vapour-laden flames was any trace of the line obtained in the spectrograms taken. Moreover, in some experiments made by one of us* some time ago and recently repeated it was found that when electrons were projected into magnesium vapour in a vacuum with gradually increasing velocities no trace of a spectral line was obtained in the light from the vapour until the electrons were given a speed corresponding to between 4 volts and 5 volts fall of potential. When this speed was reached $\lambda = 2852{\cdot}22$ A.U. came out strongly on the plates. With still greater speeds no additional lines came out until the kinetic energy of the electrons corresponded to a fall of potential of about 7·5 volts. When this potential was reached the arc suddenly struck and the many-lined spectrum came out. Combining all these results it would seem that in the case of magnesium vapour, ionisation does not take place until the conditions are such as to enable the vapour to radiate light of wave-length $\lambda = 2852{\cdot}22$ A.U. If this be so it would appear that on the quantum theory the frequency of the line $\lambda = 2852{\cdot}22$ A.U. is the one which determines the ionising potential of magnesium vapour. From the equation $Ve = h\nu$ it would appear then that the ionising potential for atoms of this metal is 4·28 volts.

Thallium.—Some experiments were also made on the conductivity of thallium vapour-fed Bunsen flames. With this metal it was found that the presence of the vapour greatly increased the conductivity of the flame and that it was difficult to obtain a saturation current. Table IV contains a set of readings taken with this metal and the curves in fig. 7 and 8 represent

Table IV.—Thallium. Distance between Electrodes = 0·9 cm.

Volts.	Without thallium vapour.	With thallium vapour.	Difference.
Column I.	Column II.	Column III.	Column IV.
	cms.	cms.	cms.
6	0·3	2·0	1·7
20	0·5	2·7	2·2
39	0·9	3·6	2·7
59	1·1	4·4	3·3
80	1·3	6·2	4·9
102	1·45	6·8	5·3
120	1·5	8·0	6·5
140	1·6	9·4	7·8
161	1·8	11·9	10·1
164	2·0	13·0	11·0
202	2·05	17·2	15·1
222	2·2	24·4	22·2
243	2·35	31·6	29·2

* McLennan, 'Roy. Soc. Proc.,' A, vol. 92, p. 305 (1915).