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THE

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THE

PHOTOGRAPHIC ART-JOURNAL.

Vol. 5. JANUARY, 1853. No. 1.

A GENERAL REVIEW OF THE DAGUERREOTYPE.

BY M. A. GAUDIN.

Translated from the French by Mrs. A. L. Snelling.

SECTION I.

ON THE FABRICATION OF THE PLATE; ON THE SILVERING AND OF THE CHOICE OF THE PLATE.

THE instability of the compositions of silver under the influence of light which has been proved and established from a remote period by chemists, is the fundamental fact which forms the basis of the Photographic art.—Niepce, who at first employed plates of tin to receive the sensitive coatings, was led to substitute in their place the silver covering to obtain a more beautiful metallic surface, and also in order to obtain a dull black instead of a reflective one. At that period he was working with Daguerre. In employing the method of the latter, founded upon the use of the substances reduced to vapor, instead of the liquids which Niepce employed, they confirmed beyond a doubt the effects of the iodine and mercury. In all probability it was Daguerre who alone discovered that series of remarkable operations, which has since with justice assumed the name of daguerreotype.

Thus, the process of Daguerre consists in forming upon the surface of the silver itself the composition sensitive to light.

The high value of this metal, and the necessity of having it in the form of resisting plates, in order that it may be able to undergo the operations indispensable to the production of the images, have very naturally caused the employment of copper coated with silver. It now becomes interesting to our readers, and useful, doubtless, to some, to become acquainted with the manner in which this silver lining is fabricated, the various operations of which I have been able to follow in the manufactory of my brother Alexis, and which I now intend to describe to you in a very few words.

FABRICATION OF THE PLATE.

The double plate results from the plating of a rectangular ingot of red copper, about 4-5th of an inch in thickness, with a superficies of 15½ square inches, covered on one of its faces with a fine leaf of silver, which by its relative thickness, gives the plate its title. In manufacturing this double plate the quality of the copper is not a matter of indifference, red or rose colored copper should be employed, very fine and perfectly flexible, and the silver leaf should be prepared of fine silver, otherwise called *virgin* silver.

Before applying the silver, the copper ingot receives a preparatory operation; its surface is briskly scraped with a long-handled graver until all the oxidated portions, cavaties and flaws, have entirely disappeared; the surface is then rubbed with a solution of nitrate of silver, which deposits upon it a black powder (precipitate of silver) which is rendered metallic

and adherent by the rubbing. The ingot of copper is then ready to receive the silver leaf. This leaf, which is larger than the surface of the ingot, is applied to it without any thing intervening, and riveted to its edges.

The upper portion of the silver leaf is protected by a light layer of powdered chalk, the whole is then covered with a very thin red copper case, riveted with care, which maintains the junction and prevents as far as possible the access of the air and gas during the heating process.

The ingot thus prepared is placed upon a brass frame heated with *charcoal* in order to avoid the sulphurous emanations and it is itself covered with the coal. As soon as the ingot reaches a light red heat, a workman presses the surface of the ingot by sliding a brass cylinder with pressure over the upper part of the case, disengaged for this purpose from the coals. The design of this operation is to bring together and commence the soldering of the two metals, which the temperature has already reduced to a certain state of malleability. Soon after, the ingot is again surrounded with coal, and, as soon as it has attained a light red temperature, it is withdrawn to pass it instantly, two or three times, through a pair of plating instruments made expressly for this use. It comes from these with a considerable elongation, and a chemical adhesion of the two metals, that is to say, without any employment of salt of ammonia borax, or other de-oxidating salts.

When the ingot is again grown cold, the silver leaf which overhangs the edges, and has not been soldered, is removed with a large file, and the surface of the silver which is discolored by the operation is cleaned off by immersing it in a bath of highly diluted sulphuric acid. As soon as the piece has been rinsed and dried, it is ready to undergo the process of plating.

This grand operation is performed by two workmen who pass the plate between two cylinders of highly dressed and polished white brass, the edges of which they bring gradually together by pushing up and down the rollers of the upper machine by means of a vertical screw which acts upon them. The two workmen, placed opposite, send to each other mutually the plate, which gradually diminishes in thickness, increasing in length altogether without any perceptible widening.

In the interval, when the gradual hardening has rendered the piece too stiff, it is again softened by bringing it to a red heat with a charcoal fire. One hour of continued labor is necessary to draw each piece to the length of 6 feet.

It is now divided into plates of 8 inches in length, which are afterwards drawn out with respect to the width, and at the end of half an hour the 6 or 7 inches width is transformed into a length of 24 or 25 inches. By this process, the original ingot is transformed into 32 normal plates of 6x8 having at most little more than 1-20 of an inch total thickness. The thickness of the silver will be forty times less, if the coating is 1-40th the copper.

In spite of all the care which is exercised in the conduct of the plating instruments, it incessantly happens that their surface becomes covered with small cavities, which result unavoidably—with this enormous pressure—from every body harder than the copper, for it is necessary that these instruments be made of somewhat pliable metal; this is the reason why the last operations are performed upon two sheets at once, by placing the silver sides together, which eventually hardens their surface.

In coming out from the plating operation, the sheets are again heated, passed through the acid, muslin and stone operations, and undergo in a word a host of minute manipulations, for the purpose of cleaning their surface. Each one of these sheets divided into four parts, forms normal sized plates, which, before being ready for the market, are yet to undergo an essential operation; this is the planishing. Without this last preparation the plates would be too soft to manage without augmenting their natural deformity, due to the last impression of the fire. Planishing also equalizes their surface, which is rough, and, in a manner, formed of a continued series of folds.

The planishing is performed with the hammer, blow by blow; much skill and care is necessary on the part of the workmen to practice it in a satisfactory manner. I have always said, and I still believe that a surface as polished as a mirror could be obtained by having the surface of the plates beaten with a steam piston armed with a hammer of the entire dimensions

of the plate ; in less than a minute a plate would be throughly dressed and polished in a manner to leave very little to be done by the daguerreotypist.

SECTION II.

ON THE POLISHING OF THE PLATES.

Since polishers or buffs covered with velvet or skin have entered into general use, it has been found necessary to turn down the sharp edges of the plates, in order to avoid cutting and rubbing against them, and especially against the corners. The edges of the plate are turned down by means of an iron rule, held, in its vertical movement from top to bottom, by guides, and worked by a screw arm. For this purpose the plate is placed on a brass or hard iron surface, so that the quantity of the plate desired to be turned under may project over it, the iron then pressing with a single stroke upon the projecting rim—it is best at a right angle—by the pressure, without the surface of the plate being thereby affected.

After having performed the operation on each of the four sides, the four angles are again straitened to fix them under the *oreillettes.**

If, in order to avoid the inconveniences attending the use of oil—essential oil is made use of—it is a matter of importance that those which are distilled be employed, without which they leave upon the plate a thin layer of resinous matter which renders necessary the after employment of spirits of wine ; and in spite of this, according to the assertion of Messrs. Sampson and Deschamps, the action of the buffs become thereby very unequal, this is the reason why these gentlemen follow a very simple and rapid process, which should, it seems to me, be preferred, especially by amateurs, who will find it a cause of success for them without the least possible trouble.

If a new plate, or a plate with an unfixed impression is to be cleaned, a few drops of spirits of wine mixed with tripoli are poured upon its surface which is then rubbed with a circular motion round the plate with a pellet of cotton, taking care to keep the pressure towards the sides of the plate, the centre, without this precaution, having always a greater tendency to wear off. This operation is continued until the part has become thoroughly dry ; the volatilization of the spirits of wine, and when the plate is, by this means, covered with a light coat of tripoli, slightly moistened, it is left to dry, in order to take a new pellet of cotton which serves to remove the tripoli gradually.

The plate acquires in this manner a sure polish ; its surface becomes clear, and when, by testing with the breath, no inequality is any longer seen upon its surface, nothing remains but the finishing polish with the buff.

This buff, covered with buckskin, has been previously impregnated with powder of sapphire,† rubbed upon its surface with cotton, and afterwards cleaned off with a brush, in order to remove all but the most minute particles which have penetrated into the fibres of the skin, when the buff produces a bluish veil over the plates, it is the sign of the presence of some greasy substance, the buff must then be briskly rubbed with linen fit for that purpose, well brushed, and the powder of sapphire put on again as before.

By means of a turning block the plate is buffed in two directions parallel to its principal diagonals, and a third time lengthwise or across the plate according to the style of picture wished to be produced. By this extremely simple process these gentlemen obtain a very lively polish, of exceeding sensibility, which gives them a uniform success.

After tripoli, many very skillful operators, such as Messrs. Vaillat, Plumier, Androix, etc., employ rouged buff, which may be used as soon as the plate becomes perfectly dry ; they finish off with a *special* buff, which has never received any polishing powder. By operating in this manner, a darker polish is readily obtained, and if the superiority of Mr. Vaillat, for example, was owing to this employment of rouge, it must generally be adopted, but every operator whom I have questioned in this respect have asserted that the remarkable vigor of the impression of Mr. Vaillat depended without doubt upon the superiority of his accelerating substances. As for myself, I believe that it is owing to the

* An instrument for rounding the sharp angles.

† Pure alumina, or earth.—*Ed. Pho. Art-Jour.*

quality of his rouge which is doubtless of extreme purity—I mean washed with great care and also sufficiently calcined to prevent its adhereing to the plates; such as the clear shaded rouge which gives a fine polish, but strangely adheres to the plate in damp weather. For the same reason, before using the powder of sapphire, it should be tasted, and carefully washed until no taste of the alum is perceived: it is the presence of this salts which has caused many disappointments in the use of this powder, disappointments which have much astonished me, and which I now perfectly account for to myself.

As for the spirits of wine, the strength is a matter of little moment, but it is necessary at Paris, to mistrust that which contains varnish; it may be recognized by the odor, and especially by evaporating a drop on a polished plate; if the drop leave a circular trace, it must be changed.

In covering the buffs, velvet, the white cotton and skins, more or less free from grease, have been employed until this day. I say more or less free from grease, because greasy substances being used in the preparation of the skins, it is nearly impossible totally to eradicate them. This is the reason why I think that fine cloth of hemp or flax (which can easily be well washed in spirits of wine), and not too new, would make excellent buffs. I intend myself trying them, and will make known the results to my readers.

I have sometime employed silver beaten into very minute leaves for covering buffs. It has appeared to me that this method has produced beautiful whites, the silver precipitate would certainly be still better, not having undergone the contact of the skin used for beating the silver into leaves.

In terminating this chapter, I will say, that every operator who desires to arrive at perfection should assure himself of the excellence of the methods he employs, of his liquids, powders, buffs, etc., and for better certainty to purify them himself; to be more particular with the first polishing of the plates, whether it be to remove the original roughness, or to remove a fixed or confined impression, and only to finish buffing when it is certain that it has penetrated into the heart of the silver. Since rouge is so capricious, I presume that the best process would be to substitute for it the powder of sapphire with the first buff, employing a second covered with calcined lamp black for burnishing, and in effacing the somewhat lively stripes left by the powder of sapphire. As for the rouge, the best quality is the violet colored; it will always be good to wash it previously with ordinary filtered water. The employment of oil with the powder of sapphire to give it hold, in the absence of very fine emery, appears to me to be indispensable for fixed impressions, taking care to operate, at one time, upon a great number of plates, which must be carefully wiped and afterwards passed to the buffing with rouge and spirits of wine.

As for those few, who may wish to work exclusively with the oil, it is indispensable that they finish off with a buff plentifully powdered with calcined lamp black, and I would repeat to them that with this process, every line or deep cavity in the plates produces black marks.

OTHER METHODS OF POLISHING THE PLATE.

Since the publishing of the foregoing article, I have obtained further information concerning the polishing of the plates, which has resulted in giving me a knowledge of a few processes and machines with the description of which I am going to entertain my readers.

In order to turn down the sharp edges of the plate there has been another instrument made and sold at a moderate price, which may be applied to plates of every dimension. It is composed of a wooden block, furnished with a projecting metallic blade, to hold the plates, and of a cylindrical form of hinge moving the length of a groove worked in a vice, fixed square upon the block.

This machine is less expeditious and less certain than that which I have before spoken of, but it is much more portable, and a great deal less expensive. Buffing machines are also constructed, which have for a long time been tending to take the place of the common hand buff, among those who have a great number of plates to polish on account of the quickness of their performance.

Such is the rotary machine of Mr. Moutier, of the price of from 70 to 80 francs, and the machine with two vertical polishers of Mr. Gouin, price from 4 to 500 francs.

The machine of Mr. Moutier consists of a vertical disk of brass about 18 inches in diameter, receiving a rotary movement by means of a *vancausou* which catches upon the cog wheels of very unequal diameter. The largest wheel is fixed upon the lower axis, furnished with a handle which is moved by the right hand. The upper axis is that of the brass disk which is covered with skin, the surface of which is kept elevated by a cushion of cotton, interposed by means of a ring of thick iron wire, and by the armatures of iron which are placed on the under side of the disk, the skin receives the requisite tension. The plate, fixed on a block, is moved with the left hand, which turns and presses it more or less upon the left. This machine, the wheelwork of which is enclosed in a brass case, occupies very little room. Mr. Vaillat operates with it successfully. On this occasion I learned that Mr. Vaillat polished his plates altogether with tripoli.

The machine of Mr. Gouin occupies a much greater space; it rather resembl s a turning lath with its foot-board, its motive wheel, fly wheel and bench. The operator has, moreover, in front of him, two polishers, incessantly animated with a vertical motion, to and fro, with an inverted movement, the one from the other. The bench carries a movable piece, for the purpose of moving the blocks. When the block is in its place, it can be given three different movements, viz., a rotary movement upon its axis, a movement from right to left, and a backward and forward movement. The movement from right to left serves only to keep the plate before the buff. It is furnished with a continual movement to and fro of the bench, which is determined by the action of the machine itself, and which may be accelerated or suspended at will

Of the two buffs, one is sprinkled with rouge and the other is destitute of any chemical compositions, and intended for finishing. In this way the polishing operations continue on uninteruptedly, and both hands being free, every facility is given for turning the plate, pressing it more or less upon the buff, and passing it instantaneously from one buff to the other. I have seen this machine worked with much success at the gallery of Mr. Bertrand, where it is in motion without intermission from morning till evening, in cleaning one hundred and fifty plates, the number required daily by his patrons, and his production of impressions by the use of the stereoscope. With the ordinary buffs, he would not be able to finish half this number, and the beauty of the polish would not be so uniform. These two machines may be examined at the office of the journal, where they are deposited. As has been seen, the process of polishing has become more and more simplified; it consists wholly in employing powders cleaned with care, and spirits of wine exempt from foreign bodies; the polishing with cotton and dry tripoli, in bearing less and less upon the plates, and lastly in using buffs *free from all greasy substances*, and rubbed with a small quantity of fine tripoli, oxide of tin, silica, or powder of sapphire.

When the plate has undergone these operations, and before using it, it is well to examine it attentively in a strong light, and to test it with the breath. If its surface then appears of a beautiful black, and the mois ure arising from the breath becomes uniformly dissipated, it is certain that the plate is in a good condition. If the plate appears somewhat bluish, it would be the sure indication of a greasy film upon it, and every impurity exposed upon its surface would be distinctly marked by a trace of the same extent, the moment the vapor condensed by the breath should dissipate.

SECTION III.

IODINE BOXES AND THE IODIZING.

The employment of iodine uncovered, rarely gives an even coating and varies too much with the temperature. At first its evaporation was lessened by covering it with cotton, and since then by the porous plates of Mr. Le Baron Gros; with the cotton it often happened that filaments impregnated with iodine became attached to the plate and formed a stain upon it from excess of iodine. The place of the porous plate may be supplied by a piece of fine tissue paper fitted to the frame, or by a sheet of very fine plasta. This last is the easiest to prepare. The following is the mode of operation; after having laid upon a piece of marble orglass, a sheet of oiled paper, the frame which is to receive the leaf of plastic is placed upon the sheet of oiled pa-

per, then some modeling plastic is poured upon the sheet to the thickness of 1-5 to ¼ of an inch, taking care to make the plastic adhere well to the interior of the plate; at the end of half an hour, the frame is taken up and the paper removed from the plaster, this operation ended, the leaf of plaster should be laid away to dry.

In the exposition of the silver to the vapor of iodine, it is not simply a condensation of the vapor that takes place, but rather a combination of the iodine with the silver; a crystaline composition the shade of which varies according to its depth. In all probability, there are layers one over another of different iodides of silver, those nearer the silver being richer in silver, and those nearer the outer coating of iodine being richer in iodine; and it is the solidity of these different compositions which produces a *tout ensemble* sensitive to the light.

The essential circumstance to be noted is that an addition of iodine restores easily and *integrally* every alteration caused in the sensitive coating by the prolonged action of the light; the effect of the sun itself on the coating is *destroyed by a fresh coat of iodine.* As operators have every facility for examining even in a strong light the coating produced by the iodizing, they should, with much stronger reason, not fail to examine it by the reflection of a piece of white paper placed in a fair light.

Before giving the plate the coating of iodine, it is necessary to dust it with a brush kept especially for that purpose; and if any dust imperceptible to the eye may have got upon the plate, it also will be removed.

The rapidity with which a plate is colored by contact with the vapor of iodine, it is useless to speak of. A plate which becomes almost entirely yellow should be mistrusted; plates of a fine silver surface are generally slow to take their first coat; so if, contrary to custom, the iodine acts unequally, being heavier in certain places, it is nearly a certain sign that the primitive impression has not been entirely removed, and the best way to act is to polish the plate anew or replace it with another.

SECTION IV.

ACCELERATING SUBSTANCES.

It was Mr. Claudet, the skillful London photographer, a native of Lyons, who first thought of, and employed successfully, accelerating substances. His process modified and improved by the aid of all, has enabled us to reduce the minutes of the time of operation in the camera-obscura to as many seconds.

His method consisted in submitting the plate already iodized to the vapors of the chloride of iodine; the chloride of iodine which he employed was a liquid of a somewhat black color, containing very little chlorine; the acceleration also, which he obtained, although already very remarkable, has only attained its maximum from the moment when the chlorine and bromine are employed in such a way as to bring forth their full power.

It appears to me, as demonstrated by every comparative experiment I have made, that every accelerating substance rightfully employed gives the same sensibility, which is limited by the appearance of the veil accompanied by an absence of image. This veil is prompt in manifesting itself, especially with chlorine or bromine water, with the chloride and bromide of iodine the more manifest change of color is an easier guide to consult; in every case the examination of the impressions obtained at the commencement of the day is essential in regulating the time of exposition which should be observed during the rest of the day; this is the reason why it is important to distinguish an excess of iodine from an excess of chlorine or bromine.

The excess of iodine is indicated by a general want of sensibility, accompanied with a sandy appearance in the dark portions; the excess of bromine or chlorine, on the contrary produces an image unequally formed on portions of the plate very close to each other, which are separated by the veil properly so called, and which are ordinarily bent in the form of an arch, with a complete absence of image and covered with characteristic white points near 1-25th of an inch in diameter, and five or six at the most in number, and which it is impossible to confound with the sandy appearance produced by excess of iodine. By attending to these observations a means of at once regulating the application of the sensitive coating is arrived at, *provided the boxes are placed in a situation*

very little subject to the variations of temperature. This precaution is one of the most indispensable.

With light coatings only blacks easy to veil, and *mezzotintos* not very distinguishable, are obtained. The veils are difficult to avoid; this is why heavy coatings are preferred at the present day; the plate is iodized till it reaches a purplish red, by the reflection of white paper and after having been coated to a violet over the accelerator it is again passed over the iodine to avoid the veil.

Indeed it has been formerly proved that coating back over the iodine produced this result, but it does not follow that it should be abused; we are only thereby more certain of obtaining a picture even when equally brought out. A shorter exposition over the accelerating substance would produce exactly the same effect; this is the reason why I would advise relying upon the change of shade or to a shorter exposure over the accelerator.

As I have already said in another article, the employment of accelerating compounds mixed with quick lime has generally prevailed, as much on account of its convenience as of its certainty; their good effect depends, also, doubtless, upon the absence of the chlorohydric, bromohydric and iodohydric acids which are wholly absorbed by their combination with the lime.

Two dishes are also very convenient for use, it is necessary however to avoid a too hasty passage from one to the other, as it might produce upon the plates crystals of iodine. If the depth of the coating contributes to giving a beautiful tone to the impression, the nature of the accelerating substances contributes no less. The chloride of iodine, once so much employed, and now totally abandoned, appears to possess this faculty in the highest degree. I have therefore resolved to study it on this account, and also for its singular property which it gives pictures taken with it, and for its singular property of being brought out by being placed under red glass.

I have made an experiment of the preparation of yellow chloride of iodine, by placing in a retort chlorohydric acid, peroxide of manganese and iodine, and distilling them over a slow fire, according to the process of my ancient chemical friend, Pierce Geverins. I have, in fact, obtained a yellow oderiforous liquid, but in very small quantity. This experiment was conducted in company with Mr. Edward Fruit. We acknowledge that there was an enormous loss of chlorine, a great slackness in the production of the yellow chloride of iodine, and that it would be much better to pass the chlorine into the interior of a balloon, with dampened sides, which would easily be covered with crystals of iodine.

The impressions obtained had, indeed, a tone of remarkable beauty.

I profited by this interview in obtaining a knowledge of the bromine box of Mr. Edward Fruit; this is rather an expensive article of the price of from 60 to 70 francs; but the certainty of its action in spite of the changes of temperature, and the clearness of the impression obtained, have proved to me that this price was very accessible for a well regulated establishment. It consists of a glass dish covered on top by a porous plate and communicating with a bottle closed by a facet, containing fine bromine. Mr. Edward Fruit is in hopes he will be able to substitute for the bromine the yellow chloride of iodine, their remains to form a compound sufficiently volatile. These compounds of iodine have been very little studied. There will doubtless something interesting result from his experiments which we shall not fail to communicate to our readers.

It would not be astonishing if the tone of the impressions obtained with the chloride of iodine was different from those obtained with the bromide and chilou-bromide of iodine; for the red rays act in a totally dissimilar manner upon the sensitive coating which derive their origin from those different compounds.

I have never been able to obtain the least trace of any image, by bringing out with red glass, or plates prepared with the bromide of iodine, while I have never failed in producing *a remarkable result* upon plates prepared at a very distant time with the chloride of iodine.

Mr. Claudet has explained to me this difference, by showing me that red lights instead of revivifying destroy every effect of light undergone by a plate prepared with the bromide of iodine.

I have heard that by a remarkable result, complete impressions have been ob-

tained in much less time than they could be had by any accelerating substance whatever, without the intervention of the red glass. It remains to be known whether a plate having attained its maximum of sensibility, with the chloride of iodine, would not act with the red glass like a plate prepared with the bromide of iodine, for at the time when I so well succeeded by the intervention of the red glass, it is certain that without it I would on the entire half have had but half of the maximum sensibility which the use of the red or yellow chloride of iodine actually gives. And if I refer to-day to this process, it is because it enables me to hope I may arrive at a method of obtaining impressions in less time than by the means now actually employed, which would be highly valuable for portraits and views to be taken on the instant.

The following was my *modus operandi;* after having iodized to a golden yellow and brought it up with the black chloride of iodine, covered with cotton, to a decided rose color—performing this last operation in perfect darkness—the plate was submitted to the camera an insufficient time to bring out a picture with the mercury; then, taking the apparatus into the dark, the plate, (one half of its surface being hidden by a black velvet band) was placed in a box covered on top by a piece of red glass of a perfectly equalized shade; this box was exposed to the direct rays of the sun for ten minutes; then, lastly, the plate passed from this into the mercury-box, which constantly produced a detailed impression wherever the velvet had not intercepted the red light, while on the part previously covered by the velvet it was, at most, visible enough to prove its existence there. I recollect very well having obtained in an eighth of a second a solarized impression with a diaphragm which would have required half a second as the correct time of exposition of an impression by employing bromide of iodine.

There is, therefore, in this a principle of extreme sensibility which will be studied by all those who understand its importance. I am perfectly decided, for my part, to occupy myself, this year, in the consideration of it, in order to impart to our readers the positive and practical results I may obtain.

In summing up, the most essential things for the proper employment of the accelerating substances, is to place the box in a situation protected from the sudden variations of temperature, and to know when there is an excess of iodine or of bromine and chlorine, in order to have a guide to the number of seconds for the exposure each day, to the accelerating substances, and the coating back over the iodine: this number of seconds will necessarily vary with the different climates, seasons and substances employed, it would, therefore, be useless for me to specify here any certain number.

The time of coating back over the iodine is ordinarily one-fourth of the time of its exposure to the accelerating substances. I would advise relying upon the examination of the color without coating back at all, or only a very insignificant period, in order wholly, to destroy the impression caused by the lights upon the plate during the last examination of its color through the reflection of white paper.

TO BE CONTINUED.

☞ A man's first care should be the reproaches of his own heart; his next, to escape the censures of the world. If the last interferes with the former, it ought to be certainly neglected; but otherwise there cannot be a greater satisfaction to an honest mind than to see those approbations which it gives itself seconded by the applause of the public. A man is more sure of his conduct when the verdict which he passes upon his own behavior, is thus warranted and confirmed by the opinion of all who know him.—ADDISON.

ANALASIS OF ENGLISH COLLODION.

BY M. LEON KRAFT, CHEMIST, PUPIL OF M. GAY LUZZAC.

Translated from La Lumiere by Ambrose Andrews.

August 25, 1852.

MY DEAR LACAN—I hasten to give you the results of the analysis which I have just made of some English collodion The specimen upon which I have operated came direct from England, and no doubt can arise as to its origin.

This collodion is very fluid, and of a high amber color ; which the action of light and air gradually changes to a reddish yellow.

Taking the density at the temperature of 20 deg. centigrade, I obtained the following result:

Flask of collodion,	26.184
The flask alone,	13.786
Collodion,	12.398

The same volume of water at 20 deg. centigrade weighs 16.115 whence

$$\frac{12.398}{16.150} = 0.769$$

for the density of the English collodion.

To find the proportion of pyroxyline which it contained, I took a certain volume of it, in a graduating glass, and poured it slowly and lightly upon a surface of distilled water. The ether was vaporised, the alcohol and saline principles were dissolved in the water, and at the end of a quarter of an hour, nothing remained but a thin white coating of pyroxyline.

This being carefully raised and well dried, showed by its weight, the precise quantity of pyroxyline held in solution in the given volume of collodion operated upon. Now, by a simple rule of three, the exact proportion requisite for any given quantity can be ascertained.

EXAMPLE.—If in 30 cubic centimetres of collodion prepared as I have above described, 0 gr. 197 of dry pyroxyline will be obtained, then by the following proportion it will be found how much is required for one litre.

$$30 : 0 \text{ gr. } .197 : 1000 : x$$
$$x = 6 \text{ gr. } .566$$

Thus it will be seen that we have 6 gr. .566 of pyroxyline to the litre. The mean result, however, of five trials, makes the quantity 6 gr. .598 for each litre of English collodion.

This manner of finding the proportion of pyroxyline held in solution in the ether is very simple, very expeditious, and sufficiently exact ; and it comes within the reach of everybody. I give it with the greater pleasure, inasmuch as there are many photographers who at present make their own collodion and it almost always happens that whilst they employ the same recipe, they nevertheless hardly ever obtain twice in succession, the same quality of collodion.

At one time it will be good and at another time bad. Sometimes it will be too thick and sometimes too slow, &c.

This, I think, arises from a cause of which these artists seem to be ignorant. It is doubtless because the gun cotton is never twice in succession the same, by whatsoever method it may have been prepared. Now, among the various recipes for collodion, some prescribe 10, 12, or 15 grammes of gun-cotton to be dissolved in 500, 600 or 1000 grammes of ether, but if the gun-cotton made one day is entirely dissolved, while that made another day is only one-third or one-half dissolved, it is obvious that the collodion thus prepared certainly cannot possess the same properties. One will be of thicker consistency than another, while it is above all things necessary that the coating upon the glass should be constantly equal, perfectly homogen ous, very transparent, and that it should have just the desired thickness, the thinner it is, the more successfully will it operate.

When a photographer has prepared for himself some collodion and finds it to be exactly right, it will be easy for him to proceed to make more of precisely the

same proportions. The best method is to saturate with gun cotton a given quantity of ether, then to ascertain the quantity of pyroxyline contained in solution in one litre, then add to this concentrated solution the proportion of ether and alcohol which your calculation has indicated as necessary to bring this quantity of pyroxyline to the proportion which was found to be the right one. A simple rule of three will then give the requisite proportions for any given quantity as I have above indicated.

Although the pyroxyline contained in the collodion forms the sensitive layer, yet it does not impart actual sensitiveness to that layer. This latter quality is imparted to it by the iodide of silver which it is made to hold in solution; or rather which is imparted to it by immersing the collodionized plates in a solution of the nitrate of silver. English collodion contains iodide of silver held in solution in virtue of an excess of alkaline iodide in which it is soluble. Collodion, I find, contains 7. gr. .179 of iodide of potassium to the litre. As to the quantity of silver, I found it so very small, and my sample being so very limited, I was unable to ascertain its precise proportion. English collodion, then, contains, 6 grammes .608 of pyroxyline, and 7 grammes .196 of iodide of potassium to the litre. If to this be added about a tenth of a litre of alcohol, (which I extracted from it) it will be seen that it may be perfectly imitated in the following manner.

Dissolve in the tenth of a litre of alcohol at 33 deg. about 7 grammes of iodide of potassium. Let this liquor stand for some time, upon the iodide of silver, in a flask with a glass stopper, keeping it from the light. When you require it for use, filter, and mix it with nine-tenths of a litre of ether holding in solution, from 6 to 7 grammes of pyroxyline.

I should caution you against trying to increase the sensitiveness of the collodion by charging it with a maximum of alkaline iodides and the iodide of silver *both at the same time*. This would produce quite a contrary result. According to some experiments which I am at this moment prosecuting, it would even seem that the most sensitive collodion is that which does not contain any iodide of silver. It should hold in solution only the alkaline iodides, and when the layer of collodion is once deposited on the glass, sensitiveness will be imparted to it by plunging the plate in a bath of the nitrate, or aceto-nitrate of silver. With your permission I will keep you advised of the results which I may obtain.

ELECTRIC TELEGRAPH.

☞ At the last meeting of the civil engineers of London, the following curious communication was made in regard to the electric telegraph.

Bain's electrical printing telegraph strikes off 300 words per minute. In the eastern counties 36,000 messages per month have been transmitted on business relating alone to administration of the railroad; and for commercial communications the employment of this telegraph has been such, that the messages of this kind transmitted through the central office alone will each day comprise a very compact octavo volume.

The instruments made use of at present, are so simple that they are almost operated by children from the Orphan's Asy' who need only to serve an apprenticeship of 15 days to understand the mechanism perfectly.

COMMUNICATION.

Cincinnati, Dec. 15, 1852.

FAIR OF THE OHIO MECHANICS' INSTITUTE.

DEAR SNELLING—At the late Annual Fair of the Ohio Mechanic's Institute in this city, Photography was, as usual, well represented. A much smaller, but choice collection, was presented for inspection, which is surely a good evidence of improved taste on the part of the exhibition. A cultivated and discerning public will appreciate and commend what is evidently intended solely to arrest their attention and win their admiration by excellence, rather than excite their wonder and confuse their judgment by multiplicity. Besides this, there is a just proportion of the display of the various branches of the arts and manufactures, that should not be disregarded by a large monopoly of room and public attention as has too frequently heretofore been the case in our fairs with daguerreotypes.

I remember that at one of our previous fairs, there were on exhibition some three or four hundred pictures. Indeed, it seemed as though the various galleries of the city had been removed from their proper locations and deposited on exhibition, to the exclusion of those mechanical productions for which the fair was mainly intended.

Perhaps, however, the exhibitors were justified in so doing, for as only a small proportion of their collections could justly be regarded as works of art, the remainder might most properly be designated as mechanical.

At this present fair, a diploma for the best daguerreotypes on exhibition, was awarded to Thomas Faris; and a silver medal for plain and colored Solographs, and improvements on the same, to E. C. Hawkins. These gentlemen continue to hold, in public estimation, that honorable position to which they are justly entitled by their long enthusiastic and laborious devotion to the art; the latter, however, did not enter into competition with his brother craftsmen at the present fair, with his usual enthusiasm, but sought new honors in the paper department. Mr. Faris devotes his whole time to the daguerreotype, determined to continue in the foremost rank, where he and Hawkins have so long walked side by side, and it is to be hoped that the public appreciation and patronage of the Solograph will soon require the undivided attention of Hawkins. We could not doubt the rapid improvement of the Solograph, and the development of its great beauty and utility if receiving the undivided attention of such a man.

These gentlemen are not the only ones who have inscribed upon their banners—"Excelsior." Their exists a fine spirit of emulation among our daguerreotypists generally, Fontayne, Porter, Potter, Erwin, Leppincott and Carter, Fithian, Davis and the younger Hawkins; are striving for excellence, and are receiving a liberal patronage.—Yours, SIDONIA.

"Though the lives of men devoted to silent study and secluded labor contain few of those incidents which embellish the biographies of more stirring spirits, yet they are scarcely less alluring and instructive. Their works are at once their actions and their history, and a record of the taste and feeling of the times in which they flourished. We love to know under what circumstances a great work of art was conceived and completed; it is pleasing to follow the vicissitudes of their fortunes whose genius has charmed us to sympathize in their anxieties, and to witness their triumphs."

SPIRIT OF THE LONDON ART-JOURNAL.

PHOTOGRAPHIC PUBLICATIONS.

THE liberation of the art of photography from the patent restrictions, which has for a long period pressed most heavily upon it, has been marked by the publication of the "Photographic Album,"* and by the importation and sale of photographic views taken in the East, which have been for some time past publishing in Paris.

The "Photographic Album" consists of four pictures in each number, two parts having now been published. Of these eight photographs six have been executed by Mr. Roger Fenton and two by M. Phillip Delamotte. They appear to have been all obtained upon waxed paper by the process of M. Le Gray, which has been already given in this Journal. We are not satisfied with the production; the specimens published are by no means equal to a great number which are now being produced by Photographic amateurs. The photographs of Mr. Buckle of Peterborough infinitely surpass in beauty any of those in the Album—for, although the operator has an artist's education, it does not appear that he has the facility of selecting an artistic scene, or of adjusting his camera to meet the difficulties with which he has to contend, but which may readily be overcome. One, and perhaps the most important mistake, has been in the selection of objects. With the exception of Tewksbury Abbey there is not one point of sufficient interest to induce a desire to possess the work, and the view of this "sacred fane" is degraded by connexion with a mean modern house and an awkward conservatory, rendered obtrusive by the prominence with which its sash-bars are brought out, while the white spots we suppose to be daisies in the foreground, are very offensive to the eye. It is quite evident that when the pictures were taken, the photographic artist consulted his convenience, and aimed only at making the best of the bad subjects which the neighbo hood of Cheltenham afforded, not having at the time any idea of publishing. We regret that he has done so, or rather that objects of large—of national interest have not been selected. The Parisian publication takes much higher ground. Egypt, Nubia, Palestine and Syria, have furnished the scenes which have been selected with great judgment, and the views of which have been executed with great skill. In the prospectus the editors say:—"Nous n'insisterons pas sur l'attrait qu'offrent les voyages si curieux qui M. Maxime Du Camp a accomplis entièrement á ses frais, après s' être chargé d'une mission du Ministère de l'Instruction Publique. Les pays qu'il a parcourus ont èta le berceau même des civilization et des religions. Sèsostris, Moïse, Alexandre, Pompèe, Cesar, Jèsus-Christ, Mahomet, Lusignan, Napoléon, et Châteaubriand les ont tour-à-tour fécondés par le glaive ou par la parole et les ont immortalisés de leur glorieux noms."

Independently of the high interest necessarily attaching to photographs of scenes like those, in which every hieroglyphic may be read as correctly as if we gazed upon the relics themselves, those pictures are remarkable as examples of photographic printing. This notice must suffice for the present, but we intend to devote an article in our next to the subject in all its details which will include several novelties described in recent numbers of the *Cosmos*,‡ an admirable scientific publication, which has on several occasions selected with complimentary acknowledgments the philosophic information to be found in the *Art Journal.* We learn from the *Cosmos* that M. Niepce de St. Victor has made very considerable advances towards the natural fixation of colors.

* The "Photographic Album," parts 1 and 2. Published by D. Bogue, London.

† EGYPTE, NUBIE PALESTINE ET SYRIE—Dessins Photographiques recueillis pendant les Annees, 1849, 1850, et 1851, et accompagnes d'un texte explicatif par Maxime du Cam, Charge d'une Mission Archeologique en Orient par Le Ministere de l'Instruction Publique. Gide et J. Bandry, Paris.

‡ COSMOS: Revue Encyclopedique Hebdomadaire des progres des sciences, et de leurs applications aux Arts et a l' Industrie, fundee par M. B. R. de Montfort, et redigee par M. L'Abbe Montford. London agents, Horne, Thornwaite and Wood, Newgate-street.

METHOD OF OBTAINING DIRECT POSITIVE PHOTOGRAPHS UPON GLASS BY M. ADOLPHE MARTIN.

This gentleman in a communication to the Paris Academy of Sciences, regrets that collodion sun-pictures—notwithstanding the ease of producing them, and the delicacy of their execution—are frequently deficient in harmony. With the view of remedying this defect, M. Martin has devised the following plan of operation, which he states to have been most satisfactory: The collodion which I employ" says he, "is composed of an ethereal solution of gun cotton, obtained by treating 2 grammes of cotton with a mixture of 50 grammes nitrate of potash, and 100 grammes of sulphuric acid. The cotton when thus prepared, then well washed and dried, is entirely soluble in a mixture of 10 volumes of ether and 1 volume of alcohol, which constitutes the solution, to which about 1 gramme of nitrate of silver transformed to iodide is now added, having been previously dissolved in 20 grammes of alcohol by means of an alkaline iodide—iodide of ammonium being used by preference. The plate of glass, covered in the usual way with a thin layer of this substance is plunged before it becomes dry into a bath, composed of 1 part distilled water, 1-12th of nitrate of silver, and 1-20th of nitric acid. Afterwards it is plunged into another bath of sulphate of protoxide of iron, and finally washed with care. Up to this moment the image has remained negative, but on plunging it into a bath composed of the double cyanide of silver and potassium, it immediately becomes positive. All that now remains is to wash it, cover it with dextrine, dry, and finally mount it. The cyanuret bath which I employ, is similar to that used by Mr. Elkington. It is composed of 1 litre of water, 25 grammes of cyanuret of potassium, and 4 grammes of nitrate of silver. I have now only to remark, that this process has always yielded me proofs, and which proofs are invariably positive. Their perfection entirely depends on the amount of manipulative care brought to bear on their development."

OBITUARY.

MR. JOHN VANDERLYN.

The American newspapers announce the death on the 23rd of September, of John Vanderlyn, one of the oldest and most distinguished citizens of the United States. He died in his native town, Kingston, in the State of New York, at the advanced age of seventy-six years. When we have had occasion to refer to the position of American Art, the name of this artist has generally found a place in our observations, so that it must be in some degree familiar with our readers. Vanderlyn's first connection with Art was as assistant in the shop of a printseller, at Richmond, in the same State—a position which helped to foster a natural taste for the Fine Arts. He here made the acquaintance of Stuart, the portrait-painter, whose works some years since were well known in London, and who was the uncle of the late Gilbert Stuart Newton, R.A. Vanderlyn had already taken some lessons in painting, and Stuart kindly permitted him to copy some of his portraits. Another generous individual, Colonel Burr, advanced him the means of studying under Stuart; and, subsequently of proceeding to Paris, in 1796, for further instruction. There he remained for five years, making the best use of his opportunities, and then returned to America, where he painted two views of the Falls of Niagara, which gained him considerable applause. In 1803 he was sent again to Europe, to purchase some pictures, and while sojourning in Paris painted his first historical work, if it may so be called, the "Murder of Miss M'Crea by the Indians," an incident of the border war of New York. From Paris he proceeded to Rome, and made some excellent copies of pictures by Titian and Correggio, and other Italian masters, the best of which are considered to be the "Danae" of Titian, the "Antiope" of Correggio, and a female figure from Raffaelle's "Transfiguration; but his great performance here was a large original picture of "Marius amid the Ruins of Carthage," a really fine composition, possessing to a great extent many of the best qualities of Art. It was afterwards removed to the Louvre, and carried off the gold medal for the year 1808, awarded by the French Institute. Napoleon is said to have expressed a very high opinion of this picture. Another original work painted about this time, was his "Ariadne," whichthey who have seen it

pronounce to be of rare merit. Vanderlyn returned to the United States in 1815; his talents were immediately called into requisition to paint the portraits of several distinguished Americans, among them those of Madison, Calhoun, Monroe, Jackson, Clinton and Yates, are conspicuous. Having, while in Paris, conceived the idea of executing some panoramic scenes, he employed several months at Versailles in preparing sketches of that renowned palace and its vicinity, which he carried to the States on his return; and in conjunction with the corporation of New York, he erected a building for the exhibition of his panorama. His plan proved so far successful, that he was induced to follow it up by other similar representations, views of Paris, Mexico, Geneva, and Athens. "Like most alliances," says Mr. Tuckerman, in his "Sketches of American Painters," this partnership was disastrous, especially as regards the artist; who lived to see the structure he had dedicated to the Fine Arts transformed into a criminal court." Vanderlyn never completely recovered the outlay entailed upon his finances and energies by this scheme. In 1832 the Federal Government gave him a commission to paint a full length portrait of Washington for the Hall of Representitives; for which, on its completion, they voted him a sum of 1500 dollars over and above the original sum agreed upon. He was chosen, in 1839, to fill one of the panels in the Rotunda of the Capitol, and accordingly set off to Paris that he might there derive more of the benefits of artistic association in the prosecution of his work than he could find in his own country. The subject of his work is the "Landing of Columbus;" "but," writes our former authority, "though excellent in parts, it is a respectable, rather than a great picture." Vanderlyn's last exhibited production was a full-length portrait of the late General Taylor.

MR. HENRY ELKINGTON.

Though scarcely coming within the limits of our ordinary necrological notices, and yet deserving of a place among them, we feel it a duty not to allow the death of this gentlemen to pass over unrecorded. Mr. Henry Elkington was a partner in the firm of Elkington, Mason & Co., of Birmingham and London, the well-known manufacturers of electro-plated goods, whose establishment owes much of its celebrity to the taste, enterprise, and energy of the deceased. He was not a practical artist himself, but he had within him all the materials which, if cultivated and brought into action, would undoubtedly have made a good one; while his intuitive perception of the pure and beautiful in Art enabled him to offer such advice and suggestions to those engaged in the artistic department of the business, as proved of infinite service to the employers and the employed. Mr. H. Elkington seems to have entered on his career of activity at a time when the Art-manufacturers of Birmingham had reached their lowest point—so low indeed as to cause reasonable doubts of their ever again flowing in a pure and healthy channel; but the qualities he brought to bear upon his especial line of business, not only elevated it to a higher position than it had ever attained before, but they operated most beneficially upon others also: our columns have often testified to the excellence of the modern productions of this great mart of Industrial Art; among which those of Messrs. Elkington are conspicuous. He died on the 26th of October, in the forty-first year of his age.

MR. THOMAS FAIRLAND.

The late Mr. Thomas Fairland, whose recent death has been announced, had so long occupied a prominent position in his department of art, that we cannot pass over this sad event without adverting to some of the leading points in his professional career. The life of an artist whose higher ambition it is to seize upon the various aspects of nature, must in his search of the beautiful and picturesque, not unfrequently furnish materials for a biography interesting on account of its varied incidents and adventure. The labors of Mr. Fairland have been mainly directed to the task of multiplying the works of others, and of enhancing their fame by giving their productions a more popular form. His biography, therefore, can be little more than a round of his artistic labors. The bent of his talent for drawing revealed itself at an early age, and he imparted to the

writer of this sketch an interesting and characteristic example of his juvenile ardor. As an artist, he was distinguished for his accurate perception of form, and he was deeply impressed with the feeling that every species of tree as well as every kind of animal had an individuality of form which could be traced from the trunk throughout the larger limbs and ultimate branches and twigs. To seize upon these characters he would, when a boy, proceed to Kensington Gardens in the depth of winter, and spend long hours in sketching, with what accuracy fingers benumbed by the frost permitted, the various branchings of the naked trees. Having got the skeleton, the element upon which the form depended, he would renew his visits as the seasons advanced, keeping pace with the unfolding buds until creative nature and the youthful artist had at last clothed the originals and the representations in all the luxuriance of leafy honors. Mr. Fairland was one of the first pupils of the Royal Academy under Fuseli, and gained the highest medal for a drawing from the "Hercules" in the entrance-hall. He also studied under the direction of Sir M.A. Shee, the late President. He at first turned his attention to line-engraving and became a pupil of the late well-known Mr. Warren. He afterwards devoted himself to lithographic drawing; and in the pursuit of this department he has been instrumental in multiplying numerous works of the best English artists. "The Recruit; or, who'll serve the King?" and "Left Leg Formost," after Farrier, obtained great repute. "The Deserter" followed. "The Poacher's Confederate," after Hancock, was equally successful. "The Rat Catcher" after A. Cooper, was a great favorite. Many of the works of Sir Edward Landseer, Hunt, and others, were entrusted to him, and owed not a little of their popularity to the new form they assumed under his hands. But the inroads of the French lithographic press soon compelled him to abandon an occupation in which he indeed took the highest delight, but which was no longer remunerative. Henceforth he gave himself up to portraiture, and in the course of this pursuit he has been instrumental in diffusing the likenessess of many of the most eminent and illustrious persons in the kingdom. He enjoyed the constant patronage and personal regard of Her Majesty. His frequent engagements at the palace had indeed of late withdrawn him very much from public observation. We believe, however, that the last work he produced was a most effective and pleasing portrait of Mrs. Chrisholm, after the painting of Mr. Hayter in the last Exhibition. So much labor and so much talent as Mr. Fairland has exerted certainly merited more worldly success than we regret to learn, he ever attained. Although he labored incessantly he never was able to raise his family above the pressure of the passing hour. As a man he was universally beloved for his amiable disposition, and his gentle manners; and he was equally respected for a singularly sensitive and modest independence of character. He died at the age of forty-eight, having suffered during the last year of his life from advancing phthisis, which, although it oftentimes exhausted his strength, never overcame his resolute application to his professional duties. He sunk in October last from acute inflammation of the lungs, supervening in a constitution broken by previous disease and toil.

MR. S. WOODWARD.

Mr. S. Woodward, the animal painter whose works have long been familiar to us, died of consumption at Worcester, in the early part of last month in the forty-sixth year of his age. He was a native of Pershore, in the same county, and at an early age was placed in the studio of Mr. A. Cooper, R.A., under whom he made such progress, that in his fifteenth year, he exhibited a picture at the British Institution: from that time to the present year he has been a constant exhibitor, both there and at the Royal Academy. His two most important pictures are the "Battle of Worcester," and the "Struggle for the Standard," but he likewise painted several other large works of similar character: his landscapes, especially of Scotch scenery, are well worthy of mention; they of course are generally made subservient to the cattle associated with them. Mr. Woodward we believe, was occasionally employed by the Queen and Prince Albert to make portraits of some of their favorite animals; and among his other patrons were the

Duke of Montrose, the late Duke of Newcastle, the late Sir R. Peel, the Earl of Essex, and the late Mr. Wells, of Redleaf.

MR. GEORGE HAWKINS.

We are much concerned to record the death, at the age of forty-two, of Mr. George Hawkins, which took place at his residence at Camden Town on the 6th of November. He had long been in a delicate state of health, so much so as to compel him during the last year or two to fix himself by the sea-side, but his decease was unexpected by all around him and even by himself, as only within three or four days of his death, he had transacted professional business in the city as usual. Mr. Hawkins was an accomplished architectural draughtsman, for a long period chiefly engaged by Messrs. Day & Son, in lithographing the principal works of this character that have issued from their establishment which will not readily supply his loss. His pencil was peculiarly correct and delicate, and his knowledge of effect enabled him to produce pictures out of, at some times, the most unpromising materials. One of his most important works is a series still incomplete, of the ancient abbeys of Yorkshire, from some exceedingly clever sketches made by Mr. W. Richardson. The architectural room of the Royal Academy frequently exhibited his skill in water-color painting, as he was often employed by architects in coloring their designs for edifices of every description. A man of gentlemanly bearing, of unobtrusive manners, and of the most kindly disposition, his death will be deeply felt by his family and friends; our estimate of his character is formed upon a knowledge of him during twenty years.

RUDIMENTARY TREATISE ON THE ART OF PAINTING ON GLASS; OR GLASS-STAINING.

BY DR. M. A. GESSERT.

INTRODUCTION.

THE beautiful art of glass painting is not only restored, in our day, to the perfect fullness of its ancient splendor, but also has acquired, through the giant strides of the science of chemistry, and the great progress latterly made in the arts of design, an amount of technical and æsthetical power, far exceeding whatever could formerly be called to its aid.

Notwithstanding this advantage, however, the art has not reached that wide state of diffusion which, from the exquisite effects it is capable of producing, it deserves, and which it attained in the olden time, even with its then more limited capabilities.

2. This circumscribed use of glass-painting can scarcely be accounted for by a comparison of the religious circumstances of our age with those of the past, or on the supposition that this art, confining itself exclusively to exhibition in sacred edifices had therefore been lost among the frivolous tastes which at present prevail. On the contrary, the works of the finest masters of the art have shown that the wonderful effects of glass-painting may be brought into use for other purposes than the service of the Church, and may be made to satisfy not less the worldly demands of our generation, than the more devotional feelings of the middle ages.

The obstacles which, on the revival of the art, have interposed to check its further extension, and therefore to diminish also the general demand for its productions are much rather to be attributed to those in whose hands it rests, than to anything properly belonging to itself; they originate in fact, less in the art than with the artists

3. One of the principal causes of the earlier decay of glass-painting was, that its rules being based so entirely upon empirical principles, those who practised it were accustomed to consider the knowledge they had acquired in the thorny path of tedious and long-continued experiment, as their most valuable personal property, forming at once the means of their subistence, and the foundation of their future artistical fame. They therefore not only kept the information they had gained profoundly secret during their lives, but even carried it with them to their graves, in preference to leaving it behind them to be made use of by their scholars.

This easily intelligible, but not on that account the less reprehensible egotism,—this avarice for artistical monopoly, also operates in some measure to damp the speculative ardor of the present day, and constitutes, in fact, the primitive cause of the evil of which we complain.

On the other hand, the most conducive element towards the full and free development of power generally, and particularly of artistical talent, is competition. It multiplies production, invites public judgment and comparison, and calls forth a laudable emulation, tending, in return, not only to promote the excellence of the works produced, but, by aiming at popularity, also to create an ever new demand for their increase and multiplication.

4. The directions which form the principal part of the following pages have already been published at different times, in earlier communications of the same author scattered through German scientific periodicals, but have now been collected, enlarged, improved, and remodelled into the present form, in the hope that their more general circulation may put into the possession ol the many that information which was formerly jealously guarded by the ini tiated few, and thereby such a general interest may be promoted as cannot fail to be beneficial to the art.

The recipes have been carefully selected, and their correctness and efficacy proved by many years' practice ; and it has been endeavored to make them so easy of comprehension, that neither those unacquanted with chemistry shall fail in their preparation, nor those unpractised in the art go astray in their application.

5. In the classification of the pigments into Fused and Mixed Colors, (understanding by the first all those which are fused into a glaze together with the flux before laid on, and by the second all coloring bodies burnt into a glass without such previous process, whether requiring the help of a flux or not,) the theory given by the Author in his late work on the 'History of Glass Painting' has been adhered to. This division has the advantage of avoiding those errors which had their origin in the early homonymic of *flux*, for the oxide previously melted with the flux, and for the fluxing medium itself.

It is hoped that these few pages may be the means of prompting, not only artists by profession, but also amateurs, to such an increased and successful exercise of the art, as may tend to show forth its beauties and capabilities to the world in a more general and extended manner than heretofore.

CHAPTER I.

OF THE PIGMENTS AND FLUXES; AND THE METHODS OF PREPARING THEM.

6. Glass Painting or Staining* may be defined to mean, the art of painting on transparent glass (either colorless or already colored in the process of its manufacture) with vitrescible metallic colors which are afterwards burnt into the surface of the glass on which they are laid, leaving it more or less transparent.

7. All colors used in glass-painting are oxides of metals, or other metallic combinations.

They may be divided into two principal classes—

1. Those whose coloring base, or the oxide, is laid upon the glass simply in its original combination with an earthy vehicle.
2. Those whose coloring base, or the oxide, must be made to adhere by

* The words "painting" and "staining" seem to be used in English synonymously with reference to this art. The former of these has been adhered to throughout this work, not only because it is more in accordance with the German expression, but because it appears more calculated to secure to this species of decoration a place (which it decidedly deserves) among the fine arts; whereas, the word *staining* might simply mean the *coloring* of glass, without any reference to design.—Tr.

the help of a glassy body,—namely, the flux.

8. The colors which require a flux may be divided again into

1. Those in which the oxide unchanged, but only *mixed* with the flux is attached to the glass.
2. Those in which the oxide requires to be vitrified, by previous *fusion* with the flux, before it is laid on the glass.

The last may be called *Fused Colors*, all others *Mixed Colors*.

9. The classification above given may be made clearer by the following explanatory remarks.

Glass-painting is distinguished especially from other illuminating processes, in that the colors and the foundation on which they are laid must, in this art, be fused together in the kiln.

Now, some few colors combine with the surface of the glass, at the temperature of fusion, without further previous preparation than the simple laying on; wherefore these give to the glass only a coloring cementation or stain.

Others, on the contrary, in consequence of their peculiar nature, can only be made to combine with the glass, by fusing them, upon its surface, into another thin sheet or layer of colored glass.

This is done by means of the *flux*, a vitreous compound, which fuses more easily (*i. e.* at a lower temperature) than the foundation, the glass plate.

10. The flux may be used in two ways. With some colors it may be simply mixed before they are laid on, so as to combine at the temperature of fusion, with their oxides, and to unite these again with the surface of the glass; but in other cases the flux must, before painting, have entered into a chemical combination with the oxides, *i. e.* must have been fused together with them into what may be called a *Fused Color*, which latter, after being pulverized, serves as a pigment.

This process is rendered necessary in consequence of the difficulty of fusion of certain oxides, which, in order to combine with the flux, and to acquire the intended shades of color, require a greater degree of heat than could be made use of in burning the colors upon the glass, without endangering the success of the operation.

From this description of the nature of the colors and the manner of their combination with the glass, we will now pass on to the practical directions for their preparation and use; in assurance that the foregoing will not only prevent erroneous notions being formed of the nature of the different elements entering into the operations, but may tend to the perfect understanding and successful practice of the directions given.

Those for white and black pigments are given first, the others follow in order.

I. WHITE.—FUSED COLOR.

11. Two parts of bone glass,* with one part minium, or red lead, are to be mixed together and melted in a covered Hessian crucible placed in a wind furnace. The mixture is then to be poured out into a flat vessel containing pure cold water, and, when cooled, is to be ground with a glass muller on a table of thick sheet glass.

MIXED COLORS.

12. One part of bones calcined to whiteness, with two parts of flux, ground together on a glass plate.

Flux. Glass of lead (flint glass).†

13. One part white oxide of tin, with two parts of flux, ground as before.

Flux. Lead glass.

14. *Preparation of the oxide of tin.*—Melt in a covered crucible one part of pure tin cuttings. When in fusion, add two parts of nitre and stir well the mixture with an iron rod. The crucible is then to be again covered, placed in burning charcoal, and the mixture occasionally stirred as before from time to time, until it begins to get white on the top. Continue the stirring a little longer, then pour the mass out of the crucible into an agate mortar and let it cool. It is then to be pulverised, boiled in water, and afterwards dried.

II. BLACK.—MIXED COLORS.

15. Two parts oxide of copper (prepar-

* Made by fluxing together eight or ten parts of calcined bones (bone ash), and eight of red lead, with about 80 of white glass.

† German *Bleiglas.* This, however, contains more lead than exists in our English flint-glass: a recipe for it, in one of the German Encyclopædias, is 15 parts dross of lead, and 12 parts common glass frit. The ordinary flint-glass may be made to serve by adding minium to it, and trials will show the best proportions. *See* Art. 88.

ed by heating nitrate of copper to redness), and one part flux.

Flux. Equal parts of crystallized borax, minium, and pounded glass, are to be mixed and melted in a crucible for about an hour or an hour and a half, in a wind furnace, then to be poured in a vessel of water, afterwards dried, and powdered on a glass plate.

16. Some oxide of iron, or of manganese added to the former, gives that brownish tone of color which was so peculiar to the ancient glass paintings.

17. One part black protoxide of iron, (prepared by mixing red oxide of iron with olive oil to a moist powder, and afterwards heating the mixture in a crucible till the oil is evaporated,) one part of protoxide of copper, (prepared by submitting green carbonate of copper to a red heat, and washing it in water,) and two and a quarter parts flux.

Flux. Two parts lead glass, ground to a proper degree of fineness on a copper plate, or color stone, with water, and one-fourth of a part gum-arabic. The latter to be added after the pigment is mixed with the glass. All are then to be ground as delicately as possible together.

18. One part oxide of cobalt, one part oxide of manganese, one part copper ashes,* and one part iron scale from a smith's forge, mixed together and heated, at first gently, but afterwards with a very strong heat, until the mixture runs freely. It is then to be poured into water, and when cold, pulverized, mixed with twelve parts of flux, and ground fine.

Flux. One part pure white sand, and three parts litharge, are to be melted together till they flow freely, and then poured out on to a warm marble plate, or into an iron mortar; when cold, to be pounded fine and washed out with water, in order to remove any reduced lead which may be present.

19. Two parts black protoxide of iron, with two and a quarter parts of the flux described in Art. 17, and treated in the same manner.

20. One part iron smithy scales, three parts oxide of copper, and four parts calcined antimony, treated as No 18, and ground with three parts of flux.

Flux. One part of sand, and three parts litharge, treated as in No. 18, and ground fine with one-third borax. The borax must be prepared in the following manner: a crucible is to be half-filled with it, and put in burning charcoal until the borax becomes spongy, or is calcined. It is then to be thrown into another crucible and melted in a strong fire to a clear flowing mass, which is to be poured into cold water, and, when cold, ground fine.

21. One part of purple (see its preparation further on), three parts oxide of cobalt, three parts iron smithy scales, six parts calcined antimony, and three parts copper smalt,* treated as in No. 18, and mixed with three parts of flux.

Flux. One part sand, and two and three-quarter parts litharge, are to be treated as in No. 18, and ground fine with three-eighths of a part of borax prepared as above described.

22. Treat three parts oxide of cobalt, three parts oxide of copper, three parts iron smithy scales, and four parts antimony, with three parts of flux, as described in Nos. 18, 20, and 21.

Flux. One part sand, two parts litharge, and one-fourth part borax, treated as described in No. 20.

23. Two parts black oxide of copper, with two and a quarter parts of the flux described in No. 17, and used in the same manner.

