“Photography: its Origin, Progress, and its Present State,” November, December 1852

(keywords: Louis Jacques Mandé Daguerre, William Henry Fox Talbot, (Carl) Karl Wilhelm Scheele, Thomas Wedgwood, Humphrey Davy, Joseph Nicéphore Niépce, M. Isidore Niepce, Miles Berry, Robert Hunt, John Herschel, John William Draper, John T. Towson, John F. Goddard, Antoine François Jean Claudet, Claude Félix Abel Niepce de Saint-Victor, Ross and Thompson, Gustave Le Gray, Louis-Désiré Blanquart-Évrard, Armand Hippolyte Louis Fizeau, Edmond Becquerel, history of the daguerreotype, history of photography.)

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PHOTOGRAPHY—ITS ORIGIN, PROGRESS, AND ITS PRESENT STATE

THE importance of Photography, whether we consider it simply in its relation to art, or as an aid to those investigations which promise to advance our knowledge of those radiant forces which perform most important offices in regulating the physical constitution of organic matter, is so great, that we feel some historical notices of its progress cannot be otherwise than interesting to our readers.

The slow advancement of abstract truth is exemplified in a very remarkable manner in the department of science which is devoted to the consideration of the physical phenomena of the sunbeam. It is tolerably certain that in the sixteenth century the darkening of horn silver (*fused chlorid of silver*) was observed by the alchemists; but it was not until the eighteenth century that any examination of the phenomenon was made. Even then the influence of light on the crystallization of salts first attracted attention, and memoirs on this subject were published by Petit in 1722, by Chaptal in 1788, and by Dizé in 1789.

In 1777, Scheele, the celebrated chemist of Sweden, writes:—“Fix a glass prism at the window, and let the refracted sunbeams fall on the floor. In the colored light put a paper strewed with *luna cornua*, and you will observe that this horn silver grows sooner black in the violet ray than in any of the other rays.” Senebier, in 1790, ascertained that this white salt of silver darkened in the violet ray in fifteen seconds to a shade which required the action of the red ray for twenty minutes. In 1801, Ritter, of Jena, demonstrated the existence of rays beyond the spectrum, having no illuminating power, but possessing active chemical properties. A similar set of researches were undertaken by Dr. Wollaston about the same time, which also proved the remarkable differences existing between the differently colored rays.

These researches led the way to the experiments of Wedgwood, the celebrated porcelain manufacturer of Etruria, in Staffordshire, which, beyond all dispute, must establish him as the first photographic artist. From the journal of the Royal Institution of 1803 we copy the title of Mr. Wedgwood’s memoir, and a few of his remarks, with the notes of Sir Humphrey Davy:—

“An account of a Method of Copying Paintings upon Glass, and of making Profiles by the Agency of Light upon Nitrate of Silver; with Observations by Humphrey Davy.” A solution of nitrate of silver spread on white paper or white leather was the photographic material employed ; and he remarks:—“The alterations of colors take place more speedily in proportion as the light is more intense. In the direct rays of the sun, two or three minutes are sufficient to produce the full effect; in the shade several hours are required; and light transmitted through different colored glasses, acts upon it with different degrees of intensity. When the shadow of any figure is thrown upon the prepared surface, the part concealed by it remains white, and the other parts speedily become dark. For copying paintings on glass, the solution should be applied on leather; and in this case it is more readily acted on than when paper is used. After the color has been once fixed on leather or paper, it cannot be removed by the application of water, or water and soap, *and it is in a high degree permanent*. Besides the applications of this method of copying that have just been mentioned, there are many others; and it will be useful for making delineations of all such objects as are possessed of a texture partly opaque and partly transparent. The woody fibre of leaves, and the wings of insects, may be pretty accurately represented by means of it; and in this case it is only necessary to cause the direct solar light to pass through them, and to receive the shadows upon prepared leather.” Sir Humphrey Davy adds, “*The images formed by means of a camera obscura* have been found to be too faint to produce in any moderate time an effect upon the nitrate of silver. *To copy these images was the first object of Mr. Wedgwood in his researches on this subject.* In following these processes I have found that the images of small objects produced by means of the solar microscope may be copied without difficulty on prepared paper. In comparing the effects produced by light upon muriate of silver with those produced upon nitrate, it seemed evident that the muriate was the most susceptible. Nothing but a method of preventing the unshaded parts of the delineation from being colored by exposure to the day is wanting to render this process as useful as it is elegant.”

