Photography in a Nutshell.

M. P. Simons.

To My friend
M A Book
From the author
M.B.S.

IMPORTANT REMOVALS IN NEW YORK.

SCOVILL MANUFACTURING Co.,

HAVE REMOVED THEIR DEPOT FOR

PHOTOGRAPHIC MATERIALS,

FROM THEIR OLD STAND, TO

Park Building.

Entrance, No. 36 Park Row, No. 4 Beekman, and
No. 141 Nassau Streets.

HOLMES, BOOTH & HADENS,

Have also found that their old quarters are too limited for the increase of their business, and have removed to a more spacious establishment,

Nos. 81 Chambers, and 63 Reed Streets.

E. ANTHONY STILL,

HOLDS OUT AT THE OLD ESTABLISHED STAND,

No. 308 Broadway,

Where he is prepared, as usual, to fill all orders for

PHOTOGRAPHIC MATERIALS.

☞ Agent for Simons' Book, on "Coloring Photographs."

Photography.

Fig. 1

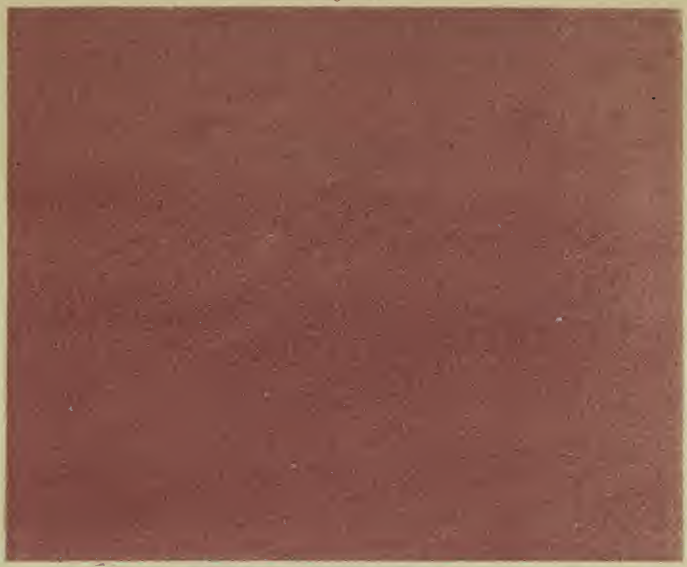

Fig. 2.

See Page 18

PHOTOGRAPHY

In a Nut Shell;

OR,

THE EXPERIENCE OF AN ARTIST

IN PHOTOGRAPHY,

ON PAPER, GLASS AND SILVER,

With Illustrations.

By M. P. SIMONS,

Author of "Plain Instructions for Coloring Photographs," &c.

PHILADELPHIA:

PRINTED BY KING & BAIRD, No. 607 SANSOM STREET.

1858.

TO THE

Memory of the Immortal

DAGUERRE,

TO WHOSE BRIGHT GENIUS AND GENEROUS HEART,

THE WORLD IS INDEBTED

FOR THE

BEAUTIFUL ART OF PHOTOGRAPHY.

This Little Manual,

IN BEHALF OF THE PHOTOGRAPHERS OF THE

UNITED STATES,

IS MOST RESPECTFULLY INSCRIBED

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PREFACE

ALTHOUGH so much has been written upon the subject of photography, it is not yet exhausted. Almost daily some curious development is made in this beautiful art, worthy to be set in LETTERS OF GOLD. No art or science has ever been favored with so much time and talent in its investigation and advancement, as photography; which is attributable solely to its rare fascinating nature. And yet it is but in its infancy—its manhood, who can anticipate? Who can foretell what will be its ultimate position among the arts and sciences; or what will be the full extent of its application and usefulness? The wonderful advancement it has made towards perfection surprises the most sanguine. Those who expected the most are the most astonished

at its present condition. How extensive and novel has been its application already! Old ocean has been compelled to disclose to photography its long hidden secrets. And the scholar is now enabled, by its magical aid, to decipher at home in his own studio the time-worn hieroglyphics upon the Egyptian monuments. Even the moon has been vain enough to sit for a full and three-quarter face likeness, lending to the scientific photographer its own silvery light for its accomplishment. Then who will say to this mysterious art, of the nineteenth century, "So far shalt thou go and no farther?" None but He who gave the waters their bounds and knows the cause and effect of all things.

GREEN HILL, *Philadelphia, November*, 1857.

INTRODUCTION.

It appears to be a common opinion, that the daguerreotype picture will eventually be superseded by the ambrotype. The writer wishes to be considered among the exceptions to this opinion. The delicacy, durability and wonderful minutiæ of the daguerreotype has never been approached by any of the *improved* pictures recently introduced. Photography on paper is, beyond all controversy, the highest state of the "Helographic Art," yet it does not—to use a mercantile expression—come in competition with the daguerreotype. Artistically speaking, the photograph bears the same relation to the daguerreotype that the oil portrait does to the water colored miniature. The advantages claimed for the ambrotype, sink into insignificance, when com

pared with the rare superiority of the daguerreotype. My opinion is that it will not be long before public taste will compel photographers to give their attention more particularly to daguerreotyping, and, I have, therefore, endeavored to give this neglected branch of photography, in the fullest and most comprehensible manner. There are other modes of operating, in all three branches of photography, besides those recommended in the following pages. But I have deemed it advisable to give but one process for each, being much better for the student to thoroughly understand one set of formulæ, than to have but a smattering idea of many. Those which I have ventured to explain, the result will show, are equal to any in use. In giving my views and experience upon the three most important branches of photography, it must not be expected that I should tread altogether an untrodden path; this I have no idea of attempting, but like an old traveller, I will endeavor to point out the best and shortest road to success. Brevity

and clearness should be the chief aim of all writers, when attempting to elucidate a subject so difficult to comprehend, and so full of detail as photography. This rule I have strictly observed, dwelling upon nothing but what is absolutely necessary that the student should perfectly understand. The "illustrations," "manipulations," and "contingencies explained," have been prepared and described with the greatest care, with the hope that they may prove beneficial to the student, amateur and professor, who have no fixed, or certain method of operating. It is not enough, that a process should be capable of producing the best effects, but it should do so, with the greatest certainty, and the least possible trouble. The public are now too well schooled in the art of photography, to be set up as heretofore, like *lay-figures* to be experimented upon.

THE DAGUERREOTYPE PROCESS.

THE DAGUEREOTYPE PROCESS.

CLEANING AND POLISHING THE PLATE.

This is the first important step in daguerreotyping, and although, seemingly, a very simple operation, it is one very difficult, in which, to become proficient, requiring considerable practice and skill. A bad picture may be made on a clean plate, but a good one cannot be made upon one that is dirty. Most failures are caused by imperfectly cleaned plates,—bear this in mind. For rubbing, use the finest rotten stone, and the finest Canton flannel, with alcohol and water in equal proportions, use less alcohol in summer, scour with these materials until all the planishing marks have disappeared, which will require about five minutes rubbing for new ones, and about three for old ones; then take a second piece of flannel and rub until the rotten stone is effectually cleaned off the plate, and a dull

polish is obtained. The higher the finish produced by simply rubbing with the flannel, the greater is the probability that the plate will be clean; endeavor, therefore, to give by this first operation a high polish, leaving as little as possible for the rouge buffs to do. All buffs unless kept in the most perfect order, are apt to deposit a scum, more or less, upon the plate, which will very materially effect its brilliancy and sensitiveness. The rule to be observed in buffing is to have the buffs well cleaned and dry; they should be frequently brushed with a stiff brush, and fresh rouge dusted upon them, make the strokes long and light; if the pressure is too great, the polish will not be so fine, nor so bright.

