CLASSIC ESSAYS ON PHOTOGRAPHY

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Leete's Island Books New Haven, Conn.

Library of Congress Catalogue Card Number: 78-61844
ISBN: 0-918172-07-1 (cloth); 0-918172-08-X (paper)
Published by Leete's Island Books, Box 1, Sedgwick, ME 04676
Manufactured in the United States of America
Designed by Susan McCrillis Kelsey
Fifth Printing
ISBN 13: 9780918172082
ISBN 10: 091817208X
Prices: US $18.95 / CDN $20.95

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When Niepce died in 1833, his son Isidore took his place in the cooperative efforts with Daguerre. By 1837, Daguerre had modified and perfected Niepce's process enough to produce a highly detailed, positive picture of a corner of his studio. He considered the technique his own invention and labeled his pictures daguerreotypes. Isidore reduced his own portion of the partnership. Daguerre demonstrated the daguerreotype process to the director of the Paris Observatory, the scientist Dominique François Arago. Excited by what he saw, Arago lectured on the technique to the Academy of Sciences on 7 January 1839, recommending that further investigations be carried out. A few months later, the Chamber of Deputies and the Chamber of Peers heard reports by Arago and Joseph Louis Gay-Lussac in support of a bill proposing that the government buy the daguerreotype process. Daguerre was granted 6,000 francs per annum, and Isidore Niepce, 4,000, for a complete history and description of the invention, as well as an outline of the workings of Daguerre's diorama.

Public excitement ran high as Parisians examined the daguerreotypes on display at the Chamber of Deputies. On 19 August 1839, Arago described the technical details of the process to an open meeting of the Academy of Sciences and the Academy of Fine Arts, and in September Daguerre demonstrated the procedure to an eager audience. He polished and cleaned the silver-coated side of a copper plate, which he then coated with iodine to form a layer of iodide of silver. The plate was placed in a camera obscura before the window and exposed to the Tuileries, the Quay, and the Seine. After fifteen minutes, the blank plate was removed, and hot mercury globules were fumed over the surface. It was next washed with distilled water or hyposulphite of soda, and a clear, minutely detailed picture of the scene appeared.

Daguerreotypes immediately became popular, though two major problems were pointed out from the start: the mirrorlike surface of the daguerreotype distracted the viewer, and multiple prints could not be struck directly from a single image. Reproductions could be produced only by taking individual daguerreotypes of the original. Though, initially, exposure times were too long to make portraiture practicable, this hindrance was soon removed by frenzied daguerreotypists experimenting in Europe and America. Only in England, where Daguerre had taken out a patent on his invention, did the production of daguerreotypes have a slow start. Until the late 1850s, when the ambrotype did away with the annoying glare of the surface and the paper print solved the problem of reproduction, millions of daguerreotypes were created all over the Western world.

Memoire on the Heliograph

Joseph Nicéphore Niepce

The invention which I made and to which I gave the name "heliography" consists in the automatic reproduction, by the action of light, with their gradations of tones from black to white, of the images obtained in the camera obscura.

Basic Conception of This Invention

Light in the state of combination or decomposition reacts chemically on various substances. It is absorbed by them, combines with them, and imparts to them new properties. It augments the natural density of some substances, it even solidifies them and renders them more or less insoluble, according to the duration or intensity of its action. This is, in a few words, the basis of the invention.

First Substance: Preparation

The first substance which I use, the one which makes my process most successful and which contributes more directly to the production of the effect, is asphaltum, or the so-called bitumin (pitch) of Judea, which is prepared in the following manner.

I fill half a glass with this pulverized pitch and then pour, drop by drop, lavender oil on it until the pitch will absorb no more and is entirely saturated with it. Then I pour more of this essential oil on it until it stands three "lignes" above the mixture, which is then covered and set in a place of moderate temperature until the oil is saturated by the coloring matter of the pitch. If this varnish is not of the proper consistency, it is allowed to evaporate in a dish, protecting it against moisture which would modify and finally disintegrate it. This unfortunate result is particularly to be guarded against in the camera during the cold damp season.

If a highly polished metal plate plated with silver is coated with a small amount of this cold varnish, using a very soft leather ball, it gives the plate a beautiful red color and spreads over it in a very thin uniform coating. Then the plate is placed on a hot table which is covered over with several layers of paper, from which the moisture previously has been removed, and when the varnish is no longer tacky, the plate is withdrawn to allow it to cool

and permit it to dry completely in a moderate temperature, protected from the influence of the moisture in the air. I must not forget to mention that this precaution is indispensable principally when the varnish is applied. In this case, however, a thin disk is sufficient, in the center of which a short peg is fixed, which is held in the mouth to keep away the moisture of the breath and condense it.

