the Division may be of help to the members, I mention that on the program of the Pittsburgh meeting we had invited papers covering several of the subjects in which interest was expressed, including the historical background of the topic of most interest, general electron optics, and papers on the perhaps somewhat neglected optics

of vacuum tubes as well as papers on the very popular subject of electron microscopy.

As another example of such service as might be rendered through the Division, I refer to an excellent bibliography of the electron microscope, which was recently prepared in another connection by Claire Marton, the wife of the Vice Chairman of the Division, and Samuel Sass. I think it should be a duty and activity of the Division to encourage the preparation of such bibliographies, of summaries of fields such as have appeared in *Reviews of Modern Physics* and in the *Journal of Applied Physics*, and also of simple tutorial papers which may serve as introductions to the various aspects of electron and ion optics which I have mentioned earlier.

Finally, one member has suggested that after the war a symposium might be held to consider new techniques and data that have not been released during the war. I certainly hope that such a symposium can be held soon. In the meantime, it may be possible to hold at a future meeting a symposium on some less secret but nonetheless vital matter.