

In the experiments which have been described all the exhaustions were made by means of a Toepler-Hagan pump and the gas was admitted to the chamber by opening a tap in a tube leading to a supply of hydrogen.

The introduction into the laboratory of a Gaede exhausting air pump during the investigation, however, suggested at once the superiority of this piece of apparatus over the older form of pump for the purposes of the present investigation.

For with this pump the gas could not only be easily and rapidly withdrawn from the discharge chamber but it could also by a reversal of the pump's action be just as easily and with full control be again admitted back into the chamber.

TABLE IV
Above Critical Pressure

Pressure in mm.	Current in amperes $\times 10^{-3}$ V. M. readings Res. of V. M.	P. D. across spark gap	Minimum sparking potential
9	2.45	335	380
..	4.1	330	
..	8.9	325	
Below critical pressure			
2	.38	375	
..	3.87	450	350
..	6.38	485	
1.5	2.8	520	500
....	5.24	560	

A point of special interest in connection with the present investigation is the confirmation it affords of some conclusions drawn by Mr. J. A. Brown¹ from his measurements on the potential required to maintain a current in a gas. With the arrangement described above the difference between the Weston voltmeter reading and that of the electrostatic voltmeter for a selected current gave a measure of the corresponding

¹ Brown, Phil. Mag., Sept., 1906.