whose frequencies are represented by $\nu = (1{\cdot}5, S)-(m, P)$. Since the single line spectra of mercury, zinc and cadmium consisted of the single spectral line whose frequency is given by $\nu = (1{\cdot}5, S)-(2, p_2)$, it was assumed that the line $\lambda = 2852{\cdot}22$ Å.U. also had a frequency represented by this formula. On the basis of this assumption it was deduced from well-known data regarding the magnesium series spectra that the wave-length of the line whose frequency is $\nu = (1{\cdot}5, S)-(2, P)$ should be approximately $\lambda = 2073{\cdot}36$ Å.U.

As in some experiments made by the writer, in collaboration with Mr. Evan Edwards,* it had been shown that the absorption spectra of the vapours of mercury, zinc, and cadmium consisted of bands at lines whose frequencies were given by $\nu = (1{\cdot}5, S)-(2, p_2)$, and $\nu = (1{\cdot}5, S)-(2, P)$ it was expected that the absorption spectrum of magnesium vapour would also exhibit bands at $\lambda = 2852{\cdot}22$ Å.U. and $\lambda = 2073{\cdot}36$ Å.U.

Wood and Guthrie† had already noted absorption by magnesium vapour at $\lambda = 2852{\cdot}27$ Å.U., but as no other absorption band had been found with this vapour an attempt was made to look for it at $\lambda = 2073{\cdot}36$ Å.U.

In making the examination a small quartz spectrograph with low dispersion was used, and it was found that a sharp clearly defined band came out at what appeared to be $\lambda = 2073{\cdot}36$? This result was therefore taken as indicating that the assumption that the frequency of the line $\lambda = 2852{\cdot}22$ Å.U. was given by $\nu = (1{\cdot}5, S)-(2, p_2)$, was correct.

A few weeks ago, however, the attention of the writer was very kindly drawn by Prof. F. A. Saunders, of Vassar College, to an inaugural dissertation by Lorenser of Tübingen, of which there appears to be as yet but one copy in America, in which it was established that $\lambda = 2852{\cdot}22$ Å.U. was the first member of the series $\nu = (1{\cdot}5, S)-(m, P)$, and $\lambda = 2026{\cdot}46$ Å.U. the second member of the same series.

With this information it was easy to deduce that the line whose frequency was given by $\nu = (1{\cdot}5, S)-(2, p_2)$, must have the wave-length $\lambda = 4571{\cdot}38$ Å.U. With this knowledge it followed that if magnesium vapour acted as regards absorption in a manner analogous to the vapours of mercury, zinc and cadmium, bands should appear in its absorption spectrum, at $\lambda = 4571{\cdot}38$ Å.U., $\lambda = 2852{\cdot}22$ Å.U., and possibly at $\lambda = 2026{\cdot}46$ Å.U. and at still higher members of the $\nu = (1{\cdot}5\ S)-(m, P)$ series. The absorption of magnesium vapour was, therefore, examined by the writer, and the following paper contains an account of these experiments and of others which followed on from them.

* McLennan and Edwards, 'Phil. Mag.,' vol. 30, p. 695 (November, 1915).

† Wood and Guthrie, 'Astrophys. Journ.,' vol. 39, No. 1, p. 211 (1909).