$\nu = (1{\cdot}5, S)-(2, p_2)$. With magnesium, on the other hand, one of us* still later has shown that the simplest spectrum which can be obtained of magnesium vapour in a vacuum by means of electronic bombardment is given by $\nu = (1{\cdot}5, S)-(2, P)$. For mercury, zinc, and cadmium vapours, then, the frequency $\nu = (1{\cdot}5, S)-(2, p_2)$—and probably also $\nu = (1{\cdot}5, S)-(2, P)$—appears to be the fundamental one, while with magnesium it is in all probability $\nu = (1{\cdot}5, S)-(2, P)$.

As the electrical conditions in flames are probably simpler than those which obtain in the electric arc or spark, one should expect that, in flame spectra of the elements, the fundamental frequency would come out relatively with specially strong intensity. Charles de Watteville,† in a number of papers on flame spectra, has pointed out that, if a Bunsen flame be fed with the spray of salt solutions of a number of different elements, the spectrum of the flame with some of the elements consists of a single strong line, and with others of a single strong line accompanied by a number of very much fainter ones. These strong lines for the different metals, with their frequencies, are given in Table I.

Table I.

Element.	Frequency $\nu = 1{\cdot}5, S-2, p_2$.	Frequency $\nu = 1{\cdot}5, S-2, P$.
	Å.U.	A.U.
Mercury	$\lambda = 2536{\cdot}72$	—
Zinc	$\lambda = 3075{\cdot}99$	—
Cadmium	$\lambda = 3260{\cdot}17$	—
Magnesium*	—	$\lambda = 2852{\cdot}22$
Calcium	—	$\lambda = 4226{\cdot}91$
Strontium	—	$\lambda = 4607{\cdot}52$
Barium	—	$\lambda = 5535{\cdot}69$

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

This Table, it will be seen, emphasises the view that for mercury, zinc, and cadmium, the fundamental frequency is given by $\nu = (1{\cdot}5, S)-(2, p_2)$, while for magnesium, and probably also for calcium, strontium, and barium, it is given by $\nu = (1{\cdot}5, S)-(2, P)$. Some earlier experiments made by Gouy,‡ with salts sprayed into a flame, also confirm this view with respect to zinc and cadmium.

* McLennan, *supra*, p. 574.

† De Watteville, 'Phil. Trans.,' vol. 204, p. 139 (1904); and 'Comptes Rendus,' vol. 142 (1906).

‡ Gouy, 'Ann. de Chimie et Phys.,' vol. 18 (1879).