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* *Explanation of the Frontispiece.*

Figures 1 and 2, are intended to represent the shades of color which should be given to the plate, over the iodine and bromine. And although, the rich tints produced by these chemicals, cannot be very closely imitated with pigments, yet the amateur will find the colored illustrations very useful, showing the depth of colors, if not the peculiar shade necessary to produce the finest effects upon the daguerreotype plate.

COATING THE POLISHED PLATE.

Immediately after the plate is polished and while it is still warm from the buff, it should be submitted to the vapors of iodine, dusting it previously with a soft camel's hair brush. It is as well to look at the plate several times while being coated, turning it each time end for end, to insure a more uniform coating. If the iodine goes on even, the quick is almost sure to follow its example. Color over the iodine to match as near as possible figure 1, (examine the color as it progresses, by holding it at an angle of forty-five degrees, against a piece of clean white paper, having a strong light reflected upon it,) then over the quick until it assumes the color of figure 2, and over the iodine again one-fourth the time given at first; you will then have a plate coated, for all ordinary purposes, in the most perfect manner. When a more sensitive plate is wanted, for making likenesses of children, etc., it will be necessary to coat somewhat lighter than this standard, which may be done very readily by making a note of the number

of seconds it required to produce colors No. 1 and 2; then reduce the time one-fourth. When a still greater sensitiveness is wanted, expose the coated plate to the light a moment before placing it in the camera. This though should only be resorted to when nothing else will answer, as plates treated in this manner are apt to give hazy pictures. The same end may be arrived at, and probably with less risk of injuring the picture, by letting the plate stand, after it is coated, from fifteen to thirty minutes, beyond which time it commences to impair and loses its sensitiveness to light, but may be restored to some extent by placing it over the iodine again for a few seconds.

TIMING THE PLATE IN THE CAMERA.

For this part of the operation no definite directions can be given, a certainty of exposure cannot be attained with the longest experience. The oldest operators are only able to judge by former sittings; and yet with a little practice the youngest, may soon acquire pretty good success in hitting the time of exposure to the light. With a whole size camera, the time will vary from seconds to minutes according to the light.

POSITIONS.

No set rules can be given for the artistic arrangement of the sitter; and yet it is of the utmost importance, and is more under the control of the photographer, than any other part of the process; good taste and long practice will alone accomplish perfection in this department. It is adviseable to allow sitters to assume their natural positions* which if awkward, may be improved upon, but not to such an extent as to lose the likeness.

Discountenance the practice many sitters have, of holding bouquets, books and oranges, in their hands, as it reflects, more or less, upon the taste of the photographer.

---

* This reminds me of an anecdote of Henry Clay, which I will now relate, being interesting and somewhat to the point. I think it was in the year '49, when I took my best picture of Mr. Clay. He came to my rooms at the time this anecdote occurred, in company with his friend, Mr. Potter, who was standing by when I asked Mr. Clay—as I am in the habit of asking my sitters—if he had any choice of position, his reply was, "None whatever, sir, I am *Clay* in the hands of a *Potter*, let him *mould* me as he will."

TO MERCURIALIZE THE PLATE.

The mercury should be kept at a point to develope the picture in about three minutes, which will be between seventy and eighty degrees of the scales, generally attached to the baths; a few experiments will soon determine where this point is. It should be slightly agitated before exposing the plate to its vapors. The plate may be looked at during the operation, with a faint light, without doing it any injury whatever, although time as a general thing may be depended upon. The mercury should be at the proper heat when the plate is placed over it, or it should be approaching the maximum, so that it will reach it before the time allowed for mercurializing expires. When the mercury is too cold, a longer time will not make up for the want of heat; the effect produced will be a cold blue tone. When too hot, shortening the time over its vapors will not give results as fine and brilliant, as though it had stood at the proper point, with a longer time, the effect will be coarse with black dots of mercury over the whole picture.

CLEARING THE PLATE WITH HYPO-SULPHATE OF SODA.

For this purpose make a solution of hypo-sulphate of soda and water.

Water, - - - - - - - - - -	16 oz.
Hypo-sulphate of Soda, - - - - -	2 oz.

When dissolved, filter, and it is ready for use. This mixture will last a long time, by occasionally adding fresh hypo-sulphate of soda; it should be filtered frequently, at least every morning; sponge or cotton answers very well for this purpose. When the picture is well cleared, which should always be done in the best manner, for if the least trace of the chemicals should be left upon the plate, it will sooner or later, act upon its surface, and eventually spoil the picture. There are a great many daguerreotypes spoiled from this cause alone; and, is it not shameful, when, with the least care, it may be prevented? Keep the wash on the plate for some time, even after the picture appears to be cleared. Then wash in plenty of water, and use the same care to get off the soda, as recommended for getting off the iodine. Wash well, both the front and back, and it is ready for gilding.

GILDING THE PICTURE.

For this operation make a solution called hypo-sulphate of gold, made thus:

Hypo-sulphate of soda,	60 gr.
Chloride of gold,	15 gr.
Water, which should be pure and soft,	24 oz.

Mix the gold and soda separately, in a portion of the water—the quantity not particular—then add the gold gradually to the soda, shaking it all the time, until the whole is well united, which will take several minutes. Filter and set aside for a few hours before using; it may be used immediately, but the result is not generally so good. It is advisable to make gilding solution at night, and filter in the morning. Filter very frequently and very carefully, through two thicknesses of the best filtering paper or cotton. This operation must not be slighted, or you will be troubled with fine brown spots, all over the picture. As soon as the picture comes from the mercury and pronounced good, its edges should be bent up with a pair of plyers or otherwise, so that it will hold the gilding; take the plate

by one corner with the plyers, pour on as much gilding as it will hold, and apply the heat; use a large flame, move the solution gently to and fro, to insure an even deposit of gold. The greatest care must attend this operation, as upon it the durability of the picture depends. Stop the operation as soon as the whites are clear, assuming a yellowish hue. If continued longer, the picture will become clouded and dull; on the other hand, if checked too soon, it will fade and will be liable to become scratched in coloring. After gilding, the plate must be washed in plenty of water, and then dried, using as little heat as possible. The black or brown specks which frequently appear upon a picture after gilding, is owing to the gilding solution not being well filtered. They may be removed with cyanide of potass, disolved in about ten times its bulk of water; use this mixture as you do gilding, but with less heat. Wash off carefully, using but little heat in drying.

COLORING DAGUERREOTYPES.

If you color your pictures, color them with taste; use but little color upon the brush at first, until you see how the picture will take it. All daguerreotypes are not equally adapted to color. Those which have been slightly over-set, and fully developed over the mercury, are the most. I do not think the rich mezzotint daguerreotype is improved by pigments. The student, before he commences to color a picture, should study the beautiful blending of light and shade upon it; he will then see with what exquisite delicacy, and wonderful defination, nature puts in *her* touches of light and shade. We cannot expect to equal her exquisite handling, but having such perfect models before us, it *is* expected that we will use sufficient care not to mar their exquisite beauty with paint. Use for the local flesh color, Indian red and chrome yellow mixed; the proportions will depend upon the tone of the picture, and complection of the subject. For the cheeks and lips, use carmine or pink madder. For

draperies, use Prussian blue, chrome yellow, chrome green, Indian red, burnt sienna, burnt amber and vandyke brown. For hair, sepia and burnt umber, &c. The brushes should be pointed, but not too long; the sable will be found to answer best.