24. A beautiful blue-black may be obtained by adding a small part of oxide of cobalt to the pigments in either Nos. 17, 19, or 23.

25. A black inclining to brown is produced by a similar addition of oxide of manganese.

26. Dull or dead black, for distances, is procured from one part of copper smalt and one part crude antimony† calcined (but not so far as to lose its blackness), ground together. Or,

27. One part copper smalt, and one part uncalcined oxide of manganese, treated as before. Or,

* An oxide or dross of copper of a coarse kind, known to the smelters.

* Copper oxide fused with glass and ground.

† The common ore of antimony; the sulphuret.

28. One part purple, one part oxide of cobalt, and one part oxide of manganese, ground fine together.

III. RED.—FUSED COLORS.

29. One part oxide of iron, (obtained by heating clean iron nails red-hot, dissolving them in nitric acid, evaporating the solution slowly by a gentle fire, and roasting the residuum,) three parts flux, (consisting of one part sand, one part litharge,* and one-fourth part borax glass†), well fused together, until a glass rod, with which the mass is to be stirred, draws fine and clear threads from it; then the crucible, with its contents in it, is to be thrown into water, and when cool, the pigment may be separated, pulverized in an agate mortar, and ground fine on a glass plate.

30. One part oxide of manganese with eight parts of flux (one drachm of sand, and three drachms litharge), melted together and treated as above.

MIXED COLORS.

31. One part sulphate of iron, free from copper, or oxide of iron precipitated from the sulphate, more or less heated, with two or three parts flux ground together, give all shades from a light red to a bluish violet.

Flux. Six parts white silicious sand washed and calcined, four to five parts yellow oxide of lead, and two to three parts sub-oxide of bismuth (made from the nitrate) finely powdered, and intimately mixed in a porcelain mortar: the mass may be thrown into a covered crucible previously brought to a red heat, and stirred frequently with a steel rod until it flows freely. It is afterwards to be poured into water, then dried, powdered, and passed through a fine sieve.

32. Common red is given by one part of sulphate of iron heated by a strong fire, washed four or six times in hot water, dried and finely ground on a glass plate, with three parts of flux.

Flux. One drachm of sand, and three drachms of litharge.

33. In order to give a fixedness to the colcothar, or crocus martis,† which otherwise is very fugitive, it is proper to calcine it with fine white sea-salt, previously brought to a half-glowing heat in a covered crucible: equal parts are then to be ground well together in an agate or glass mortar; a crucible is to be filled with the composition, and kept for two hours in an increasing fire till it is surrounded with burning coals on all sides; it may then be removed, the mass cooled, pounded perfectly fine, and washed two or three or four times with hot water, stirring it carefully each time with a glass tube, in order to wash the salt entirely away. When the water no longer takes a red tinge, it is to be poured carefully off, the mixture again washed with cold water, dried, and ground with one part of the before-mentioned flux for use. For greater certainty the sea-salt may, previous to using, be dissolved, filtered, and recovered by evaporation of the water. Lastly, it is particularly to be advised to employ in the whole process, crucibles which have not previously been used.

34. Equal parts of yellow oxide of iron (iron ochre), yellow oxide of lead or lead glass, glass of antimony, sulphuret of copper, and sulphuret of silver, ground fine together with water, and laid on the glass without the addition of any flux.

35. One part of silver which contains copper (as for example, that of which the German small coin is made), with two parts of raw antimony (sulphuret of antimony, the common ore), melted together, reduced to powder, and mixed with red oxide of iron or colcothar. This pigment also is used without flux, and is (as is the former) to be laid on in a tolerable thick layer, which will stain the surface of the glass red at the proper temperature of fu-

* *Note.*—It may be understood here, once for all, that where sand and litharge are used as flux, as directed in Arts. 32, 36, 40, and 73, both these ingredients must be pounded together, melted in a crucible by a strong fire, poured into an iron mortar, pounded fine when cold, and finally washed out with water, before they are added to the pigment.

But where sand, litharge, and *borax glass* are indicated for flux, as in Nos. 42, 69, 78, and 84, the sand and litharge are, as above directed, to be melted and pulverised by themselves, but the borax glass is only to be ground with this latter powder, *and again melted with it.*

This remark will save the trouble of repeating the same directions in the above-mentioned articles.

† Grmaen *Boraxglas*, fused borax.

† Yellow or reddish oxide of iron.

sion. What remains on the surface afterwards may be removed with a spatula.

36. One part silver, two parts red antimony, and one part sulphur, melted till clear; and mixed, for use, with two parts flux.

Flux. One drachm sand, and two drachms litharge.

37. Two parts red oxide of iron, one part litharge, one part gum, one part lead glass, and six parts of best red chalk.

The lead glass is first to be ground as fine as possible on a glass table, then the litharge, the gum, and the oxide of iron are to be added; and after these are all properly mixed together, the pounded red chalk. The whole must now be gently ground and mixed in a tall glass, with as much water as will make it the consistence of thin syrup; say four or five ounces. If the operation takes place in summer, the glass is to be put in the sun; if in winter, in the warmth of a stove, and the fluid must be most carefully preserved from all dust, yet without preventing evaporation by close covering. This is best done by inverting a glass bell over it, on whose sides the moisture will collect and flow away. The fluid must remain still three days; all the thick matter will sink and adhere to the bottom of the glass, while the liquid shows itself above on the sides in transparent rings of a beautiful red color. It is now to be carefully poured off, more water added, as before, and the operation repeated as long as any color can be obtained from the sediment. The color is then to be dried in a glass color-dish by the help of a gentle heat (best by placing it in the sun) and carefully preserved. While it is yet in a fluid state or moist, it always appears more lively and clear than when quite dry. In the latter state it is to be used like gamboge, but without grinding, which would destroy its transparency and beauty. If properly prepared and used, however, this color excels in both these qualities the most beautiful red of the ancients.

38. Brick-red is given by one part oxide of iron, and twelve parts ochre yellow (prepared from one part oxide of iron, produced from the sulphate, and one part oxide of zinc,) mixed with five parts flux.

Flux. One part sand, three parts minium, and one-eighth part calcined borax; finely ground, mixed, melted, and thrown into water, dried and pounded, as described in No. 31.

39. Flesh red is obtained by melting sulphate of iron and alum, in a coarsely powdered state, and increasing the heat till the appearance of the desired color. The residuum is to be washed with hot water, and one to two parts of flux added thereto.

Flux. Six parts white sand, washed and heated to redness, four parts yellow oxide of lead, one part borax glass, and one part saltpetre, treated as in Art. 31.

40. For dull or dark red, one part of prepared blood-stone* is to be pounded and ground on a glass plate, with three parts of flux.

Flux. One drachm sand, and two drachms litharge.

41. Purple, gold-purple, purple of Cassius, is obtained by precipitation from a solution of chloride of gold, by means of a solution of protomuriate of tin. It receives, according to the greater or less quantity of tin in the mixture, and the lower or higher degree of oxidation of the solution, either a beautiful red color of various shades, as scarlet, carmine red, rose color, flesh color, &c., or a violet or brown.

It is to be mixed for use with four parts of flux.

Flux. One part of silica in powder (made by calcining the purest flint three or four times in a crucible, washing it every time in pure water, then powdering it in a porcelain mortar, and sifting it through a fine sieve) one and a quarter part borax glass, and five-eighths of a part minium, melted together, and finely powdered.

42. Dissolve one part of thin-beaten gold in nitro-muriatic acid, or aqua regia, pour the solution into a glass, and dilute it with fifteen parts rain-water. Throw in one and a half parts of pure tin cuttings, which have been dissolved in muriatic acid, and allowed to get cool.† While this is being added to the gold solution, the liquor must be continually stirred. After the

* Hematite. The kidney iron ore of Cumberland.

† Literally from the original; probably it is this quantity of the muriate thus formed which is to be poured into the gold liquor.

mixture has stood quietly a quarter of an hour, half a part of clear urine is to be added, and all well stirred together. In about two hours the supernatant fluid is to be poured from the purple pigment, which will be found precipitated, and which is to be well washed out. When perfectly dried, put it in a flat porcelain vessel, lay a piece of paper upon it, and place it on burning charcoal till the paper is charred.

The purple pigment must be used with twelve parts of flux.

Flux. One part sand, two parts litharge, and three-fourths of a part of borax glass.

43. Dissolve gold* in aqua regia. If the gold has been alloyed with silver, the solution must be poured off from the chloride of silver, which separates itself. The precipitate must be washed with some distilled water, and this latter added to the solution, which must then, unfiltered, be evaporated by a moderate heat until a thick crystalline saline skin is formed, under which, by inclining the vessel to one side, only a little of the red solution will be found liquid. The mass is now allowed to get cool, whereby it becomes thoroughly hard; it must be dissolved without delay in ten times its weight of water, and filtered, by which a small quantity of reduced gold is left behind. In order to cleanse the filter, a small quantity of water must be reserved out of the prescribed weight, and afterwards this must be added to the solution.

For the preparation of the tin liquor, the crystallized salt of tin† will answer very well; if it is moist, it must be dried by pressing it between unsized paper.‡ One part of the salt is to be dissolved in four parts of distilled water, the solution filtered, and used immediately after its preparation, as after a time it would become turbid by attracting oxygen from the atmosphere, and would deposit oxide of tin in a white powder.

Further, dissolve one part of gum-arabic in three parts of hot distilled water, and filter it through gray blotting-paper, which must be of a loose texture, or the gummy fluid will not pass through it freely.

Having now prepared the three fluids in the above mentioned manner, mix three ounces of distilled water with twenty-eight grains of the gum solution, stir it carefully, and introduce fourteen grains of the tin solution. Rinse out the vessel in which the latter was weighed with a little water; weigh twenty-three grains of the gold solution and add it to the previous mixture, rinsing out the vessel again, but this time, instead of clear water, a portion of the compounded mixture is to be used for the purpose. The color which arises during the mixing of the fluids is a fiery red brown, but changes when burnt in upon the glass into the most beautiful purple red.

The color may possibly be somewhat altered by the action of the acid liberated by the formation of the purple precipitate in the fluid; but this is obviated by diluting it with twice its weight of water, dissolving ten grains of bi-carbonate of potash in the same, and then first mixing it with the above-mentioned mixture of the gum and tin solutions.

In order to separate the purple, whose precipitation is at present hindered by the gum, spirit of wine is to be added to the mixture until it appears very turbid: for this purpose about double its weight of 75 per cent. spirit is necessary, if the bi-carbonate of potash has been added, otherwise three times the weight. In the course of an hour, if the mixture has been occasionally stirred during the time, the purple falls down in red-brown flakes, and the fluid remains clear, or at least very little colored. This must then be decanted, some more spirit of wine poured over the precipitate, and the whole dropped into a filter. It must afterwards be gently pressed out between blotting paper, the precipitate removed, and ground in a rubbing dish or saucer, with weak 50 per cent. spirit of wine, to a thin pulp, which is to be heated§ three minutes in a suitable vessel, and then poured into a cylindrical glass. This operation is to be repeated, and the gum will then be all removed except a little harmless remnant, which is essential to be

* The German gold coins are alloyed with silver.

† The muriate.

‡ *Druckpapier,* printing paper, which in Germany is unsized.

§ *Kochen,*—literally, boiled or cooked.

done. Should the purple fall slowly from the last solution, and exhibit an inclination to re-dissolve, or form a clear red sheet tight upon the bottom, a little more strong spirit of wine must be added after the water is poured off, so that the purple may be made to coagulate to a thicker consistency, and the last portion of fluid afterwards filtered away. The precipitate must, as before, along with the filter, be pressed between blotting-paper, taken off with a blunt knife, and dried in a porcelain dish, whereby it becomes much reduced in size, and takes a perfectly dull color.

For use, the purple is to be levigated on a stone with water, until a clear deep-colored thickish fluid is obtained. Two to six* parts of flux are then to be added, the levigation continued, and afterwards the whole dried in a porcelain dish. It may then be made fit for the pencil with thickened oil of turpentine, like other glass-painting colors.

Flux. Eight parts white silicious sand, washed and calcined, four parts borax glass, one part saltpetre, and one part white chalk: treat as in Art. 31.

IV. BLUE.—FUSED COLORS.

44. Three parts oxide of cobalt, prepared in the following manner. Clean, roasted cobalt ore (zaffre) is to be dissolved in pure diluted nitric acid, at a gentle heat, until the solution is saturated; add water, precipitate the oxide with carbonate of soda, and wash the precipitate with hot water. It is then to be dried, mixed with three times its weight of pure dry nitre, placed in a crucible, and ignited with live coals. When the slight decrepitation is over, the oxide of cobalt is to be heated to redness, washed out, and dried. Three parts of this must now be melted with two to five parts of flux (composed of† eight parts washed silicious sand, four to six parts borax glass, one to two parts nitre, and one part white chalk), melted in a strong fire for an hour and a half, and ground fine for use.

45. If the cobalt ore can only be obtained raw, and it becomes necessary to roast it, the best Spanish or Sweedish must be chosen, which may be tried by solution in nitric acid, diluted with two-thirds of water. The ore which gives the finest red color in the solution is the best for the purpose, and should be chosen for the preparation of the color. In order to free it from arsenic, it must be laid on and surrounded with charcoal on all sides, and burnt until the arsenic is deposited in white crystals on the walls and stones around, and the cobalt has attained a more metallic state and lustre. This operation, however, it must be remarked, requires the greatest care and precaution, on account of the dangerous vapors which arise; and if a place is not properly set apart for it, it should be performed in the open air.

46. Another blue fused color is given by one part oxide of cobalt, and four parts borax glass, melted by a strong fire for four hours. The difficulty of fusion of the cobalt requires that this color should be ground, for use, with two parts of flux, obtained by melting together one part rock crystal, and one part borax glass, throwing them in water and grinding them fine.

47. For dark blue, mix intimately four parts king's smalt, and about two and a half parts minium, in a porcelain mortar; set the mixture in a glazed crucible in a very strong fire, until perfectly clear glassy threads of a beautiful azure blue can be drawn from the mass. It must then be taken out of the crucible with a hook, dropped into cold water, and afterwards dried and finely powdered for use.

The proportion of minium must be varied according to the variable fusibility of the smalt which is used.

48. One part black oxide of cobalt, six parts powdered white glass, and two parts minium; then two parts nitre; treated as the foregoing.

49 One part king's blue is to be melted with three parts borax glass, pounded, and then ground with two parts of the flux of the same kind, and treated in the same manner as No. 46.

50. Light blue is given by equal parts of best king's smalt, white glass (pounded in a bright iron or porcelain mortar and sifted), and minium mixed and melted, as in No. 47.

* For the reason of the indefinite proportions given here and in some other places, see Art. 88.

† A misprint in the original alters the meaning of this passage; but the sense given in the text is evidently the true one.

51. Two parts zaffre, eight parts finely powdered white glass, six parts nitre, and six parts minium, mixed, melted, and ground, as the preceding.

MIXED COLORS.

52. Let roasted cobalt (ore) stand quietly for two or three days in nitric acid, diluted with two-thirds of water, placing it from time to time in hot ashes. When the mixture has gradually become a clear and fine red color, pour it very carefully off so as to avoid letting any of the sediment go over with it. To the latter may be added water and more nitric acid, to extract any more red color which can be obtained from it. The several solutions are to be mixed together in a porcelain vessel.

To six parts of this red solution add two parts of the whitest sea salt, purified as previously described, and when the latter is dissolved, pour the fluid from the sediment (which is useless) into a porcelain vessel, and set it in hot ashes. Let it evaporate some hours, and as often as new sediment is formed, pour the fluid carefully away. Continue the heating of the latter, and stir it well, especially when it begins to thicken, with a glass rod, until at last it changes into a granulous salt of the most beautiful blue color. This salt also is to be left an hour or two on the hot ashes, and is then to be put in the open air for a few days until it becomes crimson red. It is then to be replaced in the ashes, when it becomes blue, and again in the air when it becomes red again, and this process is to be repeated until no more nitrous gas* is evolved when the salt is heated, and until a sample of it placed in a small glass with a little water poured over it becomes red in half an hour, without imparting its color to the water. When this point is arrived at, wash the salt carefully out, dry the now deep red colored pigment in a porcelain dish, in hot ashes, and bring it once more over glowing charcoal, where it changes into a beautiful constant blue.

One part of this is to be mixed for use with two and a half parts of flux.

Flux. One part rock crystal, and one part well fused borax glass, pounded together, melted, thrown into water, powdered in an iron mortar, and ground fine on a glass plate.

* *Saltpetredunste,* nitrous vapor.

V. YELLOW.—FUSED COLORS.

53. Jonquil yellow is obtained by melting together one part antimonic acid, two parts of a calcined mixture of equal parts tin and lead, one part carbonate of soda, and twenty-four parts of flux, composed of one part white silicious sand, washed and calcined, and three parts minium.

54. For citron yellow, mix and melt together two parts sand and six parts litharge; pour the mass into an iron mortar, and afterwards pound it fine. Then mix it with one part oxide of silver, and one-fourth antimony ore (antimony of commerce), and grind the whole well together; melt by a strong fire in a Hessian crucible; pour in cold water, and grind for use.

MIXED COLORS.

55. Mix fine powdered antimony with one and a half times its weight of saltpetre, decrepitate the mass in a glowing crucible, and heat it to redness for a quarter of an hour; powder it when cold, and wash it with boiling water. The remaining white powder, which consists of the bi-antimoniate and bi-antimonite of potash, must be moderately heated in a crucible for an hour, with an equal or from that to a double weight of minium, and mixed with equal parts of flux for use.

Flux. One part white silicious sand, washed and calcined, and three parts minium, ground together, and melted as in Art. 31.

56. Uranium ore must be broken to pieces and roasted, afterwards dissolved in nitric acid, the solution filtered, and the lead which may be present precipitated by dropping in sulphuric acid. The clear green solution must then be evaporated to dryness, and kept at a red heat until it is changed into a yellow saline mass. One part of the preparation so obtained is to be ground with three parts of flux.

Flux. Four parts minium, and one part flint powder, melted together and pulverized.

57. Cut one part of pure thin-beaten silver in pieces, and break one part raw antimony and one part of lump sulphur to powder. Cover the bottom of a crucible with these two last-mentioned substances, lay upon them a piece of the silver leaf, and repeat the operation till all is laid in.

Place now the crucible in red-hot charcoal and cover it with one piece of the same. As soon as the sulphur begins to burn, the mass is in fusion. It must then be thrown into clear water, dried, mixed with three parts of dark-burnt ochre, and pounded perfectly fine.

The pigment may be used without the addition of flux or gum, and laid, to the thickness of the back of a knife, on the reverse side of the glass. The superfluous quantity may be brushed off after burning.

58. For a light yellow, proceed as in the former case, only using one part of ochre instead of three.

The portion of the yellow color described in the last article, which may remain after the burning, may be used again for coloring matter.

59. The peculiar yellow of the ancient artists is obtained by the following process:

Melt two parts of good sulphuret of antimony with one part of silver tolerably free from copper; stir the mass together and pour it in a metallic mortar, pulverize the resulting sulphuret of antimony and silver, when cold, in the same mortar, and preserve it in a stopped phial. From this one part is to be taken, levigated with water on a copper table to the finest consistence, and mixed with four to seven parts of yellow ochre, twice heated to redness and washed in water, according to the proposed lighter or darker shade of the color. Lay on as in No. 57.

60. Chloride of silver, and three times its weight of burnt ferruginous clay (burnt clay out of a baking oven, previously pulverized and sifted), are to be levigated with water, and laid on as in Art. 57.

61. One part sulphuret of silver, one part glass of antimony, and one part burnt ochre, ground as fine as possible and treated in the foregoing manner.

62. For orange, dissolve pure silver in pure nitric acid, and precipitate it by hanging a piece of polished tin or copper plate in the solution. The flocculent precipitate is to be gathered together, washed in warm water, and ground fine.

One part of this to be mixed with one to two parts of the red color, No. 37.

63. One part of silver in powder, precipitated from the solution of nitrate by a piece of thin copper, must be washed in warm water, ground with one part red and one part yellow oxide of iron, and laid on as in No. 57.

VI. GREEN.—FUSED COLORS.

64. One part green carbonate of copper, prepared by precipitating it from a solution of copper in nitric acid with carbonate of potash, and afterwards properly washing and drying the precipitate; four parts powdered white glass, and two parts minium, must be well mixed in a porcelain mortar, and exposed to a very strong fire in a glazed crucible, until threads drawn out appear perfectly clear. It must then be taken out of the crucible with a hook, thrown into water, dried and pulverized.

65. Four parts oxide of copper, one part of antimonic acid, or antimoniate of potash, and six parts flux (composed of six parts sand, four parts yellow oxide of lead, one part borax glass, and one part nitre), to be melted together and ground fine.

66. One part copper precipitate, (obtained by dissolving sulphate of copper in eight times its weight of boiling water, and precipitating the copper by keeping a piece of polished iron in the solution for twenty-four hours, washing the precipitate with hot water and drying it), four parts pulverized white glass, and two parts minium, treated as in No. 64.

67. One part oxide of copper, ten parts antimoniate of potash, melted with thirty parts flux (viz. one part sand and three parts minium).

68. One part borate of copper, (obtained by dissolving pure sulphate of copper in water, and precipitating it with a solution of borate of soda, washing and drying the precipitate,) three parts white powdered glass, and one part minium, mixed and treated as in No. 64.

MIXED COLORS.

69. Dissolve three parts pure oxide of cobalt in nitric acid, and two parts tin chippings in muriatic acid; both solutions are then to be thrown together into one glass, and precipitated with carbonate of potash. The precipitate must be collected on blotting paper, washed, dried, put in a muffle on a porcelain pot, and exposed for about eight hours to a yellow heat, being frequently stirred in the mean time. When cold, one part of this green is to be mixed with four parts flux.

Flux. One part sand, two parts litharge, and one part borax glass.

70. Equal parts of chromate of potash, and sulphur, are to be mixed and melted together in a covered crucible. As soon as the mass flows quietly, it is to be poured off and freed from the liver of sulphur which will have formed, by well washing with boiling water, when the oxide remains as a beautiful green pigment. This is to be collected on a filter, dried and ground fine. One part of it may be mixed for use with three parts flux, laid on and burnt in.*

Flux. Four parts minium and one part flint powder, melted together to a perfectly transparent glass.

71. One part of pure yellow chromate of potash ground together with three parts fine powdered quartz, laid on and burnt in.

72. One part black oxide of manganese, and two part cobalt or king's blue, mixed together and ground fine.

73. Two parts pure oxide of cobalt, ground with one part flux.

Flux One drachm white sand, and two drachms litharge.

Nos. 72 and 73 serve for green distances.

VII. VIOLET.—FUSED COLORS.

74. Calcine best oxide of manganese in a potter's kiln with an equal quantity of saltpetre; take one part of this, six parts white glass in powder, and two parts minium; mix and treat in the manner already explained, with the strongest melting fire.

75. One part calcined oxide of manganese, one part zaffre, ten parts white glass powder, and four parts minium, treated as before.

MIXED COLORS.

76. Gold purple mixed with chloride of silver, in varying proportions as practice will direct. The latter must previously have been melted with ten times its weight of flux, prepared from three parts white quartz, washed and calcined, five parts calcined borax, and one part minium. The gold purple is to be mixed with this, and the whole ground together.

The gold purple may be precipitated in combination with the chloride of silver by the following process. Drop into a large quantity of water, first some solution of tin, then a little nitrate of silver, and lastly the gold solution, constantly stirring the mixture. The proper proportionate quantities of the three solutions must be ascertained by experiment. The precipitate must be mixed with about an equal quantity, or rather more, of the flux.

Flux. Eight parts sand, four parts borax glass, one part nitre, and one part white chalk, treated as in No. 31.

77. Gold purple ground together with three parts blue color, and oxide of cobalt or king's smalt. This mixture gives the most beautiful violet color, which may be made to assume different shades according to the greater or less quantity of purple, and the lighter or darker blue used.

78. One part purple, and six parts flux, ground together, give dark violet.

Flux. One part sand, two parts litharge, and one-fourth of a part borax glass.

79. Mix pure gold purple after precipitation and washing, but without previously drying it, with some flux.

Flux. One part silicious sand, washed and calcined, and three parts minium, treated as in No. 31.

VIII. BROWN.—FUSED COLORS.

80. One part oxide of manganese, and eight parts flux (from one drachm of sand, and three drachms of litharge melted together), pounded and ground fine.

81. One part oxide of manganese, one-fourth part blue of No. 52, and eight parts of the foregoing flux, used in the same way.

82. Two parts yellow of No. 57, one part antimony, and three parts flux (prepared from one part sand, and two parts lead, and one-fourth part borax, melted together,) powdered and ground fine.

MIXED COLORS.

83. Red oxide of iron, prepared by precipitation with carbonate of potash from pure sulphate of iron, and afterwards heating the precipitate to redness until it becomes a lively red color.

Flux. A quantity of lead glass equal to that of the oxide, and some gum water, ground on a glass table.

84. Two parts oxide of iron, three parts oxide of manganese, and three parts gold yellow of No. 57, melted together, poured

* There is a misplacement of words in the original here which creates some confusion.

into water, and when cold, mixed with three parts flux.

Flux. One part sand, two parts litharge, and one-fourth part borax glass.

85. Red oxide of iron, (hematite, red chalk, or natural iron rust,) with oxide of manganese, or a small portion of sulphuret of antimony and silver, or some oxide of silver, treated as in No. 83, serve the same purpose.

86. Or, the sediment left in the preparation of the red color may be laid on the glass without further preparation.

87. Lastly, seven parts gold yellow of No. 57, ground with one part oxide of manganese, without melting or adding any flux.

(No. 81 gives sepia; 82, a yellow brown.)

GENERAL REMARKS UPON THE PREPARATION OF THE PIGMENTS AND FLUXES.

88. As an essential addition to the foregoing, we may here give some few general directions respecting the preparation and combination of the pigments and fluxes, which could not well be inserted in the recipes themselves.

It is impossible to give any absolute or positive instructions for the proportionate quantities of the ingredients used in the pigments or fluxes. The determination of these must in a great measure be left to the trials and experience of the artist.

The same will apply also to the proportionate quantity of the flux to be used with the pigment, and to the quality of the flux also.

89. The materials of the colors, as well as of the fluxes, must be as good and as free from foreign ingredients as they can be obtained; otherwise disadvantageous consequences for the beauty and durability of the painting are to be feared.

90. When pigments, or fluxes, or both, are to be melted together, this must be done in strong Hessian crucibles, which are to be protected from the action of the melting mass by covering them internally with a mixture of chalk in water. Or, they may be glazed, which especially prevents the penetration of fused colors containing oxide of lead. To effect this latter object, the crucible is to be rinsed out with water, then covered on the inside with pulverized white glass, placed in the fire, and heated until the glaze adheres perfectly to its sides.

91. For the operation of fusion in Hessian crucibles, it is necessary to use an ordinary wind or air furnace, furnished with a dome or cover having a draught-pipe. The inside is to be covered everywhere with fire-clay, to a thickness of three inches, and in the cover must be a door or at least an opening, filled up with a clay stopper, by which the interior may be accessible, in order to lift off the cover of the crucible and to stir its contents with a polished glass rod. Upon the grate of this furnace must be laid a pot of clay, and upon this the crucible, which must be covered with an earthenware lid.* It may then be surrounded with wood charcoal.

92. The ingredients of the pigments which are to be fused must previously, unless particularly directed otherwise, be ground to the finest powder on a thick glass plate with a glass muller, or, where specially indicated, upon a copper table with a steel muller, and not generally upon marble, porcelain, or substances containing lime, for these, by the process of rubbing, are liable to give off a portion of their material. The ingredients must be intimately mixed; the crucible is first (unless otherwise specified) to be brought to a red heat gradually, and the mixture then placed in it, but never in greater quantity than will three parts fill it.

In like manner must the ingredients of the flux be treated, and also those of the pigments and fluxes which have to be melted togther to form a fused color, provided that nothing appear in the recipes to render another mode of treatment necessary for the particular case.

The crucible must then, as a general rule, be kept some time at a moderate red heat, which is afterwards to be increased till the mass is perfectly melted and runs freely, and till threads drawn from it with a polished steel rod appear pure and clear. It must then be poured into a dish of cold pure water, afterwards dried, pulverized, and treated according to the special directions.

93. The pigments and fluxes thus prepared are to be tested in the following manner. Place a spacious crucible in a furnace in an inclined position, and put in this

* Thonscherben,— literally a pot of clay:

strips of the same kind of glass which it is proposed to paint on, streaked with the colors which are to be used. These are to be exposed to a lively red heat in the crucible until they become weak and begin to bend, when they must be laid to cool on the top of the furnace or in the ash-pit, and afterwards examined.

Should the edges of the painted parts appear as if the colors had overrun their bounds, this is a sign of the super-saturation of the pigment with flux, and the latter must accordingly be reduced in quantity till the appearance is removed; otherwise the whole success of a glass-painting might be destroyed, for such easily fusible colors are apt to blend together, when laid near each other.

On the other hand, the dull appearance and rough feel of the colors betray a deficiency of flux, which must therefore be added in greater quantity.

94. The various shades and transitions of the principal colors may be obtained, not only by the directions as to the materials and treatment given in the special recipes, but in more frequent cases and much more comprehensively, by certain manipulations which will be hereafter mentioned in the description of the manner of laying the pigments on the glass.

95. Independently of the fluxes named in the foregoing recipes for each special pigment, there are others which may serve for every color, or at the most require a trifling variation in the peculiar proportions of the quantites of their ingredients. These proportions depend principally upon the greater or less fusibility of the pigment, and will be easily discovered by the practised artist. Such a flux, for example, is four parts minium and one part powdered silica; the latter obtained from the purest flint, free from calcareous specks, by heating it to redness three or four times in a crucible, throwing it every time into water, and afterwards pounding it in a mortar* and sifting it through a fine sieve. This powder is to be mixed as intimately as possible with the minium, melted in a covered crucible, stirring the mass frequently with a glass rod, until it is transformed into a perfectly transparent yellow glass, the silica being entirely dissolved, and threads, drawn by way of test from the mass, being perfectly clear. It is then to be pressed out in water, dried and powdered, sifted through a fine sieve, and kept in closed bottles.

Or one part rock crystal is to be pounded and melted by a strong fire, with one part of well fused borax glass, and treated when it shows the before-named signs of perfect fusion, in the foregoing manner.

Or one part powdered white glass and two parts minium may be prepared in the same way.

96. Besides the implements already named, the following are necessary for the manipulation of the processes for preparing the pigments and fluxes; namely,—coal-shovels, fire-hooks, crucible tongs, hooks of polished iron for drawing the melted masses out of the crucibles, mortars of iron and porcelain, color dishes, &c. of the same material or glass, spatulæ of iron and wood, and other things which can always be obtained without much trouble or expense, or indeed may be supplied from common household utensils.

In the absence of a proper wind furnace, a common round stove, like those used for warming the German apartments, may easily be adapted to the purpose.

97. All vessels which come into immediate contact with the pigments or fluxes, especially those used for their preservation, mixing, fusion, &c., must be kept as clean as possible, and carefully freed from all refuse after every time of using, lest by an accidental mixing of heterogeneous ingredients the fruit of the labor should be lost. Great caution is especially necessary in employing crucibles which have been used before.

TO BE CONTINUED.

* A porcelain mortar is mentioned, but this must be an oversight. See Art. 92.

THEORY OF PORTRAITURE.

Translated from "La Lumierė," for the Photographic Art-Journal, by Ambrose Andrews.

WHO has not heard of the stratagem which a certain painter made use of in order to administer a lesson of rebuke to those who had been in the habit of decrying his talents. Wearied with their unjust criticisms, he feigned to commence his work anew, and on a certain day convened the family and friends of the sitter, to pass once more their judgment on his work. They arrived at the Studio—rather dimly lighted for the occasion—and found the picture richly framed and placed in front of a sombre colored curtain.

One found the portrait too dark, another, too pale; this one is dissatisfied with the eyes, the other with the hair. "It makes him too old," said some. "It represents him too fat" said others.

Upon one point, however, they were all agreed, and that was "the resemblance was decidedly bad." But suddenly the portrait burst into a loud laugh, and the head of the original thrust itself forward from the canvass, where it had been so adjusted as to deceive the eye.

However true or false this anecdote may be it has doubtless consoled many an artist and rebuked more than one unjust judge. But for my present purpose, I will assume the truth of the story, and paradoxical as it may seem, maintain along with those on whom the trick was played, that the portrait did not resemble him, or in other words, the man, as there exhibited, did not in fact, resemble himself.

It were easy to demonstrate by logical technicalities that to resemble a thing there should exist another object besides the thing resembled, and that one should resemble the other. It would be sound logic to say that James does not resemble James, or John resemble John, &c., because in all comparisons two objects at least are required. But we wave all such philosophical subtleties, and boldly affirm that the copy of a face is substantially capable of being so made as to strike a spectator more forcibly by a sort of power of interpretation than even the original itself could do under certain circumstances.

This assertion shall be substantiated by a few words. It is undeniable that heliography reproduces, upon a plain surface, the features and face with mathematical exactitude. It is the face itself living again precisely as it is. Now it is notorious that there are both heliographic portraits which resemble and heliographic portraits which do not resemble.

From this apparently anomalous fact it follows that the daguerreotype—scientific instrument as it is—requires on the part of those who put it in operation, a power of interpretation, a sensitiveness to the various effects of light, of physiognomies, and to the inherent qualities of art.

Thus heliography, in order to rival art, calls to its aid the various knowledge, and the refined feelings which belong to the true artist, a condition which ennobles and exalts the scope, the power, and the capacity of this marvelous discovery. But the operator without taste and a stranger to the methods of procedure made use of by the great masters of art, even though he be furnished with the most perfect apparatus, will, nevertheless, produce only villainous portraits, of imperfect resemblance, of trivial, vulgar and repugnant aspect. Mr. Mestral has well comprehended this. It was but lately he said to me "the practice of daguerreotype led me into close study of the great painters of Flanders, Spain and Italy, where I found methods of finesse, and artifices of arrangement and purpose, of which I had never before dreamed.

"Who has not observed how that some faces are reproduced in the most agreeable manner, while others are rendered more ugly by the heliographic process? Some will say, "it is a lottery." But we say, it is no such thing—nature does nothing by

chance—it is simply this. There are some heads which appear best in a little more, and others in a little less light, and some which require a particular kind of light, &c. And the position and the aspect which best agree with a face of lively carnation might not be favorable to a face of another color, or a different contour. The portrait which would not be so agreeable when seen in front, might be charming when presented in a three quarter view. To cheeks of one style of color, a dim light would be necessary while upon those of another tint, we should perhaps bestow the lustre of a broad and brilliant light. Such a physiognomy requires to be neatly and distinctly displayed upon its ground, while another would gain by being impressed with shades and so on.

That heliography can render a face, either beautiful or ugly, is an incontestible fact. But the option is in the hands of the artist. Only the theory of the aesthetical daguerreotype remains yet to be formed.

To seek for the basis of this theory, it is indispensably necessary—in taking the art of painting as our starting point—first, to consider what it is that consitutes resemblance; also to show what our ideas and our instincts are in regard to the essential difference between resemblance and reality; and then retracing the foot-prints of the greatest masters of different ages and countries, we will ascend to the traditions of excellence and perfection.

There are processes whereby the exact mould of the head can be obtained,—such, for instance, as the physionotype, an instrument invented by M. Collas. Now, let us suppose this process to be still more perfect, and that by means of it the bust of some one has been fashioned with mathematical precision. To supply its lack of color an able artist takes it in hand, mixes upon his pallet the most exact shades of color for each portion of the face, carefully comparing them with the model, so as to be well assured of there exact conformity. He applies them to the marble, and blends them together with all the art imaginable. The eyes, the cheeks, the hair, the clothes, may all bear the minutest examination; the bust is as true in color as it is exact in form. In a word, you shall have attained to absolute perfection in this counterpart to reality.

But do you think that the result of all this would be the ideal of resemblance?

So far from it, the object would be repulsive, the peculiar aspect of the model would not be there. It would be looked upon as a barbarous thing, a grim parody on life, without physiognomy, without animation; and the imagination would never recognize in that bust, the personage such as she had represented it to herself.

Resemblance, then, is something else; it is something more than mere mechanical reproduction, it is an interpretation, which translates to the eyes, the image of an object such as the mind is pleased to figure it to itself by aid of the memory.

This resemblance differs from a material fact. It is an abstract idea, being the result of an interpretation, it does not essentially depend upon absolute precision, so far from it, it is susceptible even of sometimes borrowing a stronger similitude from premeditated inaccuracy. Oftentimes you do not recognise a man in his portrait, on catching a casual glimpse of it; and yet you will instantly recognise it when some one shows you a caricature of him, because it strikes your memory with more force; and the reason why it does so is, that the peculiar characteristics of his face are rendered more emphatic by exaggeration.

In the same manner as the mental action by which we appreciate resemblance is independent of our will, in the same manner also, the artist, in producing it undergoes an involuntary impulse. While exerting himself at copying he has unwittingly interpreted. What he has seen with his eye is retraced in his thought, and this thought he renders visible in his work.

It is essential that this point should be demonstrated.

Every one must have observed how a portrait does not always appear equally natural to everybody. The opinions which will be entertained of its resemblance will very much depend on the degree of intimacy, and of the nature of the sentiment which characterise the relation which may exist between the spectator and the original. Whence results this proposition. The most able artist is he who has an aptitude in giving an interpretation the most in conformity with the general impression.

If Mignard were to return, with the traditions of his time, and paint portraits, in

the present state of society, perhaps we should hardly recognize them. We are justified in this supposition, by the fact, that among his portraits, there is a general lack of well marked individuality of character, in consequence of which they bear among themselves a general resemblance to each other.

It is often observed that the faces which belong to one epoch bear a striking analogy to each other, and we often overhear expressions like this, "Observe that person passing along, do you not think he has a face of the Medicean age." "That young lady hath a profile like the medals of the 17th century," &c.

In comparing the works of different eras we find in them the indications of a strange succession of prejudices, in relation to the lineaments of the human face. And this prejudice will sometimes become personal with the artist, for it is observable that the same painter has often allowed a conformity with the prevailing taste to show itself in all his works, in consequence of which his heads have a sort of family look about them. In fact they are but one family of which he is the father.

And indeed posterity is not much mistaken in taking this view of the matter, as is often evinced by such remarks as this, "A. resembles a portrait of Vandyck,—of Boucher,—or, of Holbein." True, the races of the 14th and 15th centuries are not so much modified, and yet the reign of Louis XIV. and of his successor did not produce a single head in the style of the painters of the *moyen age*. From one epoch to another the taste and the doctrine of the *beau ideal* has been modified, and prevailing ideas mingling constantly with the art of copying, style, as a matter of course, has been ever changing its basis, and the ideal has been seen and felt differently in each succeeding age.

These successive modes have left remarks which have remained visible until comparatively recent dates. From 1788 to 1794 engraved portraits have been published of most of the men of note, in the Constituent, in Legislative Assembly and of the Convention. All of that numerous collection of heads—nearly all done in profile—have, with the exception of two or three, retreating foreheads. That was the fashion, and, as a consequence, the artist in arranging his positions, chose such as would best favor the prevailing taste. The most favorite view, in those times being that which would show the forehead in a retreating manner, it resulted, as a consequence, that from the habitual influence of this idea the artist would continue the exaggerations unconsciously.

But for the last twenty-five years the systems of Gall and Spurzheim have precipitated artists into quite the opposite extreme, and the present approved plan of forehead is the vertical. Perpendicular and high foreheads having become "all the go" exaggerations will now run in that direction, and in future the eye will hardly take cognizance of the disproportions, because of their habitual presence. In fact, it has come to this pass, that now, this part of a portrait, like a page of puffing advertisements serves to herald the genius of the original. Thus the era of stupendous foreheads, has succeeded to that where the fashion was to leave the brains off altogether.

At the time of the revival, and under the empire, every woman's face had to be ornamented with a Grecian nose. But from Mignard to Rigault, the Grecian nose disappeared, giving place to such as better agreed with the round face, which had become the fashion. During the epoch when the gothic style was in vogue, the oval face elongated and the features were diminished, while, with the cotemporaries of David, of Gros, and of Gerard, on the contrary, the tendency was to enlarge their proportions.

Under Louis XIV., the Roman nose—(*nez bombe*) was brought into close proximity with the mouth, which was very small, with lips plump and round, like a rosy bill hovering over a cherry, which it was on the point of devouring.

Now, it seems reasonable to believe that during all these periods the artists thought that they were honestly copying nature and seeking only to reproduce just resemblances, unbiased by any prepossessions, only that taste and fashion had given way to different *partis pris*.

The modes and tastes which have alternately prevailed in regard to the rendering of light and of color, furnish observations equally diverse and incongruous. Certain schools of art, as, for instance, the German, have seen everything in a strong

broad light; the Spanish sought the sombre effect, the Bolognese modelled forms by half tints softened in mild light. Ribera, Valesques and Rembrandt, above all made use of bold contrasts, snatching the most luminous splendors from the profoundest shades. In making their designs, some artists proceed by softening and melting down their lines whilst others adhere to the method of sketching the features by dry hard lines, and accordingly as the one or the other have followed their predilections, in these respects, they are denominated colorists or designers, without designating by these terms any particular perfection. Titian, was, certainly a colorist, and yet he designed better than Holbein, and a host of other modern painters classed as designers. We may be well assured that Nature is no accomplice in distinctions such as these.

From the above consideration we may come to the following conclusions.

1st. That absolute reality, even were it possible, would be far from constituting an essential condition of what is called truth in the arts of design.

2d. That resemblance is only an interpretation of nature, subordinate to the prevailing taste, to the divers prejudices of the age, and to the preconceived ideas of those who pass judgment upon the works of the artist.

3d. That although a copy may be materially faithful, yet if it be not in conformity with the prevailing fashion, it runs the risk of being considered much less true than another, actually not so exact, but which is so rendered as to give satisfaction to the mind.

If these premises are acceeded to, it will readily be understood that art and heliography are called to an interchange of precious services, in the work of mutual instruction, the daguerrean process by its realistic power will place limits to conventional abuses. It will prevent fashion and caprice, and the occasional mania of some artist from giving the pre-eminence to vile types of the human face, as has been so often done at former periods; it will accustom the eye to endless diversity of forms, and, to originality of character, it will extend the resources of art by accustoming it to seek rather after dissimilitudes than for visages bearing a conformity to each other.

On the other hand heliographers constrained to ask of art the secret of interpretation, of adjusting ideal resemblances with mathematical exactitude, will learn, that they ought never to present their models to the camera until they are disposed with such intelligence in regard to the conditions of light, of effect, of taste, of style, and of attitude, as will render the image sympathetic and striking. In fact, the heliographer cannot well neglect the theory of the painters; if he does so, he does it under peril of producing those disagreeable resemblances so much to be deprecated. His coldly mechanical works, void of life and character, will produce no impression or interest, and to eyes partial to painting, will actually appear less true to nature than paintings much farther removed from pure reality.

The elements of these theories are scattered among the traditions of the great painters, and heliographers will have to interpret them by a second labor of the mind, they will have to assimilate them to themselves, and find in them new applications. It is to this order of ideas, that we must look for the basis of our theory of heliographical æsthetics, and to this we shall endeavor to confine the attention of practitioners, while applying the experience of the schools of art to the department of portriature.

TO BE CONTINUED.

"A man possessed of intellectual talents would be more blameable in confining them to his own private use, than the mean spirited miser that did the same by his money. The latter is indeed obliged to bid adieu to what he communicates; the former enjoys his treasures, even while he renders others the better for them."

Why did Job sleep cold o'nights? Because he had such miserable comforters.

"CAN'T AFFORD TO SUBSCRIBE."*

BY ELLEN ASHTON.

"WHY don't you take a Magazine? said Mary Elwood, to her friend Susan Hall, when the latter came to know what the new fashions were. "There's PETERSON'S, which always gives plates of the newest styles, with full descriptions of every change that occurs: it can be had for only two dollars a year. I have subscribed for it, ever since it began, and would not be without it for five times its cost."

"Oh, I don't know," was the reply. "I can't afford it for one reason. Two dollars will buy a very nice dress."

"It isn't always the most tangible sort of utility that is really the most beneficial," said Mary Elwood. "I find the Magazine, for instance, useful in many ways. It gives me reading for two or three evenings every month, and it is rare that I am not benefitted, as well as interested. Moreover it tells all about managing the flower-garden; gives new receipts; informs me what new books I had best read; and imparts in a dozen other ways, useful and agreeable news, suited to our sex. I save, every year, more than the subscription price, in the making of my dresses alone; for I always get the styles from it, and so never spoil anything by making it up old-fashioned."

But Miss Hall could not be convinced. She was one of those narrow minded, penurious persons, who care nothing for the improvement of the intellect, and never spend a cent when it can possibly be avoided. She contented herself with looking at the colored plates in the last number of the Magazine, and with skimming over the reading matter that related to them, then she said,

"I can remember all this. Much obliged to you, Miss Elwood. Pray, come and see us soon." And with this she departed.

A week after a female friend called at Miss Elwood's, and, among other things, said,

"Have you seen Susan Hall's new dress? No! You were not at church yesterday, not feeling well. Dear me, you should have seen it. Such a fright as it is."

"What is the matter with it?"

"Oh! I could'nt tell you. The thing must be seen to have all its monstrosities understood. It's out of fashion in a thousand ways: too long in the body, too narrow in the skirt, cut wrong on the shoulders, and, to crown all, fits hideously, or rather does not fit at all." And the fair speaker laughed outright. Soon, however, she resumed. "Miss Hall had a mantua-maker there, all last week: it was Peggy Gray, who knows no more of the fashions than a cat does of church-going; and between them, they have made a pretty mess of it."

"I suspect," said Mary Elwood, smiling, "that I was indebted to the presence of the mantua-maker, for a visit Miss Susan paid me last week. She came to ask me how dresses were made, this fall, and I showed her the Magazine. She looked at it, read what was said, and told me she could remember the whole; but I knew better. However it was no affair of mine. Yet, in pity, for her, I tried, in vain, to induce her to subscribe."

"As neither she, nor Peggy Gray takes any periodical, they must have been put to their wit's ends; and I don't wonder at the scare-crow dress they have succeeded in making."

Scarcely had this visitor gone, when Miss Hall herself came in.

"Do pray be so good," she said, "My dear Miss Elwood, as to show me Peterson's Magazine again. I'm afraid," she continued, hesitatingly, "that I did'nt quite recollect the fashions I looked at, the other day. To tell the truth, I shall have to

* The above brief sketch is so admiraby adapted to many daguerreotypists, that we cannot refrain from copying it.—*Ed. Phot. Art-Jour.*

subscribe for that work, as I find I have made several sad blunders in my new dresses."

Mary, pitying her visitor's evident chagrin and mortification, cheerfully brought out the Magazines, and, when Miss Hall said that she intended having her dresses altered, insisted on her taking it home with her.

"You never can make the corrections half so well as with the plates before you, and the descriptions to refer to," said Mary. "Pray, carry the Magazines to your house; I shall not want them for several days."

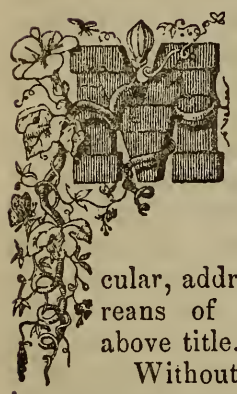
Miss Hall accepted this kind offer, and profited by it to such an extent, that, on the ensuing Sunday, her dresses were no longer a laughing-stock. Early on Monday she brought back the Magazines to Mary.

"You don't know how much I thank you," she said. "Only if I had been a subscriber, I should have saved the money the altering cost, which is a good deal more than two dollars. I have become interested too in the stories. I will not let another year go by without subscribing."

A REVIEW OF THE CIRCULAR OF L. L. HILL,

ADDRESSED TO

"THE DAGUERREAN FRATERNITY AND THE PUBLIC AT LARGE."



R.L.L. Hill of Westkill, Greene Co., N. Y. has thought proper to publish a sort of manifesto to the public through the columns of one of our city papers, and also to embody it in a circular, addressed to all the daguerreans of the Union—under the above title.

Without questioning his right to issue as many proclamations of his alleged discovery as he chooses, I would ask what possible object has he gained by this last publication, for as far as I can understand it, he leaves the subject precisely where it was a year ago. Therein, he states that "the process is my own invention in every sense and not anothers in any sense, and the right of others to control it, or me, to 'pull me out,' or drive me out, or scare me out, I utterly deny."

If the discovery is of such a nature as this, and it actually requires force to bring him out, and it really appears he apprehends it, then indeed, it must be desperate —and it will require more patience and long suffering than the community will endure to effect the object Mr. Hill so much fears.

He says he has discovered all he ever claimed, viz. "a method of heliotyping the colors of objects, truthfully, brilliantly and imperishably," and he claims "the privilege of being left alone in his mountain wilds, to dress the child of light for the public gaze." If he claims that privilege, then the daguerreans also claim the same privilege of immunity from the numerous publications of his vaunted discoveries, which he is from time to time announcing to the world—to the great detriment of the business of the artists generally, because he has yet stated no time for the promulgation of his discovery. If he could have appended to this circular some definite period, even if ten years hence, there would have been some manifest propriety in the present publication, for the daguerreans would have known their fate with absolute certainty. But as it now appears, the day is yet quite remote, if indeed it is so near as he predicted in some former announcement.

Although many offers have been made

him in good faith, by persons who were willing and able to purchase his discovery —and one by a very respectable body of daguerreotypists, agreeing to secure him the sum of $100,000—to be raised by each one subscribing $100, until one hundred thousand should so subscribe; they agreeing to take the process just as it now is, with all its difficulties, and allowing him one half that might acrue in the sale of rights, after the improvements have been made, which seem so necessary in his opinion; yet this most generous offer was declined, and an *appeal* is made in this same circular, as on a former occasion, for more funds to carry on his discovery. His refusal of the offer would imply a want of confidence in his own invention, for if he could be secured the foregoing sums, even if his discovery proves to be worthless, he will not be the looser, and if it is in reality what he alledges, then he will receive much more than a competency. For the offer was made to take the process with all its difficulties and embarrassments which Mr. Hill encounters; in fact, to relieve him of the tediousness and wearisomeness of completing the discovery. If Mr. Hill can fix surely, or once in a hundred experiments, the colors truthfully in the camera, or even one of the various hues as they are reflected on the ground glass, the whole of them are sure to soon follow in the hands of experienced operators. In the same manner as the numerous improvements were made in the original discovery of Daguerre. This fear of a monopoly—this kind of sensitiveness to the remarks of the daguerrean fraternity, and withal a great manifestation of a certain action of the organ of firmness on the part of Mr. Hill, seems to stand in the way of his accomplishing all he so much desires.

In his appeal he says, that the names of all those persons who may favor him with orders for the articles which he has for sale shall be placed in a book as first applicants for a right to use his new discovery. And yet in the very next sentence following he says; "your patronage shall give you no claim upon my invention," and that "you shall trust to my honor," &c. "If I am out soon, you shall be fair in your concessions to any reasonable plan; if I am delayed, you shall not grumble; and if I die, you shall not trouble my ashes." Now, what can be the object of Mr. Hill in such an *appeal*. It amounts to nothing; mere effort of words meaning nothing, or, if anything, almost an insult to common sense. They are so equivocal and contradictory.

With regard to the certificates given in the circular as proofs of his discovery, they amount to very little towards settling the question in the opinion of the daguerrean fraternity. Several of them were obtained rather reluctantly from the signers after they had been allowed to view some of his so called "variations of my process," merely as he (Mr. Hill) said to prove priority of invention, with an express understanding that they should not be published until he was ready to make his discovery known to the world; or rather giving the world the benefit of it and thereby receive the benefit he so much needs himself. Yet, contrary to the expectations of the signers of those certificates, he published all of them in a widely circulating newspaper, at considerable expense to himself and a much greater injury to the daguerreotype business than he possibly may be aware of. He was strongly urged and very respectfully requested by several daguerrean artists not to publish anything more, unl ss he was ready to sell his process, or at least until he could definitely state a time when he would be ready. Now, the conclusion of the public will be that he really has the process, and most, if not all who so believe, will not patronize the art now, but will await the time when a "*Hillotype*" may be bought instead of the beautiful creations of the daguerrean artist of to-day.

What further proofs did Mr. Hill desire of the priority of his invention than the fact of his announcement of his discovery in the Photographic Art-Journal more than two years ago, when he then informed us that it was almost perfect and that he soon would be ready to show his "colors."

The letter of Prof. Morse to the National Intelligencer, with which Mr. Hill closes his list of certificates, will be seen on examination to tell the whole truth, when the truth may become more known, for he says that "Mr. Hill has made the discovery of fixing the image in the camera, and though not so perfected in all its complicated parts as to be equally *true in the color* of the various objects, is sufficiently de-

veloped in its results to give assurance of its ultimate perfection." Thereby stating that the discovery is not perfect as yet, even if it is any discovery at all; and, furthermore, the Professor states, that none but the most experienced can ever expect to produce them. We would therefore, infer, that there are many more difficulties to be overcome yet. And then, we fear, that it will be like the Hill of Knowledge, the moment Mr. Hill ascends one mountain of difficulty, another will rise still higher, and his "child of light" will become at length a child of darkness, and prove an *ignis fatuus* to all who believe in the assertion of the discoverer.

Mr. Hill seems to feel very sensibly the kind rebuke administered to him in the report of the committee who were commissioned to call on him in a very respectful manner, and who were so unceremoniously informed that they had best go home as wise as they came.

Now, if this committee did not relate what was actually true why should Mr. Hill feel so keenly the rebuke, for falsehood will always fall harmless to the ground when aimed at an honorable man, and he who is assailed by an enemy need never fear, if he has truth and right on his side.

The whole tone and labor of the extracts from the country papers, also published in the circular, and, indeed many of the certificates, seemed to be aimed at the very severe remarks of that committee, and Mr. Hill lays great stress on the assertion that this body of men intended to do him injury in the sale of his works and chemicals by their report.

I will venture to assert in reply to that supposition of Mr. Hill that not one of that committee harbored such a thought; far from it. They intended to benefit rather than injure him. They were duly commissioned by the Society which appointed them to give a full and truthful report of the facts as they found them, as much or more for the benefit of Mr. Hill as for the Society, and the class of persons whom they represented. And it was then in the power of Mr. Hill to have given that committee (if indeed he had any such power) positive proof that he could take pictures with all the colors of life, by merely desiring any one to be seated in front of his camera, and producing a picture which all could have seen. This might have been done without endangering in the least his process or compromising his honor. In fact, it was demanded of Mr. Hill as a just right by the very Society which they represented. If there was no respect due to a regularly appointed committee there was none to any private individual. That committee was appointed solely with a view to command the respect and attention of Mr. Hill which the daguerrean fraternity had a right to demand. And what was the reception they met with. Such as was quite unexpected to them, and which elicited surprise and wonder from all who read their report.

The pecuniary situation to which Mr. Hill alludes in his appeal is a matter which need not trouble him in the least, if he truly has the discovery, no matter in how much difficulty it is involved, and if he can by any process transfix the exact colors reflected in the camera, he can have at his command many thousands as has already been offered him; yet he chooses rather to keep the world in suspense, or rather he chooses to keep the public mind on the rack of expectation for a discovery that has baffled the minds of much greater men in the world of science, than any who are now experimenting to produce the colors on the daguerreotype plate.

In conclusion, it may be proper to state a scientific fact with regard to the theory of colors which Mr. Hill may have lost sight of during all his publications.

It is well known that color is produced by the action of light upon certain substances. The various colors are made by the refracted rays of light, passing through the objects they act upon, and it is only those colors which exhibit themselves respectively that do not pass through. Now, it is apparent, that, in order to transfer the colors from an object by mere reflection (for the camera is nothing more) it will be necessary also to transfer the object itself to the plate, or exactly the same substance or others of a similar nature that will produce corresponding colors upon which the light acts upon them.

For although the colors are reflected upon the plate, the substances which produce those colors are not, and as soon as the object is removed, the colors no longer ap-

pear. If Mr. Hill can reproduce the exact colors upon the plate which are reflected upon the ground glass (and his assertions amount to this, then he can cause tangeable objects to move by mere reflection thereby rivalling or at least equalling the "spirit rapping" of the present day. For they cause chairs and tables to change places, causing them to pass and repass, while Mr. Hill can change tangeable substances by mere reflection alone.* And he has also entirely annihilated the present received theory of colors, which has so long been acknowledged by the scientific world. If color then is nothing but a shadow, and it can be produced without any substance whatever, then, indeed, Mr. Hill may produce the alledged pictures. And until we have more positive proof, we are constrained to conclude that Mr. Hill has only some new mode of placing the colors where he may choose, and which, indeed, may be a very great improvement in the present process, and also a peculiar process of enamelling by which the colors are more perfectly protected, and that he may believe himself that they are produced in the manner he asserts, while at the same time he may be deceived and unintentionally deceive others.

FRANKLIN.

* We cannot agree in this theory. If the color of an object—as established by Newton—is produced by the reflection of the particular colored ray which it conveys to the eye, then it must have the power of casting that colored ray upon the lens of the camera, which being perfectly transparent and free from color itself permits the color ray reflected from the object to pass through it and impringe upon the daguerreotype plate,—a fact fully established by the colored image of the spectrum—and all we have to do is to find a compound—capable of again reflecting that ray or a combination of rays—from its proper point upon the plate to secure a naturally colored daguerreotype.

That it is possible to form a compound of this kind has already been established beyond doubt. The salts of phosphorus enabled Daguerre himself to produce three colors, and M. M. Niepce, Becquerell, Hunt and others have effected the same results by means of chlorates and other salt solutions. There is no use in trying to hide these facts, or of denying that Mr. Hill may have been lucky in discovering some process of like nature, but we do doubt his scientific ability to perfect what he has accidentally discovered.

PRACTICAL TREATISE ON PHOTOGRAPHY UPON PAPER AND GLASS AND METALLIC PLATES.

TRANSLATED BY MRS. A. L. SNELLING FROM THE FRENCH OF M. AUBREE, CHEMIST.

Associate member of the Linean Society, Chemical and Physical, of Paris.

THE end which I propose to myself in publishing my process for obtaining portraits upon paper, is to put all photographists in the way of operating for themselves, and of explaining to them all the difficulties that they will daily meet in following the formulas written in the journals, more or less intelligible.

I have omitted all scientific digression. I shall especially employ myself in demonstrating to them the good conditions of a practical manipulation, without which it is impossible to produce anything satisfactory. I have left to the learned of our century the honor of initiating them into the secrets of the chemical compositions and decompositions which take place during the preparations of the photographic papers: of explaining the action of the light upon the decomposable salts with which the paper is impregnated,—of teaching them to say which are the chemical and physical phenomenas that take place in producing the image.

For myself, faithful to the plan which

I have traced out, I shall neglect nothing that may enable all the photographers and all the amateurs in daguerreotype to obtain a proof every time. I shall indicate to them a process for giving to the positive proofs all the tints they may wish, from the red color to the fine black of the engraving. This last shade has only been obtained by myself: it gives so much vigor, and at the same time so much softness to the proofs, that I can recommend its utility.