No further investigation of the subject appears to have been made for many years. The failure on the part of Wedgwood and Davy was due entirely to the want of these chemical agents, which were afterward employed as the fixing materials. Hyposulphate of soda was not discovered by Sir John Herschel until 1819, when he at once detected and described the habitudes of the salts of silver in connection with hyposulphuric acid. Iodine was not known before 1812, when it was discovered by Courtois, a manufacturer of saltpetre at Paris; and bromine was a yet later discovery, by M. Balard, of Montpelier. Without these agents photography could not have advanced beyond the point at which Wedgwood and Davy left it.

In 1814 M. Niepce, of Chalons, on the Saône, turned his attention to the chemical agency of light, his object being “to fix the images of the camera obscura;” and he discovered the peculiar property of solar radiations in altering the solubility of several resinous substances. By spreading bitumen on a glass or metal plate, and placing this in the camera obscura, Niepce found that in five or six hours a *dormant image was impressed on the plate*, which was rendered evident by placing the prepared material in any solvent of the bitumen or resin employed. This development of a dormant image has been patented as though it were a new discovery of Mr. Fox Talbot, whereas it was known exactly twenty years before he commenced an experiment on the subject. Niepce resided at Kew in 1827; and still pursuing the subject, he produced many of these pictures, some of which are still in the possession of his friends in this country. They possess much of the air of daguerréotypes, but are necessarily imperfect as pictures when compared with the photographs which we are now producing. In 1821, Daguerre commenced his researches, employing, as Wedgwood had, the nitrate and chlorid of silver. In 1826, Niepce and Daguerre became acquainted, and they pursued their inquiries together; and in 1829, Niepce communicated his processes to Daguerre, from which communication we must make a few extracts of great importance in the history of photography:—

"The discovery which I have made, and to which I give the name of *Heliography*, consists in producing spontaneously, by the action of light, with gradations of tints from black to white, the images received by the camera obscura." He then describes his process, and says:—"The plate thus prepared may be immediately submitted to the action of the luminous fluid in the focus of the camera. But even after having been thus exposed a length of time sufficient for receiving the impression of external objects, nothing is apparent to show that these impressions exist. *The forms of the future picture remain still invisible*. *The next operation, then, is to disengage the shrouded imagery*, and this is accomplished by a solvent."

In 1829, *iodine* was first employed by Niepce and Daguerre to "black the resinous plates on which the heliographic pictures were obtained." Daguerre appears, however, to have noticed some peculiarity in the action of the light on silver plates, as Niepce, in a letter to him, speaks of "a decoction of thlapsi (shepherd's purse), fumes of phosphorus, and particularly of sulphur, as acting on silver in the same way as *iodine*, and that caloric produced the same effect by oxydizing the metal, *for from this cause proceeded in all these instances this extreme sensibility to light.*''

Niepce died in 1833; and in January, 1839, Daguerre's great discovery was announced, and specimens were shown to the *élite* of Paris. In July following, a bill passed the Chamber of Deputies securing to M. Daguerre a pension for life of 6,000 francs, and to M. Isidore Niepce, the son of the originator of Heliography, a pension of 4,000 francs, as the purchase price of the secret of the process of Daguerréotype—*for the glory of endowing the world of science and of art with one of the most surpassing discoveries that honor their native land*." "This discovery France has adopted; from the first moment she has cherished a pride in liberally bestowing it—*a gift to the whole world*." Such was the language of M. Arago, and we find M. Duchâtel saying, "*the invention does not admit of being secured by patent, for as soon as published all might avail themselves of its advantages*." Notwithstanding these assertions, made no doubt with the utmost honesty, by these distinguished Frenchmen, we find M. Daguerre trafficking in the English patent market; and on the 15th of July, 1839, Mr. Miles Berry patents for "*a certain foreigner residing in France*," this process which her Minister declares cannot be patented.

The Daguerréotype patent has nearly expired, and, from the circumstance that some points of legality remain undecided, it may already be regarded as having run its period.

