



## On the passage of the electric current through air under ordinary circumstances

J. Borgmann

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according to its position. It will thus be seen that the calibration of instruments of this kind must not be forgotten when they are moved from one place to another.—*Journal de Physique*, Jan. 1887.

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ON METALLIC LAYERS WHICH RESULT FROM THE VOLATILIZATION OF A KATHODE. BY BERNHARD DESSAU.

The results of the present investigation may be summed up as follows:—

By appropriate electrical discharge in highly rarefied spaces, the metal which acts as kathode is volatilized and settles on a glass plate as a reflecting layer or mirror. If the oxygen has not been most carefully removed, all metals seem to undergo oxidation under these circumstances. There is perhaps in all cases a combination with the traces of residual gas (hydrogen or nitrogen), yet the mirrors obtained in hydrogen are not materially different from those of pure metals. With suitable arrangement of the electrodes the layer of metal is obtained as a flat cone; and when viewed in reflected light, under as acute an angle as possible, coloured interference-rings are obtained, which prove the presence of a dispersion in the metals. It may be concluded with some certainty that this dispersion is normal in platinum, iron, nickel, and silver, and abnormal with gold and copper. The layer directly produced by the discharge, whether it be metal or oxide, is always double refracting, probably in consequence of an electrical repulsion between the particles expelled, and the regular stratification thereby produced; in the metals the ray which vibrates tangentially is accelerated in respect of the others. In the metals the cross of double refraction was also observed in reflected light, and in reflection from the metal side the action was the reverse, and from the glass side the same as in transmitted light. Double refraction disappears on oxidation of the double-refracting metals, as well as by reduction of the layers of oxide, while heating without any chemical change has no effect.—*Wiedemann's Annalen*, No. 11, 1886.

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ON THE PASSAGE OF THE ELECTRIC CURRENT THROUGH AIR UNDER ORDINARY CIRCUMSTANCES. BY J. BORGMANN.

One end of the coil of a Wiedemann's galvanometer is connected with the earth, and the other with a platinum wire, which is placed in the flame of an insulated spirit-lamp. At a distance of  $1\frac{1}{2}$  metre from this lamp is an ordinary Bunsen burner, which is connected with a conductor of the Holtz machine; the other conductor is put to earth.

When the lamp is lighted the galvanometer indicates no current; but when the disk is rotated a distinct current at once appears in the galvanometer, and the deflection of the needle does not alter so long as the machine works at a uniform rate. If the Bunsen burner is connected with the other conductor of the machine, a current in the opposite direction is at once set up.—*Beiblätter der Physik*, January 1887.