I have simplified all these well known processes, since, in a fine day, and by a pure light, I can give a portrait in a minute's time.

A clear and concise explanation of the American method, which is the most simple process upon metallic plates, will find a place in this treatise. We have for a long time written upon this matter; but now the operation upon plate is no longer a secret, and the same lines which may be necessary to this effect may suffice to assist those who are not yet well acquainted with the daguerreotype art. I shall esteem myself happy, if by publishing my new process, I can assist in the progress of the great discovery of M. Daguerre.

CHOICE OF OBJECT-GLASSES.

The object-glass is the most important part of the daguerreotype; it is then necessary that this instrument possess the appropriate qualities for the use to which it is destined.

For the producing of sites, monuments, country seats, &c., we ought to use a simple object-glass with a long focus. We obtain great purity of lines and the proof being equally clear upon the whole surface is even vigorous in the parts farthest removed from the centre; the time of the exposition is longer when we have a double instrument, but that is not inconvenient since it produces inanimate objects.

For portraits on the contrary, we should have a double object-glass and a short focus; this is indispensable, for it is essential to operate rapidly for fear of having some figures forced and grimacing. Some operators systematically reject the instruments with the short focus because they centralize all the light, when for my part, I should not certainly wish to make use of an object-glass the spherical aberration of which is too decided. I should prefer the inconvenience offered by a longer focus, although slower in its operation.

It is precisely this great rapidity in operating that has fixed the reputation of the German glasses; if this quality had not been so precious it would not have been so expensive.

I have used for some time the object-glasses from the house of Wulff & Co. Paris, and have been very well satisfied with them.

These instruments possess the qualities of the Voigtlander without its inconveniences; in the first place they cost very little; the aberration of the sphericity is not appreciable, and they possess besides, the immense advantage of not having two foci; in a word, I have found them better than anything now in use, and I particularly recommend them to all amateurs in photography.

OF PAPER.

It will be useful for the manufacturers of paper to make paper especially for photographic purposes; but to do this, they should take counsel from the daguerreotypists. Then we shall be able to obtain a very white paper, of a texture like that of parchment, very smooth and satiny, but not glazed; with a grain extremely fine and dry; prepared with a piece of hemp slightly starched. If it is possible to use fish glue instead of starch, the paper will become still more photogenic, and be more easily extended on the water. If the day ever arises when we shall have perfectly good paper, photography will proceed rapidly, and we shall obtain as good results as those now presented upon metallic plates; but in awaiting these happy results in the fabrication of the paper, I recommend choosing a very white letter paper, without the blue tint, with a texture very dry and very transparent, strong enough not to become dry after having remained some hours in a bath of water. We chose a paper uniting all these conditions, but having arranged the preparations, we should make a trial of it. Commence in this manner: Take two or three sheets of this paper and soak them for eight or ten minutes in a solution of ioduret of potassium, thus composed.

Tried liquor:	Ioduret of potassium	25 gr.
	Distilled water	25 gr.

It is sufficient to add the ioduret to the distilled water, and the solution takes place two or three minutes after. After twenty minutes immersion, take out the sheets of paper, and if, after the operation of drying, they still maintain their whiteness, they will maintain all the necessary qualities. They will then be worth purchasing; if on the contrary, they are covered with black spots or other defects, we should reject them.

This fine and transparent paper of which I have spoken will produce a portrait in the dark camera which is called a negative.

The second quality of paper which will serve for the production of a portrait in the solar light, will be called positive. It will become stronger, that is to say, much thicker than the first; it does not need transparency, but it becomes whiter, more satiny, more glazed.

I have for some time used paper from the establishment of M. M. Canson, brothers, with which papers the trial will be useless, but some desire nothing better at present. Some operators use the English paper for the negative proofs; it requires a little longer exposure in the dark camera, but it resists better the action of the gallic acid, and gives more vigorous proofs.

PART FIRST.

NEGATIVE IMAGE.

First preparation.—First bath.

Distilled water.....250 gr.
Ioduret of potassium.....12 "
Fluoride of potassium.....1 "
Liquid Ammonia.....4 "

Put the Ioduret and the Fluoride into the distilled water; when the salts are dissolved, add the ammonia to them; then pass the whole through a paper filter. The ammonia will have the effect of making the operation more active and at the same time of neutralizing a certain quantity of free caloric. In half an hour after this preparation pour it into a dish a little larger than the paper that you wish to prepare. Immerse your sheet in this solution and leave it there for a moment or two. Be careful to turn it in order that the globules of air which may have formed on it will disappear. Then hang it up by a pin to dry, taking care that it does not come in contact with any other substance. When you have thus prepared several sheets of paper, and they have become well dried, enclose them in a paste board box where they may remain until you wish to use them. This first operation has no need to be done in the dark; it can, on the contrary, be effected in full light.

There is yet another kind of bath, which gives very good results.

Alcohol.....(36°).....250 gr.
Iodide of Potassium.....10 "
Bromide of Potassium.....1 "

Dissolve these two substances in the alcohol and filter them.

It is necessary to put the ioduret and the bromide into the alcohol a long time before using it; these two salts dissolving slowly in the spirits of wine.

With this mixture prepare your sheets of paper in the same manner and with the same precaution as the ammonical bath: there will be much more liveliness in the time of the exposition in the dark camera, than with the other preparations by water.

If we wish to obtain still more rapid proofs, it will be necessary to impregnate water saturate with gallic acid, disposed in the way in which I shall speak in the following chapter, and put upon it a prepared sheet with one or other of the baths as soon as they may have received the film of aceto-nitrate of silver of which I shall now speak.

I have obtained with papers prepared with fluoride and ammonia views in one fraction of a second in the sun. In different light, the time of exposition will vary from 15 to 60 seconds.

I have made a series of experiments with divers substances, such as: the ioduret of iron, the citrate of iron, the muriatic ether, the oil of petroleum, the acetic ether, the sulphuric ether, and without having obtained good results.

Let not the true friends of photography be discouraged, nor cease their investigations; for the time will yet arrive when their perseverance will receive its recompense, bringing honor to themselves, and information to the world.

If each one of us would publish the result of our observations, we should save ourselves a vast deal of labor, and great expense. It is desirable that all interested in photography should concur in aiding its progress, and publish frankly the result of their researches.

Second Preparation—Second Bath.

Crystalized Nitrate of Silver,..30 gr.
Crystalizable Acetic Acid,.....45 "
Distilled Water,.....250 "

Put into a flask the 250 grains of distilled water, add then the 30 grains of nitrate of crystalized silver; when it becomes dissolved, add the crystalizable acetic acid and stir it. This will form an aceto-nitrate of silver. This solution often becomes milky. If it sometimes forms a slight precipitate, let it rest until it is filtered. We should take the precaution to keep this preparation in a ground glass stoppered flask, covered with black paper, or stained black.

When we wish to make a negative proof, we pour into a basin of porcelain all our solution of aceto nitrate of silver, (it is well understood that this second operation as well as those which follow ought to take place in a very dark place lighted by a wax candle only.)

You take one of your sheets of ioduret-ed paper and apply it flat upon your bath on one side only. You must take the precaution of raising it immediately to assure yourself that there are no globules of air which ought to be destroyed for fear of having some stains on your negative proofs. When your sheet of paper becomes entirely white, leave it twelve or fifteen seconds upon the bath, then draw it out and spread it upon a glass plate,* which you have previously washed in distilled water and upon which you have spread a sheet of strong paper humid with distilled water. The nitrated side of the sheet of paper ought to be the most conspicuous; pass a cylindric stick of glass upon your paper, after uniting and chasing away the globules of air, which are formed under the hyacinth tints. This operation is for the purpose of drawing off the excess of the aceto-nitrate of silver which runs over the paper, and infallibly ruins the proof.

These conditions fulfilled, you put the mirror in your frame which ought to be shut on the side opposite your model by a small board to intercept the luminous rays. Place it in the dark chamber, and expose it to the light; it will be from 20 to 60 seconds according to the focus of the object-glass and the intensity of the object-glass with which you operate.

If you wish to obtain more liveliness plunge the glass on the slate in warm water for some seconds; dip equally in boiling water the paper upon which you apply the nitrated sheet.

Here it is useful to remark that for the result of the portrait, a northern light is necessary without a reflection of the sun. The light which the proof ought to receive should be that of the model. When you judge the time of exposition in the dark camera sufficient, draw out your frame, carry it into an apartment lighted only by a wax candle, and you submit your proof to the third preparation.

Tnird Preparation—Development of the Image.

Solution of Gallic Acid.

Put into a flask the quantity of 300 grains of distilled water, and add 3 grains of gallic acid; this solution ought to be made 24 hours before using it; filter, to separate it from the excess of gallic acid which ought not to be dissolved.

In drawing away your frame you lean it for support upon a copper stand which you have previously made level, and pass over the surface by the aid of a sable pencil, the saturated solution of gallic acid, that you have prepared in advance. You will soon see the image appear; which will be inversed, the blacks will be whites and the white will be blacks; that is to say, when the image is perfectly well developed in all its parts; that it will be well modeled, that the lines will be well fixed, that the blacks and the whites will be well determined, and the half tints well preserved. You determine the action of the gallic acid, by plunging your proof into a dish of crockery ware filled with common water; rain water will be preferable, because it often happens that the water contains some chalybeate salts, the gallic acid, forms a gallate of iron which blackens the water and the whites of the proof; in such a manner that they become uniformly blackish and can be no longer useful. We can avoid this inconvenience by changing the water three times in a quarter of an hour.

* Many operators use slate instead of glass, the paper adheres to it more easily and is less subject to swelling. I prefer the glass because it cleanses more easily. The slate has the inconvenience of uniting itself with the solution of nitrate of silver, and it often has the upper end of the proof stained.

In order to accelerate the development of the image, we can expose the proof to the vapor of boiling water, after it shall have undergone the wash with the gallic acid; we shall then see the blacks come out rapidly and acquire great vigor; when fixed the blacks will become very intense and opaque in viewing the proof by transparency.

It is necessary to avoid with great care the day light striking the proof before it becomes fixed, for the white parts which ought to furnish the blacks, and the half tints will be sensibly altered.

We would remark, that a proof which has enough exposition in the dark camera appears promptly under the influence of the gallic acid, and that which does not appear by force of the acid will be defective, filled with small black and white points which fixed upon the positive proof form specks which are not only disagreeable but produce a bad result.

When the negative image has remained in the water half an hour, proceed to fix it in the following manner.

Fourth Preparation—Third Bath.

FIXING THE IMAGE.

Distillled water,.....500 gr.
Bromide of Potassium,.....16 "

Put the bromide in the bottle of water, stir it, and the solution will immediately take place. As soon as you have completed this, pour the liquor into a basin. Take out your negative proof which has served to clear away the gallic acid and plunge it into that solution during ten minutes or a quarter of an hour; then wash it again with common water; dry it between sheets of blotting paper.

It is necessary to observe that this bath, after having fixed a number of proofs, has lost its strength, and it is necessary to add three or four grains of bromide. The volume of water will remain a long time the same, for, not being exhausted by wetting the proofs, they give to the water as much as they take away.

The negative proofs are fixed in a solution composed thus:

Water,.....1000 gr.
Hyposulphite of soda,.....100 "

Dissolve the hyposulphite in water and filter it. Plunge the proof in this solution for half an hour, then pass it through a basin of water and leave it for 35 or 40 minutes; if it then preserves any trace of the hyposulphite, the water ought to be changed. Dry, and suspend by one of its angles.

I prefer this fixing to the bromide of potassium because it enables me to put several proofs in the same bath which cannot be done with the hyposulphite. Most operators such as M. M. Blanquart Everard, and others use only the bromide.

TO BE CONTINUED.

"Hogarth held a contest with fortune for bread, which is the usual lot of unfriended genuis. Before the world felt his talents, and while he was storing his mind and his portfolio with nature and character, then was the season of fluctuating spirits, rising and falling hopes, churlish landladies, and creditors. When he had conquered all these difficulties, his vanity—and who would not be vain in such circumstances—loved to dwell on those scenes of labor and privation, and to fight over the battle which ended so honorably to him as a man, and so gloriously to him as an artist. But, even under the worst view which he himself gives of his own condition, one can hardly call Hogarth poor; he paid all he owed—he had a sword at home, a shilling in his pocket, and an engraving in his hands which raised ten guineas. With a head so clear, hands so clever, and youth and independent feelings on his side, he could not be destitute—and he never was."

THE ECCENTRIC STUDENT.

BY PERCY B. ST. JOHN.

I have traveled much in my time. There are few important places in Europe, or America, which bear not the imprint of my footsteps; and, if during the second, and, I hope, longer part of my existence, I only peregrinate as much as I have since the memorable year in which I was born—that of Napoleon's death, I shall run a good chance of being as great a traveler as the Wandering Jew. I have been at school in Caen, in Paris, at Dijon, in Switzerland, in London, and in other places. Schools are pretty well the same everywhere, at least I found them so; but student life is as varied as the military uniform of England, France, and Germany. A London law and medical student, a French *etudiant* and a German, have, however, many ideas in common, and resemblances. All in general indulge largely in tobacco; your genuine British youth swallows huge draughts of Barclay & Perkins; your true Gauls imbibe burnt brandy, blue wine, and a decoction of quassia, good-naturedly taken as beer; while the German rising generation ingulph huge quantities of a similar liquor.

Strasburgh is, perhaps, one of the most original localities in which to study student life in France. Its Germanic style, its provincial character, with the fiery and energetic nature of its young aspirants for legal and medical honors, rendered it far more enlivening, in my eyes, even than Paris or Heidelberg. The city contains about 80,000 inhabitants, of whom nearly one thousand are young men, aspiring to be either lawyers, doctors, or magistrates; far more than can obtain useful results. France has, since the revolution of 1799, especially since the peace, labored under a great disadvantage. For every lawyer, doctor, magistrate, and civil servant who can possibly gain a living, there are at least ten students seeking the vacant position. Not more than twenty per cent. of those who go through severe preliminary studies, to qualify themselves for the schools which lead to a certain social position, are received; and every year, a host of half-educated young men, brought up in ideas which render a return to a more humble position almost impossible, are cast loose upon society, to become in many instances poor clerks, adventurers, and too often *cafe-habitues*, *estaminet* heroes, and even galley slaves.

There are usually in Strasburg, at all events, seven or eight hundred young men, seeking to make themselves a liberal position, or rather, who are supposed to be seeking to do so. Some go there with a firm determination to do their duty to themselves, their parents, and society; others simply to spend their allowance, to amuse themselves, to be free from the trammels of home, and to learn the elaborate arts of billiard-playing, piquet, ecarte, and the other eccentric peculiarities of the French café.

About six months before the revolution of 1848, I paid a visit to the city of Strasburg. I carried letters of introduction to several persons, but I found little benefit from any save one. I certainly got into very pleasant circles, but my desire was to learn something of the less formal classes of society. My new friend, Arthur B———, was about my own age, a month or two younger; he had just been received at the bar, but had not yet left the city where he had completed his education. Though he moved in very good society, he did not abandon his old acquaintances the students. He preserved amicable and friendly relations with many of them, and as I expressed a great desire to study their manners and customs, he introduced me into their haunts; and as I am generally supposed to speak French sufficiently well to deceive many a practised ear, I got on at once admirably. During several months I devoted many hours every day to their society. As soon as I had completed my morning quantum of work, I sallied forth among them. I became for the time being a student myself, in appear-

ance, in manners, in habits. I had never, singularly enough, been really a student, and though a year or two past the age at which in general men are so called, I was delighted to be one even in fancy for a time.

It soon became a problem for me, as to when all these young men studied. I always found the greater number of them at a large and popular *estaminet*. My first introduction to this place was amusing. My friend M. Arthur took me to the Milles Colonnes,—a *cafe* monopolised by the students. I entered the doorway, and found myself in a large room, so dark with smoke, that I could not clearly distinguish objects. I blundered on, however, my friend having politely yielded me the *pas*, in search of a seat; but so indistinct were as yet all objects to me, that crash! crash! and here I was brought to a sudden stop against a waiter, upsetting his tray, and breaking three glasses. A merry, but not a mocking laugh, thus signalized my *entree*. Next minute, however, I was seated at a table, and, as the only remedy against the thick atmosphere of tobacco smoke, took a pipe myself. In five minutes all disagreeable sensation was over, and I could see clearly. I found myself in a large room; in the centre was a billiard-table, around were small tables, occupied by students, all smoking, taking coffee and beer, and playing at cards. Every one used a pipe, cigars being things in which the juvenile *savants* of France rarely indulge—the surety that the art of blackening a common clay pipe forms one of the great features in the life of a student.

One day at the *estaminet* stood for all. Cards continued until about one, when the important question being thus settled, as to who were to pay for the morning's consumption, the billiard-tables were seized upon, more beer ordered, more tobacco—at Strasburg eighteen pence a pound—and until three nothing was heard but the rolling of balls and the strokes of the players. At three the students abandoned the *cafe*, some to take a walk, some to read, some to keep an appointment; but at six all were again at their post, and until 12 o'clock the same scene was presented. At twelve the *cafe* rigorously closed, but a few of the students were inclined for bed, they in general adjourned to the lodgings of mutual friends, and consumed several more hours in drinking and smoking. One thing struck me at the Milles Colonnes, viz., that no money was ever paid. All the students had unlimited credit. No matter how extensive their orders, they were always executed, the proprietor having recourse to the parents when any of the young men failed to pay their account.

One evening my friend Arthur took me, about seven o'clock, to the residence of one of the students-at-law. I found about a dozen young men assembled. On the table was a vast bowl, containing a whole loaf of white sugar, around which the host was engaged in pouring a huge quantity of brandy. The bowl once filled, the whole mass ignited. The scene was singularly picturesque. The half-furnished room, the students gravely smoking, the lurid glare of the blue flame, made me almost fancy myself at one of those secret meetings of German *illuminati*, which have afforded such rich material for the novelist. I soon, however, became aware of the objects of the meeting. These were students who really desired to consider their avocations as serious, and they had met to read for their examination. Presently the glasses were filled, and one of the young men, taking up a book, began to read aloud with an air of conscientious gravity, which was sufficiently amusing. The punch finished, another bowl was made, and the sitting continued, each student reading in turn. Sometimes a serious but brief discussion took place on the meaning of some phrase, but in general the reading went on in solemn silence.

Two of the acquaintances of my friend Arthur soon attracted my attention; they were the heroes of all the fun, devilry, and rioting in which the body so often indulged. They were both well off, had ample allowances, and great expectations, and accordingly looked upon their student existence as a mere frolic. One was named Cassignac, and the other Bechey. Both had come to Strasburg about two years before, and the first had not even entered himself at the college. He, it is true, had paid a fee to an attorney to study law in his office, but the use he made of this opportunity may be judged by an adventure which happened to him during my residence in Strasburg. One morning after receiving a very severe letter from his

father, he bent his way in melancholy mood toward M. Durand's, determined to do a day's work. He reached the door, he put his foot on the step, when, raising his eyes, he saw his friend Bechey doing the same thing. The countenance of Bechey was equally grave with his own.

"What!" said Cassignac, "do you too, work here?"

"I have been entered this two years."

"And so have I."

"But how is it we never meet?"

"This is the first time I have ever presented myself."

"Ah! ah! ah!" laughed Bechey, "it seems we are of the same mind. I wager you have a similar letter to mine, about that affair of the masked ball."

"Exactly. But this is too droll. Let us go and drink a choppe and, *ma foi*, laugh over our wonderful unanimity."

Bechey assented. This was the first attempt at work either ever made.

Cassignac and Bechey were both gentlemen by birth and feelings, with considerable natural talents, but, unfortunately, with too liberal an allowance and too great expectations to allow them to think of work. Fun became the object of their existence. They both were received freely in good society, but they rarely availed themselves of their introductions. One house alone had serious attractions for them. Colonel Desprez had a lively daughter, to whom the three friends sedulously paid their addresses. All three loved Caroline. It is doubtful which of them would have proved victorious under other circumstances, but Bechey and Cassignac left the field too often free for M. Arthur not to avail himself of the liberty thus given him. The inseparables were rarely drunk, but they were rarely sober. Every night they made up some party always meant to be the last, a resolution forgotten the next day.

Cassignac was an inveterate seeker after adventures. His delight was to sally forth after dark when the streets were almost deserted, and to play tricks which might often had serious results. On one occasion, with the assistance of three friends, he upset a sentry, and covered him with his box. The very next night, passing by the same guard-house, he said, "Would you like to learn how to bonnet a man?" and before his companions could say a word, his fist fell on the top of the soldier's head, knocking the unfortunate individual's shako not only over his eyes, but down to his mouth. Before he could extricate himself, the noisy gang had disappeared.

One evening, Cassignac and Bechey had dined together. They had consumed an inordinate quantity of wine, after which they adjourned to the *cafe* Here, according to custom, they called for bowls of hot Burgundy, which disappeared so rapidly, that before midnight more than twenty had been served to them. It was during carnival-time, and most of the students were going to the masked ball. The *cafe* presented the aspect of a theatrical dressing-room. The inseparables were of course to be of the party. At twelve they gravely proceeded to disrobe, previous to assuming the costume which each had provided. Presently they stood before the assembled hundreds in shirt and boots, and were ready to clothe themselves in the gallant array of courtiers of the reign of Louis XIV., when suddenly a new idea crossed the brain of Cassignac. He whispered to his companion, who with a half-drunken laugh assented. Next minute, in the state above indicated, both rushed to the door, and sallied forth into the chill night air. But they minded not the cold. Bacchus had abolished all reason and delicacy. Arm in arm, with drunken gravity, they made their way along the streets, until they reached the residence of Colonel Desprez. Here they halted, and shouting a tune at the top of their voices, began dancing the monotonous figures of a French quadrille. Heads were soon protruded out of the windows, and screams of laughter saluted the carnavalesque appearance of the wild students. They paid no attention to the spectators, but continued their absurd capers with the air of men who were performing a labor of love. Presently the door opened, and the coarse voice of Colonel Desprez was heard.

"Gentlemen, will you be pleased to perform your disgusting pranks elsewhere, and at the same time receive my assurance, that if ever again you show your faces in my house, my servants will turn you out."

"Hem!" said Cassignac, "what is the matter? Angry at a harmless serenade?"

The Colonel re-entered without deigning to reply. The students would have per-

severed, changing their quadrille to a polka, but at the instant they heard the measured tramp of a patrol. They at once took to their heels, returned to the *cafe*, dressed, and went to the masked ball, where they kept their two or three hundred companions in continual meriment all the night.

Next day M. Arthur was formally accepted by the father of Caroline.

Cassignac and Bechey resigned themselves philosophically to their fate. The only revenge they imagined, was to invite M. Arthur to breakfast, and by dint of every art they could put in practice, to make him drunk. They partially succeeded; but my friend, always grave, never lost his senses, and only showed the success of their plot, by becoming intensely droll and comic, on keeping the whole company, in a roar of laughter the whole afternoon.

Despite the liberal allowance which Cassignac received, he was always without money, always borrowing, always contriving how to raise the means of carrying on the war. As he ever repaid money lent him, with scrupulous exactness, he found little difficulty in procuring assistance. Students and young professional men in France, however, are seldom able to lend money, and Cassignac much oftener found want of means than want of will. About a fornight after his absurd night adventure, he called on M. Arthur. He was very grave and sober—two facts which spoke of some serious event.

"My dear friend," said he, sitting down and lighting his pipe, "I am in a serious difficulty. To-morrow, at twelve o'clock, I shall be arrested on a bill of exchange judgment, if I cannot raise 450 francs. Can you give me any assistance?"

"My dear Cassignac, the three hundred francs I lent you the other day, have consumed my immediate resources. My father will not send me any money for a month. Fifty francs are all I can spare you."

"Ah!" cried Cassignac, heaving a deep sigh, "there seems to be a panic in the money market. The whole corporation of students could not raise that sum. Since six o'clock this morning have I been traveling in search of a money-bag, and yours is the first contribution I thankfully receive."

"It is quite at your service."

"I know it well. But the four hundred. What is to be done? Upon my word I disbelieve in money. They talk of the riches of France under Louis Phillippe. It's my opinion that this boast is a *blaque*."

"The fact is the old people keep it all to themselves. It must be in the hands of the money-changers, bankers, and Jews."

"Bright thought! Father Abraham is my man. Keep your fifty francs. I'm off."

And without another word Cassignac hurried away to the residence of a celebrated Jew, who, for a consideration, was in the habit of assisting young gentlemen in difficulties. The aged Hebrew dwelt in a retired street, making show of great poverty, and reminded all who visited him of more ancient usurers in days gone by. Cassignac was ushered into a small room, meanly furnished, where he found the Jew surrounded by boxes and small packages of goods, suspected of being securities. But as the law prohibits lending money on pledges, to all but the *Mont-de-piete*, this was best known to himself.

"My name is Cassignac," said the student, entering boldly on the business. "You know me, doubtless, by reputation, as the wildest and most profligate of Strasburg's students. But I am rich, or rather my family is; I want money. Can you let me have six hundred francs?"

"My good young man," replied Father Abraham, in his broken French, "monish ish very scarce. I am a poor man, and I ash lent too much. The young man ish very bad pay. I ash had greater loshes. But I know you. You are a wild young man, but you are honest. Father Abraham would be glad to serve you. But six hundred francs: I swear ish not got the monish. All I can raish just now ish five hundred francs, and you must take two hundred in goods."*

Cassignac haggled for some time with the Hebrew, who was, however, inexorable. He swore by all the gods, by Moses, by Aaron, and the Prophets, that three hundred francs was all the ready money he could command. The student was hard pushed. He accepted a bill at one year

* The Jew, in French, spoke thus:—"Mon pon cheune homme. L'archent est très rare. Che suis un pauvre homme," &c.

for 575 francs (15 per cent. interest) and received in return three hundered francs in silver, and a consignment of pots and kettles, wooden spoons, leaden forks, children's toys, the whole stock of a ruined pedlar, which Abraham had bought for next to nothing the day before. These Cassignac gravely ordered to be sent to his lodgings, and then returned in sad humor to his friend Arthur.

"My good fellow," said he, after telling his story, and receiving the fifty francs, "I must run to the *cafe*, and desperately try to raise the other hundred."

M. Arthur wished him good luck, and so they parted. M. Arthur remained at home at work. He had been thus occupied about two hours, when a knock came to his door.

"*Entrez*," he cried, but no one came.

Another knock brought a loud repetition of the request to come in, but the intruder remained perfectly still. Two minutes elapsed, and then the knock was repeated. M. Arthur jumped up angrily, and opened it.

There stood Cassignac in person. On his head was an old broad-brimmed hat, with a huge feather, while, attached to a long string, and hung round in every possible way, were pots, pails, spoons, forks, toys, &c. He was evidently a little the worse for liquor, and as M. Arthur opened the door, he began casting his arms about like those of a windmill, and singing—

"La vie est ennuyeuse, parsemé de chagrins
Pour la rendre joveuse il faut aimer le bon vin
Et autre chose," &c.

The whole, with an accompaniment of tin pots, leaden spoons, and a variation on a child's trumpet.

"Any pots, any kettles, spoons, forks, or bibbognets to-day, sir! Rascally Jew! Droll way of discounting a bill. I carry my funds about me. Not a centime can I get out of all the whole gang. But, *nom d'un chien*, I've got property, and valuable property, too. All the utensils of a *menage*, including *joujous* for the little family."

"But," cried M. Arthur, choking with laughter, "what are you going to do?"

"I am going to my friend, the director of the theatre. I'm going to borrow his big drum, and then Cassignac turns pedlar. Adieu!"

About half-an-hour after, M. Arthur heard a terrific beating of a drum under his window. He looked out; there was Cassignac hammering away at the old parchment in question with intense energy. Presently he ceased, and addressing the laughing mob around him, offered his goods for sale. The student being well known, and his articles useful, numerous purchasers were found; as long as the buyers came up, Cassignac went on talking, praising his goods, and lamenting the fate of a student turned pedlar. As soon, however, as the mania ceased to come in, he resumed his drumsticks, and once more roused the neighborhood by his continued *rataplanplan*. For an hour, M. Arthur heard the monotonous instrument of music in the adjacent streets, and then it disappeared. At seven the friends met at the *estaminet*. Cassignac had sold every article, and had received eighty francs. But twenty more were wanting, and these the proprietor of the *cafe* volunteered to find.

Cassignac got clear, in this manner of a temporary difficulty. But he was now crushed by debt. He owed his landlord, tailor, boot-maker, &c., and his parents, angry at his conduct, sent him no more money. He began to talk seriously of going home, but he still continued his life, and M. Arthur fully expected he would do so for some time. About three o'clock one morning, however, M. Arthur lay snug in his bed. He had been asleep and was dozing off again, when he heard his name, as he thought, shouted in the street. He listened, it was certainly M. Arthur which was being called out under his window. He got out of bed, opened, and looked out.

As he fully expected, it was Cassignac; but Cassignac, with a portmanteau on his back, and about a dozen ends of wax candles, all lit, stuck on the top of his hat.

"Adieu!" shouted the student.

"How adieu? What on earth are you doing?"

"I'm moving, my dear fellow. My landlord bullied me for rent, my boot-maker for money, my tailor has refused to make me a coat, even my washerwoman keeps back my linen. It is time to be off. I quit this ungrateful city."

"But why those wax candles?"

"My good Arthur, the streets are dark, the gas is out, and I have no lanthern.

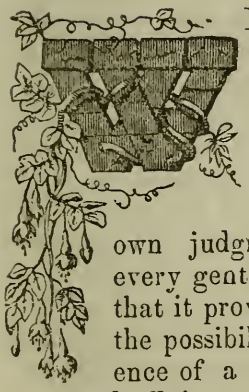
Adieu; au revoir; the coach starts at four. My place is taken."

And thus they parted. M. Arthur never saw him again, but three months later he received, with his money, a charming letter of thanks, and the information that Cassignac had given up the law, had married an heiress, and was expending his exuberant animal spirits in hunting. It is quite certain that the Eccentric Student might make a very excellent country gentleman, but never a lawyer.

Every event above narrated is strictly true. Such scenes take their origin, certainly, in a great degree, in the weakness of human nature. Many of the ruling sex remain boys all their lives, while nearly all are so until five-and-twenty. But the system of education is bad, which, at that very age, abandons nearly the whole of the juvenile members of the educated classes of France, entirely to their own guidance, at the very time when the influence, advice, and care of parents and guardians is most wanting, Nearly all the vices which corrupt society, which desecrate the national character, and which, above all, make marriage—in itself the one great source of joy on earth—so little a source of genuine happiness, take their root in this anamalous state of things.—*Magazine of Art.*

From the New York Daily Tribune.

THE NEW MOTIVE POWER.



WE were present yesterday at the second trial trip of the Caloric ship Ericsson, and are prepared to say without hesitation or reserve, and not merely on our own judgment, but on that of every gentleman in the company, that it proved utterly and beyond the possibility of doubt the existence of a new Motive Power as sure and efficient as steam, while it is free from all danger of accident, and is vastly cheaper and more manageable. The demonstration is perfect. The age of Steam is closed; the age of Caloric opens. Fulton and Watt belong to the Past; Ericsson is the great mechanical genius of the Present and the Future.

The Caloric Engine is no hasty product. Twenty-five years ago Ericsson conceived the idea. For twenty-five years he has been engaged in elaborating and perfecting it. In 1833 he propounded it to the scientific world at London. Men of the highest authority, such men as Faraday and Brunel, pronounced it good, and predicted its triumph. But there were practical difficulties. The principle was clear; not so its application. Those difficulties have had to be overcome gradually, one by one. Since the first model engine of five-horse power was constructed, the inventor has built some twelve or thirteen others, in each making some improvement, removing some obstacle. Two years since his invention was complete. No hindrance remained to be vanquished. He was ready to submit the New Motive Power to the test of trial on the largest scale. Fortunate beyond other great inventors, at every step he had found means to go forward. And now came the final demonstration. For that means were also found. Enlightened capitalists came forward, and examined, and were convinced. The funds were furnished. It was determined to bring out the machine on a scale unprecedented in the history of inventions. The Ericsson, a splendid ship of 2,200 tuns, was constructed, the machinery built and put on board. The public trial has taken place at the earliest possible moment, if anything, too soon for perfect justice to the invention. Though the engine was unfinished and unable to perform all the work for which it is designed, yet, as many unfavorable rumors had been put in circulation, such as that it could not move the ship from the dock,

that the wheels had to be turned by hand, that it was but a vast humbug, with others of the same sort,—in order to silence these assertions and relieve the owners from the sneers and imputations to which they were subjected as having thrown away their money on a delusion, it was determined to anticipate the time of bringing out the ship and to submit the Caloric Engine to public inspection, even in its present imperfect state and with the certainty that it could not exhibit its whole power.

This was first done in the trial trip of last week, when only the inventor, owners and crew of the ship were present. Her performance on that occasion we have recorded. Yesterday a second trial was made. This was for the special satisfaction of the members of the Press. Representatives were present from all, or nearly all, the journals of the City, including several of the editors in-chief of the respective papers. The party was taken from Whitehall at about half-past 9 in a small steamer. It was nearly 10 when the Ericsson was put in motion. With the tide and a light breeze against her, she ran down beyond the Narrows, a distance of some ten miles; the tide was also against her in returning; the run each way was accomplished in about an hour and a quarter, making her average speed about eight miles an hour against the tide.

The time on the passage down was spent in discussing an excellent breakfast, and in examining the engine. The first thing in the engine which strikes the observer, is the magnitude of the cylinders. These are fourteen feet in diameter, six feet more than those of the Collins' steamers. There are four in the Ericsson, standing in a fore-and-aft line; two before and two abaft the shaft, and working in pairs upon it. From the base of the cylinders to the summit is about thirty feet. Each cylinder is double, consisting of what is called a working cylinder and a supply cylinder; the latter being on top and united with the other, though of inferior diameter. The working cylinder has the furnace under it; in it the active force of the machine is developed in the form of air expanded by heat. The supply cylinder is always cold. The working cylinder is 14 feet in diameter; the piston which plays in it has a superficies of 22,300 square inches. The supply cylinder is 11 feet 7 inches in diameter, and the area of its piston is 14,500 square inches. These pistons are joined by powerful iron rods. The stroke is 6 feet. On the under side of the upper piston are valves through which the supply of fresh air is drawn after the machine is put in motion. Over the supply cylinder is a reservoir in which the upward motion of the piston compresses the air, which passes in there through valves. The connection between the reservoir and working cylinder is by a large pipe running from the former to the base of the latter. The engine is set in motion by pumping cold air into the reservoir, by hand or otherwise.

From the reservoir, through a valve at the bottom of the large connecting pipe, the compressed air is admitted into the working cylinder over the furnace. Here it is instantly heated, and by its expansion drives up the piston, and at the same time compresses the supply cylinder, and forces it into the reservoir. Then another valve in the connecting pipe opens, and the hot air is let off into the atmosphere. This removes the pressure that has driven the piston up, when its own weight brings it down again, and the escape valve closes. Then the supply valve opens again, and lets the cold air in over the furnace; it is heated, and so the process goes on.

But the great feature of the invention is yet to be described. This is the apparatus by which the main part of the heat which expands the air in the working cylinder is saved and made to do duty over and over again. This it is that produces the astonishing saving of fuel, which is one of the great characteristics of the invention. In a steam engine the heat is used but once; it passes away, and therefore has to be perpetually renewed. In the Caloric engine it is economized. This is an immense advantage. The apparatus is formed of iron wire, 1·16 of an inch in diameter, woven into a web dense enough for the holes or meshes to occupy half the surface. Fifty thicknesses, or disks, of this wire cloth are used in each pipe connecting the reservoir and working cylinders. Each disk is 6 feet long and 4 wide, and contains half a million of meshes. They are placed close together in the pipe between the working cylinder and the two valves which let in the new air and let out that which has been

used. Thus all the air which comes in passes through the meshes of the wires, as does all that goes out. Here lies the wonder of the invention. The heated air in going out leaves its heat in these wires, and the cold air in coming in takes it up again. In the engines of the Ericsson the air which comes out is but 30° hotter than the atmosphere, though before passing through the wires it was 384° hotter. Even these 30° might be saved, says Capt. Ericsson, by increasing the number of wire disks, but it is practically unnecessary. This apparatus is called the regenerator. Though the principle of it is essentially the same as that of Davy's Safety Lamp, the glory of its application to mechanical purposes is Capt. Ericsson's forever.

As we said, there are four of these double cylinders, four working and four supply. Accordingly there are four furnaces ingeniously arranged, and set without any outlay of brick, such as has been reported. In these a small fire is kept up with anthracite coal, which is preferable to other fuel, because it does not blaze—only its radiating heat is employed. From the grate to the apex of the cylinder bottom, which is arched of course, there is a distance of five feet. The cylinder bottom is 1½ inches thick. Before the engine is put in motion it may get to a brown heat, but at that distance it cannot get hotter. As soon as the cold air is let in, it cools much below that point. Thus there is no danger either of fusion, cracking, or oxydizing of the cylinder bottom, all of which have been predicted by the sceptical. A cylinder bottom will last five years—as long as a steam boiler; or if it gives out can easily be replaced. The difference in the cost of replacing cylinder-bottoms and steam-boilers would in a large ship, be from thirty to forty thousand dollars in favor of the former.

The piston in the working cylinder is made 6 feet deep from top to bottom, concave underneath to fit the cylinder bottom, and flat at the top. The top as well as the sides are of iron, but the space between is filled with gypsum and charcoal, non-conductors of heat. Thus, while the bottom has the temperature of the hot air in the cylinder the top is perfectly cool. The heat there is barely sufficient to keep the tallow used for lubrication in a fluid state, not to burn it. In fact one can stand upon it as it plays up and down, and many gentlemen amused themselves yesterday by riding there. This enables the engineer at any time to grease just the part of it which he may desire; when the ship is careening for instance, and the friction of the piston is all on one side, that side can be directly lubricated. This is a point of great practical importance, which cannot be attained in a steam engine. Nor is there any danger of burning the packing for it is at the top of the piston and never comes within less than 6 feet of the fire.

The cylinders act in pairs, and in each pair the action is reciprocating; that is to say as the piston goes up in one, it goes down in the other.

The pressure for which the caloric engine is calculated is 12 lbs. per square inch, and to obtain this it is necessary to heat the air to 384 deg. By raising the air to 450 deg., a pressure of 15 lbs could be obtained, but 12 is sufficient for practical purposes, and more convenient to manage. Capt. Ericsson is of opinion that they will be retained as the maximum pressure by future builders of engines. Yesterday, owing to the unfinished state of the machine, and especially of the valves, it was impossible to get more than 8 lbs. pressure. With that, nine or ten revolutions were obtained per minute. The full number of revolutions to be had from Ericsson's engines is reckoned at 12, and at that rate it is calculated that she will make from 10 to 12 miles an hour. This is the utmost that is hoped from her, and we think rather more than will be obtained. Her engines are not powerful enough to make her a competitor in speed with the fast Collins or Cunard steamers. For that she must have larger cylinders. The means of increasing power is to enlarge the diameter of the cylinder. When these engines were built, Capt. Ericsson desired to have cylinders of sixteen feet, but no establishment would undertake to cast them and 14 were the largest he could get. Now Messrs. Hogg & Delamater are ready to make them of any size required, at their own risk.

The smoothness with which the engines worked was remarkable. Capt. Ericsson said that half lb. pressure was enough to move them. The amount of friction he

finds very much less than he anticipated. The coal consumed by the whole four furnaces is at the rate of 6 tuns in 24 hours; 7 tuns is the utmost limit of their consumption. The engineer and one fireman suffice to tend the whole mechanism. There is no unpleasant smell as about steam machinery. There are two smoke pipes and two pipes to carry off the escaped air.

These pipes are 12 feet above the deck and 30 inches in diameter. They are painted white, with a gilt rim at the top, but there is not smoke enough to sully them. The amount of air passing through the four cylinders in an hour is from 50 to 75 tuns. This keeps the ship perfectly ventilated. It was cool and pleasant in the immediate vicinity of the furnaces.

The Ericsson is a beautiful ship as she sets on the water; a lovelier model one would not wish to see. She is 260 feet long on deck; 40 feet beam; depth of hold 27; diameter of wheel 32 feet; length of buckets 10½. With ballast in her, as at present, she draws 17 feet water. Her bottom is moderately sharp, and she is one of the strongest vessels in the port. The hull was built by Messrs. Perine, Patterson & Stack, of Williamsburgh, and the engines by several builders under the oversight of Capt. Ericsson himself.

It is not necessary here to add any reflections on the consequences to flow from this great invention. As we have already said, we do not think the Ericsson will prove a fast ship. But the New Motive Power is as well established with 9 miles an hour as with 90. Larger cylinders will be put into other ships, and speed will be attained which will leave steam as much behind as it is now surpassed in economy, safety and convenience. In this mighty revolution, the palm of honor belongs to the inventor, but no little credit is due to the gentlemen who have joined him in bringing out the caloric engine on such a scale, prominent among whom we may name Messrs. Edwin W. Stoughton and John B. Kitching. Nor do we desire to conceal a satisfaction which our countrymen will universally feel, that the New Motive Power has been brought out in the United State.

On the passage up the bay, the party assembled in the cabin, when Capt. Ericsson explained the Caloric Engine in the most satisfactory and lucid manner, leaving no point unnoticed, no questioner unsatisfied, and no objection unremoved. His lecture was illustrated by a diagram, with which he rendered every thing in the machine intelligible to all present.

After he had concluded, and no one had any more questions to ask, Mr. C. A. Dana came forward, and in a few words expressed what he was confident was the sense of all. They had witnessed the performance of the engine, and had heard the extremely clear and instructive explanations of Capt. Ericsson and they were all convinced of the entire success of his great invention. Doubt on the subject was impossible, for they had witnessed the fact and heard and understood the philosophy. The thing was accomplished, the caloric engine was a substantiated fact. It was superior to steam in every quality of a motive power. He congratulated the inventor on this result. It was the reward of years of labor and waiting, and it stamped the seal of immortality upon his name. Along with the sense of admiration for the achievement and for the inventor, it was impossible not to feel the profoundest respect for those who had helped him to bring it forward. It was a new thing in the history of inventions, that a man of genius with a great idea in his head should find capitalists capable of appreciating that idea, and ready to advance such large sums to put it into execution. With a view to some expression of those feelings which he knew were entertained by all, he would move a vote of thanks to Capt. Ericsson, not for the invention, but for the kind and satisfactory manner in which he had elucidated it, and to the owners for their politeness and hospitality during the trip. This motion was unanimously adopted.

Mr. Solon Robinson spoke in behalf of the farmers. They had more interest in the invention than merchants or journalists, for these already had steam power. He had listened with delight to Capt. Ericsson's statement that caloric was particularly adapted to small machines, and that the time would come when every house would have one.

Prof. Mapes being called upon, said that he felt more at this triumph than he could express, more even than could be felt by

the inventor. He had always known that this triumph would come. He had believed in Ericsson all through, and had been laughed at for doing so. He had never found him at fault, and never known a draft made upon his knowledge which he could not answer at once. He paid no compliment, but expressed only his honest conviction when he said, that there had been two epochs of science; one of these was marked by Newton the other by Ericsson.

Dr. Jones then made some remarks, to the effect that he had come on board sceptical, but doubted no longer.

Mr. H. J. Raymond being called upon, said that he could only say "ditto" to the gentleman who had spoken before him. Mr. Stoughton then said this could not be called an experiment. The experiment had been made before upon other engines; those of the Ericsson were the full grown application of demonstrated principles and tried mechanism, not an attempt to use the doubtful and untried. His remarks were received with interest and applause. Capt. Ericsson disclaimed the compliments of Prof. Mapes.

In accordance with the unanimous expression of the delight and satisfaction by all present at the conclusion of Mr. Dana's remarks, it was the general feeling, after further conversation, that so important an event should not be allowed to pass without a more formal and deliberate record of the convictions of those who had had the good fortune to be present on an occasion of such absorbing and universal interest. Those present, therefore organized themselves into a meeting; appointing Hon. Henry J. Raymond chairman, and Carlos D. Stuart secretary. After the chairman had made a few remarks, directing the attention of those present to the object of their organization, on motion of Mr. Richard Grant White, seconded by Professor James J. Mapes, it was resolved that a committee should be appointed to draft resolutions expressive of the sentiments of the meeting upon the matter before it. Mr. White, Professor Mapes, and Freeman Hunt, Esq., being appointed such Committee, reported the following resolutions, which, on motion, was passed unanimously, and directed to be published with the signatures of the Committee.

Resolved, That this meeting of those present upon the trial trip of the caloric ship Ericsson is no less fully and deeply impressed with the grave importance of the subject upon which it feels called upon to express a judgment, than completely aware of the many advantages to the public which must arise from the now incontestable success of the invention which has today been put into practical operation.

Resolved, That upon thorough examination and actual observation, we are entirely convinced that the invention of Capt. Ericsson is no longer of questionable practicability, but from this day takes rank with the foremost of the great and useful inventions which the world owes to science and genius, and that it promises to surpass in efficiency any other adjunct to the advancement of commerce and the industrial progress of the world.

Resolved, That from its economy, safety, and ready applicability to all purposes requiring motive power, the caloric engine cannot fail to minister largely to the happness of mankind.

Resolved, That the peculiar adaptability to sea vessels of the new motor presented to the world by Capt. Ericsson is now fully established; and that it is likely to prove in every respect superior to steam for such purposes.

Resolved, That the remarkable economy of fuel necessary for its working, the absence of all risk from explosion, and the low temperature throughout the ship, even in the engine and fire rooms, as satisfactorily exhibited on this trip, are among the most prominent claims of the caloric engine to the attention of the scientific and commercial world.

Resolved, That in his lucid, simple and comprehensive statement of his theory and description of his engine, Capt. Ericsson has not only demonstrated the beautiful completeness and perfect working of the system which he has brought, by twenty years' elaboration, to its present commanding position before the world, but has shown a fertility of resource, and a ready command of his vast scientific knowledge, which hardly less entitles him to the admiration of all who heard him.

Resolved, That in the admirable construction of the Ericsson, and the beauty of her model, and in the perfectly successful production of so novel and remarkable

an engine, Messrs. Perrine, Patterson & Stack, her builders, and Messrs. Hogg & Delamater, her machinists, have shown themselves worthy coadjutors in so noble a project, so important an invention.

Resolved, That E. W. Stoughton, Esq., the tried friend and legal adviser of the inventor, with John B. Kitching, Esq., and G. B. Lamar, Esq., and others, the men who have invested their capital and lent their influence to insure the success of this great enterprise, are entitled to the enduring gratitude of the entire social, commercial, and industrial world.

RICH'D. G. WHITE,
JAMES J. MAPES, } *Com.*
FREEMAN HUNT,

On motion of Solon Robinson, Esq., seconded by Erastus Brooks, Esq., it was resolved that in addition to the names of the officers, the proceedings should be signed by all those present on the trip; and it being noticed that several persons had left before the meeting was organized, it was also resolved that a committee should be appointed to procure the names of those gentlemen who had joined in the previous less formal expression of the opinion embodied in these resolutions.

HENRY J. RARMOND, Chairman.
CARLOS D. STUART, Sec'y.

Erastus Brooks,	John Armstrong,
T. Rainey, Cincinnati,	Solon Robinson,
Alex. Jones,	J. K. Fisher,
James L. Smith,	H. L. Webb,
Rev. Sam'l. A. Prime,	John Bigelow,
Robert Tomes,	Charles A. Dana,
John E. Durivage,	I. S. Pike,
Chas. F. Briggs,	Victor Beaumont,
Chas. Hale, Boston,	H. Vezian,
Henry G. Evans,	Robert Webb,
Hiram Fuller,	William Young,
Robert A. West,	A. P. Cummings,
David Deans,	Joseph Barber,
Thomas Stack,	C. L. Daboll,
Wm. H. Hallock,	Aug's. Maverick.

POETRY AND PAINTING.

POETRY and Painting are closely connected; what the one describes, the other portrays. Painting is only the offspring of poetry—one of the manifestations of a poetic spirit. Poetry is not syllables that jingle well together, prose cramped into metre, versification that may be measured by feet, and may be made to flow through meadows of margin; it is something higher, nobler, better than this. The poet is not simply a man who can sit in a chair and write verses, but he is a man speaking to man: a man, it is true, endued with more lively sensibility, more enthusiasm and tenderness, who has a greater knowledge of human nature, a more comprehensive soul, than are supposed to be common among mankind; who has contemplated nature in her thousand forms, who has treasured within him the remembrance of all that is beautiful and great, who has studied the huge volume that lies open before him with all its mountain tropes and lofty periods, and who is willing to communicate the sweetness he enjoys. This spirit is revealed to the world in unceasing variety.

Sometimes it produces a man towering above his fellows—as he who was driven into greatness by the deer-stalking prosecution of a Warwickshire squire—Shakspeare, at whose words the world still laughs, or sheds big tears of sorrow, as the case may be. Sometimes it gives us a man whose beautiful conceptions are vividly portrayed in glowing colors on the canvass; a Raphael, whose glorious grouping and rich coloring attract our earnest gaze, and waken up within us something of the spirit of the painter. Old Bible scenes, so touching, so august, so natural, that we seem to breathe the very air of Palestine, and dwell within that holy land where He-

brew chivalry and Hebrew sanctity were centuries agone exhibited. Sometimes the poetic spirit is embodi d in the stone, and from the granite or the marble a Canova's chisel picks out the thing of beauty. Sometimes it shows itself in the lofty building which rises up before us in all its graceful proportions; and sometimes it is heard in solemn strains of harmony that wake up memories deep and tender, and fill the soul with rapture.

Poetry is evident in all these things. But it is especially evident in words and in colors. Each of these have their peculiar advantages. The writer in harmonious numbers tells us of some bright and b autiful scene—some happy spot from which it seems all sorrow has fled forever away; or, it may be, describes some pastoral locality—with exquisite fidelity presents us with minute particulars—the old mill-stream, the lowing cattle, the humble peasant, the setting sun, the back-ground of trees, the thick close shadowy wood, where the last rays of the sun are shining in aslant, making a path of golden light along the stems and branches in its range—gnarled trunks, and twisted boughs, and trembling leaves, and bark-stripped bodies of old trees; and a long, long time it takes to tell all this, and the reader has to fashion it in his mind's eye, and imagine how it looked;—but the painter at once brings the whole scene before us, the very autumn tint upon the leaves, the parasite that climbs upon the oak, beneath whose shade the peasant man is sitting. Then, again, on the other hand, the painter has done all he can in that one view,—he can give you but a momentary glance,—he cannot show you how the sunlight died away, and darkness fell upon the wood. But the poet still goes on, the lengthening shadows lengthen still, fresh incidents occur, the narrative is told—of humble mundane life or angel world—fact after fact, or incident after incident, till the final catastrophe comes.

The poet Young and the painter Blake were of the same turn of thought, and it is this that makes the illustrations which Blake has furnished so admirably adapted to the Night Thoughts. They are grotesque and sublime, and so is the poem. The painter fully enters into all the wonderful metaphors which the poet has used, and illustrates them and makes them corporeal. The picture which is to be seen in the Society of Arts in London, the "Final Judgment," by Barry, exhibits the same sort of feeling that is evident in the "Inferno" of Dante. Poets and painters are guided by the same genius, appeal to the same feelings, but work with different tools.

Aristotle says that poetry is the most philosophic of all writing, inasmuch as its object was truth, not individual and local, but general and collective. And so it is; and the poet, or the painter, who makes his work the image of man and nature, is doing good service to the world. But nature must be presented in her beautiful form; not only the experience but the imagination must work; and the tendency should ever be to elevate, and never to debase.

The great end of painting is to please the eye, and the chief design of poetry is to please the mind. Thus far the parallel of the arts holds true; with this difference, that the principal end of painting is to please, and the chief design of poetry is to instruct. In this the latter seems to have the advantage over the former; but when we consider the work of the painter as suggestive of the highest and noblest emotions, we can hardly confine the benefit of instruction exclusively to poetry.

"True poetry the painter's power displays;
True painting emulates the poet's lays,—
The rival sisters, fond of equal fame,
Alternate change their office and their name;
Bid silent poetry the canvass warm,
The tuneful page with speaking charm.

"What to the ear sublimer rapture brings,
That strain alone the genuine poet sings:
That form alone where glows peculiar grace,
The genuine painter condescends to trace:
No sordid theme will verse or paint admit,
Unworthy colors, or unworthy wit."

Enough has been said to show that the spirit of poetry belongs alike to the writer and the painter; and here we close, lest a weary reader should be tempted to re echo the words of good King George II., "*I hate Boetry, and Bainting too.*"—*Mag. of Art.*

From the London Illustrated News.

PHOTOGRAPHY.

THE removal of the patent restrictions from the art of Photography is already producing its good effects. We find that photographic pictures are now brought to the test of their money value, which is, after all, the one by which the merits of sun pictures, like all other pictures, will be most fairly tried. If the productions of the photographic artist are more truth-telling, and no less picturesque than those produced by the artist with an educated eye and a practised hand, they will command public attention and sell. If they do not realise this point they will fall in value, because they will not be in demand. Howsoever curious and interesting the practice of photography may be, it now claims to be considered commercially; and we believe its claims will, if not immediately, at least very shortly be fully acknowledged.

On Wednesday week a *soiree* was given by the Society of Arts, at which the leading photographers were present, and recent specimens of photography shown; it being the first public exhibition of these pictures in this country. The time allowed between the adoption of the suggestion and the completion of the design was exceedingly short; yet there has been gathered together a numerous collection, possessing many examples of the capabilities of photography, and exhibiting at the same time its more prominent defects. It should be remarked that the exhibition has been confined to productions on paper and on glass, to the entire exclusion of daguerreotypes. We are not satisfied that this is judicious; for, notwithstanding the numerous advantages arising from the use of paper, there are points of excellence in well executed pictures upon the metallic tablets which have not been, as yet, approached upon paper, and of which those who practise the Talbotype should be constantly reminded.

We do not intend to examine this collection in detail, but we purpose offering a few remarks in the way rather of suggestion than of criticism, considering the defects previously to pointing out the beauties which are spread around the rooms of the Society of Arts.

It appears that the large majority of the exhibitors have forgotten one point, and that is one, too, upon which entire perfection in photography depends. A stranger to the art, looking around the room, will not fail to remark that the high lights and the shadows are often placed in the most striking and even disagreeable contrast. When the sun is shining upon the ornamented front of a palace or a temple, the details of all those portions which are shaded by the deep shadow of projections are still sufficiently illuminated by the diffused light of the sky to be seen with their minutest details. Such a subject, copied by the photographic processes employed, is usually a compound of "high" white lights and deep obscure shadows; whereas, a little careful attention to the existing conditions would have prevented this. The usual practice has been to remove the primary picture from the camera-obscura as soon as it was thought the sunlight portion of the subject had made its chemical impression, and at a period far too short for those parts in shadow to effect a chemical change. It would, however, be found in practice that a prolonged exposure to the radiations from those points the most highly illuminated, which might equal the extra time required for the dimly lighted parts to paint themselves, would not so far increase the opacity of those parts of the negative image as to render them whiter than we now find them in the positive copy; while the details in shadow might be brought out in perfection. What Mr. Stewart says with regard to landscapes applies with equal, if not with greater force, to architectural piles, statues, &c.:—"I throw aside all consideration of the bright light, and limit the time with reference entirely to the dark and feebly-lighted parts of the view." Mr. Stewart's photographs are examples of this practice, and their beauty is evidently more dependent on this point than on the manipulatory details for

preparing the paper by the use of the air-pump, so strongly insisted on.

In the photographic pictures of M. Du Camp, which we have previously noticed, great attention has been paid to the development of the parts in shadow. In most of them the details are finely brought out; but in many, the defects arising from the unequal action of radiations from surfaces differently illuminated, or in different physical conditions, as it regards color mainly, have not been entirely overcome. In the pictures of Mr. Buckle and Mr. Roslyn, considerable attention has, it is evident, been paid to the degree of illumination on the subject, and much judgment used in regulating the action on the prepared paper. Mr. Owen's interior views of Redcliffe Church, Bristol, are good examples of very difficult subjects effectively treated by one to whom the difficulties and peculiarities of the art are familiar. The works of Mr. Fenton, Sir William Newton, Mr. Shaw, Mr. Goodeve, Mr. Archer, Mr. Horne, and Dr. Diamond, are, with several others respectively, examples of much interest. Many among them are pictures of exceeding beauty, and curiously suggestive; but many should not have passed beyond the portfolio of the artist, since the subjects have been badly chosen, and the results obtained are very unsatisfactory. Mr. Fenton, on the occassion of the opening of this exhibition, read a paper "On the present Position and future Prospects of the art of Photography," in which he sketched briefly the present state of our knowledge, and judiciously pointed out the most important point for research.

"Though the excellence of the specimens now exhibited," says Mr. Fenton "might allow photographers the indulgence of a little self-complacency, still, everybody feels that, as an art, it is yet in its infancy, and that the uses to which it may be applied will yet be multiplied tenfold. We feel conscious of this; and when we examine pictures produced by the chemical agency of the sunbeam, giving us every external detail with mathematical exactitude, and adding thereto the charms of "airy distance" with the harmonious gradation of light and shadow—of such there are many examples in the exhibition—we forsee that the art must become one of the utmost utility. Under this impression, it is our intention to record every novelty which may arise either at home or abroad in relation to the chemistry of the art, in the preparation of the sensitive tablets, or the physics, by which are determined all the improvements connected with lenses, and all the dioptrical phenomena of the photographic camera.

Freedom of Mind.—We call that mind free which is not imprisoned in a sect—which recognises in all human beings the image of God, and sympathises with sufferings wherever they are seen; which conquers pride and sloth, and offers itself up as a willing victim to the cause of mankind. We call that mind free which protects itself against the usurpations of human society; which does not cower to human opinion; which respects itself too much to be the slave of the many or the few.

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Study, and the means of study, are indispensable; but all study and no reflection will never make a scholar. A man may read a monument of books, and never know the more; because knowing but little of all, he knows nothing definite of a part.

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"Nature is the fountain of all beauty; and when you exclude her fresh vital breath, reverse her seasons, and above all, neglect the great distinctions, for those of artificial society, you forfeit all the charms which may excite the imagination."

ON COLORING DAGUERREOTYPES.

From the Art of Photography, BY H. H. SNELLING, *Fourth Edition—Just Published.*

NEARLY, if not quite all the various colors used in painting may be made from the three primitive colors, blue, red and yellow, but for the daguerrean artist it would be the best policy to obtain such as are required by their art already prepared. In a majority of cases, the following will be found sufficient, viz. :—

Carmine.
Prussian Blue.
White.
Chrome Yellow, Gamboge, Yellow Ochre ; or all three.*
Light Red.
Indigo.
Burnt Sienna.
Bistre, or Burnt Umber.

If, in coloring any part of a lady's or gentleman's apparel, it is found necessary to produce other tints and shades, the following combinations may be used :

Orange—Mix yellow with red, making it darker or lighter by using more or less red.