A plate prepared in this manner may be exposed immediately to the action of light; but even after prolonged exposure nothing indicates that an image really exists because the impression remains imperceptible.

It is therefore a question of developing the picture, and this can only be accomplished by the aid of a solvent.

Preparation of the Developer

Since the developer must be regulated according to the result that is to be obtained, it is difficult to determine the proportions of its composition with exactness; but all things being equal, it is desirable that it be a little weak rather than too strong; that which I prefer consists of one part lavender oil and six parts of white mineral oil or petroleum. The mixture, which at first is quite milky, becomes perfectly clear after two or three days. It can be used several times in succession, losing its solvent property only when it approaches the saturation point, which is indicated by the liquid's becoming turbid and dark in color; but it may be distilled and made as good as before.

When the plate or varnished tablet is taken out of the camera, it is placed in a white metal dish an inch deep, and longer and wider than the plate, and a plentiful quantity of this developer is poured in it, covering the plate entirely. When the plate is observed under an oblique light at a certain angle, the image can be seen to make its appearance, slowly and gradually developing, although still darkened by the oil which, saturated more or less with varnish, flows over it. The plate is then taken from the liquid and placed in a perpendicular position, in order that it may be entirely drained of all developer, after which we proceed to the last operation, which is no less important.

Washing the Plate

A very simple arrangement is required, consisting of a board

four feet long and a little wider than the plate. Two strips are nailed on lengthwise, which form a border two inches high. On top is a hinged handle which makes it possible to move the board up and down in order to give the water which is poured on it the required speed. At the bottom is a vessel which receives the liquid flowing off.

The plate is placed on the inclined board and is kept from sliding off by two small nails or hooks, which, however, must not protrude above the face of the plate. At this time of the year (winter) it must be remembered to use lukewarm water. The water is not to be poured upon the plate itself, but on the board, somewhat above the plate in order to obtain a fall sufficient to carry away the last of the oil adhering to the varnish.

The picture is now fully developed and appears perfectly and completely defined if the operation has been successful, especially if one has a perfect camera obscura at one's service.

Uses of the Heliographic Process

Since the varnish can be used with equal success on stone, metal, and glass without necessitating any change of procedure, I shall confine myself to the method of application to silvered plates and glass, calling attention once for all to the fact that in printing on copper a little wax, dissolved in lavender oil, may be added to the varnish mixture without damage.

Until now silvered plates seem to me best suited for the production of pictures, owing to their white color and their nature. It is certain that after washing, assuming that the image is quite dry, the result is satisfactory. It would be desirable, however, to obtain all gradations of tone from black to white by blackening the plate. I therefore occupied myself with this subject, using at first a solution of potassium sulphide (sulfure de potasse); but if a concentrated solution is used it attacks the varnish, and if diluted with water it turns the metal red. This twofold defect compelled me to give up this medium. The substance which I am now using with greater expectation of success is iodine, which has the property of evaporating at ordinary temperatures. In order to blacken the plate by this method, it is only necessary to place the plate against the inner side of a box that is open at the top and to put a few grains of iodine into a groove cut into the opposite side on the bottom of the box.

It is then covered with a glass, in order to observe the result, which, although it shows less rapidly, is all the more certain in its effect. The varnish can then be removed by alcohol, and not a trace will remain of the original impression. Since this process is still quite new for me, I confine myself to this simple description until experience has allowed me to collect more precise details.

Two experiments showing views on glass exposed in the camera obscura have furnished me with results which, although still faulty, seem to me quite remarkable, because this mode of application can be more easily perfected and therefore may become of special interest.

In one of these experiments the light, which had acted with less intensity, had dissolved the varnish in such a manner that the gradations of tones showed more clearly when viewed by "transmission" (i.e., transmitted light), so that the picture reproduced, up to a certain point, the well-known effects of the diorama.