On the 31st of January, 1839, Mr. Fox Talbot published "Some account of the Art of Photogenic Drawing;" and on the 21st of February, 1839, he gave the mode of preparing the paper employed. This included a mode of covering paper with chlorid of silver, which he rendered, by repeated washings, sufficiently sensitive for the camera obscura. There we have the same agent used as Davy recommended to Wedgwood, and employed himself, there being scarcely any difference in the manipulation recommended. Mr. Talbot advised the fixing of these pictures by a solution of common salt; but this was of the most imperfect kind—the pictures turning blue in the white parts after the slightest exposure.

The next publication in order of date, of any novelty, was that of Sir John Herschel to the Royal Society, 14th of March, 1839, which was followed by his admirable memoir on the "Chemical Action of the Rays of the Solar Spectrum," &c., read 20th February, 1840. In the first of these, Sir John Herschel recommends the use of the *hyposulphate of soda* as a fixing agent; and, in the second, he advises its being used *hot* for iodid of silver, as being less soluble in it than the chlorid. Sir John Herschel also introduced the use of the hydriodate of potash for the purpose of converting the dark oxyd into iodid of silver; and what is still more to the purpose, published the peculiarities of "*iodized paper*." We quote his words:—"The preparation of this paper (with hydriodate of potash and nitrate of silver) is very variable in its results, according to the strength of the solutions used. If strong solutions of the hydriodate be used, it is nearly or quite insensible; if weak, the reverse."

At the meeting of the British Association at Plymouth, in July, 1841, Mr. Robert Hunt made a communication "On the influence of the Ferrocyanate of Potash on the Iodid of Silver, producing a highly sensitive photographic preparation," in which he gave particular directions for the preparation of *iodized paper*, as follows:—"Highly glazed letter-paper is washed over with a solution of one drachm of nitrate of silver to an ounce of distilled water; it is quickly dried, and a second time washed with the same solution. It is then, when dry, placed for a minute in a solution of two drachms of the hydriodate of potash in six ounces of water, placed on a smooth board, gently washed, by allowing some water to flow over it, and dried in the dark, at common temperatures."

Iodized paper was also employed by Mr, Ryan, Lassaigne, and others, from which it appears quite certain that any dealer in photographic materials may make and sell any of the iodized papers prepared as published by Sir John Herschel, Mr. R. Hunt, or others, previously to the date of the Calotype patent.

In Sir John Herschel's paper, already referred to, we find particular mention of the use of gallic acid as an exciting agent; but this able experimentalist says that he failed "*of any marked success in this line, with the somewhat problematical exception of gallic acid and its compounds*."

(To be concluded in our next.)

[Conclusion of article in 1:6 (December 1852): 510–12.]

PHOTOGRAPHY—ITS ORIGIN, PROGRESS, AND ITS PRESENT STATE

[*Concluded from the November Number.*]

THE production of positive pictures by the first operation in the camera, was the next subject which claimed attention. A darkened photographic paper was washed with a hydriodic salt, and placed in the camera; here it was bleached by the solar radiations, and the image produced had the lights and shadows correct as in nature. Dr. Fyfe and Mr. Robert Hunt were the most successful operators. The latter gentleman published some papers in the "Philosophical Magazine," in September and October, 1840, on "the use of the Hydriodic salts as photographic agents." This variety of picture, and papers prepared for obtaining them, were sold by Messrs. Ackermann and Co.; and Sir John Herschel says, in the memoir already quoted, "a positive paper of this nature is actually prepared for sale by Mr. Robert Hunt, of Devonport." Such is the evidence which our researches enable us to give relative to the use of iodized paper, before the date of the Calotype patent under which the extensive privilege of employing "iodized paper" paper was claimed. This Calotype patent is dated 1841, and involves the use of *iodized paper*, of gallic acid, acetic acid, and particularly *the development of a dormant image*. That we are indebted to Mr. Fox Talbot for the Calotype no one will deny; and that gentleman has now given his process to his countrymen as a free gift, which will be received with all due honor. The discovery appears to have been one of those which the world are fond of classing, much too commonly, under the term of accidental discoveries. We are not ourselves believers in accidents in science, since the mind of the observer must be previously prepared to receive and improve the fact observed, and this necessarily removes it from the condition of accident.