Having described thus far the daguerreotype process, the next in order will be the formulæ connected with the art; together with the manipulation, which have not been given, and other information.

TO MAKE LIQUID QUICK.

Put into an eight ounce tincture-mouthed bottle one ounce of good alcohol, to this add as much best iodine as it will take up—shake while adding—then add one ounce of best German bromine, and four or five ounces of pure soft water. If there are any doubts about the water being pure, add a few drops of nitric acid. An excess of bromine should be left in the bottom, the object of which is to keep the quick at a uniform strength. This quick the writer has used successfully for many years, and therefore has the greatest confidence in recommending it to others.

QUICK TO USE.

Put into a deep whole plate box, a sufficient quantity of water,—prepared if necessary, as directed for making quick with a few drops of acid—to cover the bottom about one inch deep, and add enough quick to give it a pale brandy color, or until it produces the proper hue to the iodized plate, between ten and forty seconds. Its exact strength, however, cannot be ascertained until some time after the box has been charged.

IODINE TO USE.

The best method of using dry iodine is a very simple one, and can be given in a few words. Spread evenly, upon the bottom of a whole plate box, one ounce of iodine, upon which lay a piece of paper—filtering paper I find to answer best. In summer use a much smaller quantity of iodine; common sense will soon dictate this. It is much better to keep adding a few grains daily, than to be troubled with an excess of vapor, and be compelled to let it escape into the room, which is never very pleasant, if wholesome when taken in such allopathic doses.

CHEMICAL BOXES IN WINTER.

The temperature of an operating room should never be allowed to fall below sixty degrees Fahrenheit, and even then in extremely cold weather the boxes should be warmed by the fire. This should never be neglected; the tone of a daguerreotype depends as much upon the temperature of the room and chemicals, as upon their peculiar composition. This is no longer theory, but settled practice. I have found it impossible to produce even the proper color upon a plate when the chemicals were cold.

CHEMICAL BOXES IN SUMMER.

In summer the chemicals should be kept in a cool place, and their strength should be kept quite moderate, otherwise they will be found very unmanageable, and just as impossible to produce fine results as when too cold.

TO MAKE DRY QUICK.

As this quick is so much in use, being easy to manage, and in its effects so nearly like the quick I have recommended, that I will describe a mode of making it. For a whole size box, select a piece of fresh shell lime, about the size of a hen's egg; slack by soaking in water for about one minute; water that has been previously saturated with lime will hasten the operation, and seems to answer better. Have the lime rather underslacked, bromine and air will soon finish the slacking; add as much bromine to this as it

will take up, without leaving an excess of vapor in the vessel in which it is made. Use as directed to use the liquid quick, and coat about the same color, except that the iodine may be a little deeper. In a day or two this quick will be ready for use, when it should be spread evenly upon the bottom of a box. The quantity will depend upon the season of the year; it should be strong enough to coat in about twenty seconds. The same lime will last a long time; it can be strengthened up by adding more from the bottle, or by adding bromine in small quantities.

BUFFS.

Hand buffs are preferable to wheels, for small plates, and since photographs have been introduced, large daguerreotypes are seldom or ever called for. Hand buffs are made of a great variety of shapes, and covered with a variety of materials. Buckskin is the best, and decidedly the most economical. I will give a description of the kind I use: length, twenty-two inches; width, from two and a half to three and a half inches, according to the size plate to be buffed; shape, slightly curved from end to end, with a handle either in the middle or at one end like a plane. The face is covered with four or five thicknesses of cotton flannel; tack neatly upon this a piece of fine, soft buckskin, which can be had of the dealers, prepared for the purpose. Two buffs of this description will answer, one to buff down with, and the other to be kept for finishing. To get a new buff in order, fill its surface with lamp-black and rouge, and rub it in well with cotton, or buff hard upon an old plate for several hours, until the leather

appears black with silver. A new buff will never work so well, as one that has been carefully used for several months.

GENERAL INFORMATION AND USEFUL HINTS.

In copying daguerreotypes, &c., the following rules should be observed. Firstly, have the plate perfectly cleaned, and as free as possible from scratches. Secondly, coat rather heavy with iodine, and endeavor to get it on evenly. Thirdly, use a small diaphragm. Fourthly, copy in the sun, and if a still greater amount of light is wanted, reflect it with a mirror. Fifthly, give less mercury by one-fifth, than for a portrait from life. Diaphragms should always be used in the camera, when the light is sufficiently strong to admit of it. They may be used also to advantage in making pictures from life, the extra sharpness and defination resulting from their use, will more than pay for the extra time it takes for a sitting with a good subject.

Dark drapery—especially velvet—requires more quick than lighter, to produce the proper tone. A plate coated full, over the iodine, slightly over-set, and fully mercurialized, will give a white picture; that is, provided the plate has been well cleaned. No satisfactory tone can be depended upon, unless the plates are perfectly cleaned. The rich greenish tones are produced by a slight excess of quick on a clean plate, buffed with a new buff, after it has been well worked in with rouge. This style of daguerreotype will stand rather more gilding than the white tone, and looks better without color than with it. Mix the chemicals at night, so as to have them ready in the morning, for use. The gold should be filtered always before using; keep a bottle of cyanide of potassium dissolved, ready for removing specks caused by gilding. It is also useful for removing stains and spots from old pictures.

Strengthen up the quick early in the morning, and *not* at night, for unless the boxes are perfectly tight, the very life of the quick will escape before morning, that which should be used in making the finest pictures. If the boxes are not tight set them aside, and get

those that are. Deep boxes are always preferable for chemicals especially in warm weather.

Hypo-sulphate of soda can be used over and over again, until it becomes saturated with iodine, which will be indicated by a dirty red color. It should be filtered every morning, and kept free from dust.

Mercury should be kept covered up at night, and filtered every few days, through a cone made of stiff paper. If the mercury is wet before running it through, it will cleanse much more effectually. Four or five ounces of mercury will be sufficient for any size bath, and will develop thousands of pictures.

Buffs should be kept dry. In damp weather they should be set by the fire, or in an oven, heated with a spirit lamp.

CONTINGENCIES EXPLAINED

IN THE

DAGUERREOTYPE PROCESS.

TOO MUCH BROMINE.

A picture with an excess of bromine has a dull leaden appearance, the whites are of a dirty yellow, and the blacks gray. It must be kept in mind though, that there is a distinct difference between getting too much quick upon a plate, from a coating box in good working order, and from one when the bromine is too strong. The latter will produce a plate clouded with dark spots. Plates coated in this manner it would be useless to set, as no length of exposure would produce a picture upon them. The only remedy is to let off some of the vapor and if still too strong add a little water.

TOO LITTLE BROMINE.