Purple—This is made with Prussian blue, or indigo and red. Carmine and Prussian blue producing the richest color, which may be deepened in the shadows by a slight addition of indigo or brown.

Greens—Prussian blue and gamboge makes a very fine green, which may be varied to suit the taste of the sitter or operator by larger portions of either, or by adding white, burnt sienna, indigo and red, as the case may require. These combinations, under different modifications, give almost endless varieties of green.

Brown—May be made of different shades of umber, carmine and lamp-black.

Neutral tint—is composed of indigo and lamp-black

Crimson—Mix carmine and white, deepening the shaded parts of the picture with additional carmine.

Flesh color—The best representive of flesh color is light red, brightened in the more glowing or warmer parts, with carmine, softened off in the lighter portions with white, and shaded with purple and burnt sienna.

Lead Color—Mix indigo and white in proportions to suit.

Scarlet—Carmine and light red.

For Jewelry cups of gold and silver preparations accompany each box for daguerreotypists or may be procured separately.

The method of laying colors on daguerreotypes is one of considerably difficulty, inasmuch as they are used in the form of perfectly dry, impalpable powder. The author of this little work is now experimenting, in order, if possible, to discover some more easy, artistic and unexceptionable method. If successful, the result will be published in a future edition.*

The rules we shall give for coloring daguerreotypes depends, and are founded, upon those observed in miniature painting, and are intended more as hints to daguerrean artists, in hopes of leading them to attempt improvements, than as instructions wholly to be observed.

The writer is confident that some compound or ingredient may yet be discovered which, when mixed with the colors, will give a more delicate, pleasing, and natural appearance to the picture than is derived from the present mode of laying them on, which in his estimation is more like plastering than coloring.

In coloring daguerreotypes, the principal shades of the head are to be made with bistre, mixed with burnt sienna, touching some places with a mixture of carmine and indigo. The flesh tints are produced by

* Gamboge is best for drapery ; Ochre for the face.

* Since the issue of this publication, the time of the author has been so fully occupied, that he has found it impossible to pursue his investigations ; but he would recommend the colors of G. Harrison as the best prepared for artistic effect, of any others.

the use of light red deepened towards the shaded parts with yellow ochre, blue and carmine mixed with indigo, while the warmer, or more highly colored parts have a slight excess of carmine or lake. Color the shades about the mouth and neck with yellow ochre, blue, and a very little carmine, heightening the color of the lips with carmine and light red, letting the light red predominate on the upper, and the carmine on the lower lip; the shades in the corner of the mouth being touched slightly with burnt sienna, mixed with carmine.

In coloring the eyes, the artist will of course be guided by nature, observing a very delicate touch in laying on the colors, so as to preserve as much transparency as possible. A slight touch of blue—ultramarine would be best if it would adhere to the daguerreotype plate—in the whites of the eyes near the iris, will produce a good effect.

In coloring the heads of men it will be necessary to use the darker tints with more freedom, according to the complexion of the sitter. For women, the warmer tints should predominate, and in order to give that transparency so universal with the softer sex—and which gives so much loveliness and beauty to the face—a little white may be judiciously interminged with the red tints about the lighter portions of the face.

In taking a picture of a lady, with light or auburn hair, by the daguerrean process, much of the beauty of the face is destroyed, on account of the imperfect manner in which light conveys the image of light objects to the spectrum of the camera. This may be obviated in some measure by proper coloring. To do this, touch the shaded parts with burnt sienna and bistre, filling up the lighter portions with yellow ochre, delicate touches of burnt sienna, and in those parts which naturally have a bluish tint, add *very* delicate touches of purple—so delicate in fact as hardly to be perceived. The roots of the hair at the forehead should also be touched with blue, and the eyebrows near the temples made of a pinkish tint.

The chin of a woman is nearly of the same color as the cheeks in the most glowing parts. In men it is stronger, and of a bluish tint, in order to produce the effect given by the beard.

In portraits of women—the middle tints on the side of the light, which are perceived on the bosom and arms, are made of a slight mixture of ochre, blue and lake, (or carmine), to which add, on the shaded sides, ochre, bistre and purple, the latter in the darker parts. The tints of the hands should be the same as the other parts of the flesh, the ends of the fingers being a little pinkish and the nails of a violet hue. If any portion of the fleshy part is shaded by portions of the dress, or by the position of the hand, this shade should be colored with umber mixed with purple.

"THE true scholar—and may we not add christian?—will feel that the richest romance, the noblest fiction, that ever was woven, the heart and soul of beauty, lies enclosed in *human* life. Itself of surprising value, it is also the richest material for his creation * * * He must bear his share of the common load. He must work. He must work with men in houses, and not with their names in books. His needs, appetites, talents, affections, accomplishments, are keys that open to him the beautiful museum of human life. Why should he read it as an Arabian tale, and not know in his own beating bosom its sweet and smart? Out of love and hatred, out of earnings and borrowings, and lendings and losses, out of sickness and pain, out of wooing, and worshipping, out of traveling and voting, and watching and caring, out of disgrace and contempt, comes our tuition in the serene and beautiful laws. Let him not slur his lesson; Let him learn it by heart. Let him endeavor exactly, bravely, and cheerfully, to solve the problem of that life which is set before him; and this by *punctual action* and not by promises and dreams."

GOSSIP.

ALTHOUGH the discovery of the art of photography is of comparative recent date, the rapid strides it has made in the estimation of the public, has rendered it of vast importance to the welfare of a large number of the human race. Without this discovery, where would be those now engaged in its practice? In it we can see one of those workings of a Providence that stamps the existence of an Allwise ruler, who ever looks after the well being of those he creates. Many persons are still disposed to doubt its utility and to look upon it as an insignificant and toyish employment, and none are more prone to take this view of the art, than professional artists, portrait and landscape painters, and engravers. They look upon it with jealous eyes, and fill their imaginations with bugbear fears of injury done to true art; but their fears are groundless. Whatever tends to teach the mind, or give it an inclination towards the beautiful, and improve the taste, can never interfere with works of higher art.

That photography has this tendency can not be denied by those who mingle in the least with society of any kind. In no country has this fact become more evident than in the United States, and we will venture to assert that never were painters so liberally patronized in this country as now. Instead of taste being vitiated by the daguerreotype it has been improved. It has even caused the poorest to look upon works of art with desiring appetite and to hang their walls with whatever productions come within the reach of their means, and they have been taught to criticise with some degree of discrimination, the thousands of productions thrown off by the press. We have had many opportunities within the last fifteen years of following the gradual increase of refined taste among the people, and we have been much gratified by listening to the observations of those we little expected to find possessed of the least knowledge of the principles of art. We cannot continue the subject better than by quoting the remarks of an English author:

"All men of reading desire to possess faithful representations of the monuments of antiquity—the Pyramids of Gizeh, the palaces of the temples of Ancient Greece and Rome. Every one must feel a pure and healthy pleasure in contemplating the representation of scenes made sacred to our memory by the deeds of heroes, or the words of sages. The temples of Athens, the wonderful Acropolis, the mysterious ruins of Pæstum, and the fanes and arches of Rome, proudly but vainly named the eternal, speak even from their pictures. Theirs is the still small voice of the past speaking of the mutability of all things to the present. The lesson they thus give us, even those who have never crossed the sea which washes our island home, is but little inferior to that which the traveler receives who contemplates the moral of a crumbling arch or a broken column, on the very spots where once they stood the glory of the age. Even in our land we have temples which realize, in their consistent and beautifully elaborate architectural details, the poet's fancy of a 'petrified religion.' We have monastic piles hastening to decay, but beautiful even in their dissolution, and baronial halls whose battlemented walls are tangled with the ivy and clothed with the moss of centuries; and these are hallowed by holy recollections which cling like the poetry of a pious superstition to every heart; and they cannot pass away until we have forgotten the history of our own land. Each and all of these we are

now enabled to preserve in the strictest fidelity. Every stone will tell its own tale; and as the mind of the poet shines forever from his productions, so the very genius, the very spirit of the place, may now be impressed by the subtle fingers of light upon tablets of metal or sheets of paper, to speak to future ages as they speak to us. Again, by this wondrous science, we are now enabled to preserve and hand down to future generations the *truth-telling* portraits of our statesmen, our heroes, our philosophers, our poets, and our friends, with 'all the mind, the music breathing through the face.'

"But, independently of this practical utility, we have derived another advantage from the discoveries which have been made in this branch of science. We have been enabled to perceive and contemplate the beauty and harmony of those laws by which Divine Wisdom regulates and governs the universe. They have shown us that not a sunbeam can fail without producing a molecular or chemical change. They have taught us how close is the tie which exists between all the imponderables, light, heat, electricity, &c. They have proved to us how necessary to organic life, to the germination and growth of plants, the vitality and welfare of the animal creation, is that 'efflux divine,' of which it has been poetically and truly said that 'balm, and joy, and life is in its ray'."

— It is with pleasure that we give the following evidences of the continued prosperity of the Photographic Art in our country, and of that of our subscribers.

Mr. G. N. Barnard, the daguerrean artist has removed to the third story of the City Bank Block. We took occasion yesterday to visit him in his new quarters, and were highly pleased with all his arrangements.

The Reception Room, fronting on First and Cayuga-street, is a large well lighted apartment, containing easy sofas and arm chairs for visitors, the walls being hung with excellent specimens of the art, (including likenesses of prominent citizens of this and other places) mirrors, engravings, &c., and the centre table supplied with books, where persons may agreeably while away the time passed among them. The view from this room is excellent, taking in First-street as far down as the piers, &c. The view, also, from the Operating Room is one of the best to be had anywhere. But we are anticipating a trifle. Fronting Cayuga-street, and leading from the room just mentioned, is a Toilet Room for the use of visitors preparing for a "sitting." Mr. Barnard has here supplied a want which we opine will be appreciated by his hosts of friends. The Operating Room is at the other end of the building, and is reached by a passage, where the attention of persons need not be attracted by "noise and confusion" which may occur in the other apartment. The sky-light is very large—fully large enough to let in all the daylight outside, or so adjusted as to admit all thereof that is needed Adjoining this, and entered from the hall, is an apartment for the disposing of surplus wares, &c., of which he has enough to last him for some time, should communication between this city and New York be cut off by some unforseen cause. On the opposite side of the hall, in a room for the purpose, Chemicals, &c., are kept. This arrangement will be appreciated by those to whom the fumes, arising in the preparation of plates, are offensive. The light admitted into this room is a sort of mellow *twilight*—just the quality desired by the artist. Mr. Barnard may well be satisfied with his suite of rooms. Everything is arranged with an eye to taste and convenience, and though in the hurry of moving he has not been able to have all thing *just* as he desires, we think his facilities for operating are not excelled this side of New York.

Of Mr. Barnard's ability to please as an artist, we do not intend to speak. His reputation is established, and nothing we can say will add one title to what he already possesses. —*Oswego Palladium.*

The Stereoscope.—We are indebted to Geo. P. Hansen, Esq., Daguerreotypist, No. 75 Lake street, for a practical illustration of the effects of this curious instrument. It was invented within the last twelve years, and is pronounced by scientific men both in this country and in Europe one of the most beautiful discoveries in optics, that has been made in modern times. By the use of this instrument two pictures of the same person placed side by side are merged into one greatly

enlarged, and what is still more curious the enlarged picture seems to stand out rounded precisely as the face appears to the eye. The effect upon a daguerreotype is most beautiful. There you have the original of the picture standing before you precisely as he appears in real life. No one can fail to be surprised and delighted with this singular instrument.

The practical application that can be made of this discovery will bring it into very general use among those whose means will enable them to incur the expense. In a gallery fitted up for the purpose, duplicate pictures might be placed of our great statesmen, or of any particular family that chose to appropriate a room for that purpose, and by the use of this simple instrument these individuals might be made to stand out before coming generations in life like reality. There might also be placed in such a gallery pictures of any object that it is supposed would become interesting to after ages. What price would not now be paid if we could enter a gallery where we might see, exactly as they appeared when living and acting their part in the stern realities of life, such men as Shakspeare and Milton, Newton and Bacon, Caesar and Napoleon, Franklin and Washington, and a whole host of those whose genius and noble deeds have become the admiration of the world. How much more would posterity thank us for such a legacy, should Congress appropriate even half a million of money to establish such a gallery, than were we to spend the same amount of money in building a fort upon some point of imaginary danger. Such a gallery of American heroes and statesmen would even now be absolutely invaluable. The nation would not part with it for all the gold in California.

We have little hope that anything will immediately be done to carry out these suggestions. They have, however, occurred to us while reflecting upon the uses to which this interesting invention might be put. We are much obliged to our friend Hansen for his kindness in giving us a practical illustration of its effects, and take occasion to say to those who want a beautiful daguerreotype that we know of no one whose skill and cultivated taste they can rely upon with more entire confidence.—*Chicago Democratic Press.*

— Our old friend, Mr. Robert S. Jones has become the successor of Mr. Retzer in the daguerrean art in this place. Mr. Jones was the pupil of Retzer for a considerable time, and spent a greater portion of the last summer in perfecting himself among the artists of his profession in the North, and now he takes pictures equal to his instructors, and we hope the community will extend to him a generous patronage. Mr. Jones has some daguerreotype views of Niagara Falls and other places of note, which he took while on his northern tour, that have been pronounced equal if not superior, to any ever taken. It was untrue that our friend Jones lost his life when the Henry Clay Steamer was burned on the Hudson River last summer, for the very good reason that he did not happen to be on board of her; and all who may have heard of the report, will become convinced of the truth of our statement by calling at his Gallery on Main street, and getting their pictures taken.—*Charlotteville, (Va.) Jeffersonian.*

— Mr. Henry W. Meade leaves in a few days for Europe, and will take with him the American contribution to Daguerre's monument, which is erected by subscriptions received from daguerreotypists in different parts of the world, by the Society of "Beaux Arts," Paris. While in Europe he will also present the beautiful medals of Clay and Webster to Queen Victoria and Louis Napoleon, in behalf of F. W. Green, the publisher. These medals were executed by C. C. Wright. The Clay medals are from the same die as the gold medal presented to the illustrious deceased. We also understand that both Henry and Chas. Meade have been elected members of the Society of Fine Arts of Paris.

— We can reciprocate the regret of Mr. Rea, of Indianopolis, but the day may not be far distant when the mutual desire of us both will be realized. We can assure

him that we often hear of him favorably, and that with the evidence before us we can cheerfully recommend his artistic skill.

— The following letter is quite characteristic of the liberal and high-minded man from whom it is received. We must apologize for not having given it place sooner, but we received it too late for the October number, and we were so unfortunate as to mislay it, and did not again find it until after the December issue. It will be seen that the suggestion of Mr. Fitz Gibbon has been met by an additional offer of a second prize of a pair of goblets for the best half plate picture. In regard to the style of picture and whether they shall be single or group, we would say, that it is left optional with the operator. To the second inquiry we reply that we understand that considerable preparations are making in this and our sister cities for the exhibition of daguerreotypes at the World's Fair, but we have heard no intimation that any of the Societies have moved in the matter. It is necessary for each artist to make application in his own name. For the information of our subscribers, we append the advertisement of the committee.

New York Crystal Palace.—Notice is hereby given by the Association for the Exhibition of the Industry of All Nations, to all parties in America desirous of contributing to the Industrial Exhibition to be opened in the City of New York, in May, 1853.

All persons desirous of obtaining a place in the building, erected on Reservoir-sqr., in the City of New-York, by the Association for the Exhib tion of the Industry of All Nations, are requested to send in their Appplications for Space before the 1st day of February, 1853; immediately after which date the Association will proceed to decide on Applications and allot Space.

Each Application must furnish the Exhibitor's name and address in full, and state whether he is Manufacturer, Proprietor or agent. It must contain a concise description of the articles offered for Exhibition, and a statement of the precise dimensions of the Space required; if on Wall, by Height and Length; if on Floor or Counter, by Length and Breadth.

Applications must be signed by the persons proposing to exhibit, and be addressed to the Subscriber, at the office of the Association, No. 53 Broadway, New-York.

The Association hopes that attention will be given to the exact terms of this notice, and that its requirements will be carefully observed in making preparations. By order. W. Whetten, Secretary.

No charge made to exhibitors for space allotted.

January 5, 1853.

St. Louis, Oct. 20, 1852.

Mr. H. H. Snelling—Dear Sir—It is with pleasure that I read the liberal offer of Mr. E. Anthony to award to the artist who can produce the best daguerreotype pictures a massive silver pitcher. Too much credit cannot be given to Mr. A. by our artists for this rich present to the successful manipulator of the beautiful art of Daguerre, who ever he may be. Their are some artists who have thought Mr. Anthony intended to make a speculation out of this; but, if they will read his card carefully, they will perceive that the pictures will be subject to the order of the contributors. It is to be hoped that this may be the means of bringing together the works of our best artists and laying the foundation of a United States Gallery of Daguerreotypes, for, I think, it is time such a one was established. Their are many, no doubt, like myself, that would be willing to give what works of art they contribute for the prize for the commencement of such a gallery, when they would not be willing that any private individual should become possessed of them. As I am in for the race, I will cheerfully give what I contribute for such a purpose.

I hope you will call the attention of our daguerreotypists to this subject if you think it feasible, in your valuable Journal, and get their opinions of it in time. There are other subjects connected with Mr. Anthony's premium I should like to call your attention to; the first is, Mr. A. says that pictures for competition must be on the full two-third and quarter size, now, I would ask, is it the intention to exclude all artists that do not work a whole size camera,

(and their are many first class that do not) if so, the competition will be small to what it would otherwise. If I may be permitted to suggest what I think the most liberal plan is, to leave it optional with the artist whether he will furnish whole, two-third, half, quarter or medium; the artist that don't work larger than a half camera to furnish two-half, quarter and medium. Next, I think, that operators that take pictures as low as a dollar or less ought to be excluded from the number of competitors for such men cannot have the welfare of the art in their mind while stooping so low as to take pictures at such prices when the community don't ask it; and, lastly, I would ask, is it required that artist should furnish single pictures only, or groups, or either, according to their taste and judgment. While penning these few lines to you, I would enquire if the New York artists are preparing for the World's Fair, and if any of the Daguerrean Societies are making any arrangements for space or reception of pictures of different artists through the country. My reason for this enquiry is, that artists in this section have asked the question of me. It is to be hoped that something of the kind will be done, as I have no doubt but their will be the greatest display of daguerreotypes that ever was seen together. I am glad to inform you that the dollar operators of our city seeing their folly at taking pictures at so low a price as one dollar, had a meeting on the 18th, and firmly resolved to work for no less than two dollars. I wish them success in their new undertaking.

From yours, respectfully,

J. H. Fitzgibbon.

— We clip the following *morceaus* from a Richmond (Va.) paper. May we not hope that the writer will favor us with some of the efforts of his pen?

A SHORT DISSERTATION ON THE DAGUERREAN ART

BY M. P. SIMONS.

"Sometimes fair truth in fiction we disguise,
Sometimes present her naked to men's eyes."

As the professions of medicine and law are effected with quacks and pettifoggers, so is the daguerrean profession troubled with interlopers of the mushroom growth—mere Tom Thumbs in ability and giants in presumption, who know as little about taking daguerreotypes as Louis Napoleon does about democracy.

Now it must be obvious, to some at least, that the difference is great between a good and a bad daguerreotype. Nor is it strange that such a distinct difference should exist in this beautiful and delicate work of art, requiring as it does the combination of so many circumstances to make even the slightest impression upon the plate. And yet, how often do we hear, Why is it that one operator cannot take a picture as well as another? The sun does it, and it shines as bright for one as it does for another. Now, if this be sound logic, why was it that artists such as West, Allston and Stuart, whose names adorn American history, became so eminent in their profession? Did the sun shine brighter for these sublime poet painters, and furnish them with purer lights and shades than it did their cotemporaries, many of whom were obliged to abandon their profession for something more congenial to their tastes? Does the sun prepare the painter's pallet, and dictate to him the use of its delicate and varied tints? We answer no! Nor does it prepare the daguerreotypist's pallet—his chemical box.

Neither does it point out to him the precise quantity of chemicals required to give the picture that pureness of light and shade which characterize the portraits of the scientific daguerreotypist.

And, again, it takes no ordinary skill to prepare the plate properly to receive the chemicals, nor ordinary taste to arrange the drapery, and give to the sitter a graceful and easy position. The sun, although an indispensable agent, has no more to do with making a daguerreotype than it has to do with writing a book. Both can be done by candle light,* and neither can be done well without brains; and it is just as absurd to suppose every man a daguerreotypist who calls himself one, as it would be to call every man an orator whose name is Webster, or a General whose name is Scott.

AN ANECDOTE OF HENRY CLAY.

Mr. Editor—Dear Sir: My likeness of Mr. Clay, which has elicited so many

* Dr. Paul Goddard, of Philadelphia, has succeeded in copying prints by means of artificial light.

encomiums from the Press, and which you have been pleased to criticise so favorably, as a valuable likeness, is still more valuable for having associated with it a pleasing and characteristic anecdote of that great statesman. This anecdote made such a strong impression upon my memory, as being a most elegant *impromptu*, that I am now able to give it to you *verbatim*, although it has been several years since it happened.

At the time I took the picture of Mr. Clay, he was on a visit to Philadelphia, and the guest of one of his warmest friends, Mr. Potter, who accompanied him to my Gallery.

As Mr. Potter and myself were about arranging Mr. Clay's drapery, I asked him if he had any choice of position; his answer was, "None whatever, sir; I am *Clay* in the hands of a *Potter*, let him mould me as he will."

M. P. SIMONS.

— Messrs. Brady, Gurney, Lawrence, and Beckers & Piard are all engaged in fitting up new and beautiful galleries in New York, and enlarging their facilities to meet the increasing demand upon their skill. M. A. Root, is furnishing an extensive establishment in Washington city. Mr. W. R. King has returned from England, to purchase a complete apparatus with which he designs astonishing the people of the mother country.

— The preparations among daguerreotypists throughout the country for the future, are so extensive, that it would take a volume to mention all at once; we trust therefore that those whom we now omit for want of room will be patient with us, for, although we do not think that they consider our notices a matter of much moment, it is a pleasure to ourselves that we forego reluctantly.

— R. S. J. Your letter has been answered, and we trust fully, and to your satisfaction.

— N. M. C. You have not been forgotten. We are only waiting for a favorable opportunity. If you say send by mail it shall be done, but such things are apt to get seriously injured when so sent. If any of your friends visit New York we shall be happy to receive them and deliver the engraving with those for the present year.

— We have to add to the list of competitors for the Anthony Prize Pitcher and Goblets—

Tucker & Perkins, Augusta, Ga.,
Geo. S. Cooke, Charleston, S. C.,
E. Long, St. Louis, Mo.

— Messrs. Truebner & Co. will hereafter be our regular London publishers, and will transact all business on our account, in the United Kingdoms.

The Art-Union.—We had hoped that this sordid concern was at an end, and would no longer burden the arts, and foist upon the public the tools of the servile clique who had won its favor; but we have been disappointed. A sale, after its own very successful sale, has been got up under its auspices, ostensibly for artists, but really for the toadies of the managers, and the few whom they bow to for the sake of their influence. We are told that several artists offered their works to be put up in this sale, and were impertinently told that they had not sufficient merit, and, therefore could not be admitted. Now, in the first place, they had works in the sale which were far inferior to those they rejected; and, in the second place, they had so far conveyed the idea that it was to be a sale for the benefit of artists generally, that one artist of merit expended $150 for frames as a preparation for the sale, and yet was not allowed to put in his pictures.

The board of managers still hold office, in spite of the fact that one-third of them should, by the constitution, have gone out more than a year ago, and as the other third should have gone out last Christmas; and in spite of the signal proof of the loss of confidence evinced by the loss of seven thousand subscribers in two years, which should have prompted them to resign at the earliest moment. But all this would not induce them to call the annual meeting, provided for by the constitution, and to give the subscribers an opportunity to elect better men.

It would seem that these misguided men intend to appropriate to their own use the property of the owners, which should amount to near $40,000 in real estate, good money. But they will yet have to answer before the courts of justice for their usurpation, and for the gross misapplication of the funds.

— We can now order from Europe, so as to receive it in a very few days, blue Bohemian glass of the right tint for sky lights, and furnish it to daguerreans at 40 cents per square foot. This valuable photogenic assistant should be used by all.

Premium for the best Daguerreotype.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter. I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the best four daguerreotypes that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense.

E. Anthony.

THE

PHOTOGRAPHIC ART-JOURNAL.

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A GENERAL REVIEW OF THE DAGUERREOTYPE.*

BY M. A. GAUDIN.

Translated from the French of La Lumiere by W. Grigg, A. B.

SECTION V.

ON THE CAMERA-OBSCURA; ON THE GETTING OF THE PROPER FOCUS, AND OF THE TIME OF EXPOSITION.

THE plate having been polished and having received the sensitive coating, as has been described in the preceding chapter, it is ready for undergoing the action of the light. This operation is effected by placing the plate in the focus of a camera-obscura.

When first invented the camera-obscura received its light through a very small aperture which was the point of crossing of all the rays reflected from the objects placed before it. This simple instrument was sufficient for giving a contracted image of the objects, with their colors and relative angular dimensions. The image was produced at any distance behind the aperture; but its intensity and clearness became necessarily feebler in proportion as the power which received the image, was drawn back from the point of emanation. By reason of not being able to enlarge the aperture without giving place immediately to a confused image, the necessity was very soon acknowledged of arming the aperture with a glass lens which increased the light in an extraordinary proportion, giving clearness to the images, at the same time a clearness, which (varying with the object-glasses) was recognised, at the maximum, at a distance equal to the focal distance.

With lenses formed of a single piece of glass, the clearness of the picture was not perfect, the very luminous portions appeared bordered with light; the achromatic lenses alone gave complete satisfactory results.

A lens of this kind possesses the singular property of making every ray emanating from a point before the object-glass, to meet together at the same point behind, rays which penetrate into the very substance of the glass through every point of its surface.

The meeting of an infinite number of these points of different intensity, varying in colors or in distance from each other, produce an inverted image, which possesses the maximum of clearness, when the objects are sensibly placed at the same distance from the object-glass and the screen is of a concavity which has for its centre the place of the object-glass.

In practice, the screen is a plane surface; the effect of which is that the image is always composed of objects unequally distant from the object-glass; and the operator is contented with substituting the surface of the plate clothed with the sensitive coating in the place of the ground glass which has served to obtain the focus.

The object-glass is never totally exposed; in order to avoid the very oblique lateral rays which do not aid in forming the image, and which lessens its sharpness, the glass is placed at the end of a cylinder, blackened on the inside, or, still better,

* Continued from page 5, Vol. 5, No. 1.

OUR DAGUERREAN GALLERIES.—No. I. THE MEADE GALLERY, NEW YORK.

this cylinder is closed with a disk in which an opening is made less than the surface of the object-glass; this is its diaphragm.

For portraits, it has become necessary to employ object-glasses with a longer focus, in order to obtain images of larger dimensions, and especially in order to be able to place the instrument at a greater distance off, and, consequently, to avoid the malformation of the portions of the body more forward. Though equal at the surface of the object-glass, the formation of the images is nevertheless diminished in proportion to the square of the focal distance. This is why it has been necessary to lessen, as much as possible, at the same time, the focal distance; this last requisite has been supplied by the employment of two achromatic object-glasses together, one fixed behind the other in the same tubing. This is the compound glass which is in general use for the production of portraits.

This kind of glass requires the adjunction of the blackened tube, but the employment of a diaphragm destroys the image around the borders.

The construction of the compound glasses, it is easily understood, presents difficulties much greater than the simple achromatic lens; it is extremely difficult to avoid the malformation of the images. The problem of the surfaces in proportion to the refractive power of the substances, is greatly complicated; since the appearance, also, of compound object-glasses, a competition has arisen among the manufacturing opticians of the whole world for the production of the best refractors. Germany has for a long time occupied the first rank for this fabrication; but, prejudice aside, France, England and America, are now on an equality with them.

From this, it would seem that with a good compound object-glass nothing further was required than to get the proper focus with the ground glass, in order to obtain an image enjoying the maximum of clearness; this, however, is rarely the course of matters.

In the greater number of the object-glasses, the apparent focus always differs more or less from the focus of the chemical rays.

M. Claudet was the first who discovered this singular anomally, somewhere about the year 1843; the following is his account of it:—"Having prepared a number of screens marked with very clear black lines crossing each other in every direction, I placed the screens one behind the other, at different heights, before my camera, so as to represent them first upon the ground glass and afterwards upon the daguerrean plate: I placed the focus upon the middle screen, and what was my surprise when I perceived that the daguerrean image was confused by the screen which had given a clear image upon the ground glass, and which was perfectly clear of another screen which had not appeared to be in focus on the ground glass.

I repeated the experiment many times, with different objects, and always obtained the same result. The experiment was conclusive; there was no doubt any longer in my mind that there was a focus of *photogenic action* which does not coincide with the *apparent* focus."

From the experiments of M. Claudet it has been proved that the photogenic focus was sometimes longer, sometimes shorter, than the apparent focus and situated on the same side with the same object glass.

Mr. Lerebours, at the same time he communicated to the Academy, in 1846, the result of his experiments on the existence of antagonistic rays, published a treatise on photography, in which he showed from what cause the chemical focus differs from the apparent focus, and also indicated the means of correcting object-glasses which have this very unpleasant defect, as it keeps the photographer in a continual pre-occupation; since this time, too, almost all manufacturing opticians have applied themselves to destroy it or lessen its effect.

These difficulties so numerous and singular, inherent in the construction of white object-glasses leads me again to the idea that I have very often promulgated, viz. the construction of object-glasses of a simple flat convex lens of glass, having a blueish violet tint representing the chemical rays of the spectrum. By this means, a sensibly defined chromatic image should be obtained, giving constantly clear images.

It is highly probable that these object-glasses could not produce sufficient sensibility for a portrait; but I speak of it merely as an inexpensive concern which might be highly prized in the apparatus of

an amateur in taking views or family pictures. Compound object-glasses are much more difficult than simple achromatic lenses for getting the focus. Compound object-glasses require greater attention, having the general effect of producing, with like sharpness, only objects equally distant from them, which implies the necessity of getting the focus with precision immediately before inserting the plate frame.

Correctness of the focus is observed especially in the intensity of the blacks. While occupied in obtaining it, the instrument is also raised so as to conveniently enframe the object to be reproduced.

To correct the difference of the chemical focus in the apparent focus, it is necessary to place the point on the same portions of the body before or behind the face. When the chemical focus is beyond, M. Claudet causes the person to hold before his face a white screen with black lines traced upon it on which he gets the focus on the ground glass. The same result would be obtained in bringing the object-glass a little nearer the plate if the proper focus had been obtained upon the face.

With simple achromatic object-glasses, this precaution becomes useless; objects unequally distant, in a certain manner, are equally sharp; there exists no difference in them between the chemical and apparent focus.

It remains to know the time which should be observed for the exposure in the camera. Its duration depends upon four simultaneous coincidents no one of which is susceptible of any absolute exact movement, although all connected and depending on one another; the intensity of the light, its photographic power, the sensibility of the plate and the strength of the reflection emitted from the object to be reproduced; it would then be superfluous and useless to have recourse to measurement as it would still remain an unknown matter. The best way will be always to act upon an estimate suggested by experience. The most variable rule given is, without contradiction, the sensibility of the plate. Two proofs taken upon the same object, one after the other, observing to take them in similar weather by a serene sky, it is not rare to find of very different intensity. In this is the danger, for in the course of a day, each of the other three considerations follow a perceptible and gradual diminution, which may be allowed for.

The difference in the sensibility of the plates arises principally from the nature of the silver exposed; new plates are equally sensible, but plates somewhat worn present a surface too feebly united to the copper, which immediately lessens their sensibility in a very remarkable manner.

As the day declines, it is necessary to greatly increase the length of exposition, to double or triple it, for instance; for, at this time it is excessively rare that failures are not met with, on account of the weather.

SECTION VI.

OF THE MERCURY-BOX, OF THE HYPOSULPHITE WASH, AND ON THE FIXING WITH THE CHLORIDE OF GOLD.

Until the last second, which has been noted during the exposure of the plate in the camera, every one of the operations before mentioned have concurred in the production of an image which it is always hoped will be obtained complete, but which notwithstanding is more frequently imperfect, on account of a few seconds more or less of exposure.

It sometimes occurs that when this moment arrives, there is a certainty that the impression will be bad, whether because an error is perceived in the estimation of the time, or because a fault, at first unperceived is discovered in the picture, or lastly, on account of the model having moved, or the apparatus having become displaced, or shaken under the sitting; in this case it may be easily remedied, a few seconds of a fresh exposure of the plate over the iodine and accelerating substances will radically destroy the shadowy and very superficial impression which contained the picture in its germ. I have often assured myself of this truth, and every one should profit by it.

Not the least trace of any impression is discovered upon the plate on removal from the camera; at the first sight the crystalline net work appearance has undergone in some parts an energetic change which has completely modified its texture, but not so far as to change its apparent color. The chemical composition too, has very

little altered, for the most feeble hyposulphite wash completely dissolves the coating.

A very long exposure in the camera would be necessary to obtain an apparent image, more success is obtained by completing the impressions by submitting them to the proper agents for bringing them out, among which mercury stands at the head. Evaporated by a gentle heat, its particles adhere to the argentiferous composition upon that portion of the plate where the action of the light has created a predisposition for this combination.

Experiments have been made to determine the best rules to be observed in the construction of the mercury-boxes; the chief thing studied is, the influence of the surface of evaporation, of its pureness and temperature.

M. Claudet uses iron boxes with vertical grooves into which he inserts his plates, as in a plate box. He maintains his mercury at a temperature of 100 degrees and takes no account of time before five or ten minutes.

It is well not to look at the impressions during their exposure to the mercury-box, at least without viewing them latterly with a yellow, orange, or red glass. The simple flame of a taper presented in front prevents the obtaining of fine blacks. The most usual method consists in keeping the temperature of the box at 70 degrees centigrade by means of a small spirit lamp and in leaving the impression ten minutes at the farthest in the box, without examining it. The moderating lamps of Messrs. Mayer Brothers are very handy for this purpose.

With a less temperature, the impressions would be finer, but they would be wanting in vigor and color. The coloring is owing to a commencement of some prismatic effect well understood by operators who have obtained impressions covered with richly shaded clouds from the smoke after a sudden flash of fire.

It is useless to take the trouble of often filtering the mercury; this only ends in obtaining the same result at a less temperature, with a greater risk of totally destroying the prismatic effect.

When the impression is taken from the mercury-box it may be examined at leisure, but it is imprudent to leave it exposed to the light before the hyposulphite wash; the blacks would lose their brilliancy.

For the hyposulphite wash, their are many essential rules to be observed, which are: to employ a concentrated solution, freshly filtered, and to pour it upon the plate in one continued stream without any intermissions in the operations. Weak solutions and intermissions in the process infallibly produce an appearance of blue marbling in the fixing. The chief object had in view in the filtering is to eliminate the microscopic crystals of sulphur which are often deposited in the solutions of hyposulphite when left at rest. This is the most ordinary cause of the small black spots which appear on the impression in drying.

In order to obtain a fit solution of hyposulphite of soda, it is useless to have recourse to scales, it is sufficient that the solution be only more strong than otherwise, and, for this purpose, not to spare the salt. Five parts of water to one of the salt will form a very concentrated solution.

The facet bottles, surmounted by a funnel and furnished with a stopple of cotton answers the purpose very well. After each working the hyposulphite is poured back into the funnel, and the same solution is used until it is discovered to be too weak, this is remedied by placing in the funnel a few crystals of hyposulphite.

Instead of a facet vessel, a small porcelain may be used with advantage for the small plates, and a china or gutta-percha dish for the large ones. After having poured the solution of hyposulphite into these, the plate is immersed therein with a single dip. The previous employment of alcohol or water to moisten the plate is perfectly useless and even hurtful.

As soon as the sensitive coating has disappeared the plate should be rinsed with plenty of water on both sides holding it delicately by the corners and laying more stress in this wash upon the side of the picture, and, as soon as the water has drained off a little, it is dried with the lamp commencing at the upper corner, which is not supported by the fingers.

For the small plates, it is better to hold them at one of the angles with the pincers, and to dry them commencing at the upper angle opposite the one held by the pincers.

For this wash it will be well to pour upon the plates, in the last place, some distilled water; but then it will be necessary to dry very rapidly, this water having the defect of collecting itself in drops upon the plate, and produce stains if ever so little is impure.

The ordinary filtered water gives a finer tone to impressions than distilled water on account of a varnish infinitely light which the salts contained in the former leave upon the plate; this tone, however, is of no account, since the fixing with the chloride of gold will destroy the cause.

The plates are only dried if they are wanted to be immediately fixed; otherwise, it is better, as soon as the plate has been rinsed and drained off slightly, to place it upon the fixing-stand and to pour upon it as soon as possible the salt of gold.

The preparation of the salt of gold which is used in fixing the impressions was discovered by Mr. Fizeau; it is composed of 23 grains of neutral chloride of gold combined with 92 grains of hyposulphite of soda; the chloride of gold is repeatedly dissolved in half a pint of water; the two solutions are then mixed together, taking care to pour the chloride of gold gradually into the hyposulphite of soda, in reversing the order decomposition might ensue.

The salt of Messrs. Fordo and Gêlis contains nearly the same proportions of chloride of gold and hyposulphite of soda, it is precipitated in the crystalline state, from its solution by alcohol. It is used in the proportion of 23 grains to 33 1-3 oz. of water; it is certain that its employment does not give such fine tones as the solution prepared from the receipt of Mr. Fizeau. I believe this is owing in a great degree to the salt being too concentrated at 33 1-3 ounces of water to 23 grains of salt, I prefer using it with a pint, and leaving a little water upon the plate after having rinsed it.

The fixing stand should be supported by three elevating screws, which are rapidly adjusted in such a way as to leave no portion of the plate uncovered, and to obtain a perfectly level surface of water. If the plate had been dried, it may be placed on a level by the eye before pouring upon it the salt of gold; but it would be necessary to leave the solution a few seconds in contact with the plate, before applying the heat, in order to give the liquid the necessary time to dissolve the salts deposited by the water of the wash, if distilled water has not been employed.

In the case of a plate which has not been dried, the action of the chloride of gold appears more uniform. In those which have been dried it shows itself in a marble appearance; this is the reason it is necessary for the latter to manage the fire with circumspection. This marble appearance, however, gradually disappears. The essential rule to be observed is, to heat the whole plate equally, without ever allowing the flame to dwell upon any single point; it is irregular and excessive heating in one place, which produces a blueish veiling upon the plates, followed almost immediately by a bolder film, which finally becomes detached and floats on the liquid.

There are operators who carry on the heating until the liquid boils; this is dangerous and perfectly useless. A lamp with several burners should be employed as much as possible, which forcibly hastens the process, and keeps the hand incessantly moving; with a lamp with a single burner, which heats slowly, one is apt to let the flame dwell upon a single point, which produces much oftener the exfoliations.

Fine whites, however, are only obtained by a rapid heating which approaches very near ebullition. A too strong proportion of Fardo's and Gêlis's salt gives a green shading to the blacks. With a little practice, the moment is easily seized when the blacks are well settled and the white are of a fine milk shade; at this instant the lamp is removed and a very small quantity of cold water is poured upon the plate to cool it, if it is feared this point will be overstepped, if the plate is left heated to itself, the best way is to be on the look out for this effect, and to remove the lamp as soon as it has commenced to manifest itself, and to let the impression arrive at this point by the heat already acquired.

As soon as the plate has become somewhat cold, the washing is proceeded with, then the rinsing and drying of the plates, as has been said in another place, on removal from the hyposulphite.

TO BE CONTINUED.

From the London Art-Journal.

DAGUERREOTYPE PICTURES WITH THE NATURAL COLORS OF THE OBJECTS REPRESENTED.

AT the sitting of the Paris Academy of Sciences, November 8th, M. Niepce St. Victor exhibited some daguerreotype pictures, in which the natural colors of the objects represented were given of a more or less permanent character. M. Niepce is fully assured that nothing more is required than a suitable preparation of the silvered plate in order to obtain every color. "I commenced," says M. Niepce, "by taking representations of colored engravings, then of artificial and natural flowers, and afterwards of the figure of a doll, dressed in clothes of various colors, of which gold and silver lace always formed a part. I succeeded in obtaining all the colors of the objects, and what is both curious and extraordinary, the gold and silver were always depicted of their natural metallic lustre; rock crystal, alabaster, and porcelain, were also represented of their natural appearance. A singular peculiarity was observed in taking representations of precious stones and glass; a deep green placed before the object-glass gave a yellow instead of a green picture, whilst a light green glass placed alongside a dark green was correctly represented. The great difficulty is in obtaining several colors at one time; this, however, is possible, and I have often obtained this result. I have noticed that the light colors are reproduced much better as well as more quickly than deep colors; that is to say, that the nearer the colors approach to white, the more readily are they reproduced, whilst the nearer the colors approach to black, the more difficult are they of reproduction. Thus white light, instead of hindering the reproduction of the colors, tends, on the contrary, to facilitate it. The production of the colors of the objects is effected as well by means of a camera lined with white paper, as by the ordinary darkened camera. The same results are also obtained when a dark camera lined with mirrors is employed. The color most difficult to obtain with all the others is the deep green foliage, whilst the light green is very well represented, especially if it be taken from some shiny object like that of glazed green paper. To obtain the deep green colors, the plate must be warmed previous to exposure to the light, whilst to obtain most of the other colors, and especially the fine white, it is necessary that the sensitive coating on the plate should be brought by means of *heat* to a cherry red color. The following are some practical points which M. Niepce considers likely to lead to a complete solution of the problem of heliochromy. If on the removal of the plate from the bath it is simply dried, without raising the temperature to the point at which it changes color, and be now exposed to the light covered with a colored engraving, a representation of the engraving with all its colors will be obtained after a very short exposure; most frequently, however, the colors are not visible; only some of them appear when the exposure to the light has been sufficiently prolonged, such as the greens, the reds, and sometimes the blues; the other colors, and frequently all the colors, though certainly there, yet remain latent; a proof of this is seen in the following fact. If we take a plug of cotton impregnated with ammonia, which has already been used to clean a plate, and gently rub the plate, a representation of the object in all its colors will gradually make its appearance. In this case the superficial coating of chloride of silver is removed by the rubbing, and the under and deeper layer in immediate contact with the plate, and on which the picture is delineated, is brought out. It will thus be seen that all we have to do is to find a substance which brings out the picture, and which perhaps at the same time fixes the colors; the problem would then be entirely resolved." M. Arago, after communicating the above to the Academy, mentioned a peculiarity which M. Niepce had omitted, though one of the most important results. This peculiarity is, that the impression of the light on the prepared plate is not the same at all hours

of the day; it is greater in the morning and in the afternoon than in the middle of the day, and it is less at 2 P. M. than at 10 A. M.; M. Daguerre noticed this latter fact. The alteration which the colors undergo is also not the same on the exposure of the plate to the light at one hour as another; the colors are less fugitive when the plate is exposed in the afternoon than in the morning.

RUDIMENTARY TREATISE ON THE ART OF PAINTING ON GLASS; OR GLASS-STAINING.*

BY DR. M. A. GESSERT.

CHAPTER II.

OF THE PROCESS OF LAYING THE COLORS ON THE GLASS.

THE manipulation of the process of laying the colors on the glass varies, in some measure, according to the different kinds of glass-painting, which therefore call for the first explanation.

Either the colors may be laid upon a single sheet of glass, upon which the whole figure with all its principal colors and intermediate tints are burned in (Peinture en apprêt); or,

The figure may be composed of various pieces of *pot metal* (glass already colored in its manufacture), and only the outlines and shadows painted on, the glass pieces giving the colors for the peculiar places where they are inserted (Mosaic glass painting); or,

Both these methods may be combined in one and the same picture, by composing it partly of pieces of colored *pot metal* and partly of white and painted glass, fixed together.

PEINTURE EN APPRET.

99. For painting on a single sheet of glass, the following rules must be observed.

A pure white glass must be chosen for the purpose, free from air specks or bubbles, and especially difficult of fusion, as the whole labor would be lost if it were attempted to burn in the colors upon a ground which fused as easily as themselves. It is practicable, as the examples of the ancients show, to paint on what would appear the commonest glass with a good result, provided that it does not contain too much lead, and thereby become too easily fusible.

Before the operation of painting, the glass plate must be rubbed to a sufficient extent with pure lime, slaked by exposure to the air, in order to clean it perfectly.

100. The ground or foundation must then be laid over the whole surface of the plate, which may be done in two different ways. Some artists simply dip a piece of clean linen cloth or a flat camel-hair pencil in oil of turpentine, and brush the pane of glass with it equally over its surface; while others give to the whole a thin clear ground of black glass-painting color in such manner as not to destroy its transparency, but at most to give it the appearance of a dead ground glass. Both methods answer the purpose of covering the glass with a viscous surface, which takes the design and the colors better than a polished ground; the latter prepares the glass at the same time for the painting effects which are to be obtained upon it.

In both cases the ground which has been laid on must be most carefully levelled over and brought to as thin a coat as possible with a large hair pencil, and must be dried quickly, taking great care to preserve it from dust, &c.

101. Painting on one sheet requires only

* Concluded from page 32, Vol. 5, No. 1.

one pattern drawing or cartoon, which, however, may be used in two ways.

Either the glass sheet, ground and dried as above directed, may be laid upon the drawing, and the outlines, as seen through the glass, traced lightly with a fine pencil, and with black or other glass color corresponding to the ground;

Or the drawing may be placed reversed on the sheet, and all the outlines marked over with a steel or ivory style. If this latter method is used upon a ground of simple turpentine, the back of the drawing must previously be rubbed over with black-lead, so that the traced lines may appear dark on the light ground.

In both cases, the drawing whether it is placed upon or under the glass, must, for the sake of convenience, be fastened to it with pieces of wax at the four corners.

102. For properly carrying out the process of laying on the colors, a desk or easel is necessary, which should be capable of being placed in an inclined position by means of props, and should be formed by fixing a glass plate in a wooden frame, so that the light may pass through the painting. Sometimes during the progress of the work, the glass which is being painted may be removed from the easel and laid upon a sheet of white paper, in order better to show the effect of certain colors.

103. The vehicle with which the pigments are laid on is generally oil. Some artists use exclusively water, but this alone is an insufficient medium for binding the metallic bodies to the glass particularly if, as in the case of fused colors, they are somewhat coarse in their nature, and require to be laid on in thick layers. They then easily loosen from the plate before the firing, and render the process of laying on much more difficult. It is an important advantage, that with oil the edges are more sharply defined, and the parts already painted may be again touched over when dry without danger of loosening the ground.

It must be understood that when it is wished to make use of water, the plate must either not be ground at all, or only with a glass-painting color worked up with water.

The most suitable kind of oil for the purpose is rectified oil of turpentine, somewhat thickened by standing, and to which a little oil of lavender is added. This preparation gives the mass the necessary degree of viscocity, and also prevents the color on the palette from drying up and thickening too quickly.

The palette should be of thick sheet glass, ground rough by rubbing with a glass muller and fine sand.

104. Preparatory to mixing with oil for laying on, those colors which require a flux must (unless a different process is specially indicated) be ground fine in water with the flux, and again dried. But the fused colors, *i. e.* those in which the oxide has already been vitrified with the flux into the state of a transparent glass, should, for the purpose of laying on, only be coarsely granulated; for the finer these are ground, the more likely is their transparency and perfection to be impaired when burnt in.

Those pigments which are laid on in their simple combination with an earthy vehicle, and without flux, as, for example, the yellow and red colors prepared from silver, form an absolute exception to the use of oil, and must, for laying on, be stirred up with water to the consistence of a thick cream.

The first of these three kinds of pigments should, as a general rule, be laid on in a thin, the two latter, in a pasty state. The depth of tone of the color depends, with all three, upon the degree of thickness in which the pigments are laid upon the glass.

The laying on of the fused colors is accompanied with more difficulty than that of the other kinds. The latter are simply laid on with the pencil, in the same manner as with other kinds of painting, and the only care necessary is that the coat may be perfectly equal and regular, wherefore for large surfaces a wide smooth pencil or driver is usually employed. The colors prepared from silver must be treated differently, and laid on the glass at least to the thickness of the back of a knife.

But the fused colors must be brought upon the surfaces to be covered in the state of a thick flowing mass, moist enough to run, but consistent enough to lie upon the glass. For this purpose small portions must be laid on and spread out with a pencil or small spoon, and made to flow to the circumscribing outlines, by inclining the sheet in the proper directions. If any part of the surface thus covered is required to

take a darker tone of color, the plate must be kept for some time at an inclination in the corresponding direction, so that the color may thus accumulate thicker on that part. By this process many gradations of tone may be obtained from one and the same pigment.

105. The remaining rules for the laying on of the pigments are those which principally result from the different methods of painting on one sheet, of which there are principally three.

Either the whole picture may be brought out in its outlines and shadows, on one side of the sheet, with black, brown, or gray color, and illuminated with the proper colors in the proper places on the other side;

Or, simply the manner of ordinary oil-painting may be adopted with the glass colors, and the picture treated as by an artist in oil;

Or, as is now most customary, both methods may be united, the artist making use of each in certain places, according to the requirements of the object he has in view.

For these three methods the following common rules will serve.

106. The shadows and dark colored outlines, and that which is called in oil "under-painting," should be drawn on the front side of the glass, or that which is turned towards the spectator.

The illuminating colors, especially the principal ones, should be laid on the back or reversed side.

Intermediate tints, and gradations by shading, should generally be placed on the front side, but sometimes, when they alternate, necessarily must lie on both; as they cannot be put in contact on one and the same side without danger of running into each other and making a false color.

The silver yellow and red colors, before alluded to, must always be placed on the back or reverse side.

In some particular cases colors may be laid on corresponding places on both sides of the glass, in order to produce certain effects by the light falling through the two together. Thus, purple on one side and gold yellow on the other give a magnificent fiery scarlet; blue and yellow, according to their respective intensities, give different shades of green; the latter, again, with blue on the opposite side, serve for excellent distance colors. And finally, by the mixture of several colors, the most diversified intermediate tints may be obtained, so that glass-painting in its present state may be brought to assimilate with oil painting in its power of producing varied effects.

107. In order to put a new tone of color on a surface already marked with outlines, &c., it must first be dried by a gentle and equal heat (to avoid the warping of the glass), and again painted immediately after it has cooled. Or the black lines first laid on may be at once burnt in, and, where possible, with these any yellow shades also, which may be required, after which the painting, then fixed, may be further worked upon without danger of damage. The residuum of the unfluxed yellow color may be removed after burning, and again used. This color must never be put over any other, nor over dark shadows, unless these are previously burnt in, but always requires a carefully cleaned surface of glass to lie upon; otherwise it would combine with the flux of the under color, whereby the earthy residuum would be fixed, and the transparency and beauty of the whole destroyed.

108. All pigments must be laid on somewhat darker than in other kinds of painting as they lose in depth by burning.

When a pigment has overrun its outline, the superfluous quantity must be removed, when dry, with a knife.

By taking away the ground with a style of fine grained wood, pointed in front and smooth at the back (a tool used in etching), the most effective lights may be obtained.

Should the colors not appear quite dull and dry, but shining and greasy, after the drying of the picture, this is caused by the misuse of the oil, which is always dangerous to the beauty of pigments in firing.

It is neither necessary nor advisable to allow more than one day for the drying of colors; the burning in should be proceeded with at the expiration of the time named.

Lastly, during the work, the greatest cleanliness must be observed throughout, the pencil and palette must be kept perfectly clean, and the painting preserved from dust, &c., for which reason it is not advisable to paint in a laboratory or melting-room, where the presence of vapor,

dust, and impurities of many kinds cannot be avoided.

MOSAIC GLASS-PAINTING.

109. The before-mentioned rules for laying on the colors will apply also to the method of forming designs with colored pieces of pot metal, or partly with these and partly with pointed white glass. It remains to say something more in reference to the employment of the cartoons, and the cutting and arrangement of the glasses in this branch of the art, which, however, is but little practised, since the leaden bars in a picture calculated for a near view are detrimental to the effect.

Mosaic glass-painting requires two cartoons. One of these, a finished and colored one, is used by the artist as a pattern, and serves to determine the arrangement of the pieces of glass according to their several colors, and the manner of introducing the leaden ribs to fasten them together, according to the outlines of the figures. Each piece of glass proposed to make part of the picture must be distinguished by a separate number.

The other cartoon, which consists only of the black outlines of the lead jointing, and whose several parts are numbered to correspond with the first, is to be cut up in pieces according to the outlines, and the size of each piece diminished all round by one half the thickness of the lead bar of the jointing, so that the pieces of glass may be exactly cut to the proper dimensions.

The cutting of the glass may either be done by the diamond, or by tracing the line of division with a red-hot iron, after having made a small incision at its commencement, or by cutting with scissors under water, which, however, is not a safe process.

110. With overlaid glass, *i. e.* pot metal of two several sheets or layers laid upon each other from the frit, as for example, red and white, blue and white, &c., it is possible to produce many effects of shading by removing more or less of the colored glass sheet, according to the outline, by grinding with emery. Or the colored sheet may be ground through to the white glass, and thus colored ornaments may be given on white ground, especially for the representation of damasked materials. Also, the white parts thus exposed may have a color given them at pleasure on the opposite side, in order to produce many kinds of effects, or to avoid the necessity of using many pieces when the introduction of another color in that of the pot metal is indispensable for the effect required.

The colored pot metal may be painted with intermediate tints of its own principal color, or even, in order to produce certain effects, may be covered on one of its surfaces with another color. Thus, a fiery red may be obtained by covering a red overlaid glass on its white surface with the yellow silver color, and burning it in, or a shade of green by a similar use of the same pigment on a blue overlaid glass. In these operations the widest latitude is left to the talent and practice of the artist.

CHAPTER III.

OF THE PROCESS OF FIRING, OR BURNING IN OF THE COLORS; AND THE CONSTRUCTION OF THE KILN.

111. The object kept constantly in view in the foregoing explanation of the process of glass painting, has been to bring the practice of this art into the reach of as many hands as possible; and therefore it has been especially endeavored to point out, not only the most suitable, but also the shortest and easiest methods of operation, in order to show that the processes are much less costly and complicated than generally supposed, and to put the reader as much as possible in the position of being able to construct for himself the requisite apparatus.

This principle has been particularly adhered to in the following description of the process of firing, and the construction of the necessary kiln; for it will be shown that the operation may be performed in any common kitchen, and that an ordinary fireplace may, with the aid of some fire-bricks, tiles, and iron rods, be made to suffice for the construction of a furnace which shall answer perfectly the purpose intended.

The remaining necessary implements consist of a muffle, an iron charcoal-shovel, a pair of fire-tongs, tongs to extract the trial pieces, and a pot in which to dry the charcoal.

112. The muffle, if it cannot be obtained of cast iron or plumbago, may be made of burnt earthenware, and its size

may be regulated according to circumstances. If of the latter material, it must, in order to stand fire well, be constructed of a mixture of two parts fire-clay and one part fine sand, and should be of an oblong four cornered figure; for example, twelve inches long, ten inches wide, and five inches high. It must, however, be large enough to receive the largest of the sheets to be burnt, without their edges coming in contact with the sides of the muffle.

In the middle of one of the short sides there should be an opening five inches long and a quarter of an inch wide, for extracting the test pieces. The muffle is to be closed with a cover of the same material, having two round holes of about an inch and a half diameter, running out into two tubes about two inches and a half long.

113. To receive the muffle, a four-cornered kiln is to be built, whose interior dimensions should be four inches longer, and as much wider, than the muffle which is to be placed therein.

For this purpose fire-bricks are simply to be laid on each other, but in such a manner that the wall turned towards the operator may contain an opening three inches high from the bottom and twelve inches wide, for the management of the firing. When it has reached the height of four inches all round, a perfectly horizontal bearing frame is to be formed by laying a pair of iron rods upon the long sides. Upon these the muffle is to be placed, in such manner that the test opening is turned towards the operator.

After the painted glass sheets are laid in the muffle, the walls of the kiln are to be built to such a height as to reach one inch above the tubes of the cover; in doing which, however, another opening three inches and a half wide, and two inches high, corresponding to the test opening of the muffle, must again be left in the front wall, or that turned towards the operator.

Both openings of this wall of the muffle must be capable of being closed; the lower one, that of the ash-pit, with a stopper of iron plate filled with clay; the upper one, or the one corresponding to the test opening, with a stone. Each of these stoppers must fit exactly, and be of the same thickness as the wall.

114. The painted glass intended for firing must be laid in the muffle in the following manner. Sprinkle first of all well-burnt lime with water, and dry it again, when slaked over the fire. Sift this powder through a coarse hair sieve, so as to cover the bottom of the muffle to the thickness of one inch. Carefully level over this layer (since otherwise the glass might become cracked in burning), and lay the sheets upon it near each other, but not so close as to come in contact either with each other or with the walls of the muffle. Then sift another thin layer of lime over them; lay a second set of the pieces of painted glass on the lime, and continue in this manner up to the middle of the muffle, where the opening is made for drawing out the tests. These consist of strips of glass about six or seven inches long and one inch wide, streaked with patterns of the colors which are to be burnt in. They are to be laid in the muffle like the sheets of painted glass, upon a layer of lime, and covered with it in the same manner; and they must be so placed that one end may reach to the middle of the muffle, while the other end projects half an inch out of the test opening before described, in order that they may be laid hold of with the tongs, and drawn out for examination.

After these are placed, the sheets of the painted glass and the layers of lime are to be alternated, as before, until all the glass is placed in, or until the muffle is full. If only one sheet is to be fired, the muffle must be filled with common instead of painted glass, as above directed, and the single sheet to be operated upon must form one of the middle layers. After this the muffle must be closed in.

115. In the two tubes of the cover are to be placed pieces of the same kind of glass as is used to paint upon, five or six inches long and one inch wide; these may be called *watchers;* they are to be placed vertically, and in such a manner that their lower ends may stand on the sheet of lime next under the cover, and their upper ends may project about two inches out of the tubes.

After this, and after the test opening of the front wall is closed with its stopper, the firing may be commenced by strewing glowing charcoal over the hearth of the kiln and to some little distance up the sides, then filling all the interstices between the muffle and the walls of the kiln with char-

coal up to the height of the muffle, and afterwards covering the latter in such manner that the *watchers* may project in sight. The whole of the fuel will then soon catch fire.

Proceed to lay across the walls of the kiln some iron bars, and upon these some fire-tiles, so as to cover the kiln as far as an opening in the centre, not quite one foot diameter.

It is here to be remarked, that when the muffle is new, or has not been employed for some time before, it will be safer to heat it to redness previously to using, which is to be done in the above-described manner, exactly as if it contained glass, increasing the fire to a white heat, and allowing the muffle to cool of itself after the fire is removed. When it is quite cold, it may be used with safety.

It is particularly necessary to take care that the heat of the kiln during the process is raised equally on all sides of the muffle; and the fire must also be retained at a uniform glow by the continued addition of fresh fuel.

