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RESEARCHES

ON THE THEORY OF THE PRINCIPAL PHENOMENA OF PHOTOGRAPHY IN THE DAGUERREOTYPE PROCESS.

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[Concluded.]

In the course of my experiments I have noticed a curious fact, which became very puzzling to me until I was able to assign a cause for it. I shall mention it here because it may lead to some further discoveries. I had observed that sometimes the spaces under the round holes which had not been affected by light, during the operation of the photographometer, in a sufficient degree to determine the deposit of mercury, were, as it was to be expected, quite black; while the spaces surrounding them were in an unaccountable manner slightly affected by mercury. At first I could not explain the phenomenon except in supposing that the whole plate had previously been by accident slightly affected by light, and that the exposure through the hole to another sort of light, had destroyed the former effect. I was naturally led to that explanation, having observed before that one kind of light destroys the effect of another; as, for example, that the effect of light from the north is destroyed by the light from the south, when certain vapours existing in the east part of the atmosphere impart a yellow tint to the light of the sun.

But after repeated experiments, taking great care to protect the plate from the least exposure to light, and recollecting some experiments of Moser, I have found that the affinity for mercury had been imparted to the surface of the Daguerreotype plate by the contact of the metallic plate having the round holes, while the spaces under the holes had received no similar action. But it must be observed, that this phenomenon does not take place every time. Some days it is very frequent, and at some others it does not manifest itself at all.*

In considering that the plate furnished with round holes is of copper, and that the Daguerreotype plate is of silver plated on copper, it is possible that the deposit of mercury is due to an electric or galvanic action determined by the contact of the two metals; and perhaps the circumstance that the action does not take place every time, would lead to suppose that it is developed by some peculiar electric state of the ambient atmosphere, and to a degree of dampness in the air, which would increase the electric current. May we not hope that by understanding the condition in which the action is produced, and by availing ourselves of that property, it would be possible

* In my "Researches on Light," these phenomena are explained under the title of Thermography. My experiments distinctly prove them to be due to heat radiations.—R. H.