A picture with too little bromine has an olive green appearance, and unless the chemical is quite weak, it is caused by the eye being deceived in the color while coating. Study the color in figure 2, try to imitate it more closely, and if it cannot be done, in sixty seconds, the quick is too weak and should be strengthened up. Chemicals should be tried in the morning, to ascertain how they are working, and if too strong put in a small portion of water; if too weak, add a few drops of quick from the bottle. When the quick is in the best working order, it will coat in from ten to fifty seconds, and should be kept ranging between these points—at all times. In warm weather especially, the minimum time should not be less than twenty seconds.

TOO LITTLE IODINE.

A picture with too little iodine, has a dull greenish appearance, and is apt to turn darker under the hypo-sulphate wash. Gilding will not improve pictures of this description.

TOO MUCH IODINE.

Too much iodine will produce a thick blue picture, dull in the high light, and a bluish gray in the shadows. No amount of gilding will bring up the whites to the proper tone.

TOO LITTLE MERCURY

When a picture appears of a sky blue color all over except the shadows, the exposure to the light has been too long, and the exposure over the mercury too short; for when a plate has been properly coated and sufficiently mercurialized, if set too long, a white picture will be the result, and not a blue one. When the mercury is not hot enough or wants filtering, the picture will have a pink cast of color, many times nothing but its contour can be seen.

TOO MUCH MERCURY.

Too much mercury upon a picture is indicated by black dots in the shadows of the drapery and hair; the high lights are not so bright, and the whole picture will not be so sharp as though it had been properly mercurialized.

DIRTY PLATES.

A dirty plate will show itself whilst being coated over the iodine, and still more plainly over the quick, the iodine goes on uneven, and instead of a bright, clear yellow, or golden color, it is dull and heavy. The quick goes on in greenish spots, instead of a rich deep purple. Plates coating in this manner, it would be useless to set; a clean plate will take the chemicals in less time than one that is dirty, though the mercury seems to act slower upon plates not properly cleaned, another indication of a dirty plate, is the unusual length of exposure required to make a picture, even in a strong light.

THE GILDING PEALS OFF.

When this occurs in gilding, the gilding solution is too strong, and should be reduced with water, or less heat should be used. When

a white scum or cloulds appear upon the surface during this operation, the proportion of hypo-sulphate is too great; correct by adding chloride of gold in small quantities.

TO MAKE STEREOSCOPIC PICTURES.

This wonderful and beautiful style of picture has never been appreciated according to its merits, and I am inclined to think that the fault is not on the part of the public, but rather with the photographer, for not using that judgment and care in making them they require. In order that they may be made with as little trouble as possible, I will explain briefly, the most simple, and I think the best mode.

Procure a plate shield arranged in the back, so that a quarto plate can be moved lengthwise to the right and left at pleasure, with a square opening in the front just sufficient to expose one half of the plate at a sitting. Buff the plate lengthwise, coat in the ordinary manner, then place it in this sliding shield, take the first focus on the right side of the sitter, and expose the left end of the plate, (*i. e.* the left side of

the operator as he faces the sitter,) when sufficiently exposed, stop off the light, and move the camera for an ordinary size picture, about eight inches in a direct line to the left—the sitter keeping the eyes fixed upon the same point, and remaining perfectly still during both operations—adjust the focus again, and expose the right end of the plate, about one-fifth less time than the first. It is very important to produce the finest results, that the plate should receive the highest possible polish, and be free from specks and scratches, and lastly be careful not to over-mercurialize; the fault had better be on the other side. Stereoscopes should be very carefully sealed up, to prevent dust from getting between the glass and plate, which effect very considerably the beauty of the picture when magnified.

Stereoscopes may also be made on paper and glass, by observing the above directions with these exceptions, that the second sitting must have the same length of exposure to the light as the first, and must not be forced too much in developing, or the picture, when magnified, will have a gray dotted appearance, somewhat like the effect produced by too much mercury upon a daguerreotype picture.

BACKGROUNDS.

There are a great many colors suitable for backgrounds, such as blues, drabs, grays and white. White produces the best effect upon ambrotypes. Avoid red, green, yellow and black, for either style of picture.

FANCY BACKGROUNDS.

Fancy backgrounds may be used to advantage, but they must be of the most artistical character, and adapted to your subject's age, profession, &c.

RESILVERING DAGUERREOTYPE PLATES BY THE BATTERY.

When the student is sufficiently advanced in the art of daguerreotyping, he may be desirous of learning the battery process, for the purpose of resilvering his plates. There are works published, devoted exclusively to galvanism, which the student should procure and study, in order to understand more perfectly its peculiar and mysterious nature, when the directions I am about to give will be much better comprehended.

Smee's batteries, will be found the cleanest and the most economical. They are composed of zinc and platinized silver, set in a glass tumbler, excited with sulphuric acid; when the battery is not in use it should be taken apart, and washed; the zinc should be kept well amalgamated with mercury, which saves the metal and makes the action more vigorous. Batteries of this description can be purchased of most dealers in photographic materials.

TO PREPARE THE SILVER SOLUTION FOR THE BATTERY.

Dissolve silver coin with strong nitric acid; when dissolved, precipitate with common table salt; wash the precipitate in several waters until no trace of acid is left, which may be ascertained by tasting; then dissolve the precipitate—which is chloride of silver—in a saturated solution of cyanide of potassium; weaken with as much more water, and it will be ready for the solution dish. Use a large flat plate of pure silver for the negative pole. The silver solution will require to be strengthened up every few days with cyanide and silver. Keep the wires clean and bright.

SILVERING THE PLATE.

Before the plates are silvered they should be polished in the brightest manner. Stir up the solution when they are put in—which in a measure will prevent streaking and staining. The connection should be made simultaneous with the dipping; leave in until they become sky blue—the most sensitive color—and should not be much deeper, except for such as have been gilt, which should have a white coat, dried off, rubbed down, polished and silvered again, until they are of a clear sky blue color. Silvering by the battery has many advantages, making the plate more sensitive to light, giving better whites and blacks, and enabling the operator to have his plates in a condition always ready for use at a moment's notice. I have used plates successfully that have been galvanized over twelve months, by merely buffing them in the usual manner required for plates recently silvered.

TO PUT A CAMERA IN FOCUS.

Set on end three or more books, plainly lettered on the back. Take the focus on the middle one, set a plate, and if the focused book comes out the sharpest, then the camera is in good focus; should the nearest one appear the sharpest, the ground glass must be set back from the tube. The exact distance can be ascertained by marking the tube while in focus on the middle book, and then moving it until the nearest one is in focus; mark again and measure the space between the two marks, which is the distance the ground glass should be moved back, and *vice versa*, if the farthest book should come out the sharpest. As simple as this operation is, I have known many to be very much perplexed with it.

A SIMPLE METHOD OF MAKING A FILTER.

Take a small tuft of clean cotton, soak it in alcohol and crush it slightly in the funnel. For filtering most chemicals, such as gilding, solution, ammonia, nitrate of silver, collodion, silver-bath, &c., it will answer as well as paper, and will frequently be found more convenient. When collodion is to be filtered, it should be thinned as much as it will bear, that it may pass freely through the cotton. Lay a piece of flat glass on the top of the funnel to prevent loss by evaporation.

Funnels are made for this purpose, which would soon prove a great saving.

SEALING PAPER.

The strongest and the best sealing paper for putting up daguerreotypes, &c., is made in the follow manner, and with the following named materials.

