



On the action of light upon electrical discharges in various gases

F. Breissig

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XX. *Intelligence and Miscellaneous Articles.*

VISIBLE REPRESENTATION OF THE EQUIPOTENTIAL LINES IN PLATES TRAVERSED BY CURRENTS ; EXPLANATION OF HALL'S PHENOMENON. BY E. LOMMEL. (Preliminary Notice.)

SIMPLE consideration shows that the equipotential lines at right angles to the lines of flow in a plate are at the same time the magnetic lines of force belonging to the flow. If iron filings are strewed on the plate with a sufficiently strong current, they arrange themselves to form a beautiful image of the equipotential lines.

If the plate is brought into a magnetic field these magnetic lines of force alter their position, and therefore also the lines of force which necessarily are at right angles to them. In this lies the simple explanation of Hall's phenomenon.—Wiedemann's *Annalen*, No. 12, 1892.

ON THE ACTION OF LIGHT UPON ELECTRICAL DISCHARGES IN VARIOUS GASES. BY F. BREISSIG.

As source of light the author used a gas-flame. As he had the intention of determining the influence of the visible rays in electrical discharges, he tried to find a gas in which this action is as great as possible, but he came to the conclusion that the difference between various gases in this respect is too small to lead to the preference of any one in particular.

M. Breissig uses Hallwachs' form of the luminous discharge with a somewhat different arrangement. Opposite the source of light is placed an amalgamated zinc plate, and in front of it a wire gauze, also amalgamated, of galvanized iron, both being insulated. The zinc plate was kept at constant potential by a Daniell's battery of 80 elements, while the wire gauze was connected with one quadrant pair of an electrometer. The potential was measured of the quantity of electricity passing from the zinc plate to the wire gauze owing to illumination.

A decrease of sensitiveness of the plate with the duration of the illumination was observed, as Hallwachs and Righi had also observed for other sources of light; moreover, an increase was observed in all the gases investigated as the pressure diminished. In opposition to the observations of others, the author found a feebler discharge in carbonic acid than in air; the deflexions are reduced to about one half: this phenomenon is due to the fact that in his experiments the rays of a spectral region are used differing from that of other observers, and the action of the various parts of the spectrum on many gases may be different. With cool gas a feebler action is observed if the gas has already been illuminated.

The discharges in some vapours were stronger than in all the gases examined, especially in air half saturated with alcohol vapour. The following table gives in round numbers the results observed by the author.

	Discharge.	
	Normal pressure.	Diminished pressure.
Atmospheric air	10	18-22
Oxygen	14	20
Hydrogen	8	16
Carbonic acid	6	14
Coal-gas	7	12
Sulphuretted Hydrogen	3	
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Air containing vapour of		
Alcohol	30-40	about 70
Ether	20-30	„ 50
Turpentine	6	
Benzole	10-20	
Petroleum spirit	10	
Xylol	6	

In this the mean strength of the discharge in dry atmospheric air is taken at 10—*Inaugural Dissertation*, Bonn, 1891 ; *Beiblätter der Physik*, vol. xvii. p. 60.

NOTICE OF A METEORIC STONE SEEN TO FALL AT BATH,
SOUTH DAKOTA. BY A. E. FOOTE.

On the 29th day of August, 1892, about 4 o'clock in the afternoon, while Mr. Lawrence Freeman and his son were stacking upon his farm two miles south of Bath, they were alarmed by a series of heavy explosions. On looking up they saw a meteoric stone flying through the air followed by a cloud of smoke. Its course was easily traced to the point where it fell within about twenty rods from where they were standing. The stone penetrated the hardened prairie to a depth of about sixteen inches, and when reached it was found to be so warm that gloves had to be used in handling it. Three small pieces of an ounce or two each had apparently been blown off by the explosions, but the stone still weighed 46½ lb. One of these small pieces was found by some men not far distant, and was broken up and distributed among them. The explosions were plainly heard by a large number of people at Bath, two miles away, and at Aberdeen, nine miles away, it sounded like distant cannonading. The exterior of the stone presents the usual smooth black crust. The interior is quite close-grained, resembling in texture the stones from Möcs. The iron is abundantly disseminated through the mass ; and although the grains are small, they are easily distinguished and separated on pulverizing.

Preliminary tests made by Mr. Amos P. Brown, of the Mineralogical Department of the University of Pennsylvania, prove the presence of nickel and cobalt in considerable quantity.—*Silliman's Journal*, January 1893.