

**J. Waterhouse, "The First Use of Bromine in Daguerreotype," November 1899**

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**THE DAGUERREOTYPE: AN ARCHIVE OF SOURCE TEXTS, GRAPHICS, AND EPHEMERA**  
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THE FIRST USE OF BROMINE IN DAGUERREOTYPE.

By Major-general J. Waterhouse, I. S. C, IN "Photography."

HAVING had occasion recently to refer to Volume XIII of the *American Journal of Photography* for 1892, I was very much interested to find in it a series of papers by the editor, Mr. Julius F. Sachse, on "Early Daguerreotype Days," in which he brings forward evidence to show that bromine was first used as an accelerator in daguerreotype by Dr. Paul Beck Goddard, of Philadelphia, in December, 1839, about a year before Mr. John F. Goddard published his independent discovery in this country.

Mr. Sachse further claims for Philadelphia the honor of being the mother city of photography in America, and the birthplace of photographic portraiture, the bromo-iodized plate, and the instantaneous photograph.

The specific claims he makes on these points are:

1. That Joseph Saxton, of Philadelphia, made the first heliograph in America, October 16, 1839.
2. That Robert Cornelius, of Philadelphia, obtained the first picture of a human face by Daguerre's process, in the world, November, 1839.
3. That to Dr. Paul Beck Goddard, of Philadelphia, belongs the honor of the discovery of bromine as an accelerator, December, 1839.
4. That Dr. Paul Beck Goddard, of Philadelphia, was the first in the world to obtain an instantaneous picture by heliography, December, 1839.

Besides other claims of less general interest.

Considering that the daguerreotype process was only made known to the world in August, 1839, and that the first accounts of it appear to have only reached America in September and October, 1839, and, according to Mr. Sachse, were looked upon as a hoax by some of the leading spirits of the American Philosophical Society in Philadelphia, it is interesting to note how quickly the new process seems to have been tried, improved and turned to practical account, both in Philadelphia by Saxton, Goddard and Cornelius, and in New York, where it was immediately taken up and worked out in a scientific way by Professors J. W. Draper and Morse, of the University of New York. Although the Philadelphia men may have been first in the field, Draper's researches must have been almost contemporaneous with theirs, and what is of much greater importance, he published the results of his work at once, which Goddard and Cornelius did not.

With regard to the first two of the claims put forward by Mr. Sachse, there is not much to be said. An illustration is given at page 308, of the volume referred to, of the first picture taken by Mr. Saxton in October, 1839, with a cigar-box camera and burning glass lens, silver plates, an iodine box made from a Seidlitz powder case, with a hole cut in the lid to take the plates, and an equally rough mercury box. It is marvelously good for such an attempt.

Later on Saxton had the help of Cornelius, who was a lamp maker, in making up some plated metal, and this started Cornelius on making some apparatus for himself, and the first picture he took was his own portrait, running in front of the camera after he had got all ready. The exact date is not known, but it was in November, 1839, and a copy of it is appended to Mr. Sachse's paper.

The first publication of the use of bromine as an accelerator in the Daguerreotype process is universally ascribed, and, so far as we can see, quite correctly, to Mr. John F. Goddard, who was a science lecturer at the Adelaide Gallery, and seems to have been engaged by Beard, the holder of the Daguerreotype patent in England, to assist him.

The following is the letter in the *Literary Gazette* of December 12, 1840, in which the discovery was made known:

"VALUABLE IMPROVEMENT IN DAGUERREOTYPE

"To the Editor of the '*Literary Gazette*':

"Sir,—Having been engaged for some time past in investigating the different means of preparing the plates for the action of light in photographic delineations of Daguerreotype, in the hopes of being able to render them more sensitive, the result of my experiments has been the valuable discovery, that when the bromide of iodine is used instead of the simple iodine this very desirable object is attained in the most extraordinary degree. So delicately sensitive are the plates, when properly prepared, that the faintest light acts upon them. Even on the dull, cloudy days of November, with a London atmosphere, if not too foggy, and there is sufficient light to produce a picture, it will, by a few minutes' exposure, be delineated. I have not had an opportunity of experimenting with bright solar light since I made the discovery, but from the experience I have had in the old process during the last summer, I have no doubt that with a clear summer sun in London the effects will be almost instantaneous. With the light of the ordinary gas, a picture of a plaster bust may be obtained in three or four minutes.

"I remain, sir, yours, etc.,

"JOHN F. GODDARD,

"Late lecturer on optics, etc., at the Royal Adelaide Gallery."