Mr. Talbot was engaged in a series of experiments with various chemical compounds, his object being to increase the sensibility of his preparations, and among others gallic acid was employed. Some papers upon which no impression was visible were thrown aside, and on these there were afterward discovered well-defined images which had developed spontaneously in the dark. Investigation now established the important use of the gallic acid, and the manipulatory details of the Calotype process undoubtedly were the invention of Mr. Talbot. When the early examples of these pictures were circulated among the scientific men of this country and of the continent, they created no small sensation, although the pictures then produced were exceedingly inferior to those now obtained. Mr. Fox Talbot had an undoubted right to patent his invention, and appropriate to himself all the profits which might arise from any commercial transactions, either by himself or his licenses. The questionable character of this patent, as of the Daguerréotype patent, consisted, as it appears to us, mainly in its imperfect nature. Mr. Fox Talbot still reserves his right, as far as taking portraits for sale is concerned; but this can affect the public little, as the Daguerréotype and Collodion portraits are far superior to those produced by the patent processes. As specified, it is not easy to use the Calotype for portraiture, or, indeed, for any purpose requiring much rapidity of action; and it was not until the process was fully developed by Mr. Cundell, in a paper published in the "Philosophical Magazine" for May, 1844, that much progress was made in this direction. In the same way, when Daguerre gave up his process to the French Government, it required a period of twenty minutes to produce a picture. In 1839, Mr. Towson published his views, and suggested the use of large lenses, and the adjustment required to bring the sensitive surface into the chemical, as distinguished from the luminous focus; and Dr. Draper, of New-York, in 1840, by adopting these suggestions, obtained the first Daguerréotype portrait. In this year a vastly increased sensitiveness was obtained on the Daguerréotype plate by the discovery of Mr. Goddard, and of M. Claudet, that the iodine vapor, combined with bromine or chlorine, offered a chemical surface of the most unstable character, which was consequently disturbed by the slightest influence of the sunbeam. Thus, in both instances, the processes remained unprofitable as they came from the inventors. Eventually, by the scientific investigation of others, they are improved. The utmost obstruction was given to the progress of the art by the patents, since few parties were disposed to waste time in investigations from which they could reap no advantages themselves, and from which the public would derive no benefit. In 1844, at the York meeting of the British Association, Mr. R. Hunt published the use of sulphate of iron as a developing agent—now so commonly employed—and Dr. Woods, of Parsonstown, communicated his process called the "Catalysotype," in which the iodid of iron is an active ingredient. At that meeting the merits of these processes were fully discussed, Mr. Talbot being present, and acknowledging their importance.

The next step in the way of improvement was the use of albumen upon glass plates. M. Niepce de Saint Victor published his mode of applying this organic body to glass, in the "Technologist," in 1848. The most successful operators with this material in this country are Messrs. Ross and Thompson, of Edinburgh, in whose views of that picturesque city we see realized the production of fine middle distances and those half-tones which it is so unusual to meet with in ordinary Photographs. An attempt was made to patent the use of glass in this country, but that was defeated by a well-devised application for a counter patent. Glass plates were first employed by Sir John Herschel, in 1840. He precipitated chlorid, iodid, and bromid of silver on the glass, and obtained very well-defined images, and he then described the conversion of *negative* into *positive* pictures, which has not long since become the subject of a patent. Sir John Herschel's words are: "Exposed in this state to the focus of a camera, with the glass toward the incident light, it became impressed with a remarkably well-defined negative picture, which was direct or reversed, according as looked at from the front or back. On pouring over this cautiously, by means of a pipette, a solution of hyposulphite of soda, the picture disappeared, but this was only while wet; for, on washing in pure water, and drying, it was restored, and assumed much the air of a Daguerréotype when laid on a black ground, and still more so when smoked at the back, the silvered portions reflecting most light, *so that its character had, in fact, changed from negative to positive*."