116. When the muffle reaches a dull red heat, when the *watchers* bend, and when the colors appear clear and perfectly fused upon the test strips (which must have been drawn out and laid upon the top of the kiln to cool slowly), all of which customarily takes place about the sixth or seventh hour of the burning, the fire is to be removed by the hearth opening of the kiln, as quickly as possible, but yet with care not to shake or disturb the muffle; all the openings of the kiln must be stopped and luted, and the whole left to cool gradually, which will require between twenty-four and thirty-six hours.

The spare charcoal may be thrown into a pot of water and used again.

After the cooling, the glass sheets are to be taken out of the muffle, cleaned with a brush and lukewarm water, and carefully dried.

117. Should any parts require further painting, and consequently another firing, the pigments must be mixed the second time with a greater quantity of flux, in order to render them more fusible than those previously burnt in.

Also, the heat of the second burning should be less than that used the first time.

CHAPTER IV.

OF THE OPERATION OF FIXING TOGETHER OR LEADING MOSAIC GLASS.

118. This process is most customarily and properly left to the glazier, who also ought to cut out the pieces of glass. In order, however, to leave nothing wanting for those amateurs who may wish to make the whole of a specimen of the art their own, the following rules may be useful.

Common window lead of the glaziers, but of very small dimensions, is to be laid round one of the middle pieces forming the glass-painting, so as to hold it in the groove of one of its sides, while, in that of its other side, another piece is to be inserted. Continue this, constantly under the guidance of the cartoon, upon which the work may be laid, and working always from the centre of the picture outwards, soldering the several pieces of lead together during the process, by their ends of contact, which may be interlaid in the grooves at the corners where they join.

For this the soft or tin solder (consisting of tin having so much lead melted with it that when bent it does but slightly crackle —commonly one part lead and three or four parts tin) is required, and a common glazier's soldering iron with a copper point should be used for applying it. After this is heated in a charcoal fire, it is to be rubbed in powdered sal-ammoniac and resin, and then on a piece of the solder, a portion of which will adhere to the copper and may be carried to the leaden bars. When the soldering is executed, it will be well to touch over the junctures with dark oil color, or still better with dilute sulphuric acid, in order to remove the bright metallic lustre, which might otherwise damage the effect of the painting.

APPENDIX.

ON THE GENERAL NATURE OF ENAMEL-PAINTING.

Enamel-painting differs from all other kinds in the vehicle employed for the colors, that is, to hold the parts together, and bind them to the ground they are laid upon. This is glass or some vitreous body, which, being mixed with the colors, and fused, or melted, by means of heat, be-

comes fluid; and having incorporated with the colors in that state, forms, together with them, a hard mass when cold. It answers, therefore, the same end in this, as oil, gum-water, size, or varnish, in the other kinds of painting.

The glass or vitreous body applied to this purpose of mixing with the colors, in order to bind them to the grounds, is called a flux, and makes one principal class of the substances used in enamel-painting. When this flux is easily fusible, that is to say, melts with a less degree of heat, it is, in the style of those who work in enamel, said to be *soft;* and when it is reluctant to melt, and requires a greater degree of heat, it is called *hard.* These terms are as well applied to the matter of the enamel grounds, and all other vitreous substances concerned, as to the fluxes. It is, in general, a perfection of the flux to be soft, or run easily into fusion. But the great point, with respect to this particular, is, that when several mixtures of colors and fluxes are used at the same time, they should all correspond to each other in the degree of this quality; otherwise some would be rendered too fluid, and perhaps run the matter of the enamel ground into fusion, and mix with it, while others remained solid and insufficiently fused themselves. It is always necessary, likewise, that the enamel of the ground should be considerably harder than the mixtures for the colors; for if they both melt with the same degree of heat, they will necessarily run together.

It being requisite that the body painted in enamel should undergo a heat sufficient to melt soft glass, the matter of such body can only be gold, silver, copper, porcelain, or China-ware, hard glass, and earthern-ware. And where the metals are used, if the painting be of the nature of a picture, or demand a variety of colors, it is necessary that a ground of white, or some other color, should be laid on the metal; the body of which ground must necessarily be of the same vitreous nature as the flux, but harder; as nothing else can endure so great a heat that is capable of incorporating with, and binding the matter of the white, or other color, to the surface of the metal. The grounds, therefore, make another principal class of the substances used in enamel-painting.

The third class is the colors, which must likewise be bodies capable of suffering the heat of melted glass; and such as will either themselves be converted into glass; or kindly incorporated with it in a melted state. This of course confines the matter of such colors to metals, earths, or other mineral bodies; all vegetable and animal substances being calcined and analysed with a greatly less degree of heat than the lowest sufficient to work enamel.

The fourth kind of substance is called the secondary vehicle; which is, some fluid body for laying on the ground, and working with the pencil, the flux and colors when mixed together; since, as they form only a dry powder, they could not be used as paint without some such medium. But as this is to serve only for spreading and laying on the matter of the enamel, and not, like other vehicles, to assist in holding the colors together, and binding them to the ground (that being in this kind of painting the office of the flux), it is necessary that it should be some such substance as will evaporate and dry away without leaving any part behind: it would otherwise be heterogeneous matter with regard to the enamel, and consequently injurious to it. Essential oils have been, therefore, used for this purpose, as they have the quality of wholly drying away on the first approach of heat, together with a slight unctuosity, which renders them capable of making the matter of the enamel work properly with the pencil.

On the Art of Gilding Enamel and Glass by Burning.

There are two methods of gilding enamel and glass, by burning or annealing: the one is the producing a cohesion of the gold with the glass or enamel by the intermediation of a flux; the other, by producing the like effect without any. But the principle is the same, nevertheless, in both; and is, in fact, no other than the causing the gold to adhere to the enamel or glass, in consequence of the fusion or approach to that state, either of the flux used, or the body of enamel or glass itself; by which the gold is cemented to such body.

The flux, when any is used, may be either simple glass of borax, or any of the preparations of fluxes powdered.

There are other differences likewise in the manner of this gilding, which respect

the state of the gold; for it may be either used in the form of leaf gold, or in that of powder, either mechanically made, or by precipitation.

When leaf gold is employed for gilding enamel or glass in this way, without any flux, the enamel or glass may be moistened with a very weak solution of gum arabic, and again dried. Being so prepared, it should be breathed upon till it becomes a little adhesive or sticky, and then it should be laid upon a leaf of gold; and if that be not sufficient to cover it, the remaining part must be laid on others, and the work again breathed upon, if it appear dry before the whole surface be gilded. When the gold is thus united to the enamel or glass, by the cementing quality of the gum-arabic, which is used in order to keep it close and even to the body to be gilded, the work is ready for burning.

If the leaf gold be used for gilding enamel or glass with the aid of any flux, such flux, being finely levigated, should be tempered with a very weak solution of gum-arabic, and very thinly spread on the part of the work to be gilded; and when the gum-water is nearly dry, the leaf gold should be laid on the part thus prepared for it; or if the work be kept beyond the time, it must be breathed upon till it becomes sticky: the gold thus fixed on the work, it is in a state proper for burning.

The advantage in omitting to use any flux is the rendering the gold less prominent and uneven, with respect to the body gilded; which is in some cases material. But unless the ground, whether of enamel or glass, be very soft, it requires a strong heat to make the gold take hold of it; and this, in the case of enamel, endangers the ground, or any painting upon it; for if the degree of heat be not very nicely adjusted, the glass or enamel will run into too liquid a state in some instances, and in others not be softened sufficiently to cohere with the gold. The advantage of using a flux lies in avoiding both these inconveniences; and, particularly in the case of very hard glass, the being certain that the gold will cake; which is, without this medium, sometimes dubious. But the flux lying under the gold prevents it necessarily from being so level with the surface, or having the same evenness, as when laid on the body itself without any intermedium.

Before we speak of the method of using the gold in powder for gilding in this way, it is proper to mention the manner of preparing this powder; which may be best made in the following manner: Take any quantity of gold, and dissolve it in aqua regia thus: To 8 ounces of pure spirit of nitre add 2 ounces of sal-ammoniac, scraped perfectly clean, and powdered, which will convert the spirit of nitre to aqua regia. Dissolve, in 4 ounces of this aqua regia, put into a proper phial, half an ounce of putrified gold, in the state it is to be had of the refiners, under the name of grain gold. In order to hasten this solution, the phial may be put into a gentle heat, where it must continue till the gold entirely disappears. Take, in the mean time, about the same quantity of aqua regia in another phial, and put into it filings or small bits of pure block-tin, so long as any brisk effervescence arises on the adding fresh quantities: but this must be done gradually, especially if the filings be used; otherwise the mixture will heat so much as to boil over, or break the phial. Drop then thirty or forty drops of the solution of the gold into a half pint glass of water, and immediately after about fifteen or twenty drops of the solution of tin. The gold will then be precipitated in a red powder from the solution in the aqua regia dropped into the water; and this operation must be repeated till the whole quantity of the solution is thus treated. When the last quantity of the red powder has been precipitated, pour off the clear fluid, and fill the glass with spring water; which, when the red powder has settled, must be poured off likewise. Hold then a wet sponge, but well squeezed, to the surface of the fluid remaining with the powder; and, when as much of the water as can be conveniently separated from it by that means, is drawn off, lay the powder on a marble or porphyry stone to dry, taking great care that it contracts no dust or foulness. When dissolved, make a precipitation of the gold, by putting into the solution slips of copper plate, which must be continued there till they no longer produce any effervescence in the fluid. These slips of copper being then taken out, and the gold adhering to them gently beaten off, the fluid must be poured off from the precipate, and fresh water put in its place,

which must be renewed, in like manner, several times, till the salt formed by the copper and aqua regia is entirely washed from the gold; which, being dried, will be ready for use.

The precipitation may otherwise be made by adding a solution of Roman vitriol, or of copperas, or common green vitriol, to the solution of gold, in the following manner: Take a solution of gold in aqua regia, prepared as above directed; and add to it gradually a solution of green vitriol or copperas in water, until no further precipitation of the gold is made by the addition of a fresh quantity. The solution of the copperas may be made by putting one drachm of it powdered into an ounce of water, and shaking them till they appear to be dissolved; after which the solution must stand, and the clear part be poured off from the sediment, if any be found. The fluid must be poured off from the precipitated gold as soon as it is perfectly subsided, and the precipitation must be well washed by pouring on it several successive quantities of water. Roman or blue vitriol may be employed for this purpose instead of the green, but it is somewhat dearer, and has no advantage over the other. The gold precipitate thus obtained is very bright and shining. A similar kind may be prepared by putting flat bars or plates of copper into the solution of the gold in aqua regia; but the precipitate is of a brown color, without any lustre or shining appearance.

This method is more expeditious, as the precipitation is instantaneously made. In the present practice, the (*aurum fulminans*) fulminating gold, or precipitation by alkaline salts, is made by those who gild glass in the greatest perfection; and the volatile alkali is employed for the precipitation by the chemist, who prepares it for this purpose. But when this kind of precipitate is chosen, the use of any flux must be avoided, and a very considerable degree of heat applied.

Where it will not answer the trouble to prepare precipitated powders, that formed of leaf gold may be used in its place; but the precipitates are more impalpable powders than can be obtained by any different method, and will take a finer burnish than any other kind when employed in this sort of gilding.

The manner of using the precipitates of gold in gilding of glass or enamel, except with respect to the *aurum fulminans*, may be varied two ways, as well as that of the leaf gold; viz. by adding to it or omitting any flux. The convenience of using flux is the same with that before mentioned, with the further advantage of rendering the gilding extremely durable, even to a degree of bearing to be scraped. But the disadvantages are greater; for not lying under the gold, as in the other case, but being mixed with it, the flux destroys the rich metalline look, and, what is still much worse, in many cases prevents its taking a burnish with the true lustre.

In which way soever the powder is used, it is to be tempered with the oil of spike, and worked as the enamel colors; and the quantity of flux, when any is used, may be a third of the weight of the gold. When the gold is thus laid on, the work is ready for burning; which operation must be performed in the same manner, excepting as regards the degrees of heat, as in the ordinary methods of gilding.

In cases where the glass is very hard, or where the opportunity of a strong heat cannot be conveniently obtained, the expedient of using a flux in the following manner may be adopted with great advantage.

Grind glass of borax to a fine powder, and having tempered it with oil of spike, lay it on the glass where the gilding is to be made. Burn then the glass with the degree of heat that will run the borax; and, when it is cold, apply the precipitate, or leaf gold, and burn it again, as in other cases.

In this manner the advantage of a flux may be gained, without the inconveniences before mentioned, and the gold will take a very gentle heat. It is, indeed, attended with double trouble and hazard; but in the case of using leaf gold, where a very good burnish may be wanted, this method will perhaps be found on the whole the most eligible.

The manner of proceeding for burning or annealing the work in this kind of gilding is the same with the treatment of the enamel or glass in the use of the colors, except that the pieces may either be put into the muffles, or coffins; or, in the case of the glass, if there be no painting, the operation may be performed in the naked fire.

After the work is burnt, if it be designed to be burnished, a proper lustre may be given to it by rubbing the gilded part with a dog's tooth, or with a fine agate, or iron burnisher.

ON THE TAKING OF MEZZOTINTO PRINTS ON GLASS, AND PAINTING UPON THEM WITH OIL, WATER, OR VARNISH COLORS.

The painting on glass by means of mezzotinto prints is performed by transferring the ink of the print to the surface of the glass, and thus having obtained a drawing, coloring it by proper pigments tempered with oil, varnish, or oil of a vehicle. This transferring the ink from the print to the glass is effected by cementing the face of the print to the surface of the glass by means of some glutinous body which will not dissolve in water, and then destroying the texture of the paper by water, so that it may be rubbed entirely off from the cement upon the glass,—leaving, at the same time, the whole of the ink of the print upon the cement and glass, in the same manner as if the original impression had been made there.

The particular method of performing this is as follows:

Procure a piece of the best crown glass as near as possible in size to the print to be taken off, and varnish it thinly over with turpentine, rendered a little more fluid by the addition of oil of turpentine. Lay the print then on the glass, beginning at one end, and pressing it gently down in every part in proceeding to the other. This is requisite to prevent any vesicles of air being formed in the laying it on, by the paper touching the cement unequally in different parts; and to settle the whole more closely to the glass, it is well to pass over it a wooden roller of about the diameter of two inches. Dry then the glass, with the print thus laid upon it, at the first, till the turpentine becomes perfectly hard, and afterwards moisten the paper well with water, until it is thoroughly soaked. After this, rub off the paper entirely from the cement, by gently rolling it under the finger, and let it dry without any heat; the impression of the print will be found perfect on the glass, and may be painted over with either oil or varnish colors.

The choice and treatment of the colors for painting in this way upon glass in either oil or varnish, may be the same as for any other methods; and it is therefore needless to enumerate any further particulars.

ON THE DEVICES EMPLOYED FOR THE MORE EASILY OBTAINING A JUST OUTLINE IN MAKING DESIGNS FROM NATURE; AND ON THE VARIOUS METHODS OF OFF-TRACING, CALKING, AND REDUCING PICTURES, PRINTS, OR DRAWIGS.

The drawing accurately and readily after nature, and depicted representations, by the unassisted hand and eye, requires greater practice and command of pencil than fall to the share of many, who nevertheless may not want abilities to color or shade a picture or drawing when a proper outline sketch is previously procured. The convenience of quicker despatch is moreover a matter of importance even to those who are most expert in this art. On these accounts, various means have been devised to lead or direct the eye or hand, in forming just outlines of the principal objects which compose the design. These means consist of several methods, founded on different principles.

In the drawing after nature, the interposing a transparent plane is commonly practised; through which plane the objects being seen from a fixed point of view, the outlines of their parts are traced upon it by chalk or some kind of crayon; or such transparent body is divided into squares, through which the objects being viewed, the eye may be enabled to form and dispose them with more certainty, on a paper or other proper ground, divided into a similar number of squares; or some reflected image is obtained by means of a camera-obscura, which affords an opportunity both of drawing the figure and imitating the natural color of the objects. These are the devices employed for drawing after nature; but where pictures, prints, or drawings are to be copied, various methods are adopted. The most common method is by *off tracing*, as it is called, which is the laying some transparent substance over the picture, print or drawing, and passing over the outlines of the principal parts with a pencil or crayon, which delineation is to be afterwards transferred from this transparent

body to the ground intended for the painting or drawing. The second method, which is indeed only another kind of off-tracing, practised sometimes in the case of prints and drawings, is effected by laying the originals on the ground of paper or vellum designed for the copy, the back of the original being smeared with black, or with vermillion mixed with a little butter; or a paper so prepared being laid between the original and copy, and tracing over the principal parts of the design with a needle or some other such instrument, by which means an outline sketch of it will be formed on the ground of the copy. This method is called *calking*, and is performed also in another way, by puncturing or pricking the original print or drawing, and producing an outline on a new ground, by transmitting a colored powder through the punctured holes. The third is by dissolving part of the printing ink by means of soap, and impressing it on a fresh ground in that state. Another method much practised is the using squares in the manner above spoken of, in the expedients for drawing after nature, except that here they are to be laid upon the picture. This method is likewise applied to the more certain copying of pictures or drawings, where the new design is to differ in magnitude from the original, in which case it is called *reduction*. For this last purpose there is likewise another method employed, by means of a machine hereafter described for off-tracing, and by which, after drawing over the lines of the original, the new sketch may be made greater or less.

The particular manner of using the transparent plane for taking designs from nature is, by framing a piece of tiffany or fine lawn, of the size of the picture or drawing intended, and fixing it so that the whole view of what is to be painted may be seen through it; a sight-board, that is, a flat piece of wood, with a hole in it, being placed parallel to the tiffany or lawn, in such manner that the eye may command the whole view through it, at the same time that the hand may reach with convenience to draw upon it. The outlines of the object, as they appear through the hole in the sight-board, must then be traced out on the tiffany or lawn, by a crayon formed of white or red chalk, charcoal, or any proper substance, by which means a sketch of the design will be produced. In order to form a more complete drawing from this crude sketch on paper or vellum, the tiffany or lawn containing it must be carefully laid on such paper or vellum in an horizontal position, and, being well fixed down upon it, must be struck with some flat body in every part, by which means the chalk or matter of the crayon will be transferred from the old to the new ground, and produce the same delineation of the object upon it as was before on the other. The impression thus made on the new ground should be then over-traced with a black-lead pencil, and afterwards corrected, if there be occasion, from the natural view through the sight-board; and this paper or vellum will then contain a proper outline drawing, if the design be intended for a painting in water colors. But when this method is pursued with a view to a painting in oil, the tiffany or lawn, after the sketch is drawn, must be laid upon the ground of the intended picture, and proceeded with in the same manner as with the vellum or paper; only, in this case, the over-tracing must be made with some kind of crayon instead of the black-lead pencil.

It is advised by some to use paper made transparent by means of oil of turpentine, instead of the tiffany and lawn; but the use of it is only practicable in this way in a darkened room or other confined place, and the paper thus prepared does not become transparent enough, even then, to show minute or remote objects so distinctly as is necessary. If, however, any choose to use it, the usual preparation of the paper is, only to brush it several times over with oil of turpentine, and to suffer it to dry. The transparency will be much improved if a third of nut or poppy oil be added to the oil of turpentine; or otherwise a little crude turpentine or colorless varnish; any of which will render the oil of turpentine more efficacious for this purpose, and save the trouble and expense of rubbing the paper so often over as is otherwise necessary. The paper employed for this purpose should be that called fan-paper, or, if that cannot be procured, fine post paper may be substituted; and where the design is too large to be contained in one sheet, several may be joined together, by laying the edges of the sheets a very

little over each other, and cementing them by isinglass glue, which, if neatly done, will only slightly affect the transparency in the joints. When the original sketch is made on transparent paper, the tracing or drawing may be performed by a black-lead pencil, instead of crayon, which renders the drawing much more perfect and durable; and, being thus completed, it may be used for off-tracing the sketch on any ground intended for a painting in either oil or water. If it be intended for a picture in oil colors, the back of the paper may be smeared with pounded black-lead, charcoal dust, or any powdered crayon; or, what is much better, vermillion mixed with just so much butter as will make it adhere to the paper. It must then be laid on the ground of the picture, and over-traced by a copper or iron stift, or blunted needle, which will make an impression of the sketch on the ground by means of the color on the back of the paper; or another paper may be colored, with the black-lead or vermilion, instead of the back of the transparent paper, and being laid between that and the ground, will answer the same end. The means are no way different where the sketch is to be transmitted to paper instead of oil. But in coloring the back of the transparent paper, or that interposed where any such is used, care should be taken that the color be so wiped off as not to smear the ground, or produce any effect, except where compressed by the instrument in the over-tracing; and this indeed should be regarded to a certain degree even with the oil ground. Where the sketch is large, and made on several sheets of paper, it is convenient to have weights to place on the four corners of the conjoined sheets, to keep them even and steady on the ground. They are best formed of square pieces of lead with handles, and may be about two or three pounds weight each.

The sketch on transparent paper may be otherwise transmitted to any ground by puncturing it with holes made near each other in the lines of the drawing, and then fixing it on the ground, and dusting over it black-lead or any other colored matter finely powdered, and tied up in a fine linen cloth. This dust passing through the holes of the pricked paper will delineate the sketch on the new ground, so that it may then be over-traced by any kind of pencil or crayon. Glass has been also used in the same way as the lawn or transparent paper, but its texture hinders it from being well managed with chalk, or any crayon or pencil. There is also another method, not commonly practised, by which a sketch might be well obtained by the use of glass. This is by drawing the outlines of the objects with black color in drying oil, and when the sketch is finished, laying the paper intended to receive the copy gently, and without any rubbing or shifting, on the glass, having first moistened it with water; by which means the black paint will be transmitted to the paper, as the moisture exhales from it, and an impression made sufficiently exact for the purpose.

The manner of assisting the eye, in designing from nature by means of a plane divided into squares, is, by drawing cross lines parallel to each other on tiffany or lawn framed, or on transparent paper, or glass. This may be done with common writing ink, or any other way that will render the lines visible; and the divided plane must be then placed before the sight-board in the same manner as was before directed for tracing the outlines. The ground on which the sketch is intended to be taken must be also formed into an equal number of squares; and the objects, being seen through the squares of the transparent plane, will by this means be much more easily disposed in their proper situation, and formed of a just magnitude, by placing them in the corresponding square of the ground; than where the eye had no such medium to compare and judge by. But though the above substances are most commonly used, there is a more simple and effectual way of doing this, which is, by making a frame of a proper size, and dividing the area which it forms into squares, by threads of a moderate thickness. In this way the objects to be drawn are consequently more within the power of the eye than when the most transparent body is used. The drawing by the assistance of squares, to those who have the least command of hand, is by much the most expedient way. But in order to render this or the other methods more commodiously practicable, where it is to be done in the open air, a portable machine should be made for supporting the frame of the transparent plane, and also the sight-board.

This machine may be constructed by joining three long legs together, in the manner of the surveyors' instruments, in a block and fixing the frame, by means of a foot which will slide into the same box, that it may be raised higher or lower. The sight-board must have a foot likewise, by which it may be raised higher or lower; though this must not be fixed into the block, but into a sliding piece, which must pass through the block horizontally, so that the foot of the sight-board being fixed into it at right angles, the board may be brought nearer to or drawn further from the transparent plane at pleasure.

The second method used to facilitate the drawing after nature, namely, by the reflected image of the object, is performed by the camera-obscura, of which a portable kind adapted to this purpose is commonly made by the opticians. It is needless, therefore, to give any description of these instruments, and the structure of them immediately explains the manner of their use on a very slight examination. Where they are not at hand, and a prospect through any particular window is desired to be taken, an occasional camera may be formed. This is to be done by boring a hole through the window-shutter at a convenient height, and putting one of the glasses, called the ox-eye, into the hole; when, all other light being shut out, except what passes through this hole, and a proper ground of paper or vellum, &c. being held at a due distance from the hole, the reflected image of the prospect will be formed upon the ground. If this ground be formed of paper, and fixed steady by a proper frame, the image will appear very perfectly on the reverse of it, and the artist may stand at the back, and trace the outlines of the necessary parts with great convenience.

Though the taking views of nature by the camera has several conveniences, and seems very advantageous, there is one very material objection to its use. This is, that the shadows lose their force in the reflected image; and objects, by the refraction, are made to appear rounder, or different sometimes both in their magnitude and site, from what they really are; which being opposed to the truth of any drawing, almost wholly destroys the expedience there would be otherwise found in this manner.

The method of making sketches of outlines from pictures, prints, or drawing by off-tracing, is performed by a variety of methods. The most common, where the size of the painting does not forbid it, is to take a sheet of paper prepared by oil of turpentine, or the other means, as above directed for taking views from nature; and, having fastened it even on the picture or print to be copied, to trace over the principal parts, with a black lead-pencil. By this means an outline being obtained, it may be imparted to any other ground, in the manner before described, when the same kind of outline is formed by drawing after nature. Where larger pieces are to be copied, lawn and tiffany may be used, instead of the transparent paper; or several sheets of the paper may be joined together by means of isinglass glue; and when the outline is traced by chalk, or other proper crayon, the subsequent proceeding may be similar, in this case, as above, where the same kind of outline is taken from nature. Goldbeaters'-skin and horn, as prepared in plates for lanterns, as also the talc or fossil isinglass, and dried hog's bladder, have been likewise applied to this purpose. But where horn or isinglass are used, being rigid bodies that will not yield to impart an impression by retracting, they may be best treated in the manner above advised, in the case of glass, when employed for taking views from nature, which is, by tracing the outlines with black in oil, and printing a new ground of paper with it.

Another common method of off-tracing, in the case of prints or drawings, is to fix them against a window or other hard transparent body placed in a strong light, in a perpendicular position, and to put a piece of paper, vellum or any other body sufficiently transparent, before them, to perform the off-tracing, by the view which is this way given of the objects in the print or drawing.

The other method of off-tracing, called *calking*, which is sometimes practised in the case of prints and drawings, is performed by tracing on the print or drawing itself, instead of the transparent body laid over it, as in the other manner. The back of it must be previously prepared by rubbing it over with black-lead powdered, or other such matter; or a paper blacked on

the under side may be used, instead of blackening the print or drawing. By either of these methods an outline will be made on any ground of vellum or paper laid under the print; and if several grounds of very thin paper be laid together under the print, with each a blackened paper over them, so many impressions may be made at one time, The same effect may be produced by puncturing or pricking out the proper outlines in the print or drawing, and then using it for imparting the sketch to another ground, with the black-lead powder, &c., in the manner above described in treating of the use of the oiled paper. When the print or drawing is thus prepared by puncturing, it may be employed for transmitting the sketch to any number of grounds.

The manner of using soap for taking off the impression of a print on a new ground is this: Smear the original over with the common soft soap, commix with water till it be of the consistence of a thin jelly, and then lay it even on the ground intended to receive the impression, which must be also previously moistened with water; after which, being covered with several other papers, the whole must be compressed, by passing a wooden roller over them, or by rubbing strongly on them with the calender-glass used for glazing linen, or by any similar means. The impression of the original will thus be imparted to the new ground, which must be first dried, and then carefully washed with a sponge and water to take off the soap. It has been said by some that this treatment will do very little injury to the original print; but, besides the impracticability of ever thoroughly cleansing it from the soap, a part of the printing ink is taken from it, and a proportionable share of the effect of the original impression destroyed.

A method parallel to this is sometimes used with prints and drawings, which is by holding them up to the light, and tracing the proper outlines on the back with a black-lead pencil, or any kind of crayon, and then laying the traced side on a ground proper to receive the impression, going over them with a roller or calender-glass, in the same manner as when the impression is taken by means of soap. On the same principle, in the case of copartments, cyphers, or any other regular figures, where both sides are alike, when one half is drawn or traced, the other half may be procured by doubling the paper exactly in the place where the two halves should join, and then pressing or rolling over the outside of the sketched part. By this treatment a corresponding impression of the design will be made on the other side, and the whole sketch will be finished without the trouble of drawing or tracing out the second half.

The method of copying designs by the use of the squares, either in order to paint in equal magnitude, or with a view to reduction, is this: Divide the original into a convenient number of squares, by ruling lines across it with any kind of crayon, and then do the same on the ground in a corresponding manner. The squares on the new ground may be either increased, diminished, or made equal as to their size, with respect to those of the original, according to the intended proportion of the new piece. The principal use of the squares, in this case, is so much the same as when they are applied to the taking drawings from nature, that it is needless to dwell longer on them. It may be here stated, that to those who can draw at all, the use of the squares is much more advisable, as well as in drawing after nature, than any of the other methods; it is much more improving, and, on the whole, less troublesome, to make a correct sketch in that way than by any other.

The manner of reduction, or, if that be not necessary, of tracing out an outline, where the magnitude of the original is to be preserved, by the machine above mentioned, which was formerly called a *parallelogram*, and by some a *mathematical compass*, cannot be properly understood without an explanation of the construction of the instrument.

This instrument is composed of a board or table, with ten pieces of wood fixed upon it, in a moveable manner; and by such a construction, that when one is moved, the whole of the rest move also similarly, with respect to the directions, but under greater or less angles. The board or table may be of fir deal, and is usually made in the form of a parallelogram. The magnitude of it, as well as of the other parts of the machine, must be according to that of the pictures, &c., intended to be used for reducing. But for the sake of giving the comparative proportions, it may be stated at three feet in length, and the breadth may be about a

foot and a half. It must be planed very even, but should not be of too thin a substance, and it must be covered with cloth stretched even upon it, and fastened down to it. The ten pieces of wood must be formed like rulers used for writing; and in the proportion here taken, they may be a foot long, and about half an inch in breadth, and the fifth or sixth of an inch in thickness. They must be fastened to each other in such manner that every one must be crossed by another in the centre, and by two others at such distance from the centre as exactly divides the two half-lengths on each side of it; except the two which form the extremities, and can be only crossed in the centre and in the middle of one part, which, in each extremity, will be the part opposite to that so crossed in the other, as will immediately appear on the pieces being laid together in the position here directed. The fastening must be by pins or rivets, on which each piece may be turned with perfect freedom; and near each end of every piece must be made a hole or a female screw, into which a crayon, portcrayon, or pencil, may be fixed, either by, or without, a screw. At the ends of those pieces which mark the extremities there must be a smaller hole for a pin to be passed through to fasten the conjoined pieces to the board. In order to the more commodiously fixing the several parts of the instrument to the board or table, it may be proper to have female screws at the places of the table where the rulers are to be pinned down, according to the different applications of the instrument; and the pins for fastening the respective parts must, in this case, have male screws at their extremities, correspondent to the female screws in the table. By these directions, closely followed, the parts of the instrument may be completely formed, and put together.

COLORING OR WASHING MAPS, PRINTS, &C.

The coloring maps or other prints is performed either by spreading opaque colors so thinly on the subject that the full effect of the printing may appear under them, or by using transparent colors which stain the ground and dry away without leaving any opaque body: this last method is called *washing*.

The using opaque colors, or such as have a solid body, in this way on prints depends entirely on the kind of vehicle used; for if the color be so suspended by the vehicle that it can be spread equally, it may be applied to this purpose with success; and such as are very strong and bright, even though of the most opaque body, as vermillion, verditer, ultramarine, or turpeth mineral, will answer the end. The best method of doing this, is the using the isinglass size, prepared with sugar or honey according to the following directions: Take three quarters of an ounce of gum-arabic, and a quarter of an ounce of gum-senegal. Powder them, and then tie them up in a linen rag, leaving so much unfilled room in the bag as to admit its being flattened by the pressure of the hand. Having squeezed the bag till it is flat, put it into a quart of hot water, and there let it continue, moving it sometimes about, and stirring the water, for about twenty-four hours. The gums will then be dissolved, and the bag must be taken out. The fluid being divided into two parts, to one half of it add a quarter of an ounce of white sugar-candy powdered, and keep the other in its pure state.

The following method is the most advisable for making the isinglass size: Take half an ounce of the beaten isinglass, and a pint and a half of water. Boil them till the isinglass be wholly dissolved, and then strain the fluid, while hot, through a linen rag. Divide the size thus made into two parts, and to one of them add an equal measure of hot water, by which means a strong and weak size will be likewise obtained. This makes the colors of this sort work so freely that they may be diffused almost as easily as the transparent kinds, and with nearly as good effect. But it is proper in most cases to dilute the composition more for the washing of maps, and spreading the color over large surfaces.

Besides the opaque, there are a number of colors which are semi-transparent, and yet have a body in a greater or less degree. These are carmine, bistre, and gall-stone, in the first degree, with lake and Prussian blue in the second; all which may be treated in the same manner, but require very different proportion in the strength of the size.

The transparent colors should be preferred for this purpose to either of the

other kinds, as their effect is better, and they require no preparation. The colors are, *for red*, red ink—*for blue*, litmus,—*for green*, sap green and verdigris, (in vinegar) *for yellow*, gamboge, the yellow berry wash and tumeric wash—*for purple*, the logwood wash and archil,—*for brown*, Spanish liquorice—and *for black*, Indian ink. These require only to be dissolved in water, which should be more copiously added when employed for washing prints or coloring large grounds of any kind.

It must be carefully observed, in employing the opaque or semi-transparent colors, never to cover any parts so strongly as to prevent the distinct appearance of the shades of the printed design.

In the *illuminating* (as it is called) maps, as little peculiarity in the manner is necessary as in the case of other prints; only, the intent of coloring them being to distinguish the divisions of the maps with respect to countries, districts, &c., care must be taken not to lay the fluid colors on so copiously as to flow beyond the limits of what they are intended to cover. The rest depends on the so disposing of the variety of colors in different parts as to give them a strong and pleasing effect, which must depend more on fancy and good taste than on any rules. There is indeed one thing in particular, which, it may be proper to remark, should be always avoided; it is the laying such colors as have any affinity or likeness close to each other; for by an error in this particular they will be rendered much less effectual with respect to the purpose they are to serve; as it is by such a disposition made more difficult to the eye to distinguish the limits and bounds they are intended to mark out. And moreover, for want of due apposition, the diversification of the colors is made less pleasing, when they are seen at a distance, and considered only with respect to their ornamental appearance. There is one other rule which is more especially necessary to be observed, though many think they are giving most perfection to their work when they most deviate from it; it is, the never using too strong and deep colors for this purpose, as they render the legible characters of the maps less distinct and perceptible. Such a practice is therefore repugnant in a certain degree to the principal intention of the maps, and moreover gives them a tawdry glaring appearance which is very inconsistent with good taste, one great principle of which is simplicity, and the avoiding a false and unmeaning showiness.

From the London Art-Journal.

THE USEFUL APPLICATION OF ABSTRACT SCIENCE.

PHOTOGRAPHY.

FROM the first, we were amongst those who saw that the time would arrive when the art of photography would become one of extreme usefulness, and afford a new proof, if any indeed were required, of the advantages of pursuing abstract enquiries in science. We have lately heard it declared, that the demand must regulate the supply in all things; and that, therefore, if abstract science was required, there would be a greater demand for it than now exists—and hence the conclusion,—the demand is small, the necessity for abstract investigation is not evident. Nothing can be more dangerous to progress than such a doctrine; it strikes away all the staves from the ladder by which ascent is to be made, and leaves poor humanity toiling at that level, the possession of which has already been achieved, but above which it can scarcely dare to look.

There is not one of the achievements, which so peculiarly marks the present age, and distinguishes it from every other peri-

od in man's history, which is not derived from the most purely abstract investigations; and the blundering failures, which are constantly presenting themselves, are readily traceable to that ignorance of abstract science which too generally prevails.

We drain our mines—we drive our carriages, and propel our ships—we weld our chains, and weave our cables—we move the most ponderous masses, and manufacture the most delicate tissues—by the agency of steam. We compel it to perform labors which equal even the fabled labors of the Titans, and dwarf into child's play those colossal tasks upon which the Pharaohs wasted myriads of human lives. Before the purely abstract enquiries of Black and Priestly—and the beautiful though simple experiments of Watt, in 1781, to determine the latent heat of steam under different pressure, nothing could be more rude than the attempts made to employ steam as a mechanical power, or, as Savery called it, to take advantage "of the propulsive force of fire." By these very abstract enquiries, the law was discovered, and we have reduced "the spirit to do us service." Electricity still more evidently may be quoted in evidence of the truth of our position. From the time that Œrsted discovered, not by accident, but by exact reasoning, founded on the most careful theoretical deductions, that a copper wire, carrying an electric current, attracted iron filings; every stage of progress up to the present moment, in the introduction of the electric telegraph and its uniform improvement, until now it spans alike the earth and the ocean, is a comment on the text of the present paper. The electrotype also, in all its modifications, would never have existed had not Daniel Faraday, and others, sought to discover the laws of electro chemical decomposition in relation to the powers of the voltaic battery. The electric light has not been hitherto successfully applied; and electricity, as a motive power, appears to baffle the ingenuity of all who have yet directed attention to this power; and all evidence at present goes to prove that with our existing knowledge, it is not possible to substitute electricity for steam at less than nearly one hundred times the cost. In both these examples, our ingenious mechanics have begun at the wrong end; and have gone on endeavoring to apply a power, not being acquainted with the laws by which it is regulated. They are like the Evocator, who raised by his incantations a mighty spirit, forgetting to make himself previously acquainted with the spell by which he could control the monster.

No truth, no glimpse of a truth, however shadowy it may appear, is ever revealed to man, without its commercial value. It is degrading to the philosopher to be compelled to prove that his philosophy has a *real* price in the money market, but in these days of *practical science*, it is nevertheless necessary. It is not a new thing to ridicule the minute investigations of the experimentalist, and those very instruments which we now commonly employ in navigation and surveying were at one time the subjects of the unsparing jests of clever though superficial satirists. To these, we shall however no further refer, and with one more striking example of the applications of a discovery, in the highest degree abstract, we shall for the present conclude this section of our subject, and examine the advances of photography in usefulness.

A young French engineer, who had been educated into a love for abstract science, was examining through a piece of tourmaline, the golden splendors of the setting sun reflected from one of the windows of the Tuileries, which was open at a particular angle. He held the crystal in his hand, and the stream of golden light passed through it to his eye, he turned the crystal through a quarter of the circle, and although he saw the window as distinctly as before, it reflected no light, or rather none of the light reflected could pass through the transparent body which he held in his hand. He turned it through another quadrant, and the light passed as before, and through another and the crystal became again opaque. Thus in moving this transparent body, through a circle (and there are many other similar substances now known) it was found there were two positions in which the light passed with perfect freedom, in which the rays could not pass, or in which it was opaque. The phenomena in this case were curious, but who could see that they would have any useful application. The researches of Malus, of Arago, of Biot, of Herschel, and of Brewster, make us acquainted with the laws re-

gulating this, so called, polarisation of light;—And what is the result? The polariscope is now employed in every sugar refinery. It tells the refiner the state in which his syrup is, which by no other known means could he detect. On the continent it is used in the examination of the beet-root and parsnip to determine the period when they contain the largest quantity of saccharine matter. The polariscope enables the chemist to detect adulterations which would defy every other means of analysis, and it aids the medical man in making an exact diagnosis of many peculiar forms of disease. Beyond this, by polarised light the navigator is enabled to determine the depth of the ocean over reefs upon which he dared not previously venture without careful sounding; and it enables the astronomer to tell us whether the light of the sun is derived from vapor in the state of flame, or from a solid surface in the condition of incandescence.

Photography is another striking example of the value of abstract science, and shows in a remarkable manner the necessity of abstract investigations of the highest class to ensure its advance. It was observed by the alchemists that chloride of silver blackened in the sunshine. Scheele eventually discovered that only one section of the solar rays produced this blackening, and Berard still more recently observed that the yellow and red rays concentrated by a lens would not produce in twenty minutes that degree of darkness which could be obtained by exposing this salt of silver for two minutes to the blue rays.

Upon these facts are founded all the effects which we obtain in the process of copying external nature, by exposing prepared tablets to the lenticular image formed in the camera-obscura, and the want of knowledge, as to the laws regulating the reflection, refraction, and absorption of these chemical radiations, is still evident in the defects of photography. In examining any of the finest examples of the art, the views in Egypt and Syria, to which we referred in our last—the choicest specimens obtained by Mr. Talbot, or any photographists on the calotype or on waxed paper—or those which are obtained by the employment of albumen and collodion on glass, we shall find that the higher lights and the lowest shadows are not equally consistent as in nature. Still more glaringly does this become apparent when colored objects are the subjects chosen by the photographic artist. Those colors which represent lights in the artists chromatic scale, yellows, reds, and their compounds, fail to effect a chemical change, and hence on the resulting impressions they appear as shadows, whilst the bright blues and darker indigos are photographically impressed as white on the sensitive surface.

This sometimes produces very awkward results, particularly in the application of photography to portraiture, and where the dresses of the sitters have not been judiciously selected. Artists have written on the defect of the photographic picture without knowing the sources from which they spring, and many photographic artists contentedly toil onward with the processes with which we are at present acquainted, satisfied with that exquisite correctness of detail which is always obtained, believing that an equalization of lights and shadows is not practicable—and that to hope to obtain an equality of action from a yellow and from a blue surface is an absurdity. A careful examination of the subject will however prove that by careful inquiry we may even hope to attain to this point.

In the first place, let us examine what have been the recent results from the empirical mode of experimenting adopted. M. Adolphe Martin, in addition to his modified method of producing positives by the cyanuret of silver on the collodion plate, as mentioned in our last Journal, has published a small pamphlet of instructions, which is reviewed in the "Cosmos" (a Parisian publication, which devotes a considerable portion of its pages to photography) and in that we find many remarks on the physical conditions of the film of collodion and the iodide of silver, which are worthy of attention. In the same periodical, M. Baldus communicates his method of proceeding upon paper, and has judiciously adopted different orders of combination in preparing his paper for different purposes. Although every stage of the processes of M. Baldus is marked by that care which is necessary to ensure success, there is not sufficient novelty to allow of our giving up all the space required to his manipulatory details. The success of

M. Baldus is great; we have seen some of his views of Paris, and they display much scientific knowledge of the difficulties of the art. The editor of the "Cosmos" informs us that the Minister of the Interior has employed M. Baldus to reproduce the principal monuments of Paris; and adds, partly in suggestion, and partly in hope, that the mission will only be fully accomplished by his being directed to obtain double proofs for the stereoscope. In addition to many other matters which belong to the minor, but not the less important details, we find accounts of two or three methods of securing that uniformity of tint upon all photographic pictures, which is desirable, but which is wanting in the English examples. In the very extensive series of photographs publishing by Gide & Baudry of Paris, the uniformity of color is remarkable. This is effected by M. Blanquart Everard, as we understand, by a neutral chloride of gold. His mode of manipulating has not been published, but if, after the picture has been fixed with the hyposulphite of soda, it is placed in a bath of a weak solution of the chloride of gold, rendered neutral by a few drops of lime water, this very fine tone, a dark purple, which may be mistaken for a black is produced. A second method is to dissolve as much chloride of silver in a solution of the hyposulphite of soda as it will take up, and then add to it an equal quantity of a saturated solution of the hyposulphite of soda and employ this as a bath for fixing. The photograph being placed in a flat dish, the fixing solution is poured on it, and allowed to rest for some time; the solution is then returned to its bottle, and the photograph washed and dried. This solution, though it becomes black, may be constantly employed; only from time to time, as the hyposulphite becomes saturated with the silver salt derived from the photograph, some more of that salt must be added to the solution. Pictures prepared with this have a very fine dark sepia tone, which strongly reminds one of the finest Italian engravings of the last century. The hyposulphite of gold may be, and is by some employed in a similar manner to the above, producing a tint similar to that obtained by M. Everard. Mr. Willis, of Exeter, has employed, after fixing with hyposulphite of soda, a solution of chloride of tin, as neutral as possible, in producing some very fine effects.

Amongst the more important investigations since those of M. Edmond Becquerel who appears to have abandoned the inquiry notwithstanding the success of his investigations, are certainly those of M. Niepce de St. Victor. In a former Journal the details as far as they were then published of the process by which he obtained his *photochromes*, as he terms his colored photographs were given. Proceeding upon the same tract M. Niepce has advanced towards obtaining pictures from nature, in colors, by the camera; examples of these have been sent to this country, and exhibited before the Academy of Sciences of Paris, the only difficulty appearing now to be that of fixing the photochromic images obtained. M. Niepce de St. Victor is still zealously engaged on the inquiry, and is sanguine of success.

M. Niepce states that the production of all the colors is practicable, and he is actively engaged in endeavoring to arrive at a convenient method of preparing the plates. "I have begun," he says, "by reproducing in the camera-obscura colored engravings, then artificial and natural flowers, and lastly, dead nature, a doll dressed in stuffs of different colors, and always trimmed with gold and silver lace. I have obtained all the colors: and what is still more curious is, that the gold and silver are depicted with their metallic lustre, and that rock-crystal, alabaster, and porcelain, are represented with the lustre which is natural to them. In producing the images of precious stones and of glass I observe a curious peculiarity. I have placed before the lens a deep green gem—an emerald—which has given a yellow image instead of a green one; whilst a clear green flint glass placed by the side of the other is perfectly reproduced in color." The greatest difficulty is that of obtaining many colors at the same time on the same plate; it is, however possible, and M. Niepce states that he has frequently obtained this result. He has observed, that bright colors are produced more vividly and much quicker than dark ones, that is to say, the nearer the colors approach to white the more rapidly are they produced, and the more closely they approach to black the greater is the difficulty of reproducing them. Of

all others the most difficult to be obtained is the deep green of leaves; the light green leaves are, however, reproduced very easily. After sundry other remarks, of no particular moment, M. Niepce de Saint Victor informs us, that the colors are rendered very much more vivid by the action of ammonia, and at the same time the volatile alkali appears to fix them with a certain degree of permanence. These results bring nearer than hitherto the desideratum of producing photographs in their natural colors. The results are produced upon plates of silver which have been acted upon by chloride of copper, chloride of barium or some combination of muriatic acid with a metallic or alkaline base. The manipulatory details have not been published in full, but we understand that they are very easy and that they are only reserved by the discoverer until he shall have completed his investigations. M. Niepce, who appears to possess that enquiring mind which particularly distinguished his uncle, M. Niepce of Chalons, has observed those very remarkable differences which obtain in the radiations of the morning and the evening, and of the northern and the southern sky. These have been previously noticed by Daguerre, by Claudet, and myself, but the confirmation of M. Niepce is more satisfactory, and promise to lead to some important additions to our knowledge. We learn that Mr. Talbot has discovered a preparation which is more sensitive to artificial light than to daylight, thus advancing towards that point which we desire to attain, the equalization in action of the most luminous and the most chemically active rays. I have already pointed out that collodion is affected with much rapidity by rays which pass through yellow glasses, and I have curious indications of other preparations which are readily changed by yellow light.

There is now every prospect of the formation of a Photographic Society in London. We are to have a Photographic Exhibition this month, at the Society of Arts. These are strong indications of the increasing acknowledgment of the value of this art. The society contemplates the high improvement of photography, and its use as an auxiliary aid to Art With all love for the art of photography, I cannot but fear the practice of it by artists may lead to a mechanical mode of treatment, which is destructive to all those efforts which should be the results of mental power. A figure drawn by rule and compass may be the more correct one; but it wants the vital force of that figure, which is the result of the mind guiding the educated hand; thus, photography is far more truth than any other process can by possibility be. In the last Exhibition of the Royal Academy, pictures, and bits of pictures could be detected, in which the aid of the calotype was apparent. It is with this, as with the cry of the present moment for *practical science* in opposition to abstract science: let us not sacrifice mental power in either case to merely mechanical skill—indeed they cannot long be disunited without the result becoming apparent. In Art, we should discover a rapid degeneration towards the pentagraph style of drawing; and in Science to that sluggish state which would distinctly mark a great moral exhaustion.

Abstract science in its highest meaning, must be cultivated to ensure useful practical results; and if we would advance photography to its most exalted point, we must study the philosophy of those variations which produce chemical change, and the relation which they bear to all the different substances which we can employ as our photographic tablets.

ROBERT HUNT.

TYRANNY.—It has been intimated to us by the satalites of a certain eratic planet, that all who have been independent enough to express their opinion in regard to his course, will be deprived of the rays of light from his sun. Bah!

OPTICS.

PART I.

LIGHT—DEFINITIONS; MOTION OF LIGHT; ITS INTENSITY; REFLECTION, REFRACTION AND INFLECTION.

SECTION I.—PRELIMINARY REMARKS.

THE science which treats of light is called *optics*, and it is by means of the sense of vision that we are acquainted with the powers and properties of light. This science is among the oldest branches of philosophy, Plato and Aristotle having suggested some of its most important principles; but the most valuable discoveries and the most important optical instruments are due to modern research and modern invention.

The nature of light is not yet definitely understood; it is generally believed to be matter, since in its motions it obeys the laws which govern matter, it imparts material substance in the form of color to surrounding bodies, and it is closely connected with heat and electricity. There are some reasons for believing heat, electricity, and light, are but different modifications of the same substance.

It was supposed by Sir Isaac Newton that rays of light consisted of minute particles of matter constantly emanating from luminous bodies, and causing vision in the same manner that odoriferous particles, proceeding from certain bodies, cause smelling. This is termed the system of emanation. It has also been considered that light is nothing more than the agitation of a medium called ether, which is lighter and more subtle than air; that the rays of light are produced by vibrations or undulations of this ether, as sound is produced by the vibrations of air. These theories, however, are of little consequence to the student who desires to arrive speedily at the practical effects of causes, in order to apply them to use in his daily vocations. We shall therefore confine ourselves to the effects of light upon bodies, and how light is effected by them, both of which considerations involve some of the most important principles in philosophy.

Within a few years, since the discovery of the daguerreotype, which led to it, philosophers have discovered a new property of light, termed, by Professor Hunt, Energia; but before proceeding to an investigation of any of these principles, it will be well to give the definitions of some of the terms used in optics, in order that the reader may pursue his studies with more ease.

SECTION II.—DEFINITIONS.

Light is of two kinds; *direct* and *diffused*. Direct light proceeds in straight lines from the bodies from which it is thrown off; while diffused light is spread in all directions, and, consequently, much softened in the intensity of its effects.

Luminous bodies are also of two kinds; those which shine by their own light and those which shine by reflected light.

A ray is a line of light.

A beam is a collection of parallel rays.

A pencil is a collection of converging or diverging rays.

Parallel rays are such as proceed equally distant from each other through their whole course.

Converging rays are those which, proceeding from a body, approach each other and unite in a point.

Diverging rays are those which, proceeding from a body, continually recede from each other.

A focus is that point at which converging rays meet.

Transparent bodies permit rays of light to pass through them.

Translucent bodies permit light to pass through them faintly but without representing the figure of objects seen through them.

Opaque bodies permit no light to pass through them, but reflect and diffuse the rays.

Reflection signifies the rebounding of light from surfaces upon which it falls.

Refraction denotes the bending of the rays of light as they pass from the surface of one transparent medium to another.

Inflection signifies the turning of rays of light from their course by the attraction of opaque bodies.

Incident rays are those which fall on the surface of a body.

Reflected rays are those which are thrown off from it.

SECTION III.—MOTION AND INTENSITY OF LIGHT.

Light moves in straight lines, although projected from luminous bodies in all directions. These lines cross each other at every point, but the particles constituting each ray are so minute that they do not interfere with each other. This is proved by the fact, that whenever a person is placed in any position before a luminous body every point of that part of the surface turned toward him is visible. Admit light into a dark room through a small aperture and its tendency to a straight line will be obvious.

We can see objects through a straight tube but not through a bent one, which proves that hearing and seeing are not governed by the same natural laws. As light moves in straight lines, it is impossible to see one object of the same height and size placed behind another.

The great velocity of light is made apparent when a gun is fired at a great distance ; we see the flash instantly, whereas the report is several seconds reaching our ear. It however, becomes fainter as it recedes from the source from which it emanates, in consequence of the dispersion or divergence of the rays, and this diminution of its intensity is in proportion as the square of the distance increases, " as sound within a certain distance dies away and is lost in silence, so light insensibly fades into darkness."

SECTION IV.—REFLECTION, REFRACTION, AND INFLECTION.

By the reflection of light from bodies, we see that it follows precisely the same laws as is common to all matter, thus proving that it is itself a material agent. All bodies, however, do not reflect light, it is only polished surfaces that have this property.

Rays of light, as they pass from the surface of one transparent medium to another are bent from a straight course. To the refraction of light are we indebted for the power of the lenses, or magnifying glasses which are used for spectacles, telescopes, microscopes, &c., and to this principle does the eye owe its power of seeing.

" If a beam of light be admitted through a small aperture into a dark room, and the edge of a knife or any other thin metallic plate be brought near the beam, the rays of light which would otherwise have proceeded in a straight line, will be inflected, or turned towards the knife. On placing the edge of another knife very near that of the former, the stream of light divides in the middle, and leaves a black stripe, indicating that all the light has been attracted from that space towards the two edges. As the knives are brought nearer to each other, the dark strip widens, till, upon the contact of the two knives, the whole light vanishes. Fringes of different colored light appear upon the edges of the two knives, three separate fringes on each, and all varying in their colors ; the first fringe beginning with violet and terminating with red, the second beginning with dark blue and terminating with red, the third beginning with pale blue and terminating with pale red.

" As the separation of light in the rainbow, is the effect of refraction, we may conclude, that by inflection, the different colored rays being differently acted upon, a similar decomposition of light is produced. When we look at a candle with the eyes almost closed, fringes of light appear ; the eyelids will, in this case, cause the inflection of the beams of light which enter them. Thus we find that light may suffer a change of direction, without actually infringing on a body, but merely by coming within the sphere of its influence. The inflection of light is rather to be regarded as a curious optical phenomena, than studied in relation to its bearing upon any known laws, or important application of science, but *reflection* and *refraction* are subjects which must be attentively studied as the two fundamental principles of optics."

When a ray of light falls perpendicularly upon a body it is reflected back in the same line in which it proceeded ; but when a ray falls obliquely it is reflected obliquely, and in an opposite direction from the incident ray, forming an angle at the reflecting surface, called the angle of reflec-

tion. The angles of incidence and reflection are always equal.

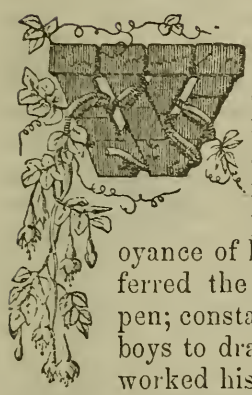
Objects are rendered visible by reflection; but light itself, unless it falls directly upon the eye is invisible; thus the agent which enables us to see all things, is itself unseen; so that the eye is not made sensible of the presence of light, till, after a certain series of operations upon its various coverings and humors.

All objects reflect light and thus their images are formed upon the retina of the eye; but smooth and polished surfaces reflect it with more intensity, and send to the eye images of objects from which the light proceeded before reflection. The reason why trees, rocks and buildings are not all mirrors, reflecting other forms instead of their own, is that their surfaces are uneven as rays of light reflected from uneven surfaces are diffused in all directions.

From the London Art-Journal.

OBITUARY.

MR. WILTIAM ROBINSON.



WILLIAM Robinson was born at Leeds, in Yorkshire, in 1799. His first years were passed at school, where he was found a most refractory pupil; and to the anoyance of his tutor, he always preferred the pencil to his books or pen; constantly bargaining with the boys to draw pictures, while they worked his sums. All means being found ineffectual to deter him from his favorite study, at an early age he was removed from school only to meet greater difficulties in the pursuit of the art he loved. His father, being a stern man of decidedly practical views, saw nothing in his son's taste that was likely to conduce to his future advance, and determined to annihilate every effort contrary to his wishes. Things now began to wear a desperate aspect, when young Robinson with that energy and self-reliance which is ever the characteristic of genius determined to throw aside all paternal authority, and stand upon his own responsibility; accordingly, he set out to seek a master, and at length found a clock-dial enameller, to whom his father very reluctantly bound him apprentice. He now worked early and late to procure pocket-money to purchase materials for drawing; these he stealthily conveyed to his garret, and secreted in an old band box. After the household had retired to rest, a thick tallow candle was produced from its hiding-place; and then to use Etty's words, "he lit his lamp at both ends of the day," and labored through the long midnight with untiring zeal. The term of his apprenticeship over, Mr. Robinson left his master, and received lessons in landscape painting from Mr. Rhodes, of Leeds; but feeling this branch of art was not the one in which his peculiar excellence lay, he commenced portrait painting, making use of every facility his native town afforded for improvement. By strict economy he was shortly in possession of a sufficient sum to take him to London, and he set out for the metropolis in 1820. Introductions had been furnished him to Sir T. Lawrence, who received him with a kindness that made a lasting impression on Mr. Robinson, and to which he always bore testimony with feelings of gratitude. He now became a pupil of Sir Thomas', who, with a noble generosity, declined any remuneration; and at various times employed Mr. Robinson to work upon his own pictures. Sir Thomas Lawrence gave him an introduction to Mr. Fuseli, who esteeming his work sufficiently meritorious, admitted him as a student in the Royal Academy. The climax of his high aspirings and ambitious hopes was now realized, and with a zealous heart and

willing hand he labored with a new energy in the mart of his high calling. In 1823-24, Mr. Robinson had returned to his native town; where his talents soon found him a lucrative practice, and distinguished patronage. His portrait of the late Mr. M. T. Sadler, M.P., first gained him celebrity, and to Mr. Sadler's efforts Mr. Robinson owed much of his early practice. Amongst his first patrons we may name W. Beckett, Esq., M.P., to whom we believe, Mr. Robinson was indebted for his introduction to Lord Grantham, now Earl de Grey. This nobleman, from the day of Mr. Robinson's introduction to his death, manifested great interest in his professional career. Earl de Grey honored him by sitting for two portraits, one in his peer's robes, and the other as Colonel of the Yorkshire Hussars. The pictures were afterwards engraved. At subsequent periods, he painted the whole of Lord de Grey's family, Lady de Grey excepted; as well as the portrait of the late Earl of Enniskillen, brother to Lady de Grey. He was also employed by the noble Earl to copy from various masters, other distinguised members of his lordship's family. About this period a subscription was raised among the members of the United Service Club, for the purpose of procuring portraits of several distingui-hed individuals. The committee, through Earl de Grey's interest, deputed Mr. Robinson to paint four of these pictures, one a portrait of the late Duke of Wellington. The Duke had been so frequently asked to sit, that the members of the commitee to whom the management was confided did not feel themselves warranted in requesting such a favor, and it was resolved that a copy of the head and face, from some acknowledged portrait by Sir T. Lawrence should be made, but that the Duke should be respectfully solicited for the use of his *sword*, *glass* and *cloak*, &c., so that there might be as much originality in the picture as possible. A three quarter portrait by Lawrence, belonging to the late Mr Arbuthnot was lent for the head, and one of the committee was commissioned to speak to the Duke, and request the use of the appointments alluded to.

