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Physics. — "*On the influence of electric waves upon platinum mirrors.* (*Coherer action*)." By Dr. J. CLAY. (Communicated by Prof. H. KAMERLINGH ONNES).

(Communicated in the meeting of December 24, 1910).

In the present paper I give the results of some of my experiments undertaken with a view to solving a difficulty regarding coherer action on platinum mirrors which, to the best of my knowledge, has not yet been cleared up. Various observers[1]) have noticed that electric waves falling upon a platinum mirror cause an increase of its electrical resistance. This was difficult to reconcile with LODGE's[2]) assumption that electric oscillations render the metallic particles of a coherer better able to conduct electricity.

It appeared to me that the influence of electric oscillations depended a great deal upon circumstances. I had several platinum mirrors constructed, which were not all raised to the same temperature, so that the platinum layer was not of the same firmness in every case. Mirrors N°. 1 and 2 (see Table) were heated to about 300°, and 3, 4, and 5 to about 400°. N°. 6 was a tube platinised on the inner side so that the platinum could not be firmly fused into the glass. N°. 7 was a tube platinised on the outside by being kept for a long time at red heat; from it platinum could not be removed even with a sharp instrument.

From the table the influence of electric waves upon the various mirrors can be seen; in 1 and 2 it is greatest, in 3, 4, and 5 it is much less, in 6 it is again great, while in 7 it vanishes completely. From this it appears that the magnitude of the change depends upon the condition of the platinum deposit, and points, therefore, to a mechanical action. Particularly with 1 and 2, tapping after a change had a strongly recuperative effect on the resistance. With N°. 2 a change of 3 ohms was observed to be occasioned even by a hissing noise.

It was also ascertained that at large distances from the source of the oscillations (the spark of an induction coil) the waves occasioned a reduction of the resistance, at shorter distances, on the other hand, they brought about an increase. It seems to me that the latter effect may be regarded as analogous to the action of an electrostatic field

1) ASCHKINASS. Verh. d. Phys Gesellsch. Berlin. 1894 and Wied. Ann. 57. BRANLY La Lumière Electrique 40. 1891. HAGA. Wied. Ann. 56. 1895. MIZUNO Phil. Mag. 40. 1895 D. v. GULIK. Diss. Groningen. 1896. Wied. Ann. 66. 1898.

2) LODGE. The Work of HERTZ and his Successors. 1894.

No. 1

Distance	Experiment. Conditions	Resistance in Ohms
		230
30 c.m.	w and t [1]	206
»	t	241
200 c.m.	w	210
	w and t	203
	t	220
50 c.m.	w and t	195
	t	220
30 c.m.	w and t	182
	t	195
	w	181
	w and t	177
	t	205
	w and t	173
10 c.m.	w	380
	t	320
5 c.m.	w and t	800
	t	690
20 c.m.	w and t	604
	t	493

No. 2

Distance	Experiment. Conditions	Resistance in Ohms
		165
30 c.m.	w and t	104
	t	163
15 c.m.	w	135
	t	160
25 c.m.	w and t	122
8 c m.	w	1100
	t	200
28 c.m.	w and t	124
	t	143
20 c.m.	w and t	100
	t	145
10 c.m.	w	220
20 c.m.	w	142
6 c.m.	w	198
30 c.m.	w and t	140
	t	210
30 c.m.	w and t	170
6 c.m.	w	490
	t	470

No. 3

Distance	Experiment. Conditions	Resistance in Ohms
	:	35.1
25 c.m.	w	34.5
	t	34 9
2 c.m.	w	35.9
6 c.m.	w	35 3

No. 4

Distance	Experiment. Conditions	Resistance in Ohms
		99 5
30 c.m.	w	99.0
	t	99.0
2 c.m.	w	157

No. 5

Distance	Experiment. Conditions	Resistance in Ohms
		144
30 c.m.	w and t	141
	t	141
5 c.m.	w	142.5
	t	142 5

No. 6

Distance	Experiment. Conditions	Resistance in Ohms
		9600
30 c.m.	w	8000
	t	9650
5 c.m.	w	∞

No 7

Distance	Experiment. Conditions	Resistance in Ohms
		10.241
30 c.m.	w	10 241
2 c.m.	w	10.241

[1]) w(aves) and t(apping).

upon a powder such as gypsum. As long as it is weak the electro-static field leads to well defined continuous lines of force, but as the field becomes stronger the directive forces become too powerful and the powder particles are heaped together and the lines of force are broken. In the present instance the effect is probably the same. In a weak field the particles are well disposed for conduction, but as the field becomes stronger this disposition of the particles is altered in many places. The inversion of the effect of the waves should thus take place at shorter and shorter distances the firmer the binding of the platinum to the glass. This, too, was observed with these mirrors.

With tube N°. 7 not the slightest change was observed even when it was brought to within 1 cm. of the spark.

These phenomena, therefore, support in a different way LODGE's assumption as to the mechanical influences of electric waves.

I take this opportunity of thanking the Director and Professors of the Delft Physical Laboratory for their kindness in granting me facilities for experimental work.

Crystallography. — *"On the orientation of crystal sections with the help of the traces of two planes and the optic extinction".* By J. SCHMUTZER. (Communicated by Prof. C. E. A. WICHMANN).

(Communicated in the meeting of May 27, 1911).

In the problem of the orientation of crystal-sections the given direction of the trace of a plane can be replaced by the direction[1]) of the optic extinction.

With optically uni-axial crystals the extinction, with regard to the trace of a plane supposed ⊥ on the optic axis, is always straight, so that the problem is reduced here entirely to that of the orientation with the help of the traces of three planes.

With optically bi-axial crystals the solution of the problem becomes less simple. Be in fig. 1 the projection plane T applied ⊥ on the bisectrix O of the optic axes A and B, be further the crystal-plane V_1 given by the azimuth $\mu_1 = CRP$ and the height $\nu_1 = Pv_1$ of its pole v_1, V_2 by the coordinates $\mu_2 = CRQ$, $\nu_2 = Qv_2$ of its pole v_2, the secant-plane S by the coordinates $\varrho = CR$, $\sigma = Rs$ of the pole s, then the angles $h_1 = \angle FOG$ and $h_2 = \angle DOG$, which are

[1]) Proc. Royal Acad. Amst. 1911, 720.