2. *Absorption Spectrum of Magnesium Vapour.*

In making these experiments a large Hilger quartz spectrograph, type C, possessing high dispersion was used. Some metallic magnesium was placed in the centre of a steel tube about 3 cm. in diameter and 20 cm. long. The ends of this tube were provided with crystal quartz plates sealed in with wax. The tube was highly exhausted by a Gaede pump and when a low vacuum was reached the metal was vaporised by heating the centre of the tube with a blowpipe, the ends of the tube being kept cool by wrappings of cloth kept soaked with water.

Some difficulty seems to have been experienced in photographing lines in the magnesium emission spectrum in the neighbourhood of $\lambda = 2000$ Å.U. on account of their feeble intensity, for, although the existence of the line $\lambda = 2026{\cdot}46$ Å.U. was predicted by Lorenser, Saunders appears to have been the only one who as yet has observed it. Some difficulty was also experienced by the writer in obtaining a photograph of it with ordinary or panchromatic plates. When, however, the Schumann plates, recently put on the market by the Adam Hilger Company, were used, it was found that the line came out clearly and with considerable intensity.

The upper spectrum in fig. 1 was obtained with the light and from a spark in air between magnesium terminals and the lower one with the light from a magnesium arc of the type already described in a previous communication by McLennan and Henderson.* The second spectrum in the figure is that of the light from a spark between zinc terminals in air, while the third is that of the light from an arc between magnesium terminals in air. The line $\lambda = 2026{\cdot}46$ A.U., it will be seen, comes out clearly in both the spark and arc spectra of magnesium and practically coincides with the last line in the zinc spectrum, an exceedingly strong line, whose wave-length is given by Saunders† as $\lambda = 2026{\cdot}19$ Å.U.

It is of interest to note that the arc spectrum of magnesium in air shows a strong reversal at $\lambda = 3838$ Å.U. and a fainter though well marked one at $\lambda = 2852{\cdot}22$ Å.U. The fourth spectrogram in fig. 1, which was obtained with the light of the magnesium arc *in vacuo*, was taken on a plate sensitive to the green, which was specially made for me by Dr. Mees of the American Kodak Company.

On account of the strong intensity of the line $\lambda = 2026{\cdot}19$ Å.U. in the zinc spectrum, and its close proximity to the magnesium line $\lambda = 2026{\cdot}46$ Å.U., the spark spectrum of zinc in air was used in looking for the absorption of

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

† Saunders, 'Astrophys. Journ.,' vol. 43, No. 3, p. 239 (1916).