Table III.—Magnesium. Distance between Electrodes = 0·85 cm.

Volts.	Without vapour.	With vapour.	Without vapour.	Difference.
Column I.	Column II.	Column III.	Column IV.	Column V.
	cms.	cms.	cms.	cms.
6	1·0	42·5	14·9	27·6
20	1·9	148·8	39·7	109·1
38	2·9	255·0	67·0	188·0
58	3·9	357·0	96·7	260·3
77	4·9	425·0	121·5	303·5
101	5·5	505·8	136·4	369·4
118	6·3	552·5	156·2	396·3
138	7·1	629·0	191·0	438·0
152	7·6	663·0	198·4	464·6
172	8·4	722·5	208·3	514·2
190	8·8	726·8	218·2	508·6
210	9·2	748·0	231·8	516·2
229	9·8	773·5	243·0	530·5

flame was being fed with the vapour. The differences between the readings in columns III and IV, namely, the numbers in column V, may be taken, therefore, to represent the conductivity actually contributed by the vapour in the flame under steady conditions. It is of interest to note that with magnesium as with mercury saturation was obtained with about 240 volts. With magnesium it would appear then that when the vapour in the flame is in the condition to emit monochromatic radiation of wave-length $\lambda = 2852{\cdot}22$ A.U. it is also strongly ionised. One cannot say definitely, however, that the conditions which determine the ionisation are the same as those which give the vapour the power to emit the radiation $\lambda = 2852{\cdot}22$ A.U. alone. We have seen that with cadmium vapour in the Bunsen flame it was possible to obtain the line $\lambda = 3260{\cdot}17$ A.U. and the line $\lambda = 2288{\cdot}72$ A.U. The line $\lambda = 2852{\cdot}22$ A.U. has been shown recently by Lorenser* to be the first line of the singlet series $\nu = (1{\cdot}5, S) - (m, P)$, and the line $\nu = 2026{\cdot}46$ Å.U. the second member of this series. As pointed out above both of these lines characterise the absorption spectrum of magnesium vapour and it is possible that radiations corresponding to both of them and to other members of the series as well were emitted by the vapour-laden flame but that the intensity of the radiation of the members of the higher frequencies was too weak to leave any impression on the photographic plates. All that can be said definitely is that the vapour in the flame was ionised and that at the same time it was strongly emitting monochromatic light of wave-length $\lambda = 2852{\cdot}22$ A.U. As indicated above the line in the magnesium spectrum

* Lorenser, 'Inaug. Diss.,' Tübingen (1913).