According to Mr. Sachse, Dr. P. B. Goddard was an assistant to the professor of chemistry in the University of Pennsylvania, and, being much interested in the results obtained by Saxton and Cornelius, he entered into communication with the latter, had a set of apparatus made up, and entered into a series of chemical experiments, in which it is said he was assisted by the celebrated chemist, Prof. Robert Hare. It is claimed for Goddard that he made the third Daguerreotype portrait. Cornelius having made the first two, and an account is given of the sitting. The exposure in the bright sunlight was about three minutes.

In the course of his experiments he discovered that bromine combined with the iodine would reduce the exposure from one-third to one-half within doors, while in the open air the exposure was almost instantaneous. He thus obtained a perfect specimen, which, as

we shall see, was not publicly exhibited till January, 1842, when he described his method before the American Philosophical Society.

There seems, therefore, to be little doubt that Dr. P. B. Goddard was the first to make use of bromine as an accelerator, as will be seen from the following extracts quoted by Mr. Sachse, and to be found in Volumes I, II and III of the *Proceedings of the American Philosophical Society*, in the British Museum, though he and Cornelius kept the discovery a close secret, and made large profits in portrait taking at \$5 a sitting.

In these volumes there are notices of Daguerreotypes produced by Cornelius being exhibited at meetings of the American Philosophical Society held on the 6th December, 1839, and on March 6, 1840 (*Proceedings A. P. S.*, Volume I, pages 155 and 181).

The first notice of Dr. Goddard's work, or use of bromine, is in Volume II of the proceedings of the same society, page 144, in the report of the meeting of January 21, 1842:

"Dr. Goddard showed some specimens of photographic portraits made by the diffused light of a room, and by a peculiar process in which dibromide of iodine is used. This process he described, and stated that he had ascertained only to-day that a similar method had been presented to the French Academy, which, however, was in some particulars inferior to his own."

No details of the method are given, and it will be noted that this apparently first publication of Dr. Goddard's use of bromide of iodine was more than thirteen months after John F. Goddard had made known his discovery here.

At page 150 of the same volume, in the report of the meeting for March 4, 1842, we find further mention of Dr. Goddard's work:

"Dr. Goddard presented specimens of Daguerreotypes on a surface of gilded silver, and stated that the surface of iodide of gold was more susceptible to the Daguerreotype action of light than that of the iodide of silver; that the surface of the plate might be polished without injury before the action of the iodine, and that the lights came out better than on the silver surface."

Again, in Volume III, No. 27, for May, 1843, page 180, we find that in the course of a discourse on Moser's experiments on invisible photographic rays, Dr. Goddard "alluded to the first employment of bromine in the photographic process, and exhibited the first Daguerreotype specimen produced by means of it. It was made in Philadelphia by himself and Mr. Cornelius in December, 1839."

Referring to this plate and Dr. Goddard's early experiments already noticed, Mr. Sachse says:

"This is the first record of the employment of bromine in the photographic process. It was during this series of experiments with bromine that Dr. Goddard succeeded in obtaining several good views and portraits instantaneously in the open air, which were the first instantaneous pictures made by any heliographic process in the world." He goes on to say: "The application and use of bromine as an accelerator was kept a close secret by Goddard and Cornelius for about two years. It was this use of bromine, together with Cornelius' superior skill in polishing his plates, which account for the great beauty of his early Daguerreotype miniatures."

The secret was divulged in the latter part of 1841 by one of Cornelius' assistants, who went to New York, and it was only then, in January, 1842, that Dr. Goddard described his method with dibromide of iodine, as mentioned above.

Further on Mr. Sachse says: "In English and Continental text books upon photography the claim for priority in the use of bromine as an accelerating agent is

usually accorded to one John Goddard, a London optician. That this is clearly an error is apparent from the above indisputable record. The honor for the first use of bromine as a sure and valuable accelerator, and the subsequent application to Daguerreotype and photography, without a shadow of doubt belongs to Dr. Paul Beck Goddard, of Philadelphia.”

This statement is, however, scarcely borne out by the facts stated above. Priority of publication is generally conceded to be the first title to any honor that may be due on account of a discovery, even if it be patented. John F. Goddard gave his discovery of the use of bromine freely to the world, and, though it was immediately followed by other similar improvements made by Claudet, Fizeau, Gaudin and others, the discovery is universally recognized as Goddard’s, even by Claudet himself, while Dr. Paul Beck Goddard, who, as there seems to be little doubt, really was the original discoverer, preferred profit to honor, and has remained in absolute oblivion till rescued by Mr. Sachse.