Boil three or four ounces of fish glue, in water sufficient to make it a stiff paste ; strain it and add about two drachms of the tincture of benzoin; stir it up and spread it evenly upon strong vanilla paper, with a flat bristle brush ; hang up to dry and it is ready for use.

THE AMBROTYPE PROCESS.

THE AMBROTYPE PROCESS.

PREPARING THE GLASS FOR COATING.

I HAVE found that the more simple the operation of cleaning glass is performed the more satisfactory are the results, and have therefore adopted the following mode, assuring the student that if he attends strictly to the directions I am about to give, he need never fail to have clean glasses, upon which the finest results may be produced.

First. Grind or file the edges, on one side only, of all new glasses. This answers a double purpose, saving the fingers, and designating which side of the glass is cleaned, as it would be useless to bestow much pains upon but one side,

Second. Let them lay in a bath for several hours, composed of one part nitric acid and

eight or ten parts water, the exact proportions not important.

Third. Wash well in plenty of clean water, and set up to dry; after which, all that is necessary is to dust off and coat.

COATING THE PLATE WITH COLLODION.

This is a nice operation, requiring much care and practice. Hold the glass at one corner, either in the right or left hand, which ever upon trial will be found the most convenient, and pour on the collodion at one end, see that it covers the plate evenly, and without any delay, letting the excess drain back into the bottle, working the plate at the same time to and fro, which tends to prevent the checkered appearance so frequently observable in negatives when new collodion is used.

DIPPING THE COLLODION PLATE.

When the film upon the plate is nearly set, being slightly adhesive to the touch, which will usually take not over fifteen seconds, it should be dipped very carefully, without any hesitation in the silver bath. It is advisable to keep the plate in gentle motion, for a few seconds, just before taking it out of the bath. This should not be done until the plate has been immersed at least half the time required to excite it. The object of keeping it in motion is to wash away the greasy appearance seen upon the plate, caused by the ether refusing to mix with the water. The sooner this is effected, the sooner will the plate absorb its maximum quantity of silver, and should be immediately set whilst its sensitiveness is at its height. The length of time that a collodion plate should be immersed in the silver bath will depend upon various causes.

First. The strength of the bath and its temperature.

Second. The proportions of ether and alcohol in the collodion, and thickness of the film, and the quantity of excitant it contains.

If the temperature is between sixty and seventy, Fahrenheit, which it should be; the bath from forty to fifty grains strong, the proper strength; and the collodion very heavily iodized, it will require a very few minutes, even less than a minute will frequently suffice. Yet when the silver bath is in good order, neither too neutral, too acid, nor too alciline, a plate may remain immersed any reasonable length of time without doing it any injury.

The appearance of a plate properly sensitized, is an opake yellow white, resembling somewhat white kid leather. If after the plate has been immersed for three or five minutes, it has a bluish cast of color, the collodion employed has not been sufficiently iodized, The proportions probably have been reduced by thinning too often, the collodion too slight, or the bath too weak. The cause however is mostly attributable to the former. Correct by adding to the collodion iodide of ammonium. If the fault is in the bath,

strengthen by adding a saturated solution of nitrate of silver. Other particulars upon collodions, baths, etc., will be found in another place.

DRAINING THE EXCITED PLATE.

When the plate is taken from the bath, it should be well drained for at least thirty or forty seconds. This care, besides saving the silver, prevents in a great measure the liability to streaking and staining, so annoying to the photographer. Have the holders wiped dry after each sitting. Arrange the sitter whilst the plate is in the bath, which will occupy about the same length of time.

TIMING THE PLATE IN THE CAMERA.

The time required for an ambrotype, will of course vary with the light, sensitiveness of the plate, and power of the camera; consequently no set rules can be given.

DEVELOPING THE AMBROTYPE.

This is the most delicate manipulation in ambrotyping. The whole tone of the picture turns upon this point, *and not so much depends upon the developer as upon the skill and experience of the operator, knowing at what particular moment to arrest the development.* If continued beyond a certain point the picture, being properly timed, will be frosty and opaque, with fine dots in the shadows like a daguerreotype over-timed,

both in the camera and over the mercury. On the other hand, if arrested too soon, under similar circumstances, before the development is complete, the picture will be thick and dull in the shadows. Hair and drapery wanting in defination. And again, if the development is continued too long upon a plate under-set, its appearance will be harsh, high light, grey and flat, resembling somewhat a daguerreotype forced with mercury.

We see that there is but little latitude between the maximum and the minimum point in the development of the ambrotype. Therefore it is necessary to watch very carefully the operation as it progresses. The developer must not be too strong, or the change produced would be too sudden, and its effect upon the plate could not be checked as soon as desirable, or in the anxiety to have it just right, it may be stopped too soon, and in either case the picture would be spoiled as a work of art.

Before sitting the plate, pour a sufficient quantity of the developer into a convenient sized vessel—a small-size tumbler answers a good purpose—ready for developing the exposed plate, which should be done with

the least possible delay. The solution should be poured on very gently, but quickly, holding the vessel containing it close to the plate that it may cover the surface evenly and at once. If applied with too much force upon a delicate collodion, it will produce a dark spot where it first touches, much to the detriment of the picture. It must now be evident, as I have stated at the outset, that the process of developing the ambrotype is the most delicate operation connected with the art of photography. And not only is it a delicate operation, requiring much care and practice to produce the finest effects, but one, from its peculiar nature, the most difficult to describe by mere words. I have, therefore, to elucidate my description more effectually, prepared an illustration which will be found facing page 65.

A DESCRIPTION OF FIG. 3.

Fig. 3 represents an ambrotype, the development of which having been checked at the exact point—washed off, and ready for the clearing solution. This illustration will furnish to the student a very good idea of a positive at this delicate stage of the process. The water upon the glass plate would, of course, give a gloss, and somewhat alter its appearance. The student will, therefore, make an allowance for this, as it would be impossible to give, upon paper, a closer imitation.

MEMORANDUM.

The original picture, of which this illustration is a careful copy, was made upon a white background; time in the camera, five seconds; the sitter wore a black suit. The collodion, bath and developer used were the same as I have recommended in the ambrotype process. Similar effects, however, can

be produced with most other processes, if the development is arrested at the proper point. In developing, the face should be the principal guide, as draperies develope according to their material and color. For example, dark silk velvet developes slowly, whilst white satin, on the contrary, appears almost instantly under the ordinary developer. When the proof is properly brought out, it must be carefully washed in plenty of water, that all traces of iron and acid may be removed. The clearing solution should be used in a flat dish. This part of the process is attended with no difficulty whatever; the time required for clearing varies from one to five minutes, according to circumstances. The best way to judge when a proof is entirely cleared, is to examine it on the obverse side. After clearing it must be washed again in plenty of water, and set away carefully to dry. For this purpose nails are driven in the wall a few inches apart, and the plates are set upon them, face inwards. The drying can be hurried with a spirit lamp; yet it is far better to allow them to dry spontaneously. It may be as well to state here that negatives are

benefitted by drying in this way, as heat renders the film tougher, and less liable to become scratched in printing.

COLORING THE AMBROTYPE.

