

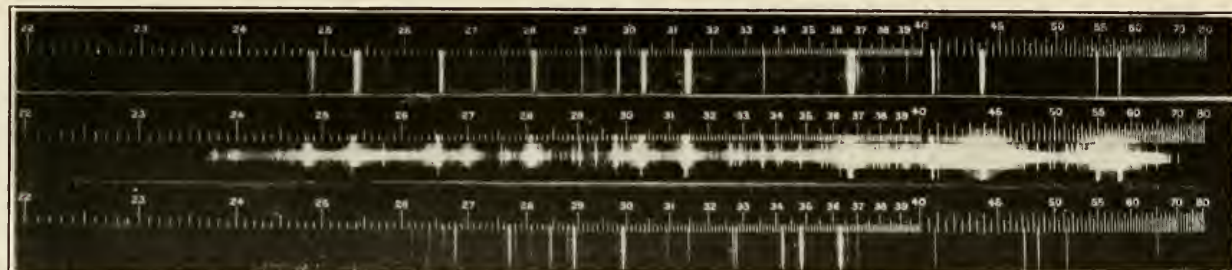
POLARIZATION OF CADMIUM CELLS.

BY R. R. RAMSAY.

This work is a continuation of some work reported at a previous meeting (Ind. Acad. Proc. 1909), in which it was shown that if a cadmium cell was polarized it would regain its normal E. M. F., if the cell contained mercurous sulphate, but would remain polarized if the mercurous sulphate was absent. In that paper it was stated that when the mercury from the polarized cell was sparked, a spectroscope showed the cadmium lines. Since then I have been able to obtain a photographic record of the fact, which I present at this time. The photographs were made with a large Hilger quartz spectrograph using Cramer spectrum plates, which are sensitive for the entire visible spectrum and far up into the ultra violet.

The cadmium amalgam from the mercury terminal of the polarized cell was placed in a small arc lamp made as follows: The lower terminal was made of the amalgam in a quartz tube which had a heavy copper wire leading into the bottom. Fireclay was used to make the tube mercury tight around the wire. The upper terminal of the arc was a heavy copper wire. After filling the cup with the amalgam the terminals were drawn apart and an arc could be maintained for about 10 seconds, after which it was necessary to fill the cup again with the amalgam. The current strength was about three amperes. The arc was focused upon the slit of the spectrograph by means of a quartz lens. The spectrum of the amalgam is shown, together with the spectrum of mercury taken with the same arc lamp, the spectrum of cadmium arc between C. P. cadmium rods and also the spectrum of an arc between copper terminals. Referring to the plate beginning at the top: We have 1st, mercury arc of short exposure, the brighter lines showing on the plate; 2d, the cadmium amalgam arc made with three different lengths of slit, thus bringing out the fainter lines and avoiding to some extent the blurring due to the brighter lines; 3d, the spectrum of the cadmium arc, showing four lines in the visible spectrum, which can be identified in the cadmium amalgam spectrum, together with a large number in the ultra violet; 4th, the spectrum of the copper arc. The wave lengths of several of the more prominent lines are marked. This will serve to give one an idea of the accuracy of the scale as well as to identify the copper lines; 5th, the mercury arc of long exposure; 6th, the cadmium amalgam arc, and, 7th, the cadmium arc.

Hg.



Hg.

Cd. amal.

Cd. amal.

Cd.

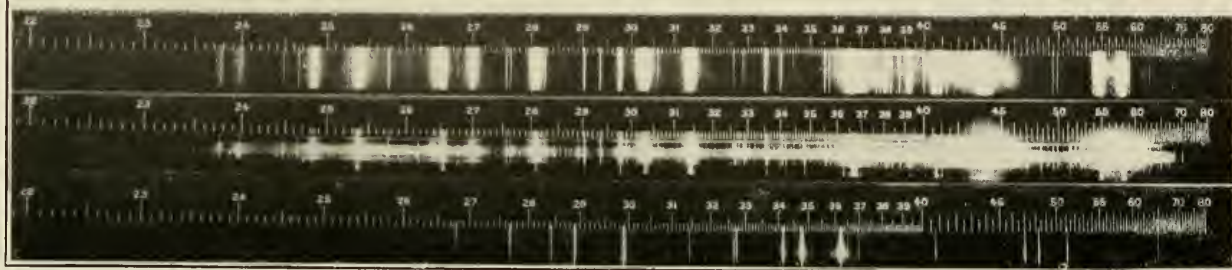
Cd.



Cu.

Cu.

Hg.



Hg.

Cd. amal.

Cd. amal.

Cd.

Cd.