When the circumstances were made known to him he assented immediately, and, with the greatest good humor, said "he would give as many sittings as might be necessary to make the picture an original." This offer was gratefully accepted, and the picture having been as much advanced as possible, the Duke gave the sittings required. He ordered that the cloak should be sent, but the sword was *missing*, and nowhere to be found. It was one with a very peculiar silver hilt, that had been mounted in India, and which he afterwards very generally wore during the whole of the Peninsular war, and for which he had a particular value. It had been painted in the picture, by Lawrence, belonging to Sir R. Peel. A hasty sketch of the sword was made from memory, in order to convey to the artist some idea of its peculiar shape. As we mentioned before, Mr. Robinson had been occasionally employed by Sir Thomas Lawrence, and still had some acquaintance with the person who had been his servant. As this chance (remote as it was) of learning something about the sword thus offered itself, Mr. Robinson took the pencil sketch to the man, who said, "there was a large number of swords, canes, whips, parasols, &c., unreclaimed, which were still collected, and were to be sold with various effects in a short time." They visited the store, and *from the sketch* identified the *very sword* which had never been sent back to the Duke, who was not aware of its loss, and totally ignorant of where it was; and as it had no name, or cypher, or ticket attached to it, it was utterly unknown and unnoticed, and would have been sold by auction without comment or observation, in a very few weeks, had it not been for this fortunate circumstance. Application was immediately made to the executor, and the sword was returned to the Duke, very much to his surprise and gratification, at his last sitting. Our readers may remember a discussion, in which Mr. Heaphy was concerned, that appeared in the daily papers some months since, respecting this sword; it is therefore unnecessary for us to enter upon the matter, which, after all, is of little importance.

The other portraits painted by Mr. Robinson for the United Service Club were, one of Lord Nelson, after Hoppner's picture in the Greenwich Hospital; George III., after Sir W. Beechy; and Sir John Moore, made into a full-length from a half-length by Lawrence. About this period

Mr. Robinson was introduced, through the late Countess de Grey's generous influence, to some members of the Royal family, and had the distinguished honor to paint the portrait of Her Royal Highness the late Princess Sophia; he also copied, for the Duchess of Gloucester, a portrait of the late Duke of York. It would be useless to attempt, in a brief memoir like this, any enumeration of Mr. Robinson's numerous works; neither is it required. It is sufficient to know that he was an example, out of many, who rose by their own self-sustained energies through trials and disappointments, to a position which is ever the reward of those who persevere to the end. In disposition Mr. Robinson was extremely affectionate, and his manners were modest and unassuming. He died at his residence, in Leeds, at the early age of thirty-nine years, of decline, August 1839, leaving a young family of children unprovided for, but who now hold honorable positions in life; and one of the daughters practises, with some success, her father's profession. Though the death of this artist occurred so long since, there are circumstances connected with his career which we deem of sufficient interest just now to find a place in our columns, and we do not believe that any memoir of Mr. Robinson has yet been published.

OUR DAGUERREAN GALLERIES.—No. 1.

THE MEADE GALLERY, NEW YORK.

IT is worthy of remark that this splendid daguerreotype establishment was built and adapted expressly for all branches of this most curious art; no expense it appears has been spared to introduce into it all the luxuries of modern times, and setting aside the great value of miniatures, views, &c. produced by this process, the resources of this great art are developed in an extraordinary degree in its application to other arts, and we find that the most eminent artists in America are executing works from daguerreotypes taken in these galleries to a degree of perfection which would be impossible to attain without their aid. Portrait and miniature painters, sculptors, engravers on steel and wood, lithographers, die cutters, &c., here obtain that aid which they cannot procure from any other source. Besides, the merit awarded to these pictures by public opinion and the Press of the United States, they have received several medals from the different Fairs and also presents and complimentary letters from the crowned heads of Europe. We will give a slight sketch of some of the most prominent pictures in the collection which amounts now to over one thousand, some of them on plates 12 x 16½ inches. First, Daguerre, the Father of the Art, taken in France in 1848, also a fine view of his chateau at Bri sur Marne, where he died last July. One of the Brothers leaves for Europe this month and will return with many valuable pictures of modern Europe and the Holy Land, also a view of the monument to Daguerre. There is to be another monument erected to Neipce and Daguerre in France, and Mr. Meade takes with him the American contribution to that structure. Mr. Neipce was the associate of Daguerre in his experiment, and he no doubt rendered efficient aid in the discovery. The only pictures of Daguerre from life in America are in this establishment. One portion of the building is used as a store for goods used in the art which the Messrs Meade import and send to all parts of the world. The last pictures ever taken of those distinguished patriots, Clay and Webster, are also here, the value of the latter may be imagined, when his son, Fletcher Webster, Esq. had copies made from the picture for himself; while Ritchie is executing an engraving, Jones a medallion, and C. C. Wright a gold and 3,505 bronze medals

from the profile views of the illustrious Statesman's face; next comes Louis Napoleon, Emperor of France, Count D' Orsay, the leader of the bon ton, now deceased. The eccentric Lola Montez, Countess of Landsfeldt in variety of costumes, Gen. Lopez, garroted at Havanna, Louis Kossuth, the brilliant orator, "Kit Carson," Billy Bowlegs, the Seminole warrior and suite; a fine panoramic view of the City of San Francisco, California, the Falls of Niagara, Shakespear's House, Stratford-on-Avon, the Boulevards, Place de la Concord, Arc de Triumph, Madalene, Notre Dame, &c., in Paris. Prof. Morse, the inventor of the telegraph; the sable Emperor and Empress of Hati; General Paez, Jenny Lind, Kate Hays, Commodore Perry of the Japan Expedition, Edwin Forrest, Views in North and South America, American Statesmen, Actors, Poets and Divines, embracing nearly all persons, male and female, of celebrity, of modern times, many of whom are deceased. In this picture visitors will readily recognise Miss Louisa Luckey, the agreeable manageress of this department—her pleasing manners and knowledge of the business, makes it very pleasant for ladies and children sitting for their pictures. The Meade Brothers take every style of picture known in this beautiful art. They have one of the largest apparatus in the world; their chemically colored daguerreotypes are much admired. They have two separate rooms for sitters with toilette rooms adjoining, and two large sky-lights with conveniences for taking groups of schools, colleges, military and fire companies. The wonderful stereoscopic or solid daguerreotypes. This popular establishment is now one of the lions of New York, and is well worth a visit from the resident or passing traveler.

PRACTICAL TREATISE ON PHOTOGRAPHY UPON PAPER AND GLASS AND METALLIC PLATES.

TRANSLATED BY MRS. A. L. SNELLING, FROM THE FRENCH OF M. AUBREE, CHEMIST.

Associate member of the Linean Society, Chemical and Physical, of Paris.

SECOND PART.

POSITIVE IMAGE.

First preparation—First bath.

Chloride of soda.....16 gr.
Distilled water.....250 gr.

DISSOLVE the salt in the distilled water, then filter it. This solution changes so easily that it is necessary to renew it from time to time. When you wish to prepare some positive paper, it will be necessary to make all the manipulation you wish to follow, in an apartment lighted only with a wax candle. Pour the solution of salt upon the paper in a basin; then apply a cover of strong paper, and be careful to cut it to the desired size, mark the paper to be prepared with a crayon, in order to know the side which has been in contact with the solution. Leave this sheet upon the bath of chloride solution until it has become sufficiently impregnated. It is necessary to bestow some time at least at the commencement of this operation, to be assured that there does not exist small globules of air, which, not being destroyed, form spots.

When you judge your sheet suffieiently impregnated, take it from the bath, and dry it between two sheets of blotting paper, you will obtain positive salt.

When your sheet of paper is dry, which you must assure yourself of, and also of a uniform color, put it immediately into the following bath for five minutes.

Second preparation—Second bath.

Distilled water.....250 gr
Crystalized nitrate of silver..34 gr.

Dissolve the nitrate of silver in the distilled water and filter it. This preparation it is necessary to preserve in a flask kept in the dark in order to prevent its turning black. Put this solution of silver into a silver dish and apply to it your sheet of paper on the side which has been in contact with the chloride water. You must take the precaution to watch this sheet of paper from time to time to be sure that there are no globules of air upon it; after four minutes, draw out the sheet of paper and suspend it by a pin to a hook.

It is necessary for this preparation to remain in complete obscurity.

When the paper is dry, preserve it by putting it between some sheets of blotting paper—sheltered from the light.

It is not necessary to prepare a great quantity of the positive paper at a time—because, in spite of all precautions, it becomes discolored after a few days preparation.

REPRODUCTION OF THE PROOF.

The reproduction of the negative proof, is very simple and offers few difficulties.

You commence at first by drying with great care the two glass plates which are to be used for this reproduction of the positive proof, when you are convinced that the glass plates are in good condition, and especially, that they are exempt from any trace of the nitrate of silver, proceed in the following manner.

Take the negative proof and lean it upon one of the mirrors, the side impressed being placed in front, lean upon it the positive paper, the nitrated side in contact with the negative. Apply upon it a piece of black paper, then the second glass plate. Put the whole into a frame, and secure it by a lid and cross bar. In this way you can see the progress of development of the impression, if the two papers are not disturbed; you then expose the frame to the solar light, in such a manner that the sun may fall freely upon the outside of the negative proof.

The time of exposition varies from fifteen to twenty minutes, according to the intensity and purity of the light.

We can obtain a positive proof in diffused light, but then it will be necessary to prolong the exposition and the results will not be as satisfactory, the positive proof will always have more vigor if it has been obtained by a vivid light.

To judge of the progress of the proofs some operators suffer some of the positive paper to extend beyond the edges of the glass, the paper will take all the different tints, passing to grey and successively to rose, lilac, violet, black, grey, blue, deep and clear green, at the last tint the proof ought to be good. In the meantime, if we can be able to open the frame without deranging the proofs it will be preferable, as we can then ascertain with certainty the progress of the operation.

Contrary to the advice of certain operators, I observe the principles of not pushing the exposition to an extreme degree, because the whites of the proofs will become blacks and will never take the tint they should have.

As soon as you judge your exposition to the solar light sufficient, take your portrait from the plate, and put it into a basin filled with ordinary water, you can put in all the proofs you wish to produce, taking the precaution to change the water occasionally as it becomes milky by the earthy salts which are decomposed by the nitrate of silver. After remaining a quarter of an hour, or half an hour in the water, plunge them into the following bath which will serve to fix them.

Third preparation—Third bath.

Filtered water.....1 litre.
Hyposulphite of soda..90 gr.

Dissolve the hyposulphite of soda in the water, and when it is filtered pour this solution into a hand basin; plunge your proofs into it; they will soon take a tint of shumac, and afterwards of a chocolate color, to attain which tint the image must be very vigorous.

When the proof submitted to the action of the hyposulphite of soda has arrived at the point we desire, it will be necessary to take it from this bath, no matter what time it may have been in it, and plunge it anew while impregnated with the hyposulphite of soda into a bath prepared as follows.

Fourth preparation—Fourth bath.

Common water.....500 gr.
Pure nitric acid.....8 gr.

Put together the two liquids, and the bath is prepared.

Pour this solution into a dish, and plunge your proof into it, which will soon change to a fine black if you desire it. It will be necessary to watch your portrait very narrowly, in order to take it out at the proper time, when it has obtained the proper tint.

If you leave the portrait too long in contact with the acidulated water, the portrait will be defaced if it is feeble, or will become soft and covered with a kind of cloud, or will take a villianous yellow tint very disagreeable to the eye. A little practice will suffice to enable you to appreciate the advantage of this precious discovery, which belongs to me.

The solution becomes decomposed during this last preparation, and the sulphuric acid disengages itself and forms a sulphuret of silver, which gives black tones to the proof.

It will be necessary to renew the bath often as it becomes milky and filled with a deposit of black sulphate of silver, which we should take the precaution of not leaving too long in the bath. When the portrait has taken the tint you desire, put it into a dish of fresh water to cleanse it of the acid; then dry it between two sheets of blotting paper, which alone will serve the purpose. The proof thus fixed cannot be changed by the light, or even the greater part of the chemical agents. The deuto-chlorate of mercury (corrosive sublimate) or another agent more powerful still, the cyanide of potassium only can completely deface the image. It is well to know that the proof can be retouched; for in plunging it into a solution of this salt, all the parts touched with the salts of silver dissolve and disappear, leaving the Indian ink or the sepia tints, which serves to restore them.

CHEMICAL PRODUCTS.

Ioduret of Potassium.
Bromide of Potassium.
Fluoride of Potassium.
Cyanuret of Potassium.
Ammoniate of Potassium.
Liquid Ammonia.
Rectified Alcohol at 36°
Crystalized Nitrate of Silver.
Crystalized Acetate of Silver.
Gallic Acid.
Pure Chloride of soda.
Hyposulphite of soda.
Pure Nitric Acid.
Distilled water.

THIRD PART.

OF GLASS AND THE VARIOUS PREPARATIONS FOR OBTAINING PHOTOGRAPHIC IMAGES.

If M. Talbot is the inventor of photography upon paper, M. Niepce de St. Victor is the inventor of photography upon glass. To him belongs the honor of this new process, which is destined to give important results.

Let photographists who sincerely wish the improvement of this immortal discovery, publish results of the modifications that they employ in their processes, and we shall soon see photography flourish the first among the arts. We can hope much of the glass, when we can see the progress made from day to day, and the fine results obtained

The glass from its transparency, and the *homo genite* of its surfaces, is really the substance most apt to receive a film of matter sensible to the light; but the greatest difficulty is to find a substance which will adhere together without dissolving in the bath.

Many persons, and myself first, have tried the gelatine of several of certain mucilages dissolved in ammonia, serum, &c. Each of us have produced, with these divers substances, proofs more or less fine, of which some have the approbation of the Academy of science, and that of the public in general, as they are anxious to learn—but all these processes leave much to desire.

It was reserved for M. Niepce de St. Victor to have the happy thought that albumen at the ordinary temperature, can amalgamate with the iodide of potassium, then to extend itself upon sheets of glass, adhering to them in drying, and becoming insoluble when they have arrived at a full degree of heat. To him then belongs the glory and merit of the process, and to our other photographists the task of contributing to its improvement.

CHOICE OF GLASS.

It is necessary to choose slender glasses as much as p ssible without streaks, of which the tint is white rather than greenish, and then to cut them to the necessary size. Wash them in the water in which you have dissolved some grains of potash, then wash them in common water, and dry them with linen. All these precautions being taken, the plate is ready to receive the film of any of the divers substances indispensable to the formation of the photographic image.

TO BE CONTINUED.

PICTURE MAKING.—No. 2.

BY D. D. T. DAVIE, PHOT.

IN our previous number, we gave a description of plate cleaning, or the first step towards the production of daguerreotype pictures. We now come to buffing, a pa t of picturing which is performed in a great variety of ways, with many different kinds of machinery, and every movement that gen us can invent.

We will endeavor carefully to discuss the merits of such mod s of buffing, as seem to possess merit, and we wi l recommend that which we think possesses most merit, or that which p rforms its work quick st, cheapest, or best. The hand buff at times does its work very well, and very fine results are obtained by this mode of polishing, at other times it is impossible to work it with any success whatever, although to all appearance, the plate is in a fine condition. This uncertainty of success is a decided objection to this mode of buffing, although at times superior pictures are obtained in this way; it has been almost universally abandoned, on account of its liability to deceive. There are perhaps good philosophical reasons for the frequent changes in the hand buff. These changes may in a great measure be attributed to atmospheric influences, and we have invariably observed while using the hand buff that excessive heat or cold, wet or dry weather, has rendered it incapable to produce a pure sensitive polish; pictures on plates buffed under these circumstances, appeared cold and indistinct, and altogether d ficient in perspective.

The hand buff is necessarily much exposed to the atmosphere, which together with the inverted movement and changes of the nap of the skin at each st oke, loosens the rouge or powder with wh ch the buff is saturat d, and that fal ing upon the plate before the nap of the skin is changed, or about the time that the change is tak ng place, is forced into the soft and polished surface, with such violence that it can only be removed by a wet process of cl ani g.

Many experiments have been made by artists to ove come these diffiulti s, but none have been successful, and all efforts to polish by this movement with machinery, have fail d to obviate the difficulties that exist with the hand buff. The grindstone buff or flat top cylinder is used by some of our most successful artists, and another still is a buckskin belt, running on two pulleys, with an India-rubb r air ball or cylinder hung on pivots, which revolves between the two sides of the b lt; directly over this cylinder the plate is held, which gives it a very gentle and uniform pressure, and small plates are polished very speedily, and quite well by this process. The principle objections to this mode of polishing, is first, that with much speed the rouge or other powder is thrown from the belt as it passes over the pullies. Second, the splicing in the belt is a decided objection. This same objection stands against the grindstone cylinder. The cone buff is more generally used than any before men-

tioned. This may readily be covered with buckskin without a seam, and is undoubtedly the best plan for buffing plates yet known, especially for the last finish, a parabolic or horizontal convex oval, which, from twenty to thirty inches in diameter, polishes very rapidly, and for preparing the plates for the galvanic battery, where the curved lines does no harm, this wheel is preferable to all others. This may be covered with buckskin, canton flannel or velvet, the latter being used by many, but I prefer the former. Having expressed our opinion frankly of the various kinds of buffs, we will next suggest a few hints in relation to keeping them in a good condition for service. First, any buff, no matter what its form or size may be, should be protected from dust and atmosphere when it is not in use.

Second, the old rouge or whatever powder is used, should be carefully brushed out every morning, the buff well cleaned with Canton flannel, and a new supply of rouge carefully distributed over the entire surface of the buff; if used constantly, it should be saturated two or three times during the day. Plumbago is an excellent article for the buff, and should be used once a week or oftener, where the buff is in constant service. The ball is generally preferred, but the pure fine powder is equally as good, though not as economical. Plumbago is more necessary on the first buff, as it materially sharpens it, it also purifies the skin or buff, which is very desirable in this respect; it is highly important on the finishing buff. Rouge is doubtless the best powder used for polishing daguerreotype plates; this is at least according to our experience. Lampblack is used by some, a mixture of rouge and lampblack by some thought to be best, and many other preparations too numerous to mention, are recommended; but we have seen the best and most certain results with rouge used according to the above suggestions; we have said nothing about drying buffs by artificial heat, from the fact that we find no necessity for doing so with cylinder buffs.—*Scientific Daguerrean.*

THEORY OF PORTRAITURE.*

Translated from "La Lumiere," for the Photographic Art-Journal, by Ambrose Andrews.

THE human face is assuredly the most complete symbol of the infinite diversity which presides over the works of creation. Since the world began, nature, who has given birth to hundreds of millions of human beings has never perhaps, cast two faces in the same mould. To all she has imparted the same organs, distributed in conformity to certain laws of proportion, nearly constant; whilst in the detail, she has scattered such an inexhaustible variety, that even members of the same family although predisposed to resemble each other, would hardly at least to unpractised eyes, be taken one for the other.

Still more diverse is the power of the human mind to remember, to imagine, and to arrange; that power which creates within the little recesses of our brain fairy palaces, vast horizons, and entire worlds; that power, in short, which displays to our mental vision innumerable portraits, siezed on the wing, so animated and so faithfully true that we recognize the original if he chance to pass before us.

These portraits thus impressed upon the mind, are not achieved in a day. They are formed little by little, and, when the model is often at our disposal, they frequently become much modified and refined. How often are lovers heard to exclaim while in adoration before the graces of their

* Continued from page 36, Vol. 5, No. 1.

mistress, "The first time I saw her I scarcely thought her good looking." The discussions so frequently heard upon the degrees of charm contained in a particular physiognomy prove that the traits attached to various visages by the imagination are even more diversified than nature has made them.

A person may be pictured in our mind, under a dozen different aspects, and yet our neighbor might depict that same personage so widely dissimilar that it would hardly be recognizable to us were he to render the image in his mind visible to our eyes.

These are ideas which could not have been advanced with certainty, previous to the experimentations and developments of heliography, but which will now very soon pass into the domain of established truths. One of our co-laborers, M. Bernard, has just related to me an incident, which offers a striking illustration of this. One day he obtained in the space of an hour, three portraits of a lady, which were, by her friends, judged to be of various degrees of resemblance. But it was found impossible to convince those who had never seen the original, that these three pictures were from one and the same face. They persisted in distinguishing three decided individualities, and found that of these three women, one was ugly, the other middling good looking, and the third a rare beauty. Evidently this last picture alone constituted a good portrait, such as fulfilled the conditions of art, for while it was not less precise than the other two, it yet realized all the charm of physiognomy.

From this it may be seen how much the heliographer ought to study his model, not in one point of view only, but in divers aspects and in various lights. His attitudes and positions should be chosen with the most scrupulous attention.

Hitherto operators have for the most part restricted themselves to such manuel precautions as the keeping the hands, the elbows and the knees from projecting forward from the figure so as to avoid perspective exaggerations. But these are not alone sufficient. It is mind, spirit and soul, that should play the most important part in these preliminary arrangements.

Here the part of interpretation is almost, if not quite, as great as in painting. But in heliography there is an important peculiarity; it is spontaneous. It excludes all mixed processes, and successive corrections, and, consequently, demands on the part of the practitioner a corresponding certainty of eye. In order to ensure a happy result, he should understand intimately the resources of art; he should know how to deduce laws for the regulations of his models, and be able to forsee in the general aspect which nature presents to his view, what will be the effect of the picture when completed.

Most faces will acquire or lose the plenitude of their character according to whether they are well or ill lighted. How many times has it happened to each one of us, to encounter in a drawing room or elsewhere, a person in such a light that at first, we did not readily recognise him; or catch a glimpse of a woman who at first appeared quite ordinary but on seeing her turn her head, or change her place a rare beauty was revealed.

There exists then, for the heliographer, as well as the painter, the double problem, how to unite the charms of ideal resemblance to sober reality. For the photographer thus to interpret nature, he must choose from the diversified aspects of every day life, and this choice must be subordinate to general laws of fitness, of agreement, and conformity.

We may divide into three classes, the various models which nature presents. One impresses us by purity and nobleness of outline; the other by physiognomy, by color, and by animated expression. The first are proper subjects for style, and they awaken in us elevated thought of the ideal; the second, recommends itself by the graceful play of pretty faces; whilst the third class comprises a very large number of faces, neither beautiful nor ugly, and offer nothing worthy of our choice.

In reproducing models of the first class, avoid the too complicated effects of light and shade and seek the aspect which will present the forms with such breadth and simplicity as will allow the spectator to fix his attention upon their quiet noble harmony of lines, without perplexity or distraction.

But with heads where a sort of witching *fantasie* presides; those sweet, attractive, fascinating faces, an opposite method is re-

quired. Here the lights, the shades, with the reflections which warm and soften them, should be so skillfully combined as to disguise any irregularity of feature, and give the idea of actual movement and of living expression.

Nor must you think that the unmeaning and vulgar heads are to be wholly neglected. It was to this class of models that the Flemish painters of former times were indebted for some of their most brilliant successes. It is exceedingly rare to find a mortal creature who has not, one time, at least, aspired to the tender emotions. Now all that hath ever loved and been beloved, must possess some degree of grace more or less perceptible, although more or less fleeting, and art, which is but passion *par excellence* should acquiesce in allowing to all some share in this fleeting kind of illusion. To reproduce a face, such as every one figures it to himself is a work of talent, certainly, but to see it, and feel it under new and agreeable points of view and so to reveal that interpretation, as to lead the spectator to see and feel it as the artist saw and felt it, this is indeed more than talent, this is the work of genius!

This slight of hand sort of management, characterises the style of Rembrandt, Valesques, and some others. It is by the strangeness of the effect produced by the potency of contrasts, by the brilliancy of lights, by the extreme depth of shades, that they have succeeded in rendering the effect of their heads so striking that while viewing them we forget to analyse or to criticise any of the particular features. Besides, on occasions when they have sought such effects, these great artists have adjusted their faces with infinite address, choosing with skill and intelligence the portions upon which they would pour their broadest and brightest streams of light. Any occasional meagreness of form they disguised by artfully losing it in tones which would harmonise with the back grounds or accessories, and thus the reliefs are shown with much vigor, and the models reproduced with such energy, that the eye arrested by the general view forgets to analyse, or to examine with critical nicety. On viewing one of their portraits, even though it be that of an ugly person, the spectator, vanquished by the genius of the artist exclaims: Behold, how truly magnificent!

Thus it belongs to colorists, to cause laurels to bloom and flourish upon an ungrateful soil; and, it may be remarked in this connection, that photography, in its best productions is beginning to pronounce the panegeric of those schools most devoted to the cultivation of color. M. M. Le Gray, Mestral and some others have openly and freely entered the lists as competitors in following some particular style or character of heads, as, for instance, portraits *a la Van Dyck*, portraits *a la Rembrandt*, &c., and, moreover, individual taste has become so evident, that our principal operators can easily discern, at the first view of a proof, who among them it was that produced it. From the time when this distinction became possible, heliography may claim the honor of forming real artists.

There is one condition or attribute of art upon which it is highly important that practitioners should study and meditate; it is that which constitutes style.

Nothing can be more contrary to artistic taste and style, than indiscriminate prolixity of detail. The shops of the quays, of the *Palais National*, and *Boulevards*, furnish frequent examples of this, where the head, sacrificed to a profusion of puerile accessories occupies but a secondary position. Figured tapestries, flowered vests, Scotch plaid cravats, watches, chains, trinkets, and gew-gaws, tables loaded with papers, ink stands, statutes, Japan vases, &c. are all only so many distractions which it were well to avoid inflicting upon the public.

When the painters encounter these difficulties, it is in their power, by recourse to the local tints, and other resources of their art to correct whatever of crudity or gaudy vulgarity, these glittering details may present. And, here again, the most able artist will exhibit the most judicious and discriminating moderation.

But daguerreotype knows nothing of these salutary resources, and the more shining and minute the details introduced, the more conspicuous will they appear, so much so, that the head, which ought to be the principal subject, becomes eclipsed, and robbed of its interest; and the picture void of unity, and glaring all over, concentrates the attention nowhere.

The theory of sacrifices, so largely practised by Van Dyck, Rembrandt, and Titian ought to be still more thoroughly un-

derstood by the heliographic artist. Those great painters generally displayed their head glowing with light and colors, in the midst of sombre vapory atmospheres and descending towards the bottom of the picture, their backgrounds were made darker and darker, until along down the shoulders they became confounded with the folds of the vestments, which were broadly layed in with a deep thick body color. With the human body they avoided all hard lines from head to foot. Their portraits did not, like some daguerreotype specimens, resemble fried fish stuck fast to a silver plate.

Now, in portraiture, what is the end and purpose of these sacrifices; whereby means of a judicious distribution of the light and shades, a modification or suppression of certain details is accomplished? It is to concentrate attention upon the faces, to heighten their light and impart to them the radiancy of life. What we look for in a portrait, is the original, and the able artist manages his picture so that the personage can be seen without the least distraction; so that a passing glance shall arrest the attention. His interpretation, truer even than simple reality, satisfies the mind by releasing it from needless attention to such objects and details as we would not care to look after in real life.

This primary law of portraiture neglected by inferior painters in proportion to their lack of talent, has also been trangressed by most heliographers, and, hence, their portraits have so often given dissatisfaction by a sort of vulgarity and absence of thought; and this in short, is, why their pictures excite the curiosity without imparting the satisfaction which belongs to works of art

Photographers are very ready to attribute the difficulty of introducing the life and expression of physiognomy into their portraits, to the slowness of the process; which obliges the sitter to remain too long immovably fixed. But this is not a sufficient reason, since in every twenty portraits, there are some five or six at least, which exhibit surprising vivacity of expression. We think that success, in this respect, depends on the effect of general arrangement, and above all upon *the nature of the background.* This is a point upon which we can scarcely reflect too much. I have seen portraits painted which seemed flat and spiritless, until the artist simply changed the shade of the ground when suddenly the head shone forth with life and animation.

A well sustained depth of ground allows the shades to be rendered with great force, to the manifest advantage of the lights. If I am not mistaken, cloth of a violet color will make a good quality of ground, because the red, which forms the base of that shade, by the daguerrean process, comes out much strengthened; while the blue which combines with the red in producing violet, weakens and softens the tint giving to it that misty or atmospheric appearance which the background of a portrait ought always to have.

There is one thing which it is also important to avoid. It is a danger which painters often fall into when they paint a single figure upon a large canvass. The background is frequently so extensive that the equilibrium cannot be maintained between the portrait and its ground, the excessive dimensions of which make it do the part of an injudicious *basso continuo,* whose ceaseless roaring destroy all harmony of sound. The Flemish painters, however, inclined to the opposite danger of filling up the canvass too much.

In a bust portrait, it is sufficient if there is space of ground between the figure and the borders of the canvass or plate, equal to half the height of the head. But if the portrait is seen to the knees or to the feet, then, in order that the body may seem able to move in the frame no more space would be necessary than about the breadth of the arm provided the draperies or the vestments, in proportion as they recede from the figure, serve the purpose of background to it; in which case they should attain the value of the ground, in regard to depth, tone, color, &c.

This rule is especially applicable to portraits of men, whose meagre disagreeable costume sit is very desirable to disguise.

The body may be thrown to the right or to the left, provided the head partake of the imaginary vertical line, which should divide the field of every portrait into two equal parts. It is, in fact, towards the centre of the picture that the eye naturally inclines, and it is important that it should be well received there by the principal object. Whatever may be the movement given to the body, it should be such

that the head be not thrown out of the centre of gravity, otherwise the portrait would not appear upright, and the whole would present a sort of staggering appearance. Although these precepts may perhaps be passed over as mere elementary, yet an attentive and frequent observation of heliographic portraits has convinced me that they are far from being out of season. Moreover, the peculiar facilities which photographers have of initiating themselves into the elevated traditions of art; the easy means of comparison which they have within their reach, ought not to be neglected. Is it not abundantly sufficient for them that they can so at pleasure reproduce upon paper, fac-simile copies of portraits by VanDyck, by Rubens, by Titian, by Rembrandt, by Rudhon, &c.; that they can with such facility bring together, examine, and compare these collections of heliographic engravings of portraits, obtained from nature by such master hands, and that they can thus, so easily assimilate those qualities of interpretation, which so elevate the works of the old masters?

It will be salutary also, to learn better modes of mounting heliographic impressions, and on this subject we may obtain useful hints, by running over cartoons of engravings, and examining collections of original designs, neatly adjusted upon bristol boards or upon cartoon grounds, (*guards de papier*) and surmounted with tasteful borders. The custom of slipping the four corners through slits cut in the cartoon ground is displeasing to the eye. Frame works of bluish or of dingy white paper, but poorly agree with photography, whose lights are ruined by them; and, finally, the practice of enclosing the design by half a dozen lines drawn around them with ink has a very meagre effect. Would it not be far better to take drawing paper of fine texture and sufficiently thick to allow a delicate line of shade to be drawn upon it, then bind this shade or border—which should be of a quiet nature—to the tint of the proof by means of a mould or line, in gold mat, delicately traced with a pencil upon the cartoon?

It is in this way that the ablest designers present their works, and heliographic proofs, by their nature resemble original designs more than the works of the burin or lithographs. It is proper also, that the breadth of the margin should be in proportion to the fineness of the design; for, the more the eye may have been occupied, the more will it need repose; photographic design, therefore, need broad margins.

Everything crude, everything coarse, injures the delicate impressionss produced by photography, the effect of which are so charming and delightful; which presents the smallest objects with the utmost minuteness, and at the same time void of dryness. For this reason, heliographers will do well to renounce the practice of writing their names and places of business in large characters like the unpoetical writing of procuring clerks, as is done by many without scruple. These coarse letters written large as life, close to a design which embraces such delicate minutiæ, obtrude themselves upon the attention, offend the eye and spoil the illusion.

Doubtless, it is quite right to put ones name to one's work; but then, artists ought not to flourish off their autograph, as if they were signing a "receipt in full of all demands," but they should take a fine crayon, lead pencil or pale ink, and proportion the characters to the dimension of the design. These titles should be delicately traced in very fine letters, and be but little seen; and as to the place it seems proper to conform to the practice of the engravers, which has been consecrated by immemorable usage.

Frames of ebony, rosewood, mahogany, &c., are generally detestable, giving to the picture a dead like paleness, by becoming confounded with the obscurity of outside shades and shadows, they in reality hardly perform the office of a frame at all. But we ought to have recourse as far as possible to plain chaste golden mats, avoiding all those chased embellishments of wreathe and flowers, and the glitter of burnishings, and, in short, all meritricious ornaments. The daguerrean process gives off such an ample sufficiency of details, that one of the functions of the frame ought to be, to introduce composure and repose to the view.

Although these remarks may appear trivial or common place, they are far from being so. It is true that they relate to little trifles but these trifles are what show the taste of the artist; and in photographic productions the part of individual talent is so re-

stricted and concealed that the public will be prone to attach a value to it even in the most apparently indifferent minuitiæ.

When a person has received his picture, after curiously and approvingly examining it, he next perhaps meditates making an ornament of it for his parlor, but if,—on taking a general survey—the mounting betrays negligence or bad taste, a feeling of disappointment intervenes; a reaction takes place in his mind ; and under the influence of the revu tion he puts it aside as an object of little worth, and without entirely withdrawing his admiration for the innate charms of the photographic image, he yet abandons the idea of making a parlor ornament of it, and exclaims, "true it is wonderful, but there is something wanting—it is not so fine after all."

What then is it that is wanting? Nothing except those little graces ; those easy seductions ; those accessory trifles (*la mise en scene*) which serve to present a picture favorably to our view, but which in themselves are only secondary attractions of a work of art.

Absolute reality is so barely flattering that we must often disguise it, and resort to all imaginable coquetries to make it acceptable. Art delights in caressing our illusions, and in offering herself to our imagination as a golden dream. And we should not forget that public favor is oftentimes due to numerous little artifices, which escape general notice. To convince our judge is doubtless an essential point but at the same time it is prudent to begin by exciting his sympathies.

In conclusion, we advise all heliographers who intend making portraiture their profession, at once to enter upon a thorough study of style, of grace, and the science of effect. We must say to them that the circumstance of the times are much in their favor, notwithstanding the opinion of M. Delecluse, who considers this branch of the fine arts to be so greatly in advance of the others ; a rather surprising opinion to assume, in the midst of an age and a country boasting of the most admirable school of landscape painters that has ever existed. Indeed, so far from this being the case, we think that the portrait painters themselves, of our day, have quite as much to gain by the study of the old masters, as the heliographers ; while the latter we also think, have less distance to travel to reach the ideal, than the former have to attain to pure reality which has disappeared before the three radical defects of the present generation. These defects—which have been magnified into principles or dogmas of the schools,—are ostentatious mannerism (*ponsif*) gothic dryness and brutal coarseness, and they have quite supplanted the simple grace, the purity of drawing, and the vigor of effect which characterise the great painters of former times.

FRANCIS WEY.

For the Photographic Art-Journal.

A POETICAL PICTURE.

TO G— H—.

Thy pale, high brow is sorrowful,
And shadow'd o'er with grief and care,
And strife with this cold world of ours,
Has left its sad'ning impress there.

Thine eyes unsearchingly as fate
Seem glancing at futurity.
Dream on—dream on—'Tis all in vain,
Thou can'st not scan thy destiny.

What would'st thou see? Fames' burning star
Luring thee: on life's changing sky,
Dazzlingly bright and beautiful ;
A moment seen—then floating by.

Oh! trust it not—its meteor glare,
More fickle than the fire-fly's light,
Leads us to utter hopelessness,
And leaves the soul in endless night.—L.

From La Lumiere.

THE HELIOCHROMATYPE OF M. NIEPCE DE ST. VICTOR.

TRANSLATED AY AMBROSE ANDREWS.

THIRD MEMOIR;

ON HELIOCHROMIE.

IN this paper I shall treat principally of certain optical phenomena which I have observed while pursuing my experiments, to fix the colors of nature by the camera.

Having obtained by contact,—that is, by applying the face of a colored engraving to a sensitive plate, and covering it with a glass, and exposing it to the light—all that was possible to attain in that stage of the business, I then sought to attain the same results, in the camera. As I had anticipated I encountered great difficulties, but to a certain point have succeeded in surmounting them.

I have now ascertained that the reproduction of all the colors is possible, and that in order to obtain them it only remains to learn how to prepare the plate in a manner most suitable for the process. I commenced the experiments, by copying in the camera, some colored engravings, then artificial and natural flowers, and then still life, (*la nature mort.*) I took a doll figure which I dressed with stuffs of different colors, trimmed with gold and silver galoon, and all these colors I have obtained. And what is very curious and extraordinary is, that the gold and silver was painted with their true metallic lustre.

I have also produced pictures of porcelain, crystal, alabaster, precious stones and glasses, with the lustre which belongs to them; and while pursuing my experiments with these, I observed an exceedingly curious fact, which I think I ought to insert here. I had exposed to the camera a deep green glass which gave a yellow image, instead of green, whilst a high green glass placed by the side of the other, was perfectly reproduced with its true color.

The great difficulty—and that which had all along, until now, obstructed my progress—was to obtain the various colors all at once; nevertheless, this is possible, since I have succeeded in doing it several times.

All clear tints are reproduced much quicker and better than deep colors; that is, the nearer they approach to white, the more easily are they reproduced, and the nearer they approach to black, the more difficult is it to reproduce them. This indeed might be forseen, since the more luminous the colors, the greater is their photogenic action.

Bodies which most reflect white light, are those also which are the best reproduced; consequently, white light so far from hindering the reproduction of colors, renders it, on the contrary, much easier as has just been shown.

Having observed that clear and shining tints are reproduced a great deal better than deep thick colors, provided the first be not exposed to the direct rays of the sun—in which case they reflect the light like a mirror, and turn the image in particular parts—I tried the effect of operating through a camera with the lightest interior possible, and for that purpose had one lined inside with white paper.

The results, so far as regards their production of colors—which it was the end and object of my experiments to demonstrate—were at least equal to those obtained from the black camera.

I then tried a camera lined inside with glass inlaid with tin, and still obtained the same results, although such a camera is contrary to all received photogenic rules.

Nevertheless, I have not been able to assure myself positively, whether it is really an advantage to use these two descriptions of camera, in preference to any others for the purpose of producing powerful effects, and for rapidity of operating, because the means I have used have not thus far

allowed me to make my comparative experiments, with sufficiently exact calculations.

Inasmuch as light colors are reproduced more easily, and especially more promptly than deep colors, it is important that the tints of the sitter's dress be nearly of the same tone, that is, when it is desirable to obtain them all at once; otherwise, the clear tints will pass the just point, before the dark ones can come up to it.

Still, colors of different tones can be obtained simultaneously, by taking the precaution to have the deep colors of a brilliant or glossy appearance, which I have practised with success.

The most difficult color to obtain along with the others is deep green, like that of foliage, for the reason that green rays have but little photogenic action, being almost as inert as black itself; nevertheless, light green is very well reproduced, especially if it be brilliant, as for instance, green glazed paper.

To obtain deep green, the plate should be scarcely warmed, before exposing it to the light, whilst for most other colors, especially fine white, it is necessary, as I have stated on a former occasion, that the sensitive coating be brought, by the heat of a spirit-lamp to a cherry red. But this red tint has its inconveniences, causing the blacks and dark shapes to remain almost red; however, it does sometimes happen that even the blacks are very well indicated, particularly when the operation is by contact.

I have tried by all the means at present in my power, to dispense with this preparation, by raising the temperature, but have not yet found it to be possible.

It was by the following experiments that I have been put on the track which I confidently hope will conduct me to a complete solution of the problem of heliochromie.

If on taking the plate from the bath, it be just dried, without raising the temperature to the point of changing the color, and in this state if it be covered with a colored engraving and exposed to the light for a very short time, the engraving will be reproduced with all its colors; but in a majority of cases, the colors are not visible; it is only some few of them that will appear, when the exposure to the light has been sufficiently prolonged; these are the greens, the reds, and sometimes the blues; several of the other colors, and frequently all of them, although certainly produced, still remain in a latent state, which is proved as follows. Take the pledget of cotton, impregnated with ammonia which had served to clean the plate, and rub the plate gently with it, when you will very soon see the image appear little by little, with all the colors.

In order to do this, you must remove the outside film of the chloride of silver, so as to reach the deeper undercoating which adheres immediately to the silver plate and on which the image is formed.

From this it will be seen that it only remains now to find some substance that shall develop the image, and which may perhaps at the same time fix the colors. This accomplished, the great problem will be entirely solved.

In the course of my multiplied researches, made to this end, I have remarked that when the vapor of mercury is employed, the image, although very well developed, will be of a uniform grey tone, without any trace of color; this image although differing in appearance from the daguerrean image, is yet like it in one respect; it shows a positive image in one point of view and negative in another.

A weak solution of gallic acid, with the addition of a few drops of ammonia, will equally cause the image to appear, especially if the plate be a little warmed, and then dried without washing. The image which then appears, will be quite similar to that produced by mercury; but, if to the gallic acid, a few drops of aceto-azotate of silver be added, it becomes almost black.

The time of exposure, necessary for the production of the colors, varies considerably according to the preparations of the plate; but I have very much abridged the time, having obtained proofs in the sun, with a German camera, upon a half-size plate, in less than a quarter of an hour, and in diffused light in less than an hour. Although it is true that the more sensitive the plate, the more rapidly do the colors come out, yet, thus far, I have not been able to obtain them in a moment; the question of permanent fixation remains to be solved, and as I have above suggested, this may perhaps, be connected with that

of finding out some substance, that shall develop the latent image.

Although much still remains to be accomplished yet the results that I have already obtained are, I think, truly extraordinary. The specimen proofs of my doll, where the model of the figure with the colors of the vestments, were all represented with great clearness; and the gold and silver galoon with their true metallic lustre, were also reproduced with great brilliancy, have excited the lively astonishment of those to whom I have shown them.

These proofs have already realized, in part, at least, the enthusiastic hopes of my late uncle, who used to say to one of his friends, the Marquis of Jonffroy, that the day would come when he could reproduce his image precisely as he saw it in the mirror. It is true, this immense progress has not yet been fully attained, but we can now indulge in the confident hope that we shall certainly attain to it at no distant day; for although the difficulties which yet remain to be vanquished are numerous and great, it nevertheless appears to me, that I have placed the possibility of entire success beyond all doubt.

Such are the facts which I have deemed it my duty to communicate at present, reserving it to myself to reveal, at some future time, the mode of preparing the plates which has conducted me to results which I have now the honor to lay before the Academy.

NIEPCE DE SAINT VICTOR.

Paris Nov. 6, 1852.

MINUTES OF THE N. Y. STATE DAGUERREAN ASSOCIATION.

SYRACUSE, Dec. 7th, 1852.

A special meeting of the N. Y. State Daguerrean Association, met at Davie's daguerrean rooms, D. D. T. Davie in the chair

Minutes of the last meeting read and approved.

Moved that the by-laws, relating to the election of members be suspended.

Moved, that Nichols, Benedict and Whitney, be a committee to investigate the character and good standing of the persons proposed for membership, and report at this meeting.

The treasurer's report was read and accepted.

Moved that the Secretary cause to be printed cards with the objects of the association, also the names of all the persons belonging to this association, and send one to each member.

The committee of investigation reported the names of J. B. Marcus, Chenango; G. Evans, Utica; L. Gray, Oswego; E. A. Hudson, Syracuse; Mrs. Agnes M. Armstrong, Peekskill; Mrs. Marcilia W. Barnes, Salem Cross Roads; all of whom were unanimously elected.

Moved, that the Report of the Committee on the Daguerrean monument be laid on the table.

Moved, that the by-laws relating to the election of Hon. members be suspended. The following names were offered and unanimously elected. Professor Curry, Geneva; Prof. Dewey, Rochester; Prof. Avery, Clinton; H. L. Davis, Oswego; Mrs. Crocker, Syracuse.

Moved, that a committee of three be appointed to report to this meeting a plan for exhibiting pictures at the World's Fair, to be held in the city of New York in 1853. The chair appointed Marcus Benedict and J. Davie, said Committee.

Moved, that Article 1, of the Constitution, be amended, and that the office of Corresponding Secretary be struck out.

The Convention went into the election of officers, which resulted in the election of D. D. T. Davie, as President; G. N. Barnard, Secretary; J. Davie, Treasurer.

The Committee appointed to suggest

some place for exhibiting pictures made by members of this association, reported as follows:

The Committee propose suitable frames for the exhibition of pictures, made by members; we deem it necessary to have two frames, one for whole plates, and one for half plates, all of which shall be mounted with G. C. Matts (oval or double Eliptic.)

The above resolution was amended so as to read one frame, and that the name of each contributor be placed on the frame, and that the picture become the property of the association.

Moved, that all the members of this association be requested to bring to our next meeting a half plate picture, as a specimen of their skill.

Moved, that Profs. Evans and Curry be appointed a Committee on daguerrean chemistry.

Moved, that a vote of thanks be tendered to the officers of this association, for their able manner in discharging their duty.

Moved, that a vote of thanks be tendered to J. Davie, for the use of his Hall

Moved, that the proceedings be published in the Photographic Art-Journal, and Scientific Daguerrean.

Moved, that we adjourn to meet in Auburn on the first Tuesday of May next.

D. D. T. DAVIE, President.

G. N. BARNARD, Secretary.

From the Illustrated Magazine of Art.

AMERICAN ANTIQUITIES AT THE LOUVRE.

IF, a century after the conquest of Mexico and Peru, any archæologists had been found to take as lively an interest in American antiquities as Boturini Benaduci did;* and if any *virtuosi*, forgetting, for a moment, the *chefs d'œuvre* of Rome and Athens, had devoted themselves, as did the Italian traveler, to the study of the somewhat barbarous arts, it is true, of the Aztecas, there might have been collected, even a hundred and fifty years ago, a number of statues, of paintings, and relics of innumerable idols, or even of symbolical books, which the great zeal of the pious Zummaraga, the first bishop of Mexico, had done all he could to destroy. Had such been the case, the small body of learned men who direct their attention in the nineteenth century to the antiquities of Anahuac and of Tihuanco, would not be compelled to remain satisfied with mere conjectures, as they are at present; it is, therefore, very praiseworthy of the directors of the museum at the Louvre to have prepared an asylum for those remains, often much dilapidated, and those fragments, often very roughly formed, which constitute the new collection. It must be owned, however, that the assemblage of these things, though it

* Lorenzo Boturini Benaduci was born of an old family in Milan, and went, in 1733, to New Spain. It was the Countess of Santillane, a descendant of Montezuma, who sent him to Mexico, to look after her affairs there. While engaged in the discharge of his duties, the Italian archæologist made the most incredible researches, in order to collect Aztec antiquities, learned the language of the Indians, and did not return to Europe before he had spent eight years in his scientific labors. It would take too much time to relate here how Boturini's collections were despoiled, how he himself was thrown into prison, and how he, at last, obtained complete redress, without, however, obtaining repossession of his treasures. Being appointed histiographer-general of the Indies, he spent the rest of his life at Madrid, where he finished the first volume of his *General History of North America*, which has never been published. He died about 1749. His book entitled, "Idea de una newa historia general de la America septentrional," is much sought after. It is a valuable catalogue of the antiquities he had succeeded in collecting together.

confers a real benefit on science, does not give us any very clear notions of the barbarous, yet often grand, art which struck the companions of Pizarro and Cortes with astonishment. Even the conqueror of Mexico, though well versed in the relics of antiquity, could not help participating in the admiration which this art still gave rise to in the sixteenth century.

There were three distinct centres of civilization in the New World: that is, three regions where the rudimentary art of sculpture was held in great veneration. Peru, Mexico, and the table-land of Cundinamarca are worthy, in this respect, of being examined successively. In consequence of their theocratical government and of their isolated position with respect to one another, each of these countries possessed an art that was peculiarly its own. Unfortunately, the new museum, which occupies one of the smallest chambers in the Louvre, does not contain any of the valuable antiquities of New Granada, but of which Monsieur Jomard, one of the stars of science, has succeeded in collecting some of the finest specimens. The directors, who have already made such praise-worthy exertions, will doubtless, soon take measures to supply this want. As for ourselves, passing over, for the present, the art of the Muiscas and that of the Peruvians, we will begin at once with that of the Mexicans, as being the most curious and perhaps the most varied.

Art among the Aztec nations was, above all, *hieratic*, that is, it assumed its fantastic and often monstrous forms under the direction of priests practising a barbarous kind of worship. It would, however, be an error to imagine that the statuaries of Tezeuco and Tenotchitlan confined themselves to the reproduction of the truly hideous idols which the symbolism of Mexican theogony imposed on the statuaries employed in the temples. We learn from the best authority, that Mexican art, devoting itself in a more direct manner to the study of nature, perpetuated by sculpture the likenesses of the sovereigns and great men of the country. Statues representing Netzahuatooyotl, the Solomon of Anahuac, had been executed over and over again, and the chronicles tell us that the statue of Montezuma ornamented the beginning of the famous aquednct which emptied its limpid water into the gardens of the imperial palace, which were themselves ornamented by the hand of the sculptor. The architects of Netzahualpilzintli executed a colossal head of this sovereign on a gigantic body of *amixtli* or of *cougard*, and every one hastened to admire this wonderful work, which was placed on the side of a mountain covered with large gardens. When Ixtlilochitl, one of the last independent chiefs of Mexico, accompanied Cortes in his memorable voyage towards the Pacific Ocean, he was followed by innumerable Indians, and forseeing, perhaps, the melancholy fate reserved for him by the ruthless conqueror, he was desirous of having his memory immortalized in a country ruled over by a sovereign who had been his ally; he, therefore, implored Apochpalan to order his sculptors to cut his statue in a very lofty block of rock which stood at a little distance from the road. "Apochpalan complied with his request," says a valuable memoir of the sixteenth century, "and his sculptors cut his statue in the rock as large as life, and represented him with the same arms he had been accustomed to wear. It is said that this statue can still be seen, an assertion corroborated by the national songs. Ixtlilochitl went to see it with Apochpalan, and, on beholding it, melted into tears. If the poets are to be believed, Apochpalan also wept, and all their attendants consoled them."

It would be useful to make a collection of several specimens of this kind, but both Europe and America hardly possess any of these monuments, which are the productions of an art freed from religious symbolism, and which iconography would have willingly reproduced, had such a thing been possible. Even the hideous statues which the priests of the blood-thirsty religion of Huitzlipuchtli and Tezcatlipuca had sculptured with such care and minuteness have gradually dissappeared since 1552; and it is worthy of remark that, in 1525, more than twenty thousand of these hieratic statues were destroyed. Cortes gave the signal, by ordering the two large statues of the immense temple of Mexico to be thrown down before his eyes. We, therefore, ought not to be astonished that the Louvre does not contain a single figure of importance enough to have assigned to it

the name of any one of the more important gods of Anahuac. With the exception of the spiral serpent, which, doubtless, represents Quetzalcoatl, the god of air, the divinities collected in Paris, and which are of pretty considerable dimensions, are all, most probably, but secondary ones, unless we choose to see Tezcatlipuca in Coyotl, which is near the symbolical reptile, Tezcatlipuca (brilliant mirror), the supreme god and soul of the world, generally represented with the features of a young man, "was fond," says Bernadino de Sahagun, "of assuming the appearance of the animal above named, and, under this terrible form, held, among a people of America, a place similar to that held now-a-days by a man-wolf in the minds of the vulgar." The best informed writer, perhaps, who has written on Mexican antiquities, thus expresses himself, while speaking of the divine Coyotl, on this fantastic myth:—"He placed himself in the public places, right in front of the passers by, as if to bar their passage." The sculptor's fancy has placed the wolf-god near the gigantic toad, which, according to the catalogue of the museum, is the symbol of the tribe of Tamozolan; on its left, is a bust sculptured in the form of an ellipsoidal cone, representing the face of a man, whose two hands clasp a vase in which are two ears of Indian wheat. We will mention, on the authority of the catalogue, and of the great work of Aglio, "that the stalk of Indian wheat is the hieroglyphical sign of the tribes of Ohuapapa and Quauxilotitlan." But the name of the god does not, for all this, remain any the less known; the armadillo with a human head, which comes directly afterwards, helps to throw no further light on the symbolical system of the Aztecas. Perhaps, like several other fantastic reptiles which are seen in the museum at the Louvre, it represents one of the inhabitants of the Mictlan, that central hell, reigned over by the god Mictlantuctli, where the souls of the departed assumed the forms of various animals.

These rude remains of Azteck art, together with many other fragments which the Louvre contains, suffice to prove that the Mexican sculptors knew how to employ the hardest and most durable materials in order to represent the various symbols of their blood-thirsty religion. Statues much anterior to the sixteenth century, are to be met with; they are made of *teotetl*, or divine stone, which appears to be a black jasper, of grey, black, and rose-colored granite, of green jasper, of basalt, of jade of different tints, and, what is no less extraordinary, of lava of several colors. Metals were also frequently employed to ornament idols, or even to represent the idols themselves. It is known for certain, that the formidable statue of the god of war, which ornamented the great temple of Mexico, was furnished with a gold head; and the little figures placed in the Louvre, which are of silver and bronze, sufficiently prove that though these people might not possess any superabundant knowledge on this point, they were certainly not ignorant of any of the caster's secrets, or even of the chaser's art. As it is fully ascertained that the use of iron was entirely unknown to the Mexicans, the Peruvians, and the other inhabitants of New Granada, and that they were obliged to substitute brass, formerly erroneously designated by the name of *tempered copper*, in its place, it is somewhat difficult to imagine by what process the Aztecas cut through basalt and granite, and how they managed to polish idols which greatly exceeded in height the ordinary stature of a man. Instruments of ixtli, or obsidianus lapis, with points made exceedingly hard by dint of patience and rubbing, supplied the place of the steel chisel used by us. The large figures contained in the American Museum, though doubtless much smaller than those which have been destroyed, bespeak, in this respect, what great difficulties the sculptor must have had to surmount. Such, among others, is the head which the catalogue states as representing Tocozintli, the goddess of abundance, and, which, though it is only made of brown lava, does not require the less patience from the sculptor, if we take into consideration the numerous details that compose its various attributes. Such is also the serpent with the human head, which the catalogue designates, according to the great work of Lord Kingsborough and Aglio, as the symbol of Acamapitchtli, but which we would rather acknowledge as the Mexican Cybele, Totonantzin (our mother), who was called, according to Bernardino de Sahagun, Ci-

huacohuatl, the woman-serpent. The capital with an abacus, an astragal, and a torus, which is surmounted by a rough statue, and observed on entering the museum, is also made of brown lava, but the figure which represents the insignia of royalty, is made of grey granite, and must have caused the sculptor many difficulties in its execution.

These various statues, worn away at present by frequent moving and time, were formerly polychromatic, and the different colors with which they were painted formed an essential part in the religious symbolism of these people. We know, for instance, from Torquemada, that Quetzaalcotl, when he was represented under a human form, was painted entirely black, with bundles of feathers to represent flames of fire. We are also aware that Mataleuage, the sister of Haloc, god of the waters, while she, herself, was goddess of the tempest, wore a blue tunic. Iacateuctli (the lord who guides us) the god of commerce, wore, according to Clavigero, an azure cloak; but his face was spotted with black and white, while his ears were gold. Macuilxochitl, the divinity who presided over flowers, was represented, says Sahagun, with the features of a flayed man, or rather of one painted red. We will not give any more of these curious details, or these barbarous names, which have, perhaps, frightened more than one of our readers; we will merely add that, while the Mexicans were acquainted with the art of cutting the hardest stone, they also knew how to form secondary figures of burnt clay as well as by the means of moulding. It was, doubtless, by the latter process that was manufactured, on certain solemn occasions, the gigantic idol of the god Huitzilapuchtli, which was formed of different vegetable grains, stuck together by Indian-wheat paste impregnated with human blood. Some historians maintain that this idol was piled up, bit by bit, on wooden bars, but the first opinion seems to us the most likely one. The figure was broken annually during a grand religious ceremony, so that its fragments, distributed among the tribes, might be used for the administration of a horrible sacrament—less horrible than the one partaken of by the priests, who glutted themselves on the hearts of the victims.

Several of the little figures we have engraved have been produced by casts. The one, for instance, which represents Yxcuin, holding a child in his arms, was, doubtless, produced in the same manner. It was by the means of these various kinds of baked clay, that the more important divinities of Mexican theogony, if we are to believe conjectures of the catalogue, were represented. One, for instance, represents a strange looking head of Quetzalcoatl, the god of air, while another is intended to represent no humbler personage than Tezcalipoca, the god creator, dressed in the spoils of a bird; but in spite of the manuscript of the Vatican appealed to here, we must own that we can find in this little statue none of the attributes of a superior being. We do not know whether any more certainty is attached to the one which presents us with the dreaded head of Totec, the military disciple of the god of air. As to Huitzlopochtli, the god so formidadable in war, and to whom so many human beings were sacrificed that the number of the victims is said to have amounted to sixty thousand in a few years, we admit his authenticity more readily because his name really is to be met with in the valuable Codex of Letellier. Though we are not able to claim for the Mexicans a very high position in the hieratic statuary of primitive nations, it would be very unjust to judge them by such specimens as the ones we have seen. We must not forget that thousands of the innumerable household gods, known by the name of Mitlou, and which were constantly renewed in every dwelling, were daily manufactured by the members of a popular calling. The large idols executed by the renowned sculptors whom King Achuetzootzni assembled together in 1487, when he finished the temple of Mexico, were, as we have already said, all broken in 1525. On the first day of that year, says Torquemada, the last temples were burnt down, at the same hour, so to say, in Mexico, in Tlascala, and in Huetzingo, and it was thus that the last traces of Mexican art were destroyed.

From the Scientific Daguerrean.

CHEMISTRY.—No. II.

BY GURDON EVANS, A. M.

OUR last article was closed by a reference, the certainty with which the laws of chemistry are observed in all their operations. Let us now enter upon a description in detail of some of these laws. Here let us observe that in pursuing this subject, the reader must be a little patient, and not expect to enter directly into the merits of a science embracing so broad a field, without first attending to a few *definitions* and explanations of *terms*, a knowledge of which is necessary to a clear understanding of the subject. For your immediate benefit and for future reference, we here insert a list of the simple elements, known to exist in nature, and to compose the earth, air and water.

DEFINITION. An *element* is matter which has not been analyzed or separated into any simple parts, thus, iron and gold are elementary substances, but water and chalk are composed of simple parts into which they may be separated.

SIMPLE ELEMENTS.