Nevertheless, it is certainly a very remarkable coincidence that two men of the same name in quite different parts of the world should have hit upon the same discovery quite independently, and within a few months of each other.

As regards Mr. Sachse’s claim on behalf of Dr. Goddard to have produced the first daguerreotype portraits instantaneously, it may be noted that Dr. J. W. Draper, who had been engaged in photo-chemical researches for many years before Daguerre’s process was brought out, and was certainly one of the first to experiment with it very soon after the details reached America, and is, moreover, also credited with the first application of Daguerreotype to portraits, has distinctly stated that his first portraits were taken in 1839, and with exposures of twenty to ninety seconds with iodized plates (*Scientific Memoirs*, page 215, or *Philosophical Magazine*, September, 1840). That he had attained some skill in the art early in 1840 is shown by the following extract from the *Philosophical Magazine*, June, 1840, page 535:

“Professor Draper, of the University of New York, informs us in a note, dated March 31st, that he has succeeded during the winter in procuring portraits by the daguerreotype, and that they have all the beauty and softness of the most finished mezzotint engraving, and only require from twenty to forty-five seconds for execution.” There is no mention of bromine being used in conjunction with iodine in any of Professor Draper’s papers on daguerreotype.

It may be noted, too, that Robert Hunt, in the first edition of his “Treatise on Photography,” published in 1841, gives Draper the credit of the first application of daguerreotype to portraits, and the process was published in the *Philosophical Magazine* for September, 1840. Here, again, it is evident that the man who published his process has reaped the credit, which seems in any case fully due to him, because Draper’s work must, as stated above, have been very closely contemporaneous with that of Cornelius and Goddard.

Sir John Herschel was one of the first to work with silver bromide and to recognize its greater sensitiveness to the less refrangible rays of the spectrum (*Philosophical Transactions Royal Society*, February, 1840).

So far, we have not been able to trace other records of the early days of daguerreotype in England, but in any case these must be reserved for a future paper.

**[End of text.]**

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### EDITOR'S NOTES:

This article is in response to the text by Julius F. Sachse, "Early Daguerreotype Days," which appears in eight parts in *American Journal of Photography* (Philadelphia) vol. 13, 1892 and vol. 14, 1893. (Sachse is the editor of the publication.) The claims for Philadelphia priority are also summarized in Julius F. Sachse, "Philadelphia's Share in the Development of Photography," *Journal of the Franklin Institute of the State of Pennsylvania, for the Promotion of the Mechanical Arts* (Philadelphia) 135:4 (April 1893): 271–87.<sup>1</sup>

Other writings by Waterhouse regarding the daguerreotype are J. Waterhouse, "Teachings of Daguerreotype," *Wilson's Photographic Magazine* (New York) 37:517 (January 1900): 34–41; 37:518 (February 1900): 80–88; Major-General Waterhouse, "Past Process Work at R. P. S—Daguerreotype in Process Work," *Process Photogram and Illustrator* No.76 (April 1900): 52–53. (The latter title is imaged in Google Books with *Photogram* [London]: <http://books.google.com/books?id=KlwXAAAAYAAJ>.)

See also John F. Goddard, "Valuable Improvement in Daguerreotype," *Literary Gazette; and Journal of the Belles Lettres, Arts, Sciences, &c.* (London) No. 1247 (12 December 1840): 803;<sup>2</sup> Jabez Hughes, "The Discoverer of the Use of Bromine in Photography: a few facts and an Appeal," *British Journal of Photography* (London) (15 December 1863): 487–8.<sup>3</sup>

1. [http://www.daguerreotypearchive.org/texts/P8930001\\_SACHSE\\_JFI\\_1893-04.pdf](http://www.daguerreotypearchive.org/texts/P8930001_SACHSE_JFI_1893-04.pdf)

2. [http://www.daguerreotypearchive.org/texts/P8400004\\_GODDARD\\_LIT\\_GAZETTE\\_1840-12-12.pdf](http://www.daguerreotypearchive.org/texts/P8400004_GODDARD_LIT_GAZETTE_1840-12-12.pdf)

3. [http://www.daguerreotypearchive.org/texts/P8630001\\_HUGHES\\_BRIT\\_JOURN\\_PHOTOG\\_1863-12-15.pdf](http://www.daguerreotypearchive.org/texts/P8630001_HUGHES_BRIT_JOURN_PHOTOG_1863-12-15.pdf)

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