In the other experiment, however, where the action of the light was more intense, the lightest parts, which were not affected by the developer, remained transparent and the gradations of the tones depended entirely and solely on the density of the more or less dark layers of the varnish. If the image is viewed on its varnished side by reflection in a mirror, and held at a certain angle, the effect is greatly enhanced, while if viewed by transmitted light, it appears confused and colorless, and, what is still more remarkable, it seemed to differentiate the separate tones of certain objects. When I considered this curious phenomenon, I believed that I might draw certain conclusions from it, which permitted a connection with Newton's theory of colored rings. It would be sufficient to assume that any prismatic ray, the green for instance, in acting on the substance of the varnish and combining with it, gave it the necessary degree of solubility, so that after the double operation of the developer and the rinsing, the layer which had formed by this method would reflect the green color. Whether this hypothesis is well founded is a matter for future investigation, but the subject seems to me of itself so interesting that it may well deserve further experiments and more exact proof.

Remarks

Although the application of the necessary media described

above undoubtedly offers no difficulty, it may happen (when the procedure is not carefully followed) that in the beginning the operation will not turn out well. I believe, therefore, that it is advisable to start in a small way by copying copper engravings in diffused light according to the following very simple method. Varnish the engraving only on the reverse side to make it thoroughly transparent. When the paper is completely dry, place it face down on the coated plate under a glass, the pressure being modified by inclining the plate at an angle of 45 degrees. By this method it is possible to make several experiments in the course of a day, using two engravings properly prepared and four small silvered plates. This can be done even in overcast weather, providing that the workroom is protected against cold and especially against moisture, which, I repeat, deteriorates the varnish to such an extent that it will float off in layers when the plate is immersed in the developer. It is for this reason that I ceased using the camera obscura during the inclement season. If the experiments which I have described are continued, one will soon be well able to carry out the details of the whole process.

In the matter of applying the varnish, I must call attention again to the fact that it can be used only in a consistency which is thick enough to form a compact yet thin coating, in order that it might resist better the action of the developer and become at the same time more sensitive to the action of light.

In respect to the use of iodine for blackening the images produced on silvered plates, as well as regarding the acid for etching the copper, it is essential that the varnish after washing be used exactly as described above in the second experiment on glass; because it becomes thus less permeable, both in acid and under the iodine vapors, particularly in those parts where it has retained full transparency, for only under these conditions can one hope, even with the best apparatus, to obtain a completely successful result.

Additions

When the varnished plate is removed for drying, it must be carefully protected not only from moisture but also from any exposure to light. In speaking of my experiments in diffused light, I have not mentioned any of these kinds of experiment on glass. I add this in order not to omit a specific improvement which relates to them. It consists simply in placing a piece of black paper

under the glass and in putting between the metal plate on its coated side and the copper engraving a border of cardboard on which the engraving has been tightly stretched and glued. This arrangement has the effect of making the image appear much more vivid than on a white background, which helps to accelerate the action, and, furthermore, of avoiding damaging the varnish by rubbing it against the copper engraving as in the other method, a mishap which is very hard to prevent in warm weather, even when the coating is quite dry. This disadvantage is counterbalanced, however, by the advantages offered by the experiments with silvered plates, which withstand the action of the washing better, while it is rare that the images on glass are not more or less damaged by this operation, for the simple reason that the varnish can adhere less easily to the glass, owing to its nature and its smooth surface. It would be necessary, therefore, in order to overcome this disadvantage, to improve the varnish by making it more sticky, and I believe that I have succeeded in doing this at least in so far as I may be permitted to pass judgment on this matter, although the experiments are still new and not numerous enough.

This new varnish is composed of a solution of bitumen of Judea in Dippel's animal oil, which is allowed to condense at the ordinary temperature of air to the degree of consistency required. This varnish is more greasy, tougher, and more strongly colored than the other, and it can be exposed to light as soon as the plate is coated, because it seems to solidify more rapidly, owing to the great volatility of the animal oil which causes it to dry more rapidly.

Daguerreotype

Louis Jacques Mandé Daguerre

The discovery which I announce to the public is one of the small number which, by their principles, their results, and the beneficial influence which they exert on the arts, are counted among the most useful and extraordinary inventions.

It consists in the spontaneous reproduction of the images of nature received in the camera obscura, not with their colours, but with very fine gradation of tones.

M. Nicéphore NIÉPCE, of Châlon(s)-sur-Saône, already known for his love of the arts and his numerous useful inventions, whom sudden death unexpectedly tore from his family and from science on 5 July 1833, had found after many years of research and persistent labour one principle of this important discovery; by numerous and infinitely varied experiments he had succeeded in obtaining the image of nature with the aid of an ordinary camera obscura; but his apparatus did not give the necessary sharpness, and the substances on which he operated were not sufficiently sensitive to light, so his work, however surprising in its results, was nevertheless very incomplete.