	Symbol.	*Comb. No.*			
Aluminum,	Al.	13,69	Boron,	B.	10,90
Antimony,	Sb.	129,04	*Bromine,*	Br.	78,26
Arsenic,	As.	75,21	Cadmium,	Cd.	55,74
Barium,	Ba.	68,55	Calcium,	Cd.	20,00
Bismuth,	Bi.	70,95	Carbon,	C.	6,00
Cerium,	Ce.	45,98	Paladium,	Pd.	53,27
Chlorine,	Cl.	35,41	Phosphorus,	P.	31,38
Chromium,	Cr.	28,18	Platinum,	Pl.	98,68
Cobalt,	Co.	29,52	Potassium,	K.	39,19
Columbium,	Cm.	184,59	Rhodium,	R.	52,11
Copper,	Cu.	81,65	Selenium,	Se.	39,56
Didymium,	Di.		Silicon,	Si.	22,18
Fluorine,	F.	18,70	*Silver,*	Ag.	108,12
Glucinum,	G.	26,50	Sodium,	Na.	23,27
Gold,	Au.	199,44	Strontium,	Sr.	43,78
HYDROGEN,	H.	1.	Sulphur,	S.	16,09
Iodine,	I.	126,36	Telurium,	Te.	64,14
Iridium,	Ir.	98,68	Thorium,	Th.	59,59
Iron,	Fe.	27,14	Tin,	Sn.	58,82
Lantanum,	Ln.		Titanium,	Ti.	24,29
Lead,	Pb.	103,56	Tungsten,	W.	94,64
Lithium,	L.	6,43	Vanadium,	V.	68,65
Magnesium,	Mg	12,67	Uranium,	U.	60,00
Manganese,	Mm.	27,67	Yttrium,	Y.	32,21
Mercury,	Kg.	101,26	Zinc,	Zn.	33,00
Molybdenum,	Mo.	47,88	Zirconium,	Zr.	33,66
Nickle,	Ni.	29,59			
Nitrogen,	N.	14,06			
Osmium,	Os.	99,56			
Oxygen,	O.	8,00			

The above is a list of all the simple elements yet known. The list embraces all the metals, and several other substances with which all are familiar. Those used in their simple state by the daguerrean, are in italics. These are of course well known to the operator, and will in their order be treated at length. The other chemicals used in the art, are compounds formed by the union of certain of the other elements, and in the appropriate place will receive due attention.

The abbreviations in the second column are often used instead of the full name of the element. Most of these consist of the initials or prominent letters in the name of the element, As Br. for Bromine, N. for Nitrogen, &c. There are, however, eleven exceptions to this mode of abbreviating. These are abbreviated from the latin name of the substance, as given below.

English.	*Latin.*	*Abbreviation.*
Antimony,	Stibium,	Sb.
Copper,	Cuprum,	Cu.
Gold,	Aurum,	Au.
Fore,	Ferrum,	Fe.
Lead,	Plumbum,	Pb.
Mercury,	Hydragyum	Hg.
Potassium,	Kalium,	K.
Silver,	Argentum,	Ag.
Sodium,	Natron,	Na.
Lire,	Stannum,	Su.
Tungsten,	Wolframium,	W.

This explanation of these symbols, I hope will aid to fix them in the minds of such as would otherwise be at a loss to perceive what relation the abbreviation bore to the name of the elements.

In all works on chemistry, these symbols are so often used instead of the word itself, the reader will find it greatly to his advantage to fix them in his mind tho-

roughly. Indeed, I shall not hesitate as we proceed, to make frequent use of them.

The column of figures, give the key note to all chemical science. They express the proportions in which the elementary substance combine with each other to form compound substances, and are called the *equivalents* of the elements, a name it must be confessed rather *equivocal*, to illustrate these equivalent numbers. Water is composed of oxygen and hydrogen, two gasses, and always in the proportion by weight, of one pint of hydrogen and eight of oxygen, hence, one is the combining number of hydrogen as given in the table, and eight that of oxygen. Indeed, hydrogen is the standard from which all the other numbers are determined, and arranged, as C on the musical staff is assumed as the key note in melody. Hence it is printed in capital letters.

The composition of water is expressed in chemical notation by the founder, H.x0-1 x8-9.

Take one more example. Oxide of silver is composed of eight parts of oxygen, combined with 198 12 parts of silver, and may be denoted by Ag. x 0-108.12 x 8—116.12, or in 116.12 ounces of oxide of silver, 108.12 ounces are silver, and eight ounces oxygen. Now apply this general rule to all the elements and the compounds from them, and their whole weight will be made up of the elements in the exact proportions indicated by the figures in the table.

Carbonic acid is composed of six parts carbon, and two equivalents, or twice 8—16 parts of oxygen, and is expressed by the Co. 2—6 x 8 x 2-22, the chemical equivalent of carbonic acid. In this the amount of oxygen is double what it is in water. And it may be laid down as a rule, that elements combine with each other in the proportions indicated by the figures, or in twice, three times, four times, these proportions, or some other mutiple of the combining number. This will answer us as an introduction to the philosophy and mathematics of chemistry, and if you have failed to comprehend my blind explanation of the subject, please go carefully over it again, for this idea is an important one, and easy to understand, though not quite as easy to explain to others.

Pray don't call this a *dry* introduction to chemistry, for really there is in it a hidden beauty in the economy of water, which, as we advance, will challenge our admiration for laws so beautiful, and cannot fail to give us more enlarged and rational ideas of the AUTHOR of laws so comprehensive, and withal so perfect in detail.

Thus it ever is with the faithful and patient student of nature; new fields explored, never fail to repay him with an addition to his stock of knowledge, proportionate to the zeal of the learner, and to enlarge the scope of his real knowledge, commensurate with the energy of purpose devoted to his research. To the common observer, this earth we inhabit, and all the minerals composing it, present little else but a shapeless mass, devoid of all proportion and system, but to the student of chemistry, every material substance is invested with a new interest, knowing as he does that externally devoid of beauty as it may be, internally its elements are arranged and proportioned in accordance with fixed laws, and held together by certain affinities or attracting forces, constant in their application, and most benificent in their results. No. 3 will treat of chemical affinities and allied subjects.

When Cromwell sat to Lely, he said "I desire you will use all your skill to paint my picture truly like me, and not flatter me at all; but remark all those roughnesses, pimples, warts, and everything as you see me; otherwise I will not pay one farthing for it."

EXTRACTS FROM LA LUMIERE.

PHOTOGRAPHY PHYSIOLOGICALLY CONSIDERED.

MANY physiologists have arisen within a few years. All classes of society from the porter to the diplomast, from the grizette to the great lady, have furnished to the pen more or less spiritual traits for our observation. If there is a class of men who have made physioligists, it is photographers. It is this class of men who have given rise to the thousand of French societies and which have increased to a degree really fabulous.

It is nearly 25 years since photography was born like a flower from the rays of the sun. Promethus of our age ravished from the heavens some of its pure rays, and if he made the art what would it not have been had he not died poor and unknown upon a rock, but in a humble provincial retreat. Then, another came, Nicephere Niepce, who took the infant, fostered it, elevated it, studied its strength, its aptitude of development, then presented it to the world, and gave it his name; then it grew and increased in strength and beauty. Then there is the good Mr. Hill—how he has improved it—how he has improved this daguerreotype!—the Talbotype, Callotype, Heliochromie, the Catalysope are born with him.

Thus, we find, that the word *daguerreotype* which is now named from the inventor is now made to signify everything instead of applying the original name of *photography*, which recalls its celestial origin.

When photography is well established among us, there will hardly be a spot new from which we shall not receive a ray of sunshine. It will enter into the cabinet of the men of letters, into the studio of the painter, into the laboratory of the savant, into the saloon of the millionaire. It has inscribed its name at all corners of the streets, upon doors, upon the sumptuous fronts of the Boulevards and promenades; wherever we turn, we behold *photographic portraits.*

Photography signifies drawing from light. The photographers are then, colaborers with the sun.

The ancients regard the men who accomplished any great work as having come from the sun, in a later age they considered them as coming from the infernal regions. At the present day, they are regarded as simple mortals, which is a position more reasonable and speaks in favor of the times. There are many men who will perhaps find that we have more pride and less faith, one and all, than our fathers, because we shall naturally discover the most extraordinary things and that we will prove capable of more extraordinary things.

We have said that photography had invaded all mansions in all grades of the social circle; we shall then see how all persons competent will approve it—the *photographic artist, photographic amateur* and *photographic savant.*

PROOFS BY RAPID COLLODION.

M. M. Bertsch, Delahaye, and Leon Krafft have sent us several proofs that they have obtained recently by the aid of the rapid collodion.

Five of these proofs represent views obtained in the Champs Elysées being the centre. Light would fail in making this kind of proof portray the animated scenes of which the Champs Elysèes is the theatre. It would fail of light to give these kind of proofs except instantaneously by a great rapidity of execution, and the light was singularly confused; but M. M. Bertsch, Delahaye, and Krafft would not allow themselves to be discouraged. They had chosen for their operations a chamber of the *Caserne* which form the corner of the Rue de Chaillot; and provided with two large apparatus, the one German, the other French, made by M. A. Gaudin,—the last being most acceptable to them,—they placed them in this chamber as the best lighted, and the most desirable, and prepared their proofs in the shade which

resembled the shade of a tent where they worked on their knees; thus these proofs were obtained with much difficulty. But they are very interesting as souvenirs. There are these groups which exhibit good results, but the whole leaves us something to desire, but by repeated experiment they may overcome the difficulties.

Among the proofs that have been shown, there is one, very remarkable, representing a group of soldiers, men, women, and children. This group, consisting of forty persons were assembled in the court of the Caserne. The soldiers smoked their pipes, the women laughed, and examined curiously the camera with their lorgnettes; the urchins hitched their shoulders the better to see and figure in the tableau. Many of these are worthy of the best designs of our masters.

We must accord praise to two portraits by the same artists. One represents a young girl in a very fantastic costume, which reminds us of a soubrette in comedy. The light strikes on it irregularly, and in places like the warm compositions of Diaz. The charming graces of the contours—the delicacy of the model—the rounded symmetry of the limbs are in the manner of Greuze. The tones a little blueish from the shade, in the manner of Le Gray, the golden aspect of the light has the happiest effect.

The other portrait, that of an infant, is very curious from the rapidity with which it has been obtained. The baby, placed without doubt, too soon upon the stand, has forgotten the attitude they wished him to preserve, and in his impatience he grasps its ear with a very expressive face, and makes a wry face, evidently very favorable to the daguerreotypist. All this is admirably delineated; and must have been instantaneous.

ERNEST LACAN.

From the Illustrated Magazine of Art.

DREAMLAND.

CHARLES Lamb regarded bed as a very regal domain, where a man may toss and tumble at his pleasure, and with his bed-curtains drawn close around, be monarch of all he surveyed. And Tom Hood in his "Lay of Kilmansegg," addresses bed most lovingly:—

> "Oh, bed, bed! delicious bed!
> A heaven on earth to the weary head."

And somebody has told us that balmy sleep is kind nature's sweet restorer, and our great dramatist has taught us that gentle sleep is nature's soft nurse that comes to weigh the eyelids down and steep the senses in forgetfulness. Sleep is a common blessing, none the worse for being common, for when the solemn night comes on, birds roost in the trees, fishes sleep in the brooks, cattle rest in the pastures, and man forgetting, and willingly forgetting the noise and strife and struggle of his life of perpendicularity and motion, lies down on beds or truckle beds to horizontal sleep—

> "To sleep, perchance to dream."

What a wonderful place is Dreamland! It is more mysterious than all the wonders of the thousand and one nights. Time and space are there annihilated; the mind may wander whithersoever it will, and all through that fairy domain where Queen Mab reigns and there her varied agency employs;—the thinking faculty, released from common drudgery, goes onward, onward, onward, knowing no barrier, and never halting in its course.

We lie down. Everything is very silent. We hear the ceaseless ticking of the

clock, and wonder when we shall go off. We hear the church clock strike, we listen and count the hour. Another clock catches up the sound, and tolls the hour; we hearken to hear if yet a lazy clock still lags behind its fellows; no. We grow restless, we become confused, we still hear the ticking of the clock, but the vibrations are becoming more and more indistinct. We are going off We become more and more confused. We forget where we are. We are off. Where are we?

In a room that we knew many years ago, that we had not been thinking about, that we had almost forgotten; but there it is, clear and plain before us. There is the window with the blind half down as we saw it last, the same frayed tassel, the same black and red carpet, the same steel fender, the same old picture bought in Drury-lane, the same library table, with the leather cut and rubbed and sorely damaged, everything just as we left it. More than that, there is the same proprietor, Old Leighton as we called him, with his silver hair hanging on the collar of his coat, and his silver spectacles thrust high upon his wrinkled forehead, talking is he earnestly, eloquently, and to us. We know that he has been dead these ten years, we are sure of that, and the feeling is anything but pleasant. We are afraid to say so, afraid to ask him anything about his sojourn in the other world; it seems that we should be taking a liberty to put any such queries, and we answer as well as we are able. But the matter becomes alarming; for as we turn slightly toward the door, and another man, whose funeral we attended but a week ago, comes in with a pleasant smile. Then a frightful thought comes into our mind that both were slain by cruel hands, and that we did it, that we are guilty, that our soul is stained with blood. How shall we escape? We dissemble ease and gaity, and laugh as of old, but we shake in every limb. He who entered last is looking out into the crowded street, our old friend in the spectacles has turned to the mantel piece; we are determined to fly, we must, we will. Away we go down the steep stairs at a bound, out into the busy street, away, away, now up against the houses, now out amid the whirling carriages, now almost down, now roughly handled, but onward still, for as we live they are in pursuit, and our hair rises and our blood creeps. We have left the busy town behind us, and are out on the dusty country road. It is night; the stars keep watch, and far away we hear the sound of feet, onward, onward, as if we were the fabled Jew who never stops to rest. There is a deep, thick, shadowy wood, where giant trees stretch out their arms, and stems and branches twist together in a strange mysterious fashion, and there is silence; we rush forward away, away, down dim mysterious aisles, and solemn dells; but hark! they are still behind, and we gnash our teeth and strive to cry aloud, but there is a stifling sensation in our throat, and we cannot shout, and, flinging ourselves upon the ground, we press our face to the sod, and refuse to look up. But gradually, confusedly begin to know that the clock is ticking, and that we are still the same guiltless Jones that we were an hour before.

Who has not at one period or another felt these or similar sensations? A poet makes Eugene Aram tell to one of his scholars the fearful story of his crime, and tell it as a dream. In Dreamland, we do not know where we are going to, our mental ship has no pilot and no chart, our mind is governed by no rules; and though all the day long it has been as quiet a jade as ever worked in harness, becomes at night Pegasus for the nonce, and scampers where it will, or upwards flies to brighter scenes in the world above, or carries us away, like another Mazeppa, into strange and dismal forests which make the heart grow cold. We lose our present self, and play fantastic tricks until the morning. No story of witchcraft and of aged dames riding on broomsticks through the air could be more wonderful than this. We are at the old diggings, playing the old game of Tom Tidler's ground, picking up gold and silver, but we came over in no emigrant ship. We are in the East amid dark faces and picturesque turbans, and dear old memories, but we did not come by the Oriental Steam-Packet Company. We are in the frigid regions of the north, huge ice islands are about us drifting triumphantly on the deep, deep sea; but we came there by no regular method, we flew there like a bird. We are in the mines such as were disclosed to the man in the northern legend

—trees effulgent with diamond fruits, pillars of gold and precious stones, fountains with water of a million hues, and over all a floating and delicious music instead of air. Well, we will not descend any shaft, we sank through the ground like a trick in a pantomime.

And it is not only space that is destroyed, but time is overleaped at a bound. We live in all ages as well as in all countries; backwards or forwards, this way or that way, it is all the same to us. And not only so, but the manner in which we compress in our dreams is the most marvellous of all. A few seconds make up a lifetime. A sound suggests a train of thought, and ere the sound has died away the train is all complete.

Strange old stories there are of dreams that have come true, that have been fulfilled to the very letter. Some, indeed, interpret dreams in a variety of ways, in which every object is rendered typical, and the whole thing resembles the picture page of an hieroglyphic almanac; and Lover tells us that

"Dreams always go by contraries, my dear,"

However it may be, and without hazarding a word about it, we must all admit that dreams are very mysterious; that the mind, at liberty to wander where it will, plays wondrous tricks with us all. Strange it is when regal Mab rides forth drawn with a team of little atomies across men's noses as they lie asleep galloping through lovers' brains, and over courtiers' knees, and lawyers' fingers, and ladies' lips; strange how she rides:

"Her waggon spokes made of long spinners' legs;
The cover of the wings of grasshopper;
The traces of the smallest spider's web;
The collars of the moonshine's wat'ry beams;
Her whip of cricket bone; the lash of film."

Some dreams there are which we would not willingly forget; some indeed, that we would willingly make reality if we could. A beautiful thought of this kind is given by Coleridge in his "Ancient Mariner," when, as the ship of death comes near the shore, and one familiar object after another is seen, the wretched man cries out:—

"Oh, dream of joy, is this indeed
The lighthouse top I see?
Is this the hill? is this the kirk?
Is this mine own country?

"We glided over the harbour bar,
And I with sobs did pray,
'Oh, let me be awake my God,
Or let me sleep away.'"

Soon after the Copernican system of astronomy began to be generally understood, an old Connecticut farmer went to his parson with the following inquiry:

"Doctor T—, do you believe in the new story they tell about the earth moving around the sun?" "Yes, certainly."—"Do you think it is according to scripture. If it's true, how could Joshua command the sun to stand still?" "Umph," quoth the doctor, scratching his head, "Joshua commanded the sun to stand still, did he?" "Yes." "Well, it *stood still*, did it not?" "Yes." "Very well. Now did you ever hear that he *set it a-going again?*"

Amusements.—What Mrs. Partington says; Yes, I did go to see the Eat-the-opium Sarah-naders, Yes, I did, and I don't keer if Deacon Blathers does hear of it. I'd rather hear them blessed black martingales than a dozen of Deacon Blathers old sarmints. One on them sung what my dear Paul used to like, in the salt cellar voice, just like a baby's whistle and musical snuff-box together. One of 'em shook his fingers, and they rattled like pipe-stems; but what I liked mostest of all, was the beautiful music of the according line; Oh, how delicious the music rolled out of it! I could have got up and danced with delight." And the old lady got up and actually shook herself all over.

From the London Illustrated News

MEMOIR OF RIETSCHLE.

THE beautiful little bas-relief which adorned our last number, is the work of a Saxon sculptor, who has achieved a European celebrity.—Rietschel of Dresden. The intention of the artist is apparently to represent the descent of Christ to earth, in the form of a child, in order to grow up amongst us as a man. It is entitled in German "Der Christ-Engal," a title which has no English equivalent. We add a few notices—too few and brief—of the life and works of this remarkable and accomplished sculptor.

Ernest Frederick Augustus Rietschel was born at Pulsintz, a little town in Saxony in the year 1804. Having shown a decided talent for art, he was sent at an early age to the academy at Dresden. Thence when about twenty, he removed to Berlin, and entered the atelier of Rauch as a student. This renowned sculptor was immediately struck by the original talent and indefatigable assiduity of his new pupil, and with a truly paternal and large hearted sympathy watched and encouraged his efforts for self-improvement.

When in his twenty-fourth year, Rietschel became one of the competitors for the great prize given by the Academy of Berlin. The subject proposed, was that scene in the story of Penelope, when in spite of her father she leaves her home and country to follow the fortunes of her husband Ulysses.

The subject happily chosen, was to be executed in bas-relief.. When young Rietschel sent in his group, it was unanimously acknowledged that he had excelled all his competitors; but on his name being made known, it was found, that being a foreigner, a Saxon not a Prussian subject, the statutes of the Academy excluded him from the prize, which consisted in a free journey to Italy, and a yearly stipend at Rome for a limited time. However on the powerful recommendation of the Berlin Academy he obtained this favor from his own Government. He had, in the mean time, produced his statue of Daniel, which added to his reputation. In the following year (1829) he accompanied his master Rauch to Munich, remained there long enough to assist him in the great monument of King Maximilian Joseph, modelled one of the figures of the pediment of the Glyptothek, and then departed for Rome where he studied for about a year. Returning to Berlin, his first work was the grand colossal bust of Luther, executed for the King of Bavaria, and now in the Valhalla. His reputation increasing, it became an object to his own Government to fix him at Dresden, and accordingly in the year 1832 he was appointed Professor of sculpture in the Academy there, and set up his *atelier* on the British Terrace, one of the most beautiful situations an artist could have selected. At this time the new theatre was about to be built from the designs of Semper.

Every traveler who has lately visited Dresden, will remember this edifice, certainly one of the most perfect specimens of elegant, characteristic, and appropriate architecture which has been produced in modern times. The two pediments representing on one side the Drama, on the other the Opera, graceful and expressive groups, are from the models of Rietschel. The statues in the vestibule, of the two great dramatic poets of Germany, Goethe and Schiller, and the two great dramatic musicians, Mozart and Gluck, have also been attributed to Rietschel, but we believe erroneously. By him, however, is the fine characteristic bust of the singer Schreeder Devrient. Some of Rietschel's most important works are at Leipsig, where for the hall of the university he executed the grand atlo-relievo of the genius of Truth and the four learned Faculties; and also the series of twelve compositions in bas-relief, representing the progress of human civilization, of mental and matorial culture

About the same time he finished a work long since begun, the great colossal statue of King Frederic Augustus of Saxony, with

its beautiful pedestal, in which the power, grace, and originality of the attendant groups and figures must strike any observer accustomed to the usual tame and conventional treatment of allegory. Another of Rietschel's most celebrated and successful works, is the stature of Thaer, a man distinguished by his public spirit, and the improvements he introduced into agriculture and the breed of sheep. This statue in bronze, a commission from the Saxon Agricultural Society, was recently (in 1850,) erected at Leipsic, and is a signal instance of the most felicitous adaptation of modern costume, and truthful, almost homely nature, to the noblest sculptural treatment. Another of Rietschel's late works is the colossal statue of the poet and writer Lessing, which has just been completed and cast in bronze for his native city of Brunswick.

In the intervals of these great works, he has produced a variety of other smaller compositions, and a great number of busts. In our Great Exhibition last year, there were three of his works; the group of the Dead Christ and the Virgin (the Pieta), which from a love of his subject he modelled without having received any commission for it, and has since executed in marble for the King of Prussia; the charming little bas-relief of Cupid carried away by the Panther; and this of the Infant Christ borne through the air by angels.

Rietschel is still living, but in delicate health, and passed this last winter at Balermo. He is a member of the Academies of Berlin, Vienna, Munsell and Paris, and as we understand, a Protestant in his religious faith. We are also informed that he is at present engaged on the monument to be erected to the great musician Carl Maria Von Weber.—*A. J.*

A FABLE.

ALTERED TO SUIT THE "TIMES."

A pheasant from his cover flew
A neighb'ring buckwheat-field into;
Squire Hilkinson the cover owns,
The field another Squire, call'd Jones.
On Jones's land a partridge bred,
Address'd the pheasant whilst he fed,
And after saying "How d'ye do?"
Inquired "I say, whose bird are you?"
The pheasant "Hilkinson's" replied,
"How so, my friend?" the partridge cried,
"Why I," returned the pheasant, "mate,
Was reared on Hilkinson's estate,
In his preserve is fix'd my home;
So I am his where'er I roam."
"No," said the partridge, "you are not,
Now that on Jones's land you've got;
And thus at once I will confute you:—
Jones has a lawful right to shoot you."
The pheasant unto this demurr'd,
And so the matter they referr'd:
For referee they sought a goose,
Nigh on a common grazing loose.
The goose, whose cackle we translate,
Thus solved the question in debate:—
"Three birds together, here we stand,
Yourself and I, on Noman's land:
If truth the partridge has averr'd,
Then each of us is Noman's bird.
But I've an owner, there's no doubt,
For he could come and pick me out;
If Hilkinson or Jones should try,
You could they thus identify?
If not, I hold you both are wrong,
And unto Noman must belong.
Where'er you are, it certain is
Noman can say that you are his.
Free denizens of Hills and woods,
Who takes you steals but Noman's goods,
To Noman's injury alone,
Depriving Noman of his own."

GOSSIP.

IN many of our former numbers we have endeavored to impress upon the minds of our readers, the absolute necessity for a thorough investigation, upon the part of all, into the theory and scientific speculations in the art of photography as well as the mechanical. That the photographic art, particularly the daguerrean branch, was susceptible of great improvement, we were convinced, and although we were laughed at by a large majority of American operators, for opinions that they considered visionary and absurd, we have lived to see the day—a day that has arrived much sooner than we anticipated—when our assertions and opinions have been most wonderfully verified.

Our readers—we must premise—will pardon us for what we are about to say in regard to our American photographers; for as an independent and impartial journalist, we are under obligations to mete out full praise to that man who by untiring industry, talent, skill, and a love of his art places himself in the front rank of his profession. We do not desire to place any one man in advance of all others at their expense; on the contrary, our motive is to instill a spirit of ambition, and competition, and to do this, we must of necessity speak of those who deserve commendation in terms justly their due.

Three or four years ago, Mr. Hesler commenced the daguerrean business at Galena, Ill., at first with limited success, but gradually improving in his manipulations, and extending his recources, until he became as successful in his art as any of the older operators of the art. Within the last two weeks we have seen results of his practice that must place him at the head of his art. In our opinion, and in the opinion of all who have seen them, they have never been surpassed, if equaled. Their richness and warmth of tone is exquisite; they are more bold and sharp than the finest steel engraving—finest steel engraving! it is a poor comparison, for we never saw an engraving, nor painting, that gave such delightful pleasure to look upon as these pictures of Mr. Hesler. There is an exquisite and refined mingling of the lights and shades, impossible for the brush to attain. The position is excellent, and the drapery well arranged, although not faultless. One of the pictures, the portrait of a young man, may, with the exception of too strong a light falling upon the top of the head, and the coloring—which always spoils a good daguerreotype—be said to be faultless. We have seen thousands of daguerreotypes, but we have never seen any that approached our idea of a perfect picture so near as this. Mr. Hesler must study his arrangement of light most intently, to produce the pleasing contrasts of light and shade exhibited in these pictures; contrasts in perfect harmony, and so exquisitely blended, that not a line or spot, however minute, appears to mar the beauty and softness of the picture, or interrupt the harmony of detail.

There could be no better comment upon the truth of the principles we have so strenuously insisted upon, than these daguerreotypes of Mr. Hesler. Those who, two years ago, insisted that the daguerrean art was as perfect as it possibly could be, would stand aghast in astonishment before these pictures.

— It will be remembered that in our October number for 1851, we took occasion to speak in high terms of Mr. R. H. Vance's California Views. "The attention that has been particularly directed towards California within the last few years, in consequence of the discovery of gold, spread over an extent unparalleled in the history of the Precious Metals, has given it an importance in the eyes of the world, never before equalled in the annals of history. To such a pitch has public curiosity been excited, that the smallest item of news in regard to this newly discovered El Dorado, is eagerly seized upon. Much valuable information has been given in regard to the country, by several excellent works, but inasmuch as the sight of a place affords so much more pleasure, and gives so much better knowledge than the bare description possibly can, the artist was in hopes that these views would afford the information so much sought after, and form a popular exhibition in the Atlantic cities. These views are no exaggerated and high-colored sketches, got up to produce effect, but are as every daguerreotype must be, the stereotyped impression of the real thing itself.

They embrace among a variety of others, a splendid Panoramic View of San Francisco from the heights at the head of Clay street, taking in the whole entire range of the city, harbor, and bay, from Rincon Point to North Beach, with a distant view of the Contra Costa, and the Islands in the Bay. Also, views of Stockton, Coloma, Carson's Creek, Mokelame Hill, the Old Mill where the gold was first discovered, Nevada, Gold Run, Marysville, Sacramento, Benicia, &c., &c. Also, a large collection of views taken of the miners at work, in different localities; also a likeness of Capt. Sutter, and a large collection of sketches of the different tribes of Indians on the Pacific coast. Embracing in all some 300 views, on largest sized plates, elegantly framed in rosewood and gilding, which, taken together, furnish a complete picture of California, an object of attraction to every one, from the associations connected with the country, and doubly so to those about visiting that golden land.

Mr. Vance was disappointed in the realization of his hopes, and although they are among the best daguerreotype views ever taken, they failed to attract that attention necessary to the support of an exhibition of any character. Mr. Vance consequently closed his rooms in this city, and returned to California. In procuring these views, Mr. Vance expended $3,000, and the frames cost him $700 more. He is now desirous of selling them, and we are commissioned to dispose of them collectively, or in portions to suit purchasers. The following is a catalogue of these views.

1. Panoramic view of San Francisco, from the top of Union Hotel in Portsmouth Square. Showing the whole surrounding country, bay, and islands.
2. Views of San Francisco, before and after the May fire, taken from the top of Russia Hill, north of the City.
3. View of Clay street, before and after the fire, taken from Dupont street.
4. Views of Central street, before and after the fire, taken from Kearney street.
5. View of California street, between Montgomery and Sanson streets.
6. Panoramic view of San Francisco, from the corner of Montgomery and Broadway streets, before the May fire, showing the shipping, and Mission lands in the distance.
7. View of the burnt district, from the corner of Montgomery and Broadway streets; four days after the May fire.
8. View of the burnt district, from the corner of Montgomery and Broadway; after the June fire.
9. View of the west side of Montgomery street, from Clay street, before the May fire.
10. View of the same after the fire.
11. Panoramic view of Stockton, from

the top of the Stockton House, showing the whole surrounding country.
12. View of Stockton House.
13. Panoramic view of San Francisco, from Powell street.
14. Ruins of the city next day after the May fire, from the head of California street.
15. Ruins of the burnt district, from Powell street; after the June fire.
16. View of telegraph hill, from Union Hotel.
17. Views of Jackson street; before and after the May fire.
18. Views of Sacramento street; before and after the fire.
19. East side of Portsmouth square; before and after the fire.
20. End of central Wharf, and shipping.
21. Belle Union—Sociedad and Louisiana gambling houses, on the north side of Portsmouth square.
22. View of Dupont street, from Clay-st.
23. Merchants street, and east side of Portsmouth square; before the fire.
24. Merchants street; after the fire.
25. Views of Sanson street; before and after the fire.
26. Views of California street; before and after the fire.
27. Montgomery street; before and after the fire.
28. View of the end of Pacific Wharf.
29. View of Oriental Hotel.
30. Part of Central Wharf, from Whitehall Hotel—east view.
31. West view of Central Wharf, from same place.
32. West side of Portsmouth square; before fire. West side of Portsmouth square; after fire.
33. South side of Portsmouth square.
34. Cunningham's Wharf and Yerba Buena Island, in the bay.
35. Stockton street, from Clay street.
36. Broadway, from Powell street.
37. Washington street, from Dupont street.
38. Kearney street, from Broadway; on election day.
39. Panoramic view of San Francisco, from the top of Telegraph Hill; showing the entrance to the bay, from the ocean, the opposite coast of Sancelita, Angel Island, and entrance to San Pablo bay.
40. View of Telegraph Hill, from Clay street.
41. View of Pacific street.
42. Mining scene in a street of Placerville.
43. Panoramic view of Placerville, from a Hill east of City; this being the first place of arrival for those crossing the Plains.
44. View of Coloma, from a Hill north of the place on the west side of the river.
45. Coloma; showing river and surrounding country.
46. View of Capt. Sutter's saw-Mill and dam across the American river.
47. Rear view of the saw-mill race, where the gold was first discovered by Capt. Sutter.
48. View of Main street, Coloma, from the court House.
49. Panoramic view of Coloma, from the east side of the river.
50. View of Coloma, from the west side of the river.
51. Panoramic view of Sonora.
52. Holden's Garden at Sonora, from which the largest lump of gold ever found, was taken, weighing twenty-eight pounds.
53. View of Yuba city, on Feather river, mouth of the Yuba river.
54. View of Main street. Makelame.
55. Panoramic view of Makelame, with ball mountain in the back ground.
56. Indian hut near Yuba city.
57. View of Indians on the Stanislaus river, dressed for a war dance.
58. Valley of Stanislaus river at Knight's ferry.
59. View of Malones, on Carson's creek, foot of gold mountain, in which is the richest quartz vein in the world, one company alone taking out $25,000 per week!
60. Evening view at Knight's ferry on the Stanislaus river.
61. Residence of Capt Webber, at Stockton.
62. View of Indian commissioners, Dr. Wozencraft, Col. Johnson, Indian agent, and clerks, in treaty with the Indians.
63. View of Hangtown.
64. Scenery of Yuba river near Marysville.

65. View of Indian village on Capt, Sutter's plantation.
66. Indian village near Yuba city.
67. View of four Indian chiefs, and wife and sister of the celebrated chief Kasuse.
58. A group of Indian chiefs on the Feather river.
69. Indian village on the Stanislaus river.
70. Indians, cooking.
71. View of Indians dressed for a dance.
72. Indian, dancing.
73. Miners at work on little deer creek, at Nevada.
74. View of gold run.
75. View of Mission church, three miles from San Francisco. This Mission, Dolores, now time-worn and crumbling to ruins, was a proud and influential religious establishment, of the days of the Jesuits, founded more than a century ago, and even up to the time of the deposition of the late government, was considered one of the most interesting Spanish missions in the whole of California.
76. Part of the mission church changed to a Hotel, with Green and Bowen's omnibuses in front.
77. Spanish house near the mission, with omnibus in front.
78. Panoramic view of the mission and surrounding country.
79. View of the mission, taken from the hill south of the church, showing the country between it and San Francisco.
80. View of miners at work near Nevada; showing the manner of washing gold with the Long Tom.
81. Miners at work on deer creek; showing the manner of sluice washing.
82. View of gold run, a mining district near Nevada.
83 Mining scene at Placerville.
84. and 85. Views—front and back of a saw-mill, near Nevada, worked by mule power.
86. Panoramic view of gold run; so called from the rich gold diggings, it being one of the first places where gold was discovered; the gold lying at a depth of thirty feet from the surface.
87. Miners at work at Gold run.
88. Mining scene at Sonora.
89. View of Central street, from a height south of the city.
90 Main street, Nevada.
91. View of Central street, Nevada.
92. Panoramic view of Nevada city, with the surrounding forest; giving the enormous size to which the trees attain in this region, some three hundred feet in height, and twenty-seven feet in circumference.
93. Panoramic view of Benicia, showing the Straits of Oarquines, on the opposite coast, Martinez village, with the surrounding country, also the U. S. Barracks, Pacific Steam Navigation Company's works, &c.; this place is a port of entry, and destined to be a place of first importance as a commercial city.
94. View of steamer Senator at the wharf.
95. View of steamer Confidence.
96. Jay street, Sacramento City, from the levee.
97. View of Hock farm, the residence of Capt. Sutter, on Feather river.
98. Hock farm, from the east side of the river.
99. View of Hock farm, from the top of the house, and the celebrated Bute mountains, sixteen miles distant.
100. Residence of Capt. Sutter; group in front, of the Captain, his daughter and son-in-law.
101. View of levee at Marysville, and steamers.
102. View of Hangtown.
103. Panoramic view of Acupulco, from a hill back of the city, showing the city, Fort, Harbor, with the steamers, Panama and Sea Bird, and others, lying at anchor.
104. Acupulco, from the bay, showing a front view of the city and mountains in the back ground.
105. Panoramic view of Panama, taken from the cathedral, showing the surrounding country, Island of Bogota, and others in the Pacific, ruins of various churches and monasteries.
106. View of the cathedral.
107 View of the Islands opposite Panama.
108. View of the cathedral at Cuzco, Peru.
109. View of a portion of Valparaiso, S. A.

110. Panoramic view of Marysville, California, from the top of the United States Hotel, giving a beautiful view of the surrounding country, with its forests of oak.
111. Ferry at Marysville, on the Yuba river.
112. View of Main-st., do.
113. A California theatre, at Marysville.
114. U. S. Hotel.
115. View of west side of the square.
116. do. south side of the square.
117. do. north side of the square.
118. Knight's ferry (Stanislaus river).
119. A view.
120. Washington, from the levee, at Sacramento.
121. View of the levee at Sacramento, taken from the south end.
122. Levee and river, from Washington, opposite.
123. Jay street, Sacramento, from top of the hotel in 2d street.
124. Panoramic view of Sacramento, with surrounding country, giving a view of Washington, opposite, separated by the Sacramento river.
125. Hotel, cor. of second and Jay street.
126. East and south view of Sutter's fort.
127. North and east view of Sutter's fort.
128. Part of first street and levee.
129. Portrait of Capt. Sutter.
130. English Admiral's house, Valparaiso, S. A.
131. View of Valparaiso, from the American counsel's residence, showing fort and barracks in the distance.

The whole collection will be sold for $1,500; half the collection for $900; one quarter for $500; or one eighth for $300. Address H. H. Snelling, Ed. Phot. Art-Journal. We have considered the acquisition of these views by any of our daguerrean artists as of some importance, and have devoted more space to an announcement of this kind, than is in accordance with our usual custom, not only to oblige a friend, but because we think that they could be beneficially employed in any of our large daguerrean galleries.

— In a former number we stated that the goblets accompanying the prize pitcher were to be awarded for the best quarter and half-size daguerreotypes. We were, however, mistaken in the matter, as they are intended to be given to the second best pictures of the quarter, half, two-third and whole sizes.

— We are again compelled to decline selling the Photographic Art-Journal in numbers, as the extra price we thus obtain for them, will not compensate us for the loss we sustain in binding, in consequence of the sale of some numbers exceeding that of others. We are sorry that any one should cavil at the price of the Journal, and consider that we "are behind the age" in our price, but we really cannot afford it at a less price, and certainly, if it is worth anything to the operator, it is worth $5,00. The cheap publications of the day, are no criterion by which to judge the price of a work of this kind. Where we can circulate one hundred copies, their publishers can sell two or three thousand, which makes a very great difference in the profits. Our Journal is now taken by a majority of daguerreotypists in this country, and in Europe, but owing to the cost of translations, and the expense of engravings, its profits to the publisher, thus far, are not worth speaking about, while the editor works *entirely without compensation.* If our daguerreans want work done cheaper than this they may do it themselves. The idea, however, can only emanate from such men as are barely capable of taking 37½ ct. and 25 ct., daguerreotypes. While we are in the vindictive mood, present tense, we would remark to our friend J——, that we are perfectly well aware that certain parties have circulated a report that the Journal is sustained by Mr. E. Anthony, and is under his influence; but a greater

lie—oh! we should have said stretch of the imagination, for fear of offending ears polite—never was promulgated. Mr Anthony does not, nor never has attempted, to influence one line of the Journal, and he contributes nothing to its support further than paying for his advertisement, and we calculate others do likewise, and so would many more, if they did not possess more of the mean spirit of jealousy than any thing else. The report was only got up from personal and sinister motives, and if you had not asked us about it, we should have kept silence upon the subject as a mere *bagatelle*, having exposed the falsehood on a former occasion.

This has not been the only means taken to injure the circulation of our journal; statements, the most dishonorable to the men who made them, have been circulated, our character privately assailed, our abilities sneered at, and many other tricks of the tongue and pen resorted to; but in defiance of all this the circulation of the Photographic Art-Journal has steadily increased since its commencement. This evidence of the utter insignificance of the *material* employed against us was sufficient to induce us to keep silence, and we now wish our friend J— to understand that we reply only to *his query*, *not to the attacks and slanders* alluded to; they have been made in a sneaking manner and are beneath contempt. Those who choose to believe them and withhold their patronage are perfectly welcome to do so, they are the losers, not us.

— We are requested to say that the N. Y. State Daguerre Asso. is preparing a frame for daguerreotypes to be exhibited at the Fair of All Nations, in New York city, next May. Members wishing to contribute to this frame are requested to address Mr. Geo. N. Barnard, Oswego, N. Y.; stating size of pictures to be sent, before the 1st of April. The daguerreotypes should also be forwarded by the 15th of that month.

— It appears that we were misinformed as to the purpose of Mr. L. Babbit to publish a Photographic Magazine. He denies the charge.

— The second number of the Scientific Daguerrean made its appearance in due course, and we are happy to hear that its success is quite equal to the publishers' expectations. Terms 50 cents a year. Davie & Evans, Utica, N. Y.

— We see by the Placer Times—for a copy of which we are indebted to Berford's Express—that Mr. Vance has recovered from the disasters of the great fire in San Francisco, Cal., and is doing an extensive business. We know of none more deserving of success. The Times remarks:—

Mr. V. is well known as one of the most accomplished operators in the state, and indeed the numerous specimens of his skill which now grace his gallery, such as mining scenes, panoramic views of cities, towns, etc., landscapes, portraits of persons single and in grouping of all descriptions, fully justifies such report.

In fitting up his premium gallery, Mr. V. has spared no expense or trouble, not only furnishing and decorating but also in securing all the latest improvements and plans for advancing still further the important character of the daguerrean art. He has a most admirable sky and side light, instruments suitable for pictures of all sizes from that of the breast-pin to the largest frame size, besides an elegant selection of miniature cases, comprising some finished with surpassing richness. In fact nothing has been neglected by Mr. Vance that would contribute one iota to producing pictures at least as near perfection as the most successful operator has yet reached.

— We take the following from Putnam's Monthly, dissenting from the conclusion that the extinction of the Art-Union has had a depressing effect on art in this country, but on the contrary, asserting that

American art suffered more by the existence of such a misgoverned concern, than it possibly can without it. The majority of its pictures were mere daubs, painted at a cheap rate, and were more calculated to mislead than improve taste. We want an Art-Union, but we want one ably and impartially managed.

The utter extinction of the American Art-Union, by a decision of our courts, has had a temporarily depressing effect upon the cause of art in this country. But so vital a principal as the love of art is not to be extinguished by the demolition of any institution. The love of art remains, and those who minister to it are not weakened in their energies. Pictures will continue to be painted, and statues chiselled, now that the Art-Union has ceased to exist, as they were before that institution was organized. We were never well satisfied that Art-Unionism was a healthy and sound principle; it was too direct an interference with the principle of *laissez faire*, which is as essential to a vigorous and healthy development of genius in art as in every thing else. So that we have no tears to shed over the destruction of the Art-Union, while we are very far from approving of the means by which the ruin of that, our only institution for the encouragement of art in the United States, was accomplished. Our artists will now be compelled to depend upon chance visitors to their studios, and the annual exhibition, for purchasers of their pictures; and we do not much doubt but they will be better off in consequence. They will work better, and, generally, find more discriminating customers than they have done the past five years.

The pictures of the Art-Union, which were to have been distributed last year to the members, were sold, on the 15th and 16th, at auction, for the benefit of all concerned. We believe it has not yet been determined what use shall be made of the Art-Union galleries in Broadway; but it would be a great pity for such admirable exhibition rooms not to be employed in some way for the promotion of art. We believe that the managers of the Art-Union have entertained an idea of keeping the galleries open as an exhibition and salesroom for works of art of various kinds. This would be an excellent plan, no doubt; something of the kind is needed—an artist's exchange, or market-house, where their productions might be seen by the public, and purchased. It is a rather difficult matter for our Medici, who would be glad enough to act the part of patron, to discover all the "studios" and "ateliers" of our rising artists; and the National Academy opens its galleries but once in a year. But a better use to which the Art-Union rooms can be put, is to make them a school of design for artists. There is nothing that we so much need as practical artists, to create designs for our fine-art manufactories. Millions of dollars are annually sent to France, to pay for little artistic knick-knacks, which might easily be produced here. The English have opened their eyes to the importance of encouraging their fine-art manufactures, and, by the establishment of national schools of design, have already done much for the cause in all parts of the kingdom. The appropriation of one hundred thousand pounds, by Parliament, fifteen years ago, for the establishment of schools of design, has been ten times repaid by the benefit conferred upon their fine-art manufactures. Our Free Academy has made a small effort in this matter; but it requires the aid of the government, either of the state or nation, to do any thing on a sufficiently liberal scale to be of any permanent benefit.

— A rumor has been going the rounds for some two months, that a gentleman of this city has discovered another process for taking daguerreotypes in the natural colors. We are now assured, on good authority, that such is the fact, and that an announcement will be soon made from the proper quarter. Three Richmonds in the field will create some competition, and daguerreotypists need not be effected by those puerile fears which have been so much felt by the majority in regard to the distribution of the Hillotype process.

— The following evidence of the esti-

mation in which Mr. C. C. Harrison's cameras were held by the committee of the World's Fair, we feel convinced will please our readers.

EXECUTIVE MANSION.
Washington, 31st Jan'y., 1853.

To C. C. HARRISON, N. Y.:

Sir.—I have the pleasure to inform you that a Jury of the Royal Commissioners connected with the Exhibition of the Works of all Nations, at London, in the year 1851, in consideration of your having exhibited a camera obscura, and daguerreotypes, has awarded you an exhibitor's medal, certificate, and a copy of the reports of the jurors.

These articles are in possession of Col. Peter Force of this city, chairman of the American executive committee, and will be forwarded to you by such mode of conveyance as you shall suggest.

Very respectfully,
Your obedient servant,
MILLARD FILLMORE.
Chairman of Cen. Com., U. S.

PETER FORCE,
Chairman of Executive Com.

P. S. You will please direct your communications on this subject, to Jos. C. G. Kennedy, Secretary of the Executive Committee.

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter. I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the BEST FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense.

E. ANTHONY.

THE

PHOTOGRAPHIC ART-JOURNAL.

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PRACTICAL TREATISE ON PHOTOGRAPHY UPON PAPER AND GLASS AND METALLIC PLATES.*

TRANSLATED BY MRS. A. L. SNELLING, FROM THE FRENCH OF M. AUBREE, CHEMIST,

Associate member of the Linaen Society, Chemical and Physical, of Paris.

Preparation of Albumen.

ITS APPLICATION UPON THE GLASS.

TAKE the whites of 8 fresh eggs and beat them into a froth with a small osier brush. Leave it in this state for seven or eight hours; after which leave it in this foam and proceed in the following manner:

Take Albumen,.....125 grs.
Honey,.....4 "
Iodide of potassium,..8 "
Fluoride of potassium, 1 gr.

Add the three last substances to the albumen, and leave them to dissolve. When the solution is perfect take the plates of glass which you wish to prepare and expose them to a slow fire; then place them upon the copper support of which I have previously spoken, and by the aid of a strong hair pencil spread the film of this mixture upon them, taking care to destroy the globules of air that rise over the surface. That done, leave them to dry in the shade. When they are dry, apply anew, and in the same manner, a second coating, and let it dry as in the first instance. All these films being successively dried, renders the albumen insoluble, on submitting the plates to a heat of 30 degrees before a good fire, or being put in a basin above a vase of boiling water according to the advice of M. Le Gray.

You obtain the same result by laying the glass upon a worsted cloth upon a table, the albuminated side upwards. Cover this side with a sheet of white paper, then with a piece of black merino, and by the aid of a hot iron, render the albumen insoluble, taking care that the iron be not too hot.

The sheets of glass thus prepared can be preserved a long time, provided they are kept in the shade—they are then ready to receive the following preparation, by which they will receive the necessary sensibility for being exposed to the action of the light in the dark chamber.

Of aceto-nitrate of silver bath.

SENSIBILITY OF GLASS.

Take distilled water,.....250 grs.
Nitrate of silver,.....34 "
Crystalizable acetic acid,.....45 "

Add the nitrate of silver to the distilled water, when the solution is complete pour off the acetic acid and leave it to repose. Then take the glass which you wish to use and brush off the particles of powder or dust which may adhere to the surface, and plunge it with a single immersion into this bath, the side impressed always being upwards; leave this sheet of glass in contact with the aceto-nitrate of silver during four or five minutes; after that draw it out and leave it to dry by the light of a candle. When the glass is dry, put it into the frame and expose it to the light in the camera.

* Continued from page 103, Vol. 5, No. 2.

The time of exposition should vary from one to ten minutes when an apparatus with a long focus is used.

The habit of manipulating will soon teach the operator the time necessary for obtaining the result in the development of the image which he desires to obtain.

It is necessary that the albuminated glass be immersed with a single dash into the aceto-nitrate. M. Le Gray describes an apparatus for this purpose which perfectly attains this end. It is simply a box formed of strong plate glass cemented together with white of eggs and lime and secured in a wooden frame. Fill this box two-thirds full of aceto-nitrate of silver and place the albumenized plate in it, taking great care not to let it remain too long Dishes may be found in the shops which will answer the same purpose.

Development of the Image by gallic acid.

When we judge the time of exposition in the dark camera sufficient, take out the frame and carry it into the dark closet where the above preparation is preserved; then draw out the glass plate and place it for support on the stand, and by the aid of a flat painter's brush put on the water saturated with gallic acid. The image will be invisible at first but will appear very clearly whenever the light shines upon it with all the vigor it requires.

It will be necessary to apply the gallic acid repeatedly from time to time, and we can leave in one proof till we prepare another sheet of glass: it is necessary to examine it well to be sure that there are no gray or black specks upon the parts that should be white.

When the image has taken all the vigor desirable, plunge it into a basin filled with common water which will soon acquire a milky tint; then you can place it for a second or two in another water, until the image is fixed which will be explained hereafter.

FIXING THE PHOTOGRAPHIC IMAGE UPON THE PLATE OF GLASS.

Draw out the sheet of glass and immerse it for a quarter of an hour in the following bath:

Distilled water,.....500 grs.
Bromide of potassium,.....20 "

After this immersion, wash it in another dish filled with water and leave it to dry; it will in this state serve for the productions of a large number of positive proofs, or it will serve in this state, for some papers prepared with the baths of which I have given the composition in the second part of this work in speaking of the positive paper.

The following is another preparation of albumen, which, although not giving so much rapidity in the formation of the image in the dark camera, is equally as good for views, and for the reproduction of inanimate nature:—

Albumen,.....125 grs.
Iodide of potassium,.....8 "
Chloride of Soda,.....1 gr.
Honey,.....4 grs.

PROCESS FOR OBTAINING DEEP PROOFS.

If you wish to obtain deep whites with your positive portrait, it is necessary to cover the negative proof on the side of the image with a rose colored paper of the same dimension as the portrait. Make them adhere together at the corners with a little paste or farina. This being done place the two sheets of paper upon a plate of glass in such a manner as to preserve the transparency of the picture. Be sure that the back of the negative proof rest upon the glass and the front is before you. Then take a crayon and mark all the outlines of the portrait, and of all the objects which you wish to reproduce; that done, raise the portrait and the objects which you wish to copy, and cut with the scissors all the parts which you have traced, in such a way as only to put in contact with the positive paper the accessaries that you wish to have appear. All the rest will be covered with the rose colored paper, which, intercepting the light, will render it whiter according to the strength of the color of the paper.

When you wish a darker tinge use rose paper, but more transparent.

Never wax your negative proofs if you wish to obtain vigor and fine whites, for they are sufficiently protected by the rose or white paper.

I have made many experiments with the published processes and I am convinced that we can attain a greater superiority in the

manipulation and in the beauty of the results.

With a little care, I can guarrantee that we can obtain a fine portrait every time, and which cannot be obtained by any other means now known.

The daguerreotype upon Metallic Plates.

POLISHING.

The polishing is the first operation of the daguerreotype process; it is upon this that the result often depends.

We use for polishing:

1st. Rectified alcohol at 36 degrees;
2d. Essence of lavender.
3d. Extra fine cotton.
4th. Rottenstone.
5th. Rouge.
6th. Buffs.

The polishing is divided into two parts; the scouring and the buffing.

OF THE CLEANING THE DAGUERREOTYPE PLATE.

We ought, before proceeding to polish, to bend the edges of the plates in order to avoid scratching the buff. Fix the plate, by introducing the corners into the four small clamps of the plate block. We powder it then with rottenstone, then with a fillet of cotton rub it with a circular motion. We know that the plate is well cleaned when upon breathing upon it we perceive no defects.

The alcohol is sufficient for cleaning the new plates; it is also employed with the tripoli to efface the film of the iodine and bromine upon the plates which have been exposed to the light without result.

The essence of lavender ought only to be employed to annul completely an image which has been fixed by the chloride of gold, or efface the impurities which resist the action of the alcohol. When the plate is well dried, it is ready to receive the burnish.

POLISHING.

This is effected with a buff which gives the polish necessary for bringing the plate to the required state to receive the coating. Put English rouge upon the buff, and rub it well backwards and forwards; then take a fine black polisher and buff it in the same manner, until you obtain the required polish and with a buff perfectly free from rouge or other substance.

COATING THE PLATE.

When the polishing is terminated carry the plate to the box and place it in the frame then slightly dust it quickly with a piece of cotton or fine brush to detach the grains of powder which may remain upon it; expose it to the vapors of iodine—leaving it just long enough to obtain a gold tint, which may be ascertained by the reflection of a piece of white paper upon the plate.

It is necessary that the plate should be turned from time to time that it may be well coated with the iodine.

Then place it over the bromide of lime, until is assumes a lilac tint, put it again upon the iodine as long as at first, taking care to shield it from the light, until ready to be exposed in the camera. After submitting it to the last operation, it is not necessary to look at it again until after it has received the action of the mercury.

EXPOSITION TO THE LIGHT.

The plate is now ready to receive the action of the light, and it is shut up in the frame and placed as soon as possible in the dark camera at the focus of the object-glass, where the true image of the object is properly developed. We are assured of having obtained the proper focus, when the image is produced with great clearness. Every image that is not at the proper focus, will be confused and indistinct.

We cannot determine the time which it ought to be exposed to the light; to the air in fine weather from 3 to 4 seconds—covering a time from 8 to 12 seconds, in an apartment well lighted and well situated. We ought always to be sure of a clear sun in order to operate with certainty.*

When the exposition to the sun has not been sufficient the proof, will be black. It is, on the contrary white, and almost effaced when the exposure is too long.

EXPOSITION TO THE MECURIAL VAPORS.

When we judge the exposition to the light sufficient, shut up the frame, and draw out the plate in the midst of the greatest

* American operators do not require this; they are equally successful in rainy as in fair weather. *Ed.Pho. Art-Jour.*

obscurity, and by the light of a candle place the plate over the bath and leave it 4 minutes. Heat the mercury from 45 to 50 degrees for a quarter plate size and 55 to 60 for the half plate; we hold the thermometer at this point during the whole time; after which we can expose the proof to the light.

WASH WITH THE HYPOSULPHITE OF SODA —FIXING.

If the proof is good enough to be preserved draw it out carefully and plunge it with a single dash into the solution of the hyposulphite of soda, which should have been previously prepared in a basin destined for this use; then leave it there until all the violet tint has disappeared.* Put the hyposulphite into a flask; wash the proof twice in filtered water; lean it upon the support, pour upon the proof a sufficient quantity of chloride of gold, and by means of a strong flame heat the proof until the whites of the plates are all well traced and then the image will appear with great vigor.

Put the plate into distilled water and wash and dry it rapidly with the lamp which has been used for the chloride. If not dried promptly it will be ruined. It should then be put into the water and dried again.

We ought never to use an old solution of the chloride of gold.

SOLUTION OF HYPSULPHITE OF SODA.

Dissolve 125 grains of the hyposulphite of soda in 1,000 grains of water.

When all the salt is dissolved, filter the solution and add to it 18 grains of alcohol rectified to 30 degrees.

SOLUTION OF CHLORIDE OF GOLD.

Take 1,000 grains of water and divide it into two parts; in one part, dissolve 3 grammes 50 centigrammes of hyposulphite of soda, and filter it; in the second part dissolve one gramme chloride of gold, then pour by degrees the chloride of gold into that of the hyposulphite, and taking care to mix it well and constantly shake the flask which ought to contain the whole.

If we pour the hyposulphite into the chloride of gold a precipitate will result.

OF COLORS.

It is when the proof is perfectly fixed to the chloride of gold that we proceed to the application of colors.

We commence by putting a very small portion of the color we wish to employ, upon the paper, grind it with a knife very fine and dry; then take a little upon a brush and apply it swiftly and with caution upon the parts that you wish to color, then remove the excess with another dry brush; until there only remains upon the plate what is necessary to give the tint wished for. To fix the color condense the breath upon it, or expose it to the vapor of hot water; we can then commence with another color, and manage in the same manner; we ought generally to avoid putting it on the black parts.

The badger's foot contained in the box, is intended for taking off the powder which may fall upon the plate during the coloring.

Before we use the gold and silver contained in the cups we ought to wet slightly the paint brush.

TO BE CONTINUED.

* Most of our American operators pour the hyposulphite of soda solution upon the plate, allowing it to run off into a bowl.—*Ed. P A. J.*

"Painters of history," says Kneller, "make the dead live, and do not begin to live themselves till they are dead. I paint the living, and they make me live!"

From Cosmos.

THE STEREOSCOPE.

BY THE ABBE MOIGNO.

Translnted from the French by Ambrose Andrews.

STEREOSCOPE—a name formed by two Greek words signifying the power to show pictures of natural objects, under the form of solids, precisely as they themselves appear standing out in isolated relief—made its appearance in the scientific world before the Royal Society of London on the 21st of June 1838, nearly fourteen years ago.

It was invented by Mr. Wheatstone, an English philosopher of incomparable merit, and eminently ingenious. Although he was one of the creators of the magnetic telegraph, he yet regards the stereoscope as his best title to fame, and in all truth it does in itself suffice to immortalize his name.

What then is this stereoscope? We will tell you, dear reader, what it is, after having first answered another apparently very simple question. Why is it that we have two eyes? Had this question, apparently so simple, been propounded twenty years ago, it would have greatly puzzled the physiologists and philosophers of that time, and only evasive or insignificant answers would have been returned. "We have two eyes in order to see the clearer." "We have two eyes, so that if by accident we lose one, we have still one left." "It is, perhaps, because Nature was pleased to amuse herself by proposing this inexplicable enigma to us, that, having two eyes, why is it that we do not see double?" "We have two eyes because * * * Alas! we know not why it is that we have two eyes." Such would have been the answers to the simple question by the philosophers of twenty pears ago. Would it be believed that during all the past ages, it was alone the great philosopher and painter Leonardo de Vinci, who had some glimpses of the difference there is between two images of the same object seen alternately, by each eye, and foresaw the effect of their simultaneous perception? And yet, from his time, four centuries had still to pass away, before the theory of binocular or double vision could be clearly laid down.

By researches which have been pursued in our own day, it has been demonstrated that we have two eyes, in order that we may the more clearly distinguish the difference between the points in an object, which are the nearest to the eye and those most remote from it; in a word, to see it as it is in itself, with all its relief, recesses and concavities. As a result of the relative position between our two eyes, in relation to some object, we do not see it precisely under the same point of view with both eyes. Between the two images painted on the retina, by the rays of light emitted, from the object, there is a veritable difference, sometimes apparent, sometimes, and more frequently, imperceptible, but nevertheless, very real.

We shall enter into no further details here: suffice it to show, that, as a result of the simultaneous existence of the two images, our soul is in the condition of a geometer, who, in order to fix upon his diagram a given point, is in possession of a fixed base, and two angles, which describe the lines leading from the extremity of that base, to the point in question. Every body knows that the position of the desired point would then be completely determined.

But to return to the marvellous effects of the stereoscope. "If the theory of the binocular vision be true," said one Mr. Wheatstone, in a moment of auspicious inspiration, "it must follow as an infallible consequence, that if I take two drawings or images of the same object, for instance, a cone or a pyramid, as they are alternately seen, by the right eye and the left, and place them opposite each other against two parallel partitions on the right side and on the left of a small box, and adjust between them two mirrors, so as to face the two

drawings at angles of forty-five degrees, which mirrors, would thus form, between themselves a right angle, the common termination of which would describe a vertical line, exactly in the centre between my two eyes, (see plate page 173, vol. 3.) then, my distances being adjusted with critical accuracy, if I look with both eyes into the mirrors; I would see there, the reflected images of the two designs superposed or blended into one image; and since the two images, thus superposed, were two drawings of the same pyramid as seen turn by turn with the two eyes, I would necessarily see, not the representations of a flat object, but, as the unique result of their superposition, or mutual intermingling, I would behold the pyramid itself in full relief, with its apex rising towards my eyes, and the sides receding from it towards the distance." This process of reasoning, simple as it is, is nevertheless the work of a genius, and it became the starting point of one of those grand discoveries which suffice to render an age illustrious among all ages.

