From these results it will be clear that between $\lambda = 6000$ A°.U. and $\lambda = 1800$ A°.U. there are but three regions of absorption in the absorption spectrum of non-luminous mercury vapour, viz., in the neighbourhood of $\lambda = 1849{\cdot}6$ A°.U. of $\lambda = 2338$ A°.U., and of $\lambda = 2536{\cdot}72$ A°.U. It should be noted that $\lambda = 1849{\cdot}6$ A°.U. is the first line in the series of the mercury arc spectrum given by n = 1.5,S—m, P and $\lambda = 2536{\cdot}72$ A°.U. is the first line in the series n = 2, p_2—m, S^1 of the same spectrum. The line $\lambda = 2338$ A°.U. has not been shown as yet to belong to any series.

III. The Absorption Spectrum of Cadmium Vapour.

In the experiments with cadmium vapour the spectrum of the light from the spark between terminals of cadmium in air was first of all photographed directly and then after it had passed through cadmium vapour of different densities contained in a heated, highly exhausted tube of clear fused quartz. A photograph taken in this way with the small quartz spectrograph is shown in Fig. 5. The upper spectrum is the spark spectrum taken directly and the lower two are absorption spectra. They show as will be seen, strong and symmetrical absorption at λ 2288 A°U. The experiments were repeated with the larger spectrograph and one of the photographs taken with the instrument is shown in Fig. 6. The second spectrum is the spark spectrum taken directly and the third is the absorption spectrum. This photograph shows a sharply defined narrow absorption band at $\lambda = 3260{\cdot}17$ A°.U. as well as a wide symmetrical band with centre at $\lambda = 2288$ A°.U. Although numerous experiments were made with vapour of varying densities, no trace of any other bands was found. This confirms the observations of Wood and Guthrie.[2]

In this connection, however, it should be noted here that in a number of the photographs of the absorption spectrum of cadmium vapour a narrow, tolerably well defined absorption band came out at $\lambda = 2536{\cdot}72$ A°.U. This was no doubt due to absorption by mercury vapour which either came back, during the process of exhaustion, from the mercury pump into the tube containing the cadmium vapour or else was present as an impurity in the metallic cadmium originally. This absorption band was clearly shown in the original photograph from which the reproduction shown in the third row of Fig. 6 was made but as will be seen it is scarcely detectable in the reproduction.

It is interesting to note that the lines at $\lambda = 2288$ A°.U. and $\lambda = 3260{\cdot}17$ A°.U. are respectively the first numbers of the series

[1]Dunz. Inaugural Dissertation. Tubingen 1911, pp. 67 and 68.
[2]Wood and Guthrie. *loc cit.*