Ambrotypes can be colored in the same manner and with the same colors used for coloring daguerreotypes; there are some exceptions to this rule, among which, are carmine and the lakes,—the most useful colors, with the daguerreotyper,—but are too light to adhere to the collodion plate, and they do not imitate flesh so closely as they do upon the silver plate, which probably is the greatest objection to their use. The chromes, umbers, raw and burnt seinna, Prussian blue, Indian red and Venitian red, will answer to compound all the tints desired for coloring ambrotypes. For black—which answers finely for subduing other colors—use lamp-black, made by holding a piece of glass over a fluid lamp.

BRUSHES USED.

The brushes for coloring ambrotypes should be of the finest quality of sable, and of various sizes. The points of some should be quite sharp, while others for draperies, &c., may be blunt, but soft and elastic.

PUTTING UP THE AMBROTYPE.

The very best mode of putting up ambrotypes is the following: Lay another glass upon the collodion side, separating them with thin strips of card board; then seal the edges with a cement composed of beeswax and rosin, in equal parts, melted together, and used while warm. This will secure—without varnishing—the collodion picture much better than any other method. Above all things, if you have any regard for your patrons, never seal with balsam, the *hermitically sealing*

varnish, as pictures sealed in this manner fade and blister in a short time.

This balsam process, for which a patent has been so foolishly granted, is a cheat upon the public, and should be frowned down, by all honest operators. When the picture requires to be brightened up, seal with gum-demar, dissolved in pure turpentine, which, in time, becomes almost as solid as the glass itself.

FORMULÆ IN THE AMBROTYPE PROCESS.

GUN COTTON.

This article can be procured ready manufactured, yet it is much better that the photographer should understand thoroughly how to manufacture it for himself, otherwise he may have to put up with an indifferent article, when no remedy is at hand. I will therefore give directions for making it, and explain as far as I am able, all the contingencies attending its preparation:

Sulphuric acid, (C. P.)	1 oz.
Nitric acid, (C. P.)	1 oz.
Cotton, (finely carded,)	80 gr.

Put the acids together in a mortar or bowl, and let it stand for a few minutes until it becomes cool, then put in the cotton, stirring it up until it is fully saturated with the acids, when it should be covered up and set away for five or six hours; turn it over several times during this operation. When the action of the acids is thought to be sufficient, it is then to be washed in plenty of running water. This should be done very expeditiously, changing the water several times, to get out the acids, as soon as possible. When all the acid is removed—which can be tested with litmus paper—it should be dryed quickly or washed in alcohol, changing the alcohol two or three times, to be certain that no water remains. In this state, it can be dissolved in the ether and alcohol, which answers much better than though it had been allowed to dry first. Gun cotton may be tested in the following manner: when perfectly dry, set fire to a small portion of it, and if no ashes is left, the acids have been too strong. If it burns without explosion, like ordinary cotton, leaving a large proportion of black ashes behind, the acids have been too weak. If it explodes quickly like gunpowder making but a

small portion of coal, then the acids have been of the proper strength, and it will be found—if the ether and alcohol are pure—that good collodion will be the result. If the cotton dissolves in the acids, the probability is, that the mixture has been too hot, it should invariably be allowed to cool for several minutes before the cotton is immersed. On the other hand, if it burns during the operation, emitting red vapor, the acids contain too much water, causing the action to be too violent—sulphuric acid should be kept well corked, as it attracts moisture so readily.

Another formulæ for making gun cotton :—

Refined nitre, . . .	3 ozs.
Oil of vitriol, . . .	2½ ozs.

Pulverize the nitre in a mortar, and dry it over a spirit lamp, put in the acid, let it stand a few moments, then put in the cotton, have it well saturated with the acid, and set away, cover up close for five or six hours. Either of these processes will make good gun cotton, and it is difficult for the writer to say which is the better of the two, having been equally successful in making good collodion by both methods.

PLAIN COLLODION.

Ether, ...	10 ozs.
Alcohol, absolute . . .	6 ozs.

Dissolve in this mixture, a sufficient quantity of gun cotton, to make a collodion that will flow evenly over the plate.

TO EXCITE POSITIVE COLLODION.

Collodion, ...	1 oz.
Bromide of cadmium, . . .	2 grs.
Iodide of cadmium, . . .	4 grs.

These chemicals will readily dissolve in the collodion without first being dissolved in water, which is an advantage, as water produces an injurious effect upon the collodion.

POSITIVE BATH.

Water,.	16 ozs.
Nitrate of silver, . . .	1 oz.
Iodide of cadmium, about . .	3 grs.

Mix these well together and filter: this should be done in the dark. After it has stood a while, test with litmus paper, which should be turned slightly red after an immersion of a few seconds, but if it does not, add a few drops of nitric acid until it does. This is the best bath for positives known. Yet the same bath used for negatives, will answer for positives by adding a few drops of nitric acid to the ounce of developer, which, in a measure, will make up for the want of it in the silver bath. Nitrate of silver produces the best positives whilst the acetate of silver gives the most intense negatives.

POSITIVE DEVELOPER.

Water,	32 ozs.
Proto-sulphate of iron,	2½ ozs.
Acetic acid, No. 8,	3½ ozs.
Alcohol,	2 ozs.

Grind the iron in a mortar, filter, and add the acid and alcohol. It has been recommended not to add the acid, until just before using, but this I have found, from actual experiment to be a useless precaution. Developing solution will be as effective, if not more so, a week old as when first made.

CLEARING SOLUTION FOR POSITIVES.

Water,	16 ozs.
Cyanide of potassium,	2 ozs.

This solution should never be thrown away, as it gets better with age, filter and keep adding cyanide of potassium, as it weakens.

After each of these processes of developing and clearing, use an abundance of water.

THE NEGATIVE PROCESS.

THE NEGATIVE PROCESS.

In many particulars the negative process is similar to the positive; and only so far as it differs, will it be necessary for my purpose to enter into any of its details. The most important difference is in the time of exposure to the light. The collodion bath and developer, are also different, yet a negative can be made by the positive process, and even ambrotypes have been rendered sufficiently intense to print pretty fair positives from. The glass is prepared with the same care, and in the same manner as for positives; coating and dipping the plate are the same. A negative sufficiently intense should be produced in about double the time required for an ambrotype; hence, it is an easy matter to ascertain the proper time to give one, by first taking an ambrotype and noting the time it took. When a negative is properly timed, the picture will appear almost as soon as the developer is flooded upon its surface. Keep the developer upon the plate until the middle tints of the face are seen by transmitted light, or until it produces no further change which does not generally exceed thirty or sixty seconds.

CLEARING THE NEGATIVE.

For this purpose use the following mixture.

Hyposulphate of soda,	4 oz.
Water,	16 oz.

Filter before using. This solution can be used over and over again, the proportions are not arbitrary, as it becomes weak add more soda; this strengthening—if the solution is in constant use—will be required every day. The operation of clearing may be hastened in winter by warming the solution. When thoroughly cleared, which may be readily seen by examining the obverse side, it should be washed in plenty of water, and either allowed to dry spontaneously or by means of a gentle heat. Some collodion (especially that which has been made a long time,) is very liable to become scratched in printing, when this is the case, the film should be protected with some suitable varnish, I have found nothing to answer better than bleached shellac dissolved in *absolute* alcohol. Put the shellac in the alcohol, and let it stand for several days; then pour off the clear, and dilute it about one third with absolute alcohol. To use this, warm the negative very slightly, and pour on

the varnish as you would collodion; set away to dry free from dust, and in a few hours it will be ready for printing; all negatives, however tough the film, should be protected with varnish, when a large number of copies are wanted. Another plan, although not quite so durable, is to flood gum arabic upon the plate whilst it is still wet, after washing. This answers very well when only a small number of impressions are wanted, but not otherwise. Varnish lessens the intensity of a negative, therefore those that are weak should not be varnished.