We need not detail the peculiarities of the more recent patents of Mr. Fox Talbot : porcelain plates form the subject of one of them, but these we believe have never been employed ; and the difficulties of their manufacture are so great that there is little probability of their ever being useful to the photographer. In the last patent we have a combination of the sulphate of iron and iodid of iron, producing a very decidedly instantaneous action. In a letter from Mr. Fox Talbot, published in the *Athenaeum* of December 6th, 1851, we read:—"In the process which I have now described, I trust that I have effected a harmonious combination of several previously ascertained and valuable facts, especially of the photographic property of iodid of iron, which was discovered by Dr. Woods, of Parsonstown, in Ireland, and that of sulphate of iron, for which science is indebted to the researches of Mr. Robert Hunt. In the true adjustment of the proportions, and in the mode of operation, lies the difficulty of the investigations." Mr. Talbot concludes his communication:—"I venture to recommend it (this process) to the notice of your scientific readers." Here we have Mr. Fox Talbot's own acknowledgment that he is indebted to two experimentalists for his process; he admits that the only thing he has done is to adjust the proportions. In this way a most serious check has been given to investigations of the greatest value. Sir John Herschel stopped in the midst of a series of the most valuable researches on the chemistry of the sunbeam; and Dr. Woods abandoned his promising inquiry, after some angry letters between him and Mr. Talbot in one of the Irish scientific journals. We have now disposed of the processes which are in any way connected with the English patents, of which we hope to hear no more. Mr. Talbot has resigned the rights which the patent laws of this country allowed him to assume. Several of these patents would never have been granted had there been a scientific board to examine the merits of them, and test their originality. For a long time several gentlemen have been endeavoring to make terms with Mr. Talbot, and it is through their exertion that the patentee has been at length induced to make a reluctant surrender of his patents. They failed as a commercial speculation, as might have been expected they would do.

Mr. Talbot made a great mistake; but now he has done his utmost to redeem that error by handing over to the public all his patents as a free gift. We hope the portraits will soon follow, and that the Talbotype, as the Calotype process should now be called, will, in its freedom, advance to its highest pitch of excellence in this country. The use of waxed paper by M. Le Gray, involved no new process, although we believe waxed paper may be used for several processes beside the Calotype. M. Le Gray has published a work on his modes of manipulation. M. Blanquart Everard has published several papers in which we have that perpetration of injustice which no feeling of nationality can justify. If the Frenchmen refer to the works of Mr. Robert Hunt or any of the smaller manuals which have been published in this country, they will find the utmost credit given to them for their labors. We believe no modification which has been devised by the photographers of the Continent is mentioned without the name of the inventor or improver. Now M. Le Gray never mentions an English name in his books, and M. Blanquart Everard coolly appropriates Mr. Talbot's processes, and accepts the honors of the Academy as the reward for his audacity. We have no desire to return evil; we therefore acknowledge that, after Daguerre, Fizeau, Becquerel, Niepce de St. Victor, Le Gray, and Everard have been most successful investigators of Photographic phenomena. On the Continent, every improvement has its full value, is very readily appreciated, and it is soon in the hands of the most skillful manipulators. The consequence is that Photography puts on an entirely different feature in Paris from what it does in London. In London, the trade being centered, up to this time, in the hands of three licensees, who are under obligations of the most stringent kind, we are required to pay as many pounds for a picture as it costs shillings on the Continent. Wedgwood was the undoubted originator of Photography; and in this country, next in time, and the first in merit, as the originator of a most highly beautiful process, is Mr. Henry Fox Talbot.

The art of Photography has not, however, yet attained that point of excellence to which it must soon arrive.

With the advantages of the stereoscope, what may we not expect to see realized? Every scene hallowed to our memories by its associations with human progress, in all its varied phases, may be revived before our eyes in all the truthfulness of nature. From the East we may copy the temples and the tombs which tell the story of a strange but poetic creed. Assyria and Egypt may disclose their treasures to those who cannot travel to survey them, in such a form that all doubt of authenticity must vanish. The harmonious elegance of the remains of Greece, and examples of Roman art, may thus be easily collected and preserved; and every time-honored fane of Europe may be brought home and made to minister to our pleasures—instructing and refining our tastes, and teaching all the mysteries of the beautiful, behind which, as under the shelter of a zephyr-woven vail, we may survey all that is good, and gaze upon the outshadowing of the Divine.

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EDITOR'S NOTES:

This article, by an unnamed author, certainly appeared in British press. The editor welcomes information regarding the author and the original publication of this text.

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