a little mercury. The mercury was gradually heated and a series of photographs was taken with a small Hilger quartz spectrograph. A reproduction of one of these photographs is shown in Fig. 1. The upper spectrum is that of the mercury arc alone, the second is that obtained when the quartz tube was moderately heated and the third is that obtained when the mercury vapour density was considerably higher. The asymmetrical character of the absorption band at $\lambda = 2536{\cdot}72$ A°.U. is clearly brought out by the photograph.

In the second experiments a photograph was first taken of the spark spectrum of mercury in air in a manner already described in a previous communication by one of us.[1]

Photographs were also taken of the spectrum of the light from the spark between terminals of cadmium in air after it passed through the mercury vapour in the exhausted quartz tube mentioned above. These were taken with gradually increasing vapour density and are shown in Fig. 2. In this photograph the mercury spectrum is shown at the top well down into the ultra-violet and the strong lines at $\lambda = 1942{\cdot}1$ A°.U. and $\lambda = 1849{\cdot}6$ A°.U. are clear and distinct. The succeeding four spectra show that even with small vapour density the absorption was such as to cut off the light of wave-lengths in the region of $\lambda = 1942$ A°.U. and $\lambda = 1849{\cdot}6$ A°.U. In the second last spectrum, absorption at $\lambda = 2536{\cdot}72$ A°.U. can just be detected but in the last one it is well marked. The absorption band at $\lambda = 2338$ A°.U. also comes out in this spectrum and that at $\lambda = 1849$ A°.U. has widened out so that on the side of longer wave-lengths it has reached $\lambda = 2144{\cdot}0$ A°.U. From the general appearance of the photograph it will be seen that the absorption at $\lambda = 1849{\cdot}6$ A°.U. develops symmetrically with increasing vapour density. This photograph also shows that light of wave-lengths near to $\lambda = 1849{\cdot}6$ A°.U. was the most strongly absorbed by mercury vapour. That in the neighbourhood of $\lambda = 2536{\cdot}72$ A°.U. came next, while high vapour densities were required to bring out the absorption at $\lambda = 2338$ A°.U.

In the third experiment a large Hilger quartz spectrograph was used. With this instrument the arc spectrum of mercury from a quartz lamp was first taken, then the spark spectrum between aluminium terminals in water after the manner devised by Henri[2] and the the spectrum of the light from the spark between these aluminium terminals in water after it had passed through a heated clear fused quartz evacuated tube containing mercury vapour of high density. These three photographs are shown in Fig. 3. The spark from

[1]McLennan. Proc. Roy. Soc. A. Vol. 91. p. 26, 1914.
[2]Henri. Phys. Zeit. No. 12. p. 516. June 15th, 1913.