THE PRINTING PROCESS.

This is the most fascinating as well as the most particular stage in photography, and like all the preceding ones, much depends upon careful manipulation. In the first place none but the best make of paper should be used; all experienced operators agree that Saxe's—a German manufacture—is the best, which must be prepared in the following manner:

SALTING SOLUTION.

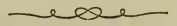
Water, ...	64 oz.
Chloride of ammonium, ...	2 dm.

Make this solution in a clean shallow dish, run the paper through two or three times, or until it becomes evenly wetted all over, then hang up to dry in a clean place free from dust. Salted paper will last a length of time, if kept flat in a dry place, a port folio answers well for this purpose. The same solution may be used a number of times, it should be filtered before using. When the prints tone up too red, increase the proportion of salt to the ounce of water.

AMMONIA, NITRATE OF SILVER.

Dissolve one ounce of nitrate of silver in sixteen ounces of distilled water, when dissolved pour one eighth out into a separate vessel. To the bulk add ammonia drop by drop, until the whole is converted into a dark olive precipitate, which is ammonia of silver. When at this point, watch very carefully, and

keep adding the ammonia until the solution clears up without an excess of ammonia. Then add the reserved eighth of silver, which will make it slightly turbid, silver being in excess, which should always be, for preparing plain paper for printing. This solution should be filtered always before using.



TO SILVER THE SALTED PAPER.

Lay the paper down, pinning it at each end, on a clean piece of board, made a trifle smaller than the paper, to be silvered. Fix a bunch of cotton upon a glass rod, with this brush the ammonia nitrate of silver upon the paper, use plenty of silver, and brush it evenly and carefully all over the surface. This operation should not be hurried. Cast the eye across the surface and see that there are no dry spots—if any appear, it must be gone over again with more silver. After the paper is silvered, hang it up in a dark place, free from dust and chemicals. And not until it is *perfectly dry* will it be fit for printing. The foregoing applies to plain paper only, Albumenised paper is sold ready salted, and should be very

carefully floated upon plain silver solution for about five minutes. This plain solution is simply, nitrate of silver dissolved in distilled water, sixty grains to the ounce of water. Both of these solutions should be very carefully filtered before using.

PRINTING.

The time it takes to print positives, varies from one minute to sixty, according to the light, and the intensity of the negative. A good negative prints slower than a poor one, owing to its intensity—a quality all negatives should possess to a large extent. The student will soon be able to judge by the appearance of the proof, when it is sufficiently printed. The deep shadows should be of a dark bronze color, to allow for toning. As the positives are printed, they may be laid carefully aside in the dark, and when too late to print, they can then be toned, and washed altogether, which will insure a much greater uniformity of color, than when they are put into the bath, one after the other as they are printed.

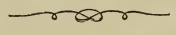
TONING AND FIXING.

TONING.

ON THE PERMANENCY OF PHOTAGRAPHS.

A great deal has been said and written upon the fading of photographs. It is now, however, a settled fact, that they are, with the proper treatment, as permanent as any other description of picture. The photographer should bestow his especial attention and greatest care upon this branch of his art. It should be a matter of principle with him, as well as one of business and profit, to have his photographs fixed indelibly. The fixing process given below, will be found, not only durable, but one producing the most brilliant and beautiful effects, and although somewhat more expensive than the old method, it should always be adopted for first class pictures. I will give the manipulation and formulæ of this process in the order in which they are to be used. In the first place after the print partakes of the proper tone, which must not be much darker than a

finished picture, as this mode of toning and fixing, produces very little change upon the printed photograph. It should be immersed in clean water, containing a small quantity of salt, to remove all the chloride of silver—this will require about five minutes—then well wash in plenty of water, and it is ready for the gold bath made in the following manner.



GOLD TONING BATH.

Chloride of gold, . . .	15 grs.
Hyposulphate of soda, . .	90 grs.
Water, ...	24 ozs.

Dissolve the gold and hyposulphate of soda separately, in a small portion of the water, then add the gold to the hyposulphate of soda, shake well, add the remainder of the water, and the bath is ready for use, and will tone several hundred prints.

For bright sepia or violet tones, leave the prints in this bath—when new—from five to seven minutes. For the darker or blue-black

tones, leave in about ten minutes. When the desired tones are produced, they must be washed again in pure running water for at least five minutes, then carried to the final clearing or fixing-bath. Composed of hyposulphate of soda and water.

Hyposulphate of soda, . . .	4 ozs.
Water, ...	24 ozs.

Immerse the proof in this bath until it looks clear by transmitted light, which usually requires from ten to fifteen minutes, according to the strength and temperature of the solution. From this bath they are again placed in running water over night, face downward. It must be remembered, that during the whole of this operation up to the last soda bath, that the proof is sensitive to light, and should, therefore, be conducted in a darkened room. Besides permanency, this process possesses another and a very great advantage over the other toning baths, which is, that the photographer can print his proof very nearly the tone or shade he pleases without any fear of its changing to any great extent in the operation of toning; he will, consequently, be careful not to print *much* deeper than he wishes

it to be when finished. Experience—dearly bought—has taught me that this is *the* toning bath. I have subjected prints, treated in this manner, to the severest tests, viz., exposing them for a length of time to the strong sunlight, leaving them all night in a concentrated hyposulphate of soda bath, etc. I have even tried the effect of coal gas upon them, and I am happy to state that this experiment, the severity of which would be ruinous to the ambrotype, had no visible effect upon the photograph, proving that they are, when properly fixed, as indelible as they are beautiful. It is a singular fact, that neither the daugerreotype nor photograph are permanent without chloride of gold, and yet the nature of the two pictures are so very different.

As some may desire a less expensive bath, one not quite so complicated, I will give the formulæ of one, but cannot speak so positive as to its preservative qualities, as I can of the former.

TONING BATH.

Dissolve four ounces of hyposulphate of soda in sixteen ounces of water. Saturate this solution with chloride of silver, then dissolve about fifteen grains of chloride of gold in about two ounces of water. Add this dissolved gold gradually to the hyposulphate of soda, shaking it well to insure an intimate chemical mixture; then add about four drops of muriatic acid. The older this solution is, the better it will work, that is, if the gold and hyposulphate of soda are kept up. I have known this bath to give fine rich tones—and apparently durable—when it had been in use over two years. The strength of this toning solution should be kept as uniform as possible, by replenishing it every day or two with hyposulphate of soda and chloride of gold, the quantity to be regulated by the number of prints toned daily. I have endeavored to be particular in giving clear and definite directions for toning and fixing, as it certainly is, an important part of photography. Toning

with gold is to the photograph what gilding is to the daugerreotype, neither would be durable without its agency.

WASHING AFTER TONING.

After the photograph is toned, it must be well washed in plenty of running water for at least twelve hours, otherwise it would be likely to fade in a very short time. The face of the print should be turned downwards whilst being washed—hung up to dry, on pins fixed in calks, to prevent staining.

MOUNTING THE PHOTOGRAPH ON CARD-BOARD.

