this line by magnesium vapour. The light from this spark was sent through the steel tube described above which contained the magnesium vapour, and photographs were taken of the spectrum when the tube was both strongly and gently heated. Two of the spectrograms taken in this way are shown in fig. 2.

The upper reproduction is that of the ordinary zinc spark in air with the light sent directly into the spectrograph, the second was obtained with vapour of low density, and the third when the tube was strongly heated. In the second spectrogram it will be seen that while the intensities of all the lines are much lessened, absorption at $\lambda = 2852{\cdot}22$ Å.U. is clearly marked. The intensity of the line $\lambda = 2026{\cdot}19$ Å.U. is also very greatly diminished. In the third spectrogram the line $\lambda = 2026{\cdot}19$ Å.U. has completely disappeared and absorption is widespread in the neighbourhood of $\lambda = 2852{\cdot}22$ Å.U.

Repeated attempts were made to see if absorption by magnesium vapour could be obtained at $\lambda = 4571{\cdot}38$ Å.U., but in no case was any trace of it observed. Fig. 3 shows the results of one of these attempts. The upper photograph was obtained with the light from an incandescent Nernst filament after it had passed through magnesium vapour of high density, and the lower one with the light from the zinc spark after passing through the same vapour. Absorption at $\lambda = 2852{\cdot}22$ Å.U., it will be seen, is well marked in the second spectrum, but there is no trace of it at $\lambda = 4571{\cdot}38$ Å.U. in this photograph or in the spectrum of the light from the Nernst filament.

As far as all these experiments go, then, absorption by magnesium vapour was obtained only at $\lambda = 2852{\cdot}22$ Å.U. and at $\lambda = 2026{\cdot}46$ Å.U., the first and second lines in the singlet series $\nu = (1{\cdot}5, \mathrm{S})-(m, \mathrm{P})$.

3. *Single-line Spectrum of Magnesium.*

In a previous communication some experiments by the writer were described in which it was found that if magnesium vapour in a vacuum were bombarded by electrons the vapour could be made to emit a radiation consisting of the single spectral line $\lambda = 2852{\cdot}22$ Å.U., provided the electrons possessed the requisite amount of kinetic energy. Since it has been shown that the frequency of this line is given by $\nu = (1{\cdot}5, \mathrm{S})-(2, \mathrm{P})$, and since with mercury, zinc, and cadmium vapours the frequency of the spectral line in their single-line spectra is given by $\nu = (1{\cdot}5, \mathrm{S})-(2, p_2)$, the experiments were repeated to see if the magnesium vapour could not be made to emit the line $\lambda = 4571{\cdot}38$ Å.U.—frequency $(1{\cdot}5, \mathrm{S})-(2, p_2)$. The apparatus used was the same as that described by McLennan and Henderson.* Potential differences, gradually increasing, were applied between the Wehnelt cathode—a

* McLennan and Henderson, 'Roy. Soc. Proc.,' A, vol. 91, p. 485 (1915).