For my part, I was already occupied with similar researches. It was in these circumstances that relations were established between M. NIÉPCE and me in 1828 [*sic*], as a result of which we formed a partnership with the object of perfecting this discovery.

I brought to the partnership a camera obscura modified by me for this application which rendered a larger field of the image sharp and greatly influenced our later success. Some important modifications which I made to the process, combined with the continual researches of M. NIÉPCE, augured well, when death came to separate me from a man who besides vast and profound knowledge had all the qualities of the heart; may I be permitted here to pay a just tribute of esteem and regret to his memory, which will always be dear to me.

Upset by this loss, I abandoned my work for a while; but soon, pursuing it with renewed eagerness, I attained the goal which we had set ourselves.

This apparently happy result did not, however, render the effects of nature sufficiently correctly, because the operation lasted several hours.

In this state the discovery was extraordinary, but it would not have been of any utility.

I realized that the only way to succeed completely was to arrive at such rapidity that the impression could be produced in a few minutes, so that the shadows in nature should not have time to alter their position; and also that the manipulation should be simpler.

It is the solution of this principle that I announce today; this new process to which I have given my name, calling it DAGUERREOTYPE, and which differs entirely as regards rapidity, sharpness of the image, delicate gradation of the tones, and above all, the perfection of the details, is very superior to that invented by M. NIÉPCE, in spite of all the improvements which I made to it. The difference in its sensitivity to light as compared with M. Niépce's process is as 1 to 70, and compared with chloride of silver, it is as 1 to 120. In order to obtain a perfect image of nature only *three to thirty minutes at the most* are necessary, according to the season in which one operates and the degree of intensity of the light.

The imprint of nature would reproduce itself still more rapidly in countries where the light is more intense than in Paris, such as Spain, Italy, Africa, etc., etc.

By this process, without any idea of drawing, without any knowledge of chemistry and physics, it will be possible to take in a few minutes the most detailed views, the most picturesque scenery, for the manipulation is simple and does not demand any special knowledge, only care and a little practice is necessary in order to succeed perfectly.

Everyone, with the aid of the DAGUERREOTYPE, will make a view of his castle or country-house: people will form collections of all kinds, which will be the more precious because art cannot imitate their accuracy and perfection of detail; besides, they are unalterable by light. Even portraits will be made, though the unsteadiness of the model presents, it is true, some difficulties [which need to be overcome] in order to succeed completely.

This important discovery, capable of innumerable applications, will not only be of great interest to science, but it will also give a new impulse to the arts, and far from damaging those who practise them, it will prove a great boon to them. The leisured class will find it a most attractive occupation, and although the result is

obtained by chemical means, the little work it entails will greatly please ladies.

In conclusion, the DAGUERREOTYPE is not merely an instrument which serves to draw Nature; on the contrary it is a chemical and physical process which gives her the power to reproduce herself.

resumed again. The thing fell into entire oblivion for more than thirty years: and therefore, though the Daguerreotype was not so entirely new a conception as M. Daguerre and the French Institute imagined, and though my own labours had been still more directly anticipated by Wedgwood, yet the improvements were so great in all respects, that I think the year 1839 may fairly be considered as the real date of the birth of the Photographic Art, that is to say, its first public disclosure to the world.

The Daguerreotype

Edgar Allan Poe (1809–1849)

Unlike Charles Baudelaire, whose works he influenced, Edgar Allan Poe paid homage to the invention of photography as "the most important, and perhaps the most extraordinary triumph of modern science." In 1840, Poe published three articles on photography: the first, "The Daguerreotype," appeared in the January 15 issue of Alexander's Weekly Messenger *and the next two, on improvements in the Daguerreotype, in the April and May issues of* Burton's Gentleman's Magazine. *Both Poe and his contemporary Nathaniel Hawthorne understood photography to be an invention representative of the "miraculous" or even magical potential of the modern age. Poe, like many men of his day, delighted in what he considered the magical accuracy of the photographic image. His fascination with photographs was not based on the images' mechanical origins so much as on origins that appeared as magical. Many scientific inventions of the time seemed somewhat miraculous to the public-at-large, and Poe touted photography as representative of them all. He thought that the future results of most scientific inventions would "exceed . . . the wildest expectations of the most imaginative," and he proposed that this would be the rule for photography as well.*

This word is properly spelt Daguerréotype, and pronounced as if written Dagairraioteep. The inventor's name is Daguerre, but the French usage requires an accent on the second e, in the formation of the compound term.

