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REMARKS ON THE DAGUERREOTYPE.

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Of copying objects by Artificial Light.—It has been known for many years, that chloride of silver would become dark, when exposed to the light emitted from incandescent lime before the oxy-hydrogen blow-pipe, or to the galvanic discharge between charcoal points. The same effect takes place much more promptly with iodized silver. I arranged a gas microscope with a lime pea, and also with charcoal points; and procured an impression of a part of a fly's wing without any difficulty. The same result was also obtained by means of Drummond's light: a jet of oxygen passing through the flame of a spirit lamp, and directed on a piece of lime.

The image of an argand gas-light being received in the camera, at a distance of about ten feet, upon an iodized plate, for three quarters of an hour gave a very strong and well-defined result.

On holding a similar plate, one half of it being screened by a piece of tin-foil, within two inches of the same flame, in three quarters of a minute the exposed portions were strongly affected, and in a minute and a half had begun to turn black.

I placed a flat gas-burner (bat's-wing) in a magic lantern, and received the image of one of the grotesque transparencies, on a plate three inches square: in half an hour, a very fair representation was obtained.

Of images of the Moon.—The rays of the moon, reflected by the mirror of a heliostat, were made to pass through a lens four inches in diameter, and fifteen inches focus. The image, when received on an iodized plate, was about one-sixth of an inch in diameter. After an exposure of half an hour, the plate was mercurialized, and a very well marked result obtained. It appeared however to have been exposed to the light too long, as it had commenced to blacken.

The moon being about seventeen days old, by means of two lenses I obtained an image of her nearly an inch in its longest diameter; and to this, for three quarters of an hour, an iodized plate was exposed. The mercury bath evolved a chart, which was however deficient in sharpness; partly owing to defects in the optical arrangement, but chiefly on account of the difficulty of making the heliostat follow the course of the moon with accuracy. The position of the darker spots on the surface of the luminary was distinct.

Of making Duplicates of Daguerreotypes.—There is no difficulty in making copies of Daguerreotype pictures of any size. The proof from which a duplicate is to be taken, should be placed in a full light, and in such a position as respects the incident light, that its lights and shadows may come out with the utmost clearness. During last winter I made many copies of my more fortunate proofs, with a view of ascertaining the possibility of diminishing the bulk of the traveller's Daguerreotype apparatus, on the principle of copying views on very minute plates, with a very minute camera; and then magnifying them subsequently to any required size, by means of a stationary apparatus. These arrangements will probably add great facilities to the practice of the art.

Of the Rays which affect the Iodized Plate.—It is commonly supposed that these are identical with what are generally called in the books on optics, "the chemical rays;" rays which are situated in the most refrangible portion of the spectrum. This is, however, an error. The point of maximum intensity for Daguerre's ray, lies within it in the region of the blue. Before the paper of Mr. Towson, in the London and Edinburgh Journal of Science, had reached this country, last November, I had determined the proper focus for the Daguerreotype. In truth, every ray except the yellow, leaves an impression on the iodine. Theoretically, therefore, it would seem, that in order to obtain perfect pictures, an achromatic lens is absolutely necessary. A more attentive consideration of the matter soon convinced me, that lenses in which the chromatic aberration was uncorrected, might be employed, provided care was taken to remove the plate from the camera at a certain period. For the impressions of light upon the retina are solely regulated by intensity; but in the action of a decomposed beam on an iodized plate, time enters as an element. Suppose, therefore, a plate be exposed in the camera during the space of five minutes, in light of a certain brilliancy, if the focus has been adjusted to the focus for blue light, a neat picture may be obtained; for these being the rays in which the action is at a maximum, they will have had time to make a complete and perfect impression, whilst the red and violet rays will not have had time to give any perceptible effect. Upon these principles, I found that very sharp pictures might be obtained, not merely by spectacle lenses an inch in diameter, but also by means of lenses of three or four inches aperture, such as have since come into common use. The first portrait I obtained last December was with a common spectacle glass, only an inch in diameter, arranged at the end of a cigar box.

The risk of failure by employing an uncorrected lens, is greater than the risk by a good achromatic, or a reflector.

Of the methods of removing the Iodine from the Plate.—Daguerre recommends two agents for the removal of the sensitive coating —hypo-sulphite of soda, and solution of common salt. The former acts very well, but is somewhat expensive; the latter often fails, and the proof is ruined. There is however a process far better than either, which succeeds without any difficulty, and is of no expense.

Having taken a clear and moderately strong solution of common salt, place the proof in it, and touch it at one corner with a little piece of zinc that has been scraped bright. The instant that contact is made, the iodine is seen disappearing like a mist from the surface of the plate, commencing at the point where the zinc touches it, and gradually progressing to the further extremity. The plate is then to be washed thoroughly with water.

This process, which adds not a little to the magic of the whole operation, depends on the following principle: The silver surface, and the zinc plate in contact, form a simple voltaic couple. The zinc taking oxygen from the saline solution, hydrogen is evolved

from the silver; but being in a nascent state, it unites at once with the film of iodine, forming hydriodic acid, which is very soluble in water.

The hypo-sulphite of soda and the zinc plate, therefore, act in different ways: the former dissolving off the iodide of silver, the latter decomposing it. Pictures cleaned in this way are not of that slaty blue color, which some that have been treated with hypo-sulphite of soda possess. They are of a warm cream tint.

[End of text.]

EDITOR'S NOTES:

Draper's method of fixing images with a salt solution and contact with zinc (without the use of hyposulphite of soda) was mentioned again in "Improvements in the Daguerreotype," *Visitor, or Monthly Instructor, for 1841* (London) (January 1841): 29; S. D. Humphrey, *American Hand Book of the Daguerreotype* 5th edition (New York: S. D. Humphrey, 1858): 60–61.

For the paper by Towson referenced by Draper, see John T. Towson, "On the Proper Focus for the Daguerreotype," *London and Edinburgh Philosophical Magazine and Journal of Science* (London) 15:97 (November 1839): 381–85.[1]

Draper makes a curious statement: "The first portrait I obtained last December was . . ." Regarding Draper and the topic of the "first portrait," see Howard R. McManus, "'It Was I Who Took the First' An Investigation Into Professor Robert Taft's Assessment of Whether Dr. John William Draper Took the First Portrait," *Daguerreian Annual 1996* (Pittsburgh: The Daguerreian Society, 1997): 70–100.

1. http://www.daguerreotypearchive.org/texts/P8390028_TOWSON_PHILO-MAG_1839-11.pdf

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