For this purpose use gum arabic and gelatin mixed. Six parts gum arabic to one of gelatin, water sufficient to make a thick paste, after it has been boiled down.

VARNISHING THE PHOTOGRAPH.

After the photograph is mounted, it may be varnished with this same article, some use the gelatin alone: the great point is to have the varnish of the proper consistence and well strained. Apply with a good brush—hog-hair will be found the best for the purpose. Varnishing should only be applied to plain photographs, those intended to be colored should be rubbed or burnished, which renders the surface much better for coloring. Another plan in use, with some water colorists, is to float the back of the photograph upon a weak solution of gum arabic, about one part gum to twenty parts water. This will give a hardness to the paper well adapted to coloring.

FORMULÆ IN THE NEGATIVE PROCESS.

FORMULÆ IN THE NEGATIVE PROCESS.

NEGATIVE BATH.

Water,	12 oz.
Nitrate of silver,	1 oz.
Iodide of ammonia,	3 gr.

Filter and add acetic acid sufficient to turn litmus-paper a pale red.

TO EXCITE NEGATIVE COLLODION.

No. 1.

Collodion,	1 oz.
Bromide of ammonia,	1 gr.
Bromide of cadmum,	1 gr.
Iodide of ammonia,	4 gr.

Make these excitants fine, by pulverizing them in a glass mortar, then add them to the collodion, and shake until the collodion becomes colored. Let stand over night and it will be ready for use. The result will be

better if the cotton is put in last, after the ether and alcohol have been excited, with the desired chemicals.

NEGATIVE COLLODION.

No. 2.

Collodion,	1 oz.
Bromide of potash,	2 gr.
Iodide of potash,	4 gr.

NEGATIVE COLLODION.

No. 3.

Collodion,	1 oz.
Bromide of potash,	½ gr.
Bromide of ammonia,	½ gr.
Bromide of cadmine,	½ gr.
Iodide of potash,	1 gr.
Iodide of ammonia,	2 gr.
Iodide of cadmine,	1 gr.

The above I have used and found good; it is founded upon the idea, that mixed collodion works more smoothly, though I am inclined to think that it is age which gives it this quality.

There are a number of other excitants for collodions, such as the iodides and bromides of magnesia, &c., but they have been found upon frequent trials, to be inferior to either of those I have mentioned.

STRENGTHENING NEGATIVES.

Very frequently negatives, owing to the collodion, state of the bath, or want of light, are too weak to print from, the proofs are undefined in the drapery, and without high light in the face. Such negatives may be very considerably improved by submitting them to a chemical process, technically called *intensifying*, or *strengthening*. There are many modes of accomplishing this end, but the following I have used in preference to any of the others:

Water,	16 oz.
Sulphuret of potassium,	2 oz.

This solution is poured freely upon the negative, and kept in motion, after it has been cleared and washed, but before it is dry. It may be done even after it has been dried, by wetting it again. Although it is attended with some little risk, being apt to stain or split and peal off. The first application of this intensifyer has the effect of making the negative appear more positive; that is, the

picture is seen more distinctly by reflected light. Keep on the solution until this positive appearance disappear, which will seldom exceed five or six minutes; wash afterwards in plenty of water, and set up carefully to drain and dry.

HINTS TO BEGINNERS IN THE NEGATIVE AND POSITIVE PROCESS.

Too much ether in collodion retards the action of light, whilst alcohol in excess facilitates it. A plate takes longer to excite in the silver bath when ether is in excess, but it does not require so long to set ready for the bath, as when alcohol predominates. I have seen it somewhere recommended to thin collodion in summer with alcohol only. This I think is a mistaken idea, as collodion must contain a certain proportion of ether, and if it evaporates faster in warm weather—which it does—leaving the alcohol behind, it is the ether and not the alcohol which should be added. The best method of thinning, is with a thin collodion properly excited. A collodion which has been prepared for several days, will give the most intense negatives, and the prints will be much finer.

When a negative or positive developes slowly, the sitting has been too short, and the developer should in consequence be kept on a

much longer time than usual, although the full effect cannot be produced by this means.

An ambrotype slightly over-timed and under-developed, produces a transparent picture, under-timed and over-developed produces a picture somewhat resembling an ivory miniature. When the film is thick and tough, inclining to wash off the plate in the silver bath, thin with alcohol. Ether makes the collodion tough, and alcohol rotton; therefore, when the collodion is thick, having no disposition to leave the plate, add ether.

FOGING.

The most common causes for foging are light getting upon the plate, either before or after sitting, or want of acid in the bath, the operator can easily ascertain which of the two is the cause.

STREAKS AND SPECKS.

Streaks upcn the plate are more frequently caused by carelessness in the manipulations than in the quality of the chemicals. The following may be named as some of the most likely causes. First. The plates not being properly cleaned. Second. Taking the plate out of the bath before the ether has been washed away or dipping before the collodion is sufficiently set. Third. The developer not being poured on evenly at first Fourth. Too much water in the collodion. Fifth. The bath too neutral. Sixth. The plate shield being dirty, the shield should be wiped quite dry after each sitting.

Specks are of frequent occurrence, especially when new collodion is used, then it is caused by loose particles floating in the collodion, it should be allowed to settle for several days, then decant and set carefully away for use.

HINTS UPON SILVER BATHS.

The silver bath should be very frequently filtered and kept free from dust; flooding answers a good purpose also, but does not do away with the necessity of filtering, when the bath becomes too alkaline, which will be the case if the ammonias are used as excitants. Add a few drops of acetic acid for negatives, and for positives a few drops of nitric acid. If by any cause it should become too acid, add pure aqua ammonia, until it becomes neutral, and then put in the proper quantity of acid desired.

Another method, and probably a much better one, although attended with more time and trouble, is to heat the solution over a slow fire, and add to it whilst it is warm oxide of silver, until it becomes neutral. Then, if too much nitric is present, the oxide will be converted into the nitrate of silver, and on the other hand if too much acetic acid is present, acetate of silver will be formed in the shape of needles, which can be filtered out, and reduced

to metallic silver. Baths should be filtered very carefully through two thicknesses of paper, and flooded, if used much, every day or oftener. When the bath becomes weak, add nitrate of silver, dissolved in a small quantity of water. Another very simple method of reducing the proportion of acid or alkali in the nitrate bath, is to add to it nitrate of silver dissolved in a small quantity of water.

In conclusion, I will repeat in substance what I have said at the commencement, that success depends more upon a thorough acquaintance with one set of formulæ, than having a general knowledge of all in use. If the student, keeping this fact in view, is observing, and carefully attend to the directions I have given, however imperfectly they may seem to those who adopt a different course, he will find photography to be an easy and a fascinating study, highly worthy of his leisure time and talents.

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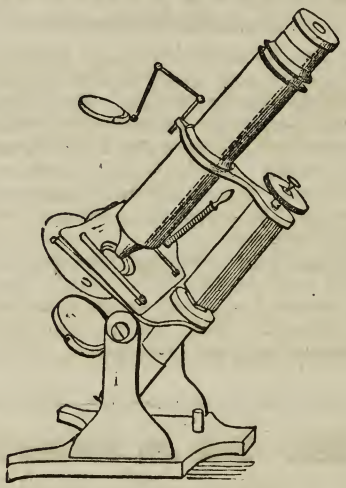

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