The instrument itself must undoubtedly be regarded as the most important, and perhaps the most extraordinary triumph of modern science. We have not now space to touch upon the *history* of the invention, the earliest idea of which is derived from the camera obscura, and even the minute details of the process of photogeny (from Greek words signifying sun-painting) are too long for our present purpose. We may say in brief, however, that a plate of silver upon copper is prepared, presenting a surface for the action of the light, of the most delicate texture conceivable. A high polish being given this plate by means of a steatitic calcareous stone (called Daguerreolite) and containing equal parts of steatite and carbonate of lime, the fine

surface is then iodized by being placed over a vessel containing iodine, until the whole assumes a tint of pale yellow. The plate is then deposited in a camera obscura, and the lens of this instrument directed to the object which it is required to paint. The action of the light does the rest. The length of time requisite for the operation varies according to the hour of the day, and the state of the weather — the general period being from ten to thirty minutes — experience alone suggesting the proper moment of removal. When taken out, the plate does not at first appear to have received a definite impression — some short processes, however, develope it in the most miraculous beauty. All language must fall short of conveying any just idea of the truth, and this will not appear so wonderful when we reflect that the source of vision itself has been, in this instance, the designer. Perhaps, if we imagine the distinctness with which an object is reflected in a positively perfect mirror, we come as near the reality as by any other means. For, in truth, the Daguerreotyped plate is infinitely (we use the term advisedly) is *infinitely* more accurate in its representation than any painting by human hands. If we examine a work of ordinary art, by means of a powerful microscope, all traces of resemblance to nature will disappear — but the closest scrutiny of the photogenic drawing discloses only a more absolute truth, a more perfect identity of aspect with the thing represented. The variations of shade, and the gradations of both linear and aerial perspective are those of truth itself in the supremeness of its perfection.

The results of the invention cannot, even remotely, be seen — but all experience, in matters of philosophical discovery, teaches us that, in such discovery, it is the unforeseen upon which we must calculate most largely. It is a theorem almost demonstrated, that the consequences of any new scientific invention will, at the present day exceed, by very much, the wildest expectations of the most imaginative. Among the obvious advantages derivable from the Daguerreotype, we may mention that, by its aid, the height of inaccessible elevations may in many cases be immediately ascertained, since it will afford an absolute perspective of objects in such situations, and that the drawing of a correct lunar chart will be at once accomplished, since the rays of this luminary are found to be appreciated by the plate.

Photography

Lady Elizabeth Eastlake (1809–1893)

At the time of her marriage to the English neoclassical painter Sir Charles Eastlake in 1849, Lady Elizabeth Eastlake (née Rigby) had already embarked on a literary career of her own, writing on art and photography. During the early 1840s, she had worked for the publisher John Murray, in Edinburgh, at whose house she met the artist-photographer David Octavius Hill. Periodically over the next years, Hill and his partner, Robert Adamson, made portraits of her, one of which was probably the first calotype ever seen by Prince Albert, an avid enthusiast of photography. Lady Eastlake's contact with Hill and Adamson stimulated her life-long interest in photography.

Through her husband's active career as a member and then as president of the Royal Academy of Arts and his association with the National Gallery, Lady Eastlake continued to cultivate her interest in the visual arts. She translated the German art historian Gustav Waagen's Treasures of Art in Great Britain *(1854–1857) and edited the second series of his* Contributions. *Inspired by an intense reexposure to photography through Lord Eastlake's term as the first chairman of the London Photographic Society, from 1853–1855, Lady Eastlake published a long article on the association of photography and art in the* Quarterly Review *of March 1857, which is reprinted here. She was acutely aware of the interest in photography that had pervaded all classes of European society since the invention of the daguerreotype, and she saw this interest in the new medium as a social leveler.*

Like many mid-nineteenth century writers on art, Lady Eastlake tried to formulate a definition for photography. She granted the photograph the position of the most truthful pictorial report of fact but denied it the status of fine art. At the time, many popular aestheticians demanded that art works be judged against some ideal visual experience of nature, and here, in Lady Eastlake's estimation, photographs failed to meet the standard. She considered photographs unquestionably accurate when taken of subjects at close range, but faulty in tonal relations when made of subjects at any distance from the camera. Reflecting another predominant belief of the day about art, Lady Eastlake stressed the necessity that some evidence of man's creative genius and sensitivity to nature appear in an artistic work. Because she believed photographs to be the products of a wholly mechanical process of picture-making,