THE PHOTOELECTRIC PROPERTIES AND CONTACT RESISTANCES OF THIN CATHODE FILMS. II.[1]

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A second point of interest about Fig. 3 is that the curves are approximately logarithmic. It is known that the absorption of light also increases logarithmically as the thickness of the film increases. This would support the view that the number of emitted electrons is at least approximately proportional to the amount of light absorbed in the film.

Finally, attention should be called to the "humps" observed in two of the curves at *A* and *B*. Here the current increases rapidly, then decreases and again increases more slowly. This same phenomenon was consistently observed by Robinson.[2] For some reason this phenomenon was not present in curves 5 and 8. Apparently the normal course of the curve in this region would be that indicated by the dotted lines. The first departure below these dotted lines has been shown to be due to faulty contact. Several explanations of these maxima in the curves have been considered but we have not sufficient data to support any of them. We simply, therefore, call attention to this peculiarity without attempting to explain it.

SUMMARY.

The most important results of this investigation are:

1. Thin platinum cathode films emit photo-electrons with maximum velocities at least approximately the same as those emitted by ordinary platinum. The intrinsic potential of these films is also the same, or very nearly the same, as that of ordinary platinum. If variations in these quantities occur, due to the as yet unknown properties of very thin films, they are certainly small.

2. The high photoelectric potentials which we observed, and doubtless those observed under similar conditions by other investigators, were due to the presence of soft wax or grease inside the sputtering apparatus.

[1] Concluded from the September number.

[2] Loc. cit.

3. The saturation currents from thin sputtered films appear to be larger than those obtained from ordinary platinum. They increase approximately logarithmically with the thickness of the film and are therefore proportional to the amount of light absorbed by the film.

4. The method of making contact with the films has a great influence on the observed electrical properties of very thin films.

In conclusion we wish to thank the departments of physics of Princeton University and the University of Pennsylvania for the generosity with which they placed the facilities of their laboratories at our disposal. We especially wish to thank Professor O. W. Richardson for his suggestions and continued interest in our work.

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