What Mr. Wheatstone thus foresaw in theory, he realized in practice. His stereoscope was created; and sure enough the pyramid did appear to his eye, as if the real object were really standing there before him. Again, reasoning theoretically, he argued, that if the pyramid in relief, were reversed or transposed, that is, if the drawings were transferred from the right side to the left, and from the left to the right, the effect produced would be that of a hollow pyramid. Accordingly, he transferred to the right the one which had been before on the left, and to the left the one on the right; and the result was as he had foreseen; the pyramid in relief became a hollow pyramid.

By the same process of reasoning it was also judged that if two pictures of the object, as seen with one eye only, were placed on both sides, then the relief and the hollow would both disappear, and give place to a picture absolutely flat; and this also came to pass when the experiment was tried. Thus the seal of demonstration was fixed, all shadow of doubt became impossible, and the learned theory received its final consecration.

How then has it happened that ten long years has rolled away and this astonishing discovery had scarcely excited the attention of a few men of science? The answer is easy. It is a fact which all history proves, that the more wonderful and the more glorious an invention or discovery may be, the more of indifference, apathy, or hostility will it have to encounter. And it is a fact, that Mr. Wheatstone's reflecting stereoscope was almost entirely forgotten, when Sir David Brewster constructed his stereoscope, which we will now describe in a few words.

Here also, you take two designs or pictures of an object taken turn by turn, with the right eye and the left, but instead of placing them against two right and left parallel partitions you adjust them side by side, perpendicularly before your eyes at the bottom of a little box (see plate, page 175, vol 3.) the image on the right being seen by the right eye, and that on the left by the left eye; between each eye and image you interpose a prism at such an angle or inclination, as will force the two images from the right and left towards the centre. If you have correctly adjusted the angle of the two prisms, as also the distance from your eyes to the images, all the corresponding points of the two images, will be seen so magically blended and comingled as to form one identical image, the looking at which, produces at first a very singular physical sensation in the eyes, which very soon passes away, and you behold there the one image in the most perfect isolated relief, with all its advancing and retreating parts, as perfect as if the real object, without any intervening medium, was invincibly standing there before you.

To describe to you, dear readers, the magical and captivating effect of this spontaneous transformation of two images into one solid image and of three times the size, length, breadth and depth, would be a thing impossible; I only ask you to go at once and experience the effect for yourselves by seeing it with your own eyes.

The effect of the stereoscope—so extraordinary and which is finally producing such a lively impression in the world are not confined to the representation of geometrical objects, such as pyramids, cones, &c. If in this marvellous apparatus, we look at two drawings of a bas-relief, a statue, or two portraits of a living person, or two views of a landscape, they will appear just

as they are in nature. We see the eyes, the lips, the nose, in short, all the striking features of the face and all projecting parts of the body, coming forward very clearly from the back ground with all their relative proportions. The illusion is complete and we see the person whom we esteemed or despised, loved or detested, just as they were, or just as they are, standing there identically before us.

It may be said that it is strictly impossible even with the pencil of Raphæl, to execute by hand, these designs, with that almost imperceptible degree of dissimilarity which results from looking at the object alternately with the right eye and the left, with all the absolute exactitude, all the positive perfection, in the strictest sense of the word, all of which the stereoscope imperiously demands, in order to display its magical effects. We at once freely admit that this is true beyond all doubt. But a wise and bountiful Providence, who brought the stereoscope to light in the world, at the day and hour appointed in its wise and eternal councils, was careful first to give birth to photography. It gave birth to Niepce, Daguerre, and Talbot, before Wheatstone and Brewster.

It is known that pictures of natural objects are reproduced on the plates of Daguerre, the paper of Talbot, and the albuminated glass of Niepce de Saint Victor, with the same absolute exactitude that their fleeting images are pictured on the retina of the eye.

When therefore we wish to obtain the image of a bas relief, a statue, a landscape or a living person, for the stereoscope, we have only to arrange before the object a binocular camera,—that is, a camera furnished with object-glasses of the same diameter, and focal distance, and two plates of albuminated glass. This camera looks for us, and sees the object placed before it. Like a complaisant artist it paints for us the two images, with superhuman skill and perfection, and we thus obtain with ease and facility every thing essential for the stereoscope. And, henceforth, at any day we please, and in the hour of our caprice, we can behold just as they were, or are, in all their solid reliefs, the bas-relief, the statue, the landscape, the living person, &c.

The stereoscope, which, without photography—if we may be pardoned so forced a comparison—had remained only a dwarfish idiot, with it, has become a giant, a genii with audacious wings, and, like a grateful child who exalts and magnifies its mother, now bears aloft on his ample shoulder, and transports upon his rapid wing, the photographic mother art.

Photography, which was before only a designer—perfect and experienced it is true—but still only a designer of beautiful pictures in gray tint, with the incomparable pencil, which the stereoscope lends to her, has now become transformed into a superhuman painter and sculptor, armed with a pencil which would have driven Raphæl and Michael Angelo to despair, the wonderful vivacity of whose lights and shadows and the inexpressible gracefulness of whose draperies, exceed any lights and shadows or draperies, ever produced by Phidias or Apelles. And this divine photographic metamorphosis is purchased at very small expense, it sufficing only to obtain two images instead of the single one which it was before the custom to obtain.

Behold then the glorious result of this mysterious union of photography and the stereoscope; we can now without trouble realize galleries of portraits which shall no longer display the fictions of terrestrial painters, or sculptors—like flat canvasses hung to the walls, or cold and passionless marbles,—but fair forms, beautiful faces, and strong heads, glowing with life and animation, such as we most wish to immortalise; of museums, of all the *chefs d'œuvre* of ancient and modern sculpture and painting; of collections of celebrated cities, grand ruins, and proud monuments of architecture, just as they are in themselves, with that profound sentiment of reality which the pencils of all the Claude-de-Lorains, the Holbeins, and the Poussains that ever lived, were never able to render.

Photography thus completed, and crowned by the stereoscope is so vastly superior to herself that the day must soon come when nearly all important photographic pictures of landscapes, monuments, portraits, &c., will be produced double, that is, by couples, in order to their stereoscopic reproduction, in all the mild, and the severe beauty, and all the exact truth of living nature.

And let it be borne in mind that this is no question of hope, no twilight of uncer-

tainty, no infant in its cradle, but it is an entire creation, a magnificent reality, accepted with enthusiasm, which has taken possession of the world. Since the time when the stereoscope was received into the studio of M. Jules Dubosq, the centre, and point of departure of progress in modern optics, again to come out with all those superadded improvements and perfections, it has gone forth and conquered France, England, and Germany, and the fascinating invention is now as popular and as much sought after as it was before neglected and unknown.

The views of those vast galleries of the Crystal Palace at London, of the triumphal arch of l'Etoil, by M. Dubosq; the family group, and the Academies by M. Claudet; a numerous collection of monuments, statues, bas reliefs, portraits, &c., are all so many substantial proofs of the triumphant success of the stereoscope, which is still going on, enlarging its boundaries from day to day.

Artists have been waiting with patience for photography on paper to make sufficient progress; until it should become an art sufficiently certain in its results to enable them to substitute, in most cases, proofs on paper for the daguerrean images on plates, whose mirror-like polish renders the vision more difficult and less clear; and behold, this wish also, is now fully realised.

M. Ferrier, one of the ablest photographers of France, and of the world, is now producing positive proofs on paper, with such certainty, that for stereoscopic purposes, they are fast supplanting the daguerrean images.

And better than this also has been done; positive proofs have been obtained on glass which are viewed by means of light admitted at the bottom opening of the stereoscope, and which produce a truly magical effect.

The first designs of this kind shown to us, and which challenge our admiration, are some views of the principal gallery of the Crystal Palace, &c., which cannot be too much admired. And thus have we entered upon an entirely new era for photography, and for the reproduction of works of art, and in this point of view, the stereoscope with these transparent designs, is not less marvellous and astonishing than was the original discovery of the daguerreotype itself.

F. Moigno.

From Cosmos.

PHOTOGRAPHY.

Translated from the French by Ambrose Andrews.

PHOTOGRAPHY played its appropriate part and assumed its true position in the splendid religious and military fete of the 10th of May 1852. M. Macaire,—whose great ability in producing pictures instantaneously, has been celebrated in *La Lumiere*—having received an official commission to take a view of the spectacle, erected for that purpose, a charming pavilion in the interior of the Camp de Mars, which was very well situated for obtaining a view of the altar, and the alcove of the President But, alas! in the morning, a peremptory order was sent to him to remove the pavilion, and since that time, we know not what has become of M. Macaire.

M. Thompson, who had also been officially designated, with more prudence perhaps, erected his platform in the open ground of the reserved outside enclosure, where it remained unmolested. He obtained several admirable views of the august ceremony, and was enabled to make an offering to the President of two perfect proofs,

which will perpetuate the memory of that grand solemnity. Being provided with a gigantic apparatus,—constructed by M. Plagnot, which for grandeur of dimensions leaves far behind it, everything in Germany, England, or America,—M. Thompson, attempted views four times the size of a full plate. The dust raised in the Camp de Mars on the occasion, unfortunately obscured them a little, but, they will for all that, remain as monuments to the glory of photography, Niepce and Daguerre.

Baron Gross, had obtained permission to place his apparatus in the stone gallery which crowns the central pavilion of the Military School, but as the gallery could not be reached without passing over roofs, and the distance from the altar of the Camp de Mars, being too great for him to obtain fine proofs, either of whole or half-size plates, he abandoned it, and took his place by the side of M. Thompson. From that point he obtained divers excellent views with that ability and facility of which he has given so many proofs, and which has enabled him to achieve the numerous *chefs d'œuvre*, with which he has enriched his incomparable collection. By means of these views, Baron Gros will identify his name, with that august fete, as his illustrious father had identified his with the solemnities and the victories of the empire.

M. Jules Dubosq—with some amateurs—was forced to remain in the stone gallery, which overlooked, only enough of the scene to enable him to take a few views, which he wished to show in relief in the stereoscope. But the too great distance, and the impossibility of procuring cameras of long focus and great illuminating power, paralised his efforts, and the two small proofs which we have seen, but imperfectly fulfil the end which we so ardently wish to see attained. But, how truly magnificent would have been the effect produced in the stereoscope by good views of the grand spectacle which the Camp de Mars presented, at the moment of the elevation, or of the benediction of the standards.

II. This circumstance has forcibly drawn our attention to the absolute but two much forgotten necessity there is, of still further perfecting the optical apparatus of photography. It is doubtless very important to labor actively, to render more and more sensitive, the impressionable coating on which the action of the light is to exert itself; but the action which gives birth to the image in a longer or shorter space of time depends not alone upon the sensibility of the coating, it depends also upon the illuminating power of the camera.

We remember that five years ago, Professor Petzval of Vienna, to whom the German cameras of Voigtlander, owe all their merit; read, at one of the meetings of the friends of natural science, a very curious note which has ever since pre-occupied our thoughts, but we have not been able to obtain the necessary details for the purpose of giving it publicity. It treated upon a question in optics, which M. Petzval called the *problem of illumination*. That geometrician brought a celebrated photographer, M. Posch, with him to the sitting and invited him to produce before the learned assembly several proofs which he had obtained. with an apparatus newly constructed by Weibel of Vienna. The curvatures and distances of the glasses of this photographic apparatus, called illuminator, had been calculated with the greatest care by that celebrated mathematician, and the quantity of light, or its illuminating power exceeded, by an enormous proportion, all that had ever been obtained before. During the sitting, by means of a *photometeique expeditif* process, they measured the intensity of the luminous focus, which the apparatus projected upon a screen, and it was found to exceed six thousand wax candles.

We profess not to comprehend anything of this astonishing condensation of light, which in itself constitutes a brilliant discovery. M. Posch then operated with it, and the proofs which he obtained, excited universal astonishment and admiration.

At another sitting of the same society on the 18th of Jan. 1847, M. Petzval read a note, on the construction of optical instruments; having particular reference to labors which he had been for several years pursuing, and which he had finally brought to a successful termination. This brief note was only the prelude to a long series of memoirs, none of which have yet reached us. But we have learned that these new researches differ totally from those of anterior geometers; that the influence of the thickness of the lenses, their distances, the aberration of sphericity and of refran-

gibility, which had defied the genius and exhausted the forces of Euler, of Lagrange, of Biot, &c., did not arrest the progress of M. Petzval; and instead of dashing headlong against a few vague and general theorems, he completely vanquished all difficulties, and invariably arrived at numbers, which any optician can immediately put in practice. Telescopes of large dimensions, for astronomy, smaller object-glasses for photography, and microscopic glasses, M. Petzval embraces all, in his all-powerful formulas. The impossibility of arriving at the knowledge of them and of applying them is a veritable calamity for our French opticians, and which M. Secretan, the other day expressed with great energy; saying that the chagrin he felt at being compelled to remain in ignorance of this astonishing improvement, disturbed the repose of all his nights.

What a cruel necessity, at an epoch like the present, when such primary materials abound; where art is every day creating such resources; where such large masses of crown and flint glass of such great purity, are to be had in such abundance, to be forced as it were, thus to grope in the dark, to work on blindly upon an immense object-glass, placing it on the turning-lathe a hundred times over, and sometimes, after great waste of time and money, by thus blindly and incessantly working away at it, rendering it entirely unfit for service, when the opticians of Vienna, are, it is said, in possession of numbers, which enable them to work promptly, and with infallible certainty! Moved by these frequent and loud complaints which are ringing in our ears, we are using our utmost endeavors to obtain the above said transactions of the great Austrian geometrician.

In the meantime, we are happy in being able to announce to the photographers of France, that in reference to all these facilities, it depends only on themselves to enter upon an entirely new era.

Let us, first enquire whether the German cameras are, in reality, superior to the French. Many photographers say yes; while the most experienced, and consequently, the most competent to judge, say no.

M. de Brebisson, among others, even gives the preference to the object-glasses composed by M. Charles Chevalier. As the French glasses cost a great deal less, they are everywhere found in great numbers. But to possess a German camera of large dimensions, one must be already almost rich, and, in fact, they are generally to be met with only in the operating rooms of rich amateurs, or with those fortunate artists, who have extensive patronage. Now, when these latter wish to drive business, and work fast and sure, they always work with their German camera, which is their veritable war-horse, leaving their French camera to sleep in the dust. Does not this, in itself suffice to place the relative superiority of the German camera beyond all doubt?*

At the same time let us not be too ready to believe, that the same German cameras, which are sold at such excessive prices, embrace the highest perfection of optics.

They certainly do not; and we hasten now to indicate the urgent improvements which it is absolutely necessary for us to realize.

1st. The German glasses have too short a focus: and the difference between the action of the centre and the sides, is much too great. They seem to be made expressly for portraits, for, when it becomes necessary to take images of large dimensions at some distance, they refuse the desired service.

2d. German cameras, in case of taking views or monuments, can give only small images and there is not one, who, while leveling his apparatus upon some monumental edifice has not, a thousand times regretted not being able to vary at will, the size of the image, without displacing his camera.

3d. German object-glasses have the field too much restricted and we cannot succeed in taking a panoramic view without having recourse to the apparatus,—ingenious, it is true, but very expensive, and difficult to use,—invented by Martens, and construct-

* What will our French author think of the fact, that in America, where the superiority of the daguerreotype over all other countries is acknowledged, we have an optician whose cameras rank higher even than the German? The cameras of Mr. C.C. Harrison, of New York, have entirely superseded those of all others in this country, and are deservedly considered the most accurate in use; they not only develop a strong clear image, but are entirely free from that defect of the German, a difference between the visual and chemical focus. *Ed. Pho. Art-Jour.*

ed by Lerebours. However, it may be said, that the difficulty of taking panoramic views without the aid of the above apparatus, is the same with all known cameras.

In short, what photography needs, and what must be created, whether or no, is an object-glass which shall: First, allow a larger or smaller image to be obtained, simply by a very little elongation of the camera without changing the relative distance from the object; which distance, could then always be such as would best agree with a reproduction in conformity with the rules of art.

2d: Which shall have sensibly the same power of action at the sides and at the centre; and, 3d. Which shall without a single moveable appendage, that is, without having to use the diaphram, or to curve the sensitive plate, and which shall at the same time, give an image of one-third of the horizon, or a zone of 120 degrees, so that the entire horizon might be obtained in three operations.

Here would be progress indeed! This would be the beau-ideal of optical perfection!

But it may be asked; is it not an evident impossibility to attain to all this? We also might despair of ever seeing it realised if we must judge by what has been thus far obtained; or if we had not now in our hands, and under our eyes undeniable proofs of its possibility. It is so possible that we dare proclaim now to our photographers that it depends only on themselves to possess, in less than three months these incredible advantages which we have here written down.

Would it not be doing injustice to the human mind to think that because a problem has for centuries defied the penetration of able and wise opticians that it is for that reason forever impossible? The truth is, it is not impossible, as the triumph of M. Petzval has abundantly proved.

But we have before us still another example of triumphant achievement over old difficulties, which also relates to the subject before us. Ever since the invention of the spy-glass it has been a desideratum, to find a method of increasing the distances by aid of micronometers; but all efforts to this end had been without success; the degree of exactitude which had been sought for and counted upon, had not been attained for the reason that the variation of the focal distance, in passing from great distances to small; from near sighted eyes, to long sighted, forcibly changed the relative proportion of the size of the object and the image and rendered the micronometrical indications inexact. There was, therefore, in that difficulty, a true gordian knot, which M. Porro has completely cut, by the construction of his analytical spy-glass of four lenses, which leaves the relative size between the image and the object rigorously invariable, and that too, in spite of the variation of length necessary to accomodate it to different distances, and different sights.

The success of this new spy-glass is so complete that it already forms part of the instruction in schools for the projection and construction of roads and bridges—of sappers and miners, of the *etat-major*, and is used by a great many surveyors and engineers.

This problem solved, M. Porro attacked another quite opposite, but not less difficult one; the point he wished to attain was, on the contrary, to render visible according to a given law, the same relation of size between the image and the object, at the same time leaving the focus, or place whereon the image is formed completely immovable; it was only by that method that improvements so greatly to be desired, could be realized; for example, to obtain by direct study the typographical distances, reduced at the horizon, and seen in an inclined spy-glass (*lunette inclinee.*)

This second spy-glass, also already executed and greatly appreciated is called *sthenallatique.* Now, by reducing the object-glass of this *sthenallatique* to the appropriate dimensions it applies immediately to photography, and completely realizes the grand improvement, the formula of which we have laid down in the following words. How to vary the size of the image at the will of the operator while remaining at the same distance from the object, by elongating the camera only a very little in proportion to the augmentation of the image. Here then is a primary conquest authentically confirmed.

On the 28th of July 1850, M. M. Vaillat and Thompson, whose testimony we invoke in all confidence—took a series of large sized proofs, at the house of M. Porro, which we have seen and which were shown at the Academy, representing all the

phases of the sun's eclipse. The diameter of these images is 83 millimetres; and to have attained this size by the ordinary landscape camera, it would have been necessary to enlarge its object-glass by means of eye pieces at least to 8 metres and a half of focus! And yet the object-glass with which these photographers operated was only 75 centimetres in length. But it was one of these sthenallatique object glasses of which we are speaking; it was more than sthenallatique, it was *bi-aplanitique.* It may be still seen at M. Porro's, where it stands an ocular proof that from this day images of large dimensions and of monuments at remote distances can be obtained with the ordinary camera box.

One thing yet remained to be done, which was to construct such object-glasses as would act equally at the sides and at the centre, and which should, at the same time be truly panoramic.

To attain this, M. Porro followed an entirely different route; for the purpose of applying them to photography, he conceived the happy idea of availing himself of Dr. Blair's liquid object-glasses; excellent in themselves, and which support a large opening, but difficult to employ in astronomy by reason of the rapid changes and coloration of the refracting fluid. In an observatory, that which is above all things necessary, is an instrument constantly invariable, always ready to perform its functions, and which requires no preparatory manipulation. But in a photographers operating-room the case is quite different. There, to employ liquid objectives, instead of glass, is simply to adjust a flask to its fellow flask; to empty and refill the objective perhaps once in 10 or 12 days, which would not increase the manipulation more than the 100th or the 1000th part. And surely there should be nothing in this to frighten one! If it then be true, —as we can no longer doubt,—that the entire field of illumination of liquid objectives is uniformly clear, and, consequently, the image uniformly sharp, by reason of the great refractive power of the carburet of sulphur; above all, if it be true that liquid objectives are truly panoramic, capable of reproducing at one time, the third part of the horizon;—and of this, M. Porro, assured himself by numerous experiments, before securing the property of this new application—we cannot comprehend how that photographers will still hesitate to appropriate to themselves these new precious and important resources.

This discussion demonstrates, as far as evidence can do, that the immense advantage of which we have spoken, to wit; objectives which give, first an image of invariable size; and immensely surpassing the scopes, the power, and the distances of all previous object-glasses; secondly, presenting an image perfectly equal in the centre and at the sides; and, thirdly, giving a panoramic image, are not only realizable, but actually realized.

And now, since the calculations are all made, tried, and proved, what more is wanting to manufacture these vastly important objectives in such numbers as to render them accessible to all? All that is necessary is an outfit of tools, implements, and appliances, (*outillage*) to enable the inventor to bring out his enterprise. And how is this to be obtained? Simply by the concurrence of some twenty professional photographers, or amateurs of photography, who shall advance one-third of their order. Or what would be better still, the strong will of a single individual, some ardent friend of progress, and jealous of the glory of France.

We have nothing further to add, unless it be to hint at the means by which M. Porro was enabled to construct these glasses, with such unerring precision, without ever having to recur to indefinite retouches or successive trials, by coupling together flint and crown lenses, which requires an immense assortment of them. It was the discovery of an entirely new and extremely simple method of substantiating and forming the *achromatism*, the method of which we reserve for future observation, at least so far as that may be done without injuring the property of the inventor.

III. Our readers will doubtless learn with pleasure that the stereoscope is still advancing; that it is daily taking new forms and opening to itself new fields; rendering unforseen applications of its scope and capacity, not only possible but easy; that photographers can hardly supply the demand that has suddenly sprung up in England, Germany and France, for stereoscopic pictures; that immense numbers of proofs, of nearly all the architectural mo-

numents of the capital, are already being reproduced upon transparent glass with incredible truth. For example, the collection of M. Jules Dubosq, comprises the Place de la Concorde, with its streaming fountains and the Church of the Madeleine in the distance; the Hotel de Ville, de Paris; a delightful view of Notre-Dame; the Church de Saint-Etienne du Mout; the basilique of Saint Vincent de Paule; the Pantheon, or Saint Genevieve; the square and Vendome Column: a view of Pont-Neuf, and statue of Henri IV.; the Court of the Palais-Royal; the Court of the Palais du Beaux-Arts; Cafe Morel, at the Champs-Elysees; the triumphal arch of l'Etoil; &c.

These images, double for the stereoscope, and single for the fantasmagoria are so many *chefs d'œouvre*, for which we are indebted to the ability and the indefatigable ardor of M. Ferrier.

How excellent a thing is it thus to possess upon albuminated glass, a stereotype which transfers itself indefinitely, into positive images, and which can be removed as fast as taken.

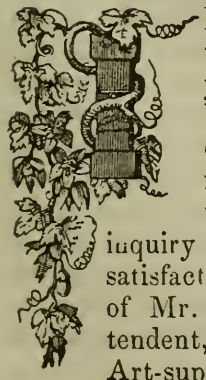
What a source of riches for France, is photography combined with the stereoscope! And what a noble inspiration it was that prompted the government to purchase Daguerre's discovery and give it to the world!

M. Arago has laid before the Academy several photographic images on paper, which Sir David Brewster had sent to him. The first of these proofs,—which, thanks to the kindness of the great philosopher, we have now before us—is a general view of Edinburgh, comprising St. Giles' Church; the Governor's House; North Bridge; Sir Walter Scott's Monument, &c. This proof is 25 centimetres in breadth, which is enormous, and presupposes a gigantic camera; unfortunately the sides of this image is somewhat faint and indistinct, but the centre is of great beauty and incomparable vigor. One of these images representing the trunk of an old tree, blasted and prostrate upon a marshy ground, also 25 centimetres in breadth is of such incomparable beauty that amateurs will be thrown into transports of admiration before it.

The length of this article forces us to postpone until our next number, a notice of the magnificent volume, "Egypt, Nubia, Palestine and Syria," serving as a textual frame work to the photographic designs of M. Maxime Ducamp of which M. M. Gide and Baudry have courageously undertaken the publication.

From the London Art-Journal.

ART EDUCATION.



IN taking a retrospect of the transactions of the past year the question naturally arises, what has been done to promote the general diffusion and right appreciation of Art? The inquiry is answered, and we think satisfactorily, by the recent lectures of Mr. Cole the general superintendent, and of Mr. Redgrave, the Art-superintendent of the department of Practical Art, at Marlborough House. The merit of the establishment of this department is ascribed by Mr. Cole to the Prince Consort, "the foremost uniform, and consistent, though oftentimes unknown, advocate of the better education of all classes of the people." The interest taken by Her Majesty in its success is shown by the assignment of forty rooms in Marlborough House, for the purposes of the department. The grand object of the establishment is stated to be the improvement of British manufactures. It was thought at first that this would have been

effected by the Schools of Design but the experience of many years has shown that it is not enough to produce good designs unless the taste of the consumer is sufficiently educated to appreciate them. Until Art-education is more generally extended, and the principles of form, and of the harmony and contrast of colors, are better understood and acted upon by the people, in vain is it for the manufacturer to produce good designs, while staring and vulgar patterns and heterogenous assortments—if the term may be so misapplied—of colors alone meet with the patronage of the public. If the public taste demands good designs and well-assorted colors, both will be produced. "The manufacturer," observes Mr. Cole, if he would, has really no option about serving his consumer. He simply obeys his demand; if it be for gaudy trash he supplies it; if for subdued refinement, he will supply it too. The public according to its ignorance or wit, indicates its wants, the manufacturer supplies them, and the artisan only does what the manufacturer bids him. The improvement of manufactures is therefore altogether dependent upon the public sense of the necessity of it, and the public ability to judge between what is good and bad in Art. "Our first and strongest point of faith is, that in order to improve manufactures, the earliest work is to *elevate the Art-education of the whole people*, and not merely to teach artisans, who are the servants of manufacturers, who themselves are the servants of the public."

The instruments by which these views are to be carried out are the Schools of Design, metropolitan and provincial, the elementary drawing schools to be established throughout the kingdom in connexion with the Department of Practical Art, and the Museum of Ornamental Art at Marlborough House. The Schools of Design are limited to the instruction of those who intend to study and follow the pursuit of ornamental design. Special classes intended for the students, but open under certain conditions to all persons, are formed for the study of painting on porcelain, for wood-engraving, for chromolithography; for artistic anatomy, for architectural details and practical instruction, for moulding and casting. Other classes are also in course of formation. The intention of the elementary schools is more extensive than that of the Schools of Design; they are intended to benefit all classes who are willing to profit by the advantages offered to them, and "are established with a view to give instruction in drawing simply as a language useful in every relation of life, and have reference rather to a power of expressing FORM by lines than to any ornamental or other special direction of the studies." These elementary schools are to be established in every large town, and there is to be a central school in every district into which the best pupils are to be drafted. Besides its use to the students of the Schools of Design, the Museum of Ornamental Art will, it is thought, promote the Art-education, and cultivate the taste of those grown-up men and women who consider themselves too old to go to school and whom the onward tendency of the times and the march of improvement have at once convinced of their deficiencies, and of the necessity of acquiring some knowledge of Art.

Without the knowledge which enables one to analyse the motives of the designer, and to appreciate his skill, the museum would be comparatively useless to the greater number of visitors. "Unless," Mr. Cole remarks, "museums and galleries are made subservient to purposes of education, they dwindle into very sleepy affairs." To supply the necessary information, lectures on subjects connected with the arts are given at certain intervals. That the public are beginning to appreciate the value of these advantages is evident from Mr. Cole's statement. He says, "In about fourteen weeks upwards of 27,000 persons have visited the Museum which we have begun to form; and of these, as many as 1174 have paid as students, in about ten weeks. We open the Museum to the public generally on Mondays and Tuesdays, but reserve the Wednesdays, Thursdays, and Fridays, for the purposes of study. And we exact a fee of sixpence as the test that the visitor really comes to study, and desires to have the quiet necessary for prosecuting it. On these days every one is free to make any drawings of objects in the Museum without additional fee. The students, numbering about 500, are admitted without further fee."

The scheme for promoting the general

education in Art, as far as it can be promoted, at present, by government, is therefore complete. The Schools of Design educate those designed for commerce and Art-manufactures; the elementary schools teach drawing as a useful art to the people; while the Museum is available for those whose occupations permit them to reside in or visit the metropolis.

But there is a large class of persons to whom all these advantages are at present unavailable, and who have yet to become acquainted with the necessity and advantages of possessing the power to delineate simple objects, of the education of the eye, and of the cultivation of the taste. We allude to a very large proportion of those who are styl d the better educated classes, and especially those whose education is now being carried on in different schools, public as well as private, and male as well as female. In all of these there are some pupils who learn to draw, but the kind of drawing which they are taught is considered solely as an accomplishment, and is frequently esteemed second in importance to music. How few of those who have learnt drawing have been taught one principle of form or color! How few aim higher than to be good copyists! How few of those who have learnt for years on the usual method, can represent correctly any simple form, or give, by means of light and shade, relief to any s.lid object which they see before them! The pupils rush at once to the higher walks of art, landscape and figures, instead of beginning with the elements. It is as if they would attain the summit of the hill at a bound, instead of climbing step by step from the base. No wonder, then, that so many fall short of the object at which they aim! We have reason to think that there are not many young ladies, even of those who have had the advantage of expensive masters for drawing, who could make their own designs for Berlin-wool work, or even transfer to the squared paper the groups of flowers they have painted. They manage these things better abroad. We remember to have seen at Paris, a retired French military officer, executing with great skill and apparent pleasure, a copy in Berlin-wool—for this employment is, in France, not considered as exclusively the privilege of ladies—a beautiful, and very large group of flowers: and with so much facility did he work, that in transferring the design to the canvas, he had no other guide than his eye, and was not only able to dispense with the usual mechanical contrivance of the net work of squares, on which the pattern is generally painted, but even with the black outline which in this country is almost indispensable. This power of imitation he undoubtedly derived from the early discipline in practical drawing which forms an integral part of French military education. Drawing is also taught in our military and naval academies, but we have some doubt whether the system of instruction is so efficient, and so thoroughly practical, as that which is organised by the Department of Practical Art. One thing appears to us quite clear: viz., that if the middle classes do not mind what they are about, they will discover, before many years are over, that artisans and mechanics are better educated in Art matters than themselves.

Mr. Cole anticipates the time when schools, and especially public schools, will be desirous of availing themselves of the assistance of government in acquiring a practical knowledge of drawing; and he holds out a prospect that this assistance may, at a future time, be accorded. The system adopted by the department of practical art, requires not only an outlay of capital (about 10*l.* only), but as the pupils are taught from examples on a large scale and from models which cannot be conveniently carried by the master from house to house, a regular class-room would also be necessary. The system is therefore better adapted for classes than for private tuition.

In the great metropolis where the pupils are strangers to each other, the distinctions of class are broken down, and the students meet as equals, but in the large country towns the different grades of society do not mix for educational purposes; and the sons and daughters of the gentry, especially those who are placed in the more expensive schools, would not be permitted to attend classes which were frequented by the children of tradesmen. We could mention instances, were it necessary, of the failure of classes from this cause. This exclusiveness is we think the great bar to the general

adoption of the excellent plan of Art education proposed by the Department of Practical Art.

"The facilities afforded by this department to all classes of the community, for acquiring education in Art, may" observes Mr. Cole, "thus be summed up. As far as practicable, on self-supporting principles, we shall endeavor to encourage and assist, but not supersede, all local efforts to introduce education in the elements of form and color in schools of ALL kinds, and for all grades of society; to promote the establishment of special schools for the practice of advanced studies; to afford instruction in the specialities of the manufacture so far as they regulate the nature of the art to be applied; and, lastly, to establish a central branch with its local museums of Art and manufactures, applicable to direct instruction. In all these various ways, the principle will be to give assistance half-way, but no further. We shall submit all our proceedings to the test of the fullest publicity—we shall court suggestions and invite criticism; when we make mistakes, we shall endeavor to correct them. Our work is a fight against national ignorance in Art, to be won by persuasion and reason; we shall win it if we are able; if unable, we can only promise that the fault shall not be laid to our want of perseverance, watchfulness, or patience."

There is one feature in the government plan of Art-education which we view with peculiar satisfaction, and which we think will be welcomed with general approbation. We allude to the provision which is made for the profitable employment of females in a line for which they are admirably fitted. The classes for instruction in wood-engraving and chromolithography are exclusively appropriated to females. Besides these classes they have the advantage of general instruction in design, and in painting on porcelain. The opportunities which afford to females an honorable and efficient means of sustaining themselves are so rare, that we observe this arrangement with unfeigned pleasure.

We have devoted so much space to Mr. Cole's lecture that we can merely notice the excellent and instructive lecture of Mr. Redgrave. As Mr. Cole's explained the design and motives of the committee of management, so Mr. Redgrave's was an exposition of the method of teaching which it was intended to establish. After setting forth the advantages of drawing, Mr. Redgrave stated that one of the chief objects of the government in connection with that department was to cultivate and improve the public taste. For this end it was necessary that the student should go through a regular course; what was proper for the peer being good in kind, if not in degree, for the peasant. The government, he said, had now come to the conclusion that elementary instruction in drawing should be given to all classes, and the question arose what was the simplest and best means of effecting the object. In order to avoid the defects of former methods, a mixed system had been determined on.

Mr. Redgrave then proceeded to describe the method intended to be adopted. The elementary teaching he observed was divided into two courses, the first of which, commencing with straight lines and curves, comprised drawing from flat examples; the second course consisted of drawing from models, no others being used. He then explained the course of instruction for training-masters, and afterwards spoke of instruction in ornamental Art, and concluded with enumerating the advantages to be derived from the library, museum, and lectures. M.

From the London Art-Journal.

DRESS—AS A FINE ART.

BY MRS. MERRIFIELD.

Part I.

IN a state so highly civilised as that in which we live, the art of dress has become extremely complicated. That it is an art to set off our persons to the greatest advantage must be generally admitted, and we think it is one, which, under certain conditions may be studied by the most scrupulous. An art implies skill and dexterity in setting off or employing the gifts of nature to the greatest advantage, and we are surely not wrong in laying it down as a general principle, that every one may endeavor to set off or improve his or her personal appearance, provided that in doing so, the party is guilty of no deception. As this proposition may be liable to some misconstruction, we will endeavor to explain our meaning.

In the first place, the principle is acted upon by all who study cleanliness and neatness, which are universally considered as positive duties, that are not only conducive to our comfort, but that society has a right to expect from us. Again, the rules of society require that to a certain extent we should adopt those forms of dress which are in common use, but our own judgment should be exercised in adopting these forms to our individual proportions, complexions, ages, and positions in society. In accomplishing this object the most perfect honesty and sincerity of purpose may be observed. No deception is to be practised, no artifice employed, beyond that which is exercised by the painter, who arranges his subjects in the most pleasing forms, and who selects colors which harmonize with each other; and by the manufacturer, who studies pleasing combinations of lines and colors. We exercise taste in the decoration and arrangement of our apartments and in our furniture, and we are equally at liberty to do so with regard to our dress: but we know that taste is not an instructive perception of the beautiful and agreeable, but is founded on our observance of certain laws of nature. When we conform to these laws, the result is pleasing and satisfactory; when we offend against them, the contrary effect takes place as our persons change with our years; childhood passes into the youth, the youth into maturity, maturity changes into old age; every period of life has its peculiar characteristics, its pleasures, its pains and its pursuits: The art of dress consists in properly adapting our clothing to these changes.

We violate the laws of nature when we seek to repair the ravages of time on our complexion by paint, when we substitute false hair for that which age has thinned or blanched, or conceal the change by dyeing our own grey hair; when we pad our dress to conceal that one shoulder is larger than the other. To do either is not only bad taste, but it is a positive breach of sincerity. It is bad taste, because the means we have resorted to are contrary to the laws of nature. The application of paint to the skin produces an effect so different from the bloom of youth, that it can only deceive an unpractised eye. It is the same with the hair: there is such a want of harmony between the false hair and the face which it surrounds, especially when that face bears the marks of age, and the color of the hair denotes youth, that the effect is unpleasing in the extreme. Deception of this kind, therefore, does not answer the end which it had in view; it deceives nobody but the unfortunate perpetrator of the would-be deceit. It is about as senseless a proceeding as that of the goose in the story, who, when pursued by the fox, thrust her head into a hedge, and thought that because she could no longer see the fox, the fox could not see her. But in a moral point of view it is worse than silly; it is adopted with a view to deceive; it is *abetting a lie* to all intents and purposes, and it ought to be

held in the same kind of detestation as falsehood with the tongue. Zimmerman has an aphorism which is applicable to this case—"Those who conceal their age, do not conceal their folly."

The weak and vain who hope to conceal their age by paint and false hair, are, however, morally less culpable than another class of dissemblers, inasmuch as the deception practised by the first is so palpable that it really deceives no one. With regard to the other class of dissemblers, we feel some difficulty in approaching a subject of so much delicacy. Yet as we have stated that we are at liberty to improve our natural appearance by well adapted dress, we think it our duty to speak out, lest we should be considered as in any way countenancing deception. We allude to those physical defects induced by disease, which are frequently united to great beauty of countenance, and which are sometimes so carefully concealed by the dress, that they are only discovered after marriage.

Having thus, we hope, established the innocence of our motives, we shall proceed to mention the legitimate means by which the personal appearance may be improved by the study of the art of dress.

Fashion in dress is usually dictated by caprice or accident, or by the desire of novelty. It is never, we believe, based upon the study of the figure.

It is somewhat singular that while every lady thinks herself at liberty to wear any textile fabric or any other color she pleases, she considers herself bound to adopt the form and style of dress which the fashion of the day has rendered popular. The despotism of fashion is limited to *form*, but *color* is free. We have shown in a former essay,* what licentiousness this freedom in the adoption and mixture of colors too frequently induces. We have also shown that the colors worn by ladies should be those which contrast or harmonise best with their individual complexions, and we have endeavored to make the selection of suitable colors less difficult by means of a few general rules founded upon the laws of harmony and contrast of colors. In the present essay we propose to offer some general observations on form in dress. The subject is, however, both difficult and complicated, and as it is easier to condemn than to improve or perfect, we shall more frequently indicate what fashions should not be adopted, than recommend others to the patronage of our readers.

It is impossible within the limits we have prescribed ourselves to enter into the subject of dress minutely, we can only deal with it generally, and lay down certain broad principles for our guidance. If these are observed, there is still a wide margin left for fancy and fashion. These may find scope in trimmings and embroidery; the application of which, however, must also be regulated by good taste and knowledge. The physical variety in the human race is infinite, so are the gradations and combinations of color, yet we except a few forms of dress to suit every age and complexion! Instead of the beautiful, the graceful, and the becoming, what are the attractions offered by the dress-makers? What are the terms to invite the notice of customers? Novelty and distinction. The shops are "Magasins de Nouveautes," the goods are "distingues," "recherches," "nouveaux," "the last fashion." The new fashions are exhibited on the elegant persons of one of the dress-maker's assistants, who is selected for this purpose, and are adopted by the purchaser without reflecting how much of the attraction of the dress is to be ascribed to the fine figure of the wearer, how much to the beauty of the dress, or whether it will look equally well on herself. So the fashion is set, and then it is followed by others, until at last it becomes singular not to adopt some modification of it, although the extreme may be avoided. The best dressers are generally those who follow the fashions at a great distance.

Fashion is the only tyrant against whom modern civilization has not carried on a crusade, and its power is still as unlimited and despotic as it ever was. From its dictates there is no appeal; health and decency are alike offered up at the shrine of this Moloch. At its command its votaries melt under fur boas in the dog-days, and freeze with bare necks and arms, in lace dresses and satin shoes, in January. Then, such is its caprice, that no sooner does a fashion become general, than, let its merits or beauties be ever so great, it is changed for one which perhaps has nothing but its

* See Art-Journal for the year 1852.

novelty to recommend it. Like the bed of Procrustes, fashions are compelled to suit every one. The same fashion is adopted by the tall and the short, the stout and the slender, the old and the young, with what effect we have daily opportunities of observing.

Yet with all its vagaries, fashion is extremely aristocratic in its tendencies. Every change emanates from the highest circles, who reject it when it has descended to the vulgar. No new form of dress was ever successful which did not originate among the aristocracy. From the ladies of the court, the fashions descend through all the ranks of society, until they at last die a natural death among the cast-off clothes of the housemaid.

Had the Bloomer costume, which has obtained so much notoriety, been introduced by a tall and graceful scion of the aristocracy, either of rank or talent, instead of being at first adopted by the middle ranks, it might have met with better success. We have seen that Jenny Lind could introduce a new fashion of wearing the hair, and a new form of hat or bonnet, and Mdlle. Sontag a cap which bears her name. But it was against all precedent to admit and follow a fashion, let its merits be ever so great, that emanated from the stronghold of democracy. We are content to adopt the greatest absurdities in dress when they are brought from Paris, or recommended by a French name, but American fahshions have no chance of success in aristocratic England. It is beginning at the wrong end.

The eccentricities of fashion are so great that they would appear incredible if we had not ocular evidence of their prevalence in the portraits which still exist. At one period we read of horned head dresses which were so large and high, that it is said the door of the palace at Vincennes were obliged to be altered to admit Isabel of Bavaria, (Queen of Charles VI. of France) and the ladi s of her suite. In the reign of Edward the IV., the ladies' caps were three quarters of an ell in height, and were covered by pieces of lawn hanging down to the ground, or stretched over a frame till they resembled the wings of a butterfly.*

At another time the ladies' heads were covered with gold nets like those worn at the present day. Then again, the hair stiffened with powder and pomatum, and surmounted by flowers, feathers, and ribbons was raised on the top of the head like a tower. Such head-dresses were emphatically called "Tetes." But to go back no further than the beginning of the present century, where Mr. Fairholt's interesting work on British Costume terminates, what changes have we to record. The first fashion we remember was that of scanty clothing, when slender figures were so much admired, that many to whom nature had denied this qualification, left off the under garments necessary for warmth, and fell victims to the colds and consumptions induced by their adoption of this senseless practice. To these succeeded waists so short, that the girdles were placed almost under the arms, and as the dresses were worn at that time indecently low in the neck, the body of the dress was almost a myth.

About the same time the sleeves were so short, and the skits so curtailed in length that there was reason to fear that the whole of the drapery might also become a myth; a partial reaction then took place, and the skirts were lengthened without increasing the width of the dresses, the consequence of which was felt in the country if not in the towns. Then woe to those who had to cross a di'ch or a style! one of two things was inevitable, either the unfortunate lady was thrown to the ground—and in this case it was no easy matter to rise again—or her dress was split up. The result depended entirely upon the strength of the materials of which the dress was composed. The next variation, the *gigot* sleeves, namely, were a positive deformity, inasmuch as they gave an unnatural width to the shoulders, a defect which was further increased by the large collars which fell over them, thus violating one of the first principles of beauty in the female form, which demands that this part of the body should be narrow—breadth of shoulder being one of the distinguishing characteristics of the stronger sex. We remember

* Mr. Planche has shown, in his "History of British Costume," that these head-dresses are the prototypes of those still worn by the women of Normandy. We may also refer to Mr. Fairholt's paper on English head-dresses in the *Art-Journal* for 1845; or to his more detailed notice in his "Costume in England."

to have seen an engraving from a portrait by Lawrence of the late Lady Blessington, in which the breadth of the shoulders appeared to be at least three quarters of a yard. When a person of low stature, wearing sleeves of this description, was covered with one of the long cloaks which were made wide at the shoulders to admit the sleeves, and to which was appended a deep and very full cape, the effect was ridiculous, and the outline of the whole mass resembled that of a hay-cock with a head on the top. One absurdity generally leads to another; to balance the wide shoulders, the bonnets and caps were made of enormous dimensions, and were decorated with a profusion of ribbons and flowers. So absurd was the whole combination that when we meet with a portrait of this period we can only look on it in the light of a caricature, and wonder that such should ever have been so universal as to be adopted at last by all who wished to avoid singularity. The transition from the broad shoulders and gigot sleeves to the tight sleeves and graceful black scarf was quite refreshing to a tasteful eye. These were a few of the freaks of fashion during the last half century. Had they been quite harmless, we might have considered them as merely ridiculous, but some of them were positively indecent, and others detrimental to health. We grieve especially for the former change; it is an anomaly for which, considering the modest habits and education of our country women, we find it difficult to account.

It is singular that the practice of wearing dresses cut low round the bust should be limited to what is called full-dress, and to the higher and, except in this instance, the more refined classes. Is it to display a beautiful neck and shoulders? No, for in this case it would be confined to those who had beautiful necks and shoulders to display. Is it to obtain the admiration of the other sex? That cannot be; for we believe that men look upon this exposure with unmitigated distaste, and that they are inclined to doubt the modesty of those young ladies who make so profuse a display of their charms. But if objectionable in the young, whose youth and beauty might possibly be some extenuation, it is disgusting in those whose bloom is past, whether their forms are developed with a ripe luxuriance which makes the female figures of Rubens appear in comparison slender and refined, or whether the yellow skin stretched over the wiry sinew of the neck remind one of old women whom some of the Italian masters were accustomed to introduce into their pieces to enhance by contrast the beauty of the principal figures. Every period of life has a style of dress peculiarly appropriate to it, and we maintain that the uncovered bosom so conspicuous in the dissolute reign of Charles II., and from which, indeed, the reign of Charles I. was not, as we learn from the Vandyck portraits, exempt, should be limited, even in its widest extension, to feminine youth or rather childhood.

If the dress be cut low, the bust should be covered after the modest and becoming fashion of the Italian women, whose highly picturesque costume painters are so fond of representing. The white drapery has a peculiarly good effect, placed as it is between the skin and richly colored boddice. As examples of this style of dress, we may refer to Sir Charles Eastlake's "Pilgrims in sight of Rome,"* "The Grape-Gatherer of Capri"† by Lehmann, and "The Dancing Lesson"‡ by Mr. Ewins, all of which are engraved in the *Art-Journal.* Another hint may be borrowed from the Italian costume; we may just allude to it *en passant.* If boddices fitting to the shape must be worn, they should be laced across the front in the Italian fashion. By this contrivance the dress will suit the figure more perfectly, and as the lace may be lengthened or shortened at pleasure, any degree of tightness may be given, and the bodice may be accommodated to the figure without compressing it. We find by the picture in the Louvre called sometimes "Titian's Mistress" that this costume is at least as old as Titian.

We have noticed the changes and transitions of fashion; we must mention one point in which it has continued constant from the time of William Rufus until the present day, and which, since it has entailed years of suffering, and in many instances has caused death, demands our most serious attention. We allude to the pernicious practice of tight-lacing, which as

* Engraved in the *Art-Joun.* for 1848, p. 339.
† " " " " 158.
‡ " " " " 369.

appears from cotemporary paintings, was as general on the Continent as in this country.

The savage American Indian changes the shape of the soft and elastic bones of the skull of his infant by compressing it between two boards; the intelligent, but prejudiced Chinese, suffers the head to grow as nature formed it, but confines the foot of the females to the size of an infant's: while the highly intellectual and well-informed European lady limits the growth of her waist by the pressure of the stays. When we consider the importance of the organs which suffer by these customs, surely we must acknowledge that the last is the most barbarous practice of the three.

We read in the History of France that the warlike Franks had such a dislike to corpulency that they inflicted a fine upon all who could not encircle their waists with a band of a certain length. How far this extraordinary custom may have been influential in introducing the predilection for small waists among the ladies of that country, as well as our own through the Norman conquerors, we cannot determine.

During the reign of Queen Elizabeth, the whole of the upper part of the body from the waste to the chin, was encased in a cuirass of whalebone, the rigidity of which rendered easy and graceful movement impossible. The portrait of Elizabeth by Zucchero, with its stiff dress and enormous ruff, and which has been so frequently engraved, must be in the memory of all our readers. Stiffness was indeed the characteristic of ladies' dress at this period; the whalebone cuirass covered with the richest brocaded silks was united at the waist with the equally stiff vardingale or fardingale, which descended to the feet in the form of a large bell without a single fold.

There is a portrait in the possession of Mr. Seymour Fitzgerald, of the unfortunate Mary Queen of Scotts when quite young, in a dress of this kind, and one cannot help pitying the poor girl's rigid confinement in her stiff and uncomfortable dress.

With Henrietta Maria dresses cut low in the front, and flowing draperies, as we find them in the Vandyck portraits, came into fashion, but the figure still retained its stiffness around the waist, and has continued to do so through all the gradations and variations in shape and size of the hoop petticoat, and the scanty draperies of a later period, until the present day.*

If the proportions of the figure were generally understood, we should not hear of those deplorable, and in many cases fatal, results of tight-lacing which have unfortunately been so numerous. So general has the pernicious practice been in this country, that a medical friend, who is professor of anatomy in a provincial academy, informed us that there was great difficulty in procuring a model whose waist had not been compressed by stays. That this is true of other localities besides that alluded to, may be inferred from a passage in Mr. Hay's lecture to the Society of Arts "On the Geometrical Principles of Beauty," in which he mentions having, for the purpose of verifying his theory, employed "an artist who, having studied the human figure at the Life Academies on the continent, in London, and in Edinburgh, was well acquainted with the subject," to make a careful drawing of the best living model which could be procured for the purpose. M. Hay observes, with reference to this otherwise fine figure, that "the waist has evidently been compressed by the use of stays." In further confirmation of the prevalence of this bad habit, we may refer to Etty's pictures, in which this defect is but too apparent.

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* The fardingale differed from the hoop in the following particulars. The hoop petticoat was gathered round the waist, while the fardingale was without a fold of any description. The most extraordinary instances we remember to have seen of the fardingale, are in two or three pictures of the Virgin in the Spanish gallery in the Louvre, where the fardingale in which the Virgin is dressed, takes the form of an enormous mitre.

From La Lumiere.

POISONOUS SUBSTANCES USED IN PHOTOGRAPHY.

TRANSLATED BY AMBROSE ANDREWS.

MANY of our subscribers have expressed a wish to be enlightened on the subject of the dangers arising from the use of those chemical agents employed in the daguerrean process, which although the hands may be wet with impunity in their solutions, are, nevertheless, active poisons when received into the stomach. To see clearly that this is really so, let us enquire into the various modes by which poisons act.

Poisonous substances penetrate the animal economy in three ways. 1st. by the lungs, when they are in a gaseous or vaporous form ; 2d, by the stomach, when they are in the state of solids or liquids, &c. ; 3d, by cutaneous absorption when in the state of concentrated solution.

Daguerreotypes when based upon the vapors of iodine, of the chlorides, of bromine and of mercury, are capable of producing poisonous effects of the first kind, rather then when founded on the use of liquids ; and yet in the practice of this quiet profession, the vapors which become disengaged are so rare that poisonous effects properly so called, will not be experienced, unless a phial of bromine, by some accident becomes broken.

In lieu of bromine, ether is sometimes used in the photographic process, and then in the event of a bottle of it being broken, it is explosion and conflagration, that are more to be feared than poison. A quart flask of ether, after its vaporization can cause an explosion equal to an ordinary field-piece, and the respiration of the melange cause an etherization in rule, (*en regle*) which might at length cause death to ensue. A bottle of bromine of 20 grammes, would under the same circumstances, be quite as deleterious. It is important then never to expose one's self to this danger, which would also exist in case of sleeping in a room where a quantity of bromine or ether is kept standing.

The second kind of poisoning is the most frequent ; and is often incurred by carelessness and sometimes by despising the salutary precautions which science dictates.

It is not without very great difficulty that the stomach accomodates itself to the metallic salts, and to pungent chemical substances. The oxide of arsenic, a poison so well characterized, derives all its potency from the feebleness of its reactions on the internal organs, which allows it to penetrate into the circulation, where it unfolds at once all its venomous power. Even in small doses it produces all the symptoms of the cholera,—so as sometimes to be mistaken for it—such as vomitings, excessive purgings, cramps, coldness at the extremities, distortion of the features, &c.

The energy of action upon the animal economy, of the salts employed in photography is rather external than internal ; they are caustic, and the accidents which they are capable of causing, will come in a great part, from inflammation of the organs invaded by them. In order the better to understand this subject let us examine briefly the several deleterious substances in question.

NITRATE OF SILVER.

In the liquid state this is one of the most violent caustics at present known ; and it is for this reason that it is sometimes called *infernal stone.*

On the flesh, where the skin may be broken, and on the mucous membranes it cauterises like a red hot iron ; but, inasmuch as it coagulates all vital fluids, its absorption cannot take place ; its action is limited to instantaneous and radical disorganization of the membranes with which it comes in contact. In solution with water, its causticity is less, but still it persists in its deleterious force even to a dilution of a thousandth part. The solutions of the nitrate of silver are all violent poisons, for

the digestive tube, by reason of the extraordinary inflammation which they can immediately provoke in that part. As used in photography, we cannot well avoid putting the hands into it. But by making use of a film of India rubber on the ends of the fingers, the contact may be prevented; without which precaution the fingers will inevitably turn black, but at the same time without causing pain, unless it encounters a cut or a scratch, in which case there will be a very keen smarting while the cauterization is going on, which will be very rapid, and then it stops no more to be renewed. For this reason it is highly important never to rub the eyes with your fingers after handling this substance until they have been well washed with soap and water.

CYANIDE OF POTASSIUM.

This salt is almost always exceedingly alkaline, by reason of the excess of caustic potash which it contains. Because of which, it very much softens and relaxes the skin, predisposing it to absorb the poison, and thereby creating a veritable danger. At the same time I ought to say that in the early times of galvanizing plates by the cyanide, I have had my fingers very much softened by the prolonged imbibing of the cyanide of potassium without experiencing other inconveniences than keen smarting at the ends of the fingers.

In case of cuts, scratches, lacerations, and the like, there will be, it is said, serious danger of poison by absorption; which appears to me to be probable, by the analogy there is, between that and what is known to take place during the dissections of dead bodies, where the hands of the dissectors are freely plunged into the putrid flesh, while the hands are protected by a whole skin, without incurring any danger, but when there has been the least cut, or scratch upon the fingers a poison is absorbed which has often rendered the operation mortal.

The cyanide of potassium has the greatest analogy with the *cyanhydric* acid, where the potassium takes the place of hydrogen, and since the *cyanhydric* acid is mortal, even by the minutest absorption, we ought, in view of this analogy, always to be distrustful of it when there is the least rupture of the skin.

HYPOSULPHITE OF SODA, BROMINE AND IODIDE OF POTASSIUM.

All these salts are eminently laxitive, and in themselves are but little deleterious; their absorption presents no danger; but when they are charged with the salts of silver, they become veritable poisons for the stomach.

GALLIC ACID AND TANIN.—PYROGALLIC ACID—SULPHATE OF IRON.

These substances are more mischievous to the stomach than the preceding; they can really poison; but they may be handled without the least inconvenience.

BICHLORIDE OF MERCURY.—(CORROSIVE SUBLIMATE.)

The vulgar name of this substance indicates clearly enough that it is really a poison; it may be classed along with the cyanide of potassium; it is certainly even more easily absorbable by the skin, but absorption is not capable of producing quite so serious results.

From all this we may conclude that photographers can freely handle all liquids, cyanide of potassium and corrosive sublimate being the only ones which demands the total absence of any cuts or breaks of the skin, upon the hands or fingers.

When I said that the greater part of substances used in photography are violent poisons for the digestive tube, I had it in reserve to make some urgent recommendations, that these preparations should always be kept beyond the reach of little children, who alone might be tempted to eat or drink of them. It will be particularly necessary to keep out of their reach the productions in form of salts and of lumps, for a child will hardly drink down a liquid before tasting it; but he might very easily be deceived by the sugar-like appearance, and so swallow a crystal of the nitrate of silver, or a piece of cyanide of potassium thinking it to be sugar, in which case he would be mortally poisoned and that without remedy.

Acetic acid, ammonia, spirits of wine, &c., have a strong odor which will prevent children from tasting them, or if they do taste, they will soon lose the wish to drink of them. The emanations from these liquids, when they are feeble, exert no de-

leterious influence upon the health; ether —which always emits vapors in great abundance, the smell of which invites you to breath it—being the only one which will in the long run, exert an influence upon the nervous system more or less enervating. In our last article, on the injurious effects which result from an immediate inspiration of these vapors, a paragraph was inadvertly ommitted which gave an account of the *onasthesique* effects which I have experienced while operating with collodion in a small laboratory. There is a direct means of escaping this influence, it is to work as much as possible in a spacious locality which should be consecrated alone to the application of collodion. It is unnecessary to immerse the collodion as soon as poured out, for I have found the contrary. In fact, I have never succeeded so well as when I had to traverse a long corridor with my plate in the wind, and that too in the summer before applying it upon the bath. At the same time we should take care not to push this drying to the extremity; but I am persuaded that the white *striae* almost always proceed from the collodion being too fresh. M. A. GAUDIN.

From the Scientific Daguerrean.

CHEMISTRY.—No. III.

BY GURDON EVANS, A. M.

CHEMICAL AFFINITIES. All compound substances with which we are acquainted, are formed by one of two processes. First—by a simple mixture of mingling, in which the properties of the simples are retained in the compound formed, as when sugar and vinegar are mixed, both a sweet and a sour are perceptible to the taste, or when corn and wheat are mixed, the two grains both remain in the same state that they were before being mixed. Milk and water combined is another example of a *mechanical mixture.*

The second method of forming a compound substance is called a Chemical Combination, or a union resulting from the laws of *chemical affinities.* The illustration of these phenomena is the object of this section.

A chemical combination differs from a mechanical mixture, at least, in two essential particulars, viz: Simples combine chemically in certain definite proportions, and the resultant compound is always very different from either of its components, or from what a mixture of the two would be expected from their nature to produce.

To illustrate this: sulphuric acid (or oil of vitriol,) is a well known fluid, exceedingly corrosive to the flesh, and poisonous; and magnesia is another well known substance, a white powder resembling slaked lime. Now, if these two be mixed a chemical union will ensue, and the compound produced will be epsom salts; a crystaline salt differing widely in its taste, texture, color, and effects upon the animal system from either sulphuric acid or magnesia. Epsom salts then is a chemical compound, the result of certain laws of affinity.

Take another example: Common salt, a substance so palatable and withal so wholesome, is composed of soda, a vile and caustic alkali, and chlorine, a gas so suffocating that a single full breath of it would produce disastrous consequences if not instant death. But the combination of these two substances, viz: sodium and chlorine, produce a salt differing in every particular from either element composing it.

The form of substances is often materially changed in passing from a simple to a compound state. The elements of water, all are aware, are two gases, Oxygen and

Hydrogen, but in combining to form water, a liquid is produced of a much less bulk than the gases composing it.

When a glass of soda water is prepared, the salts used so react upon each other, in forming new compounds, that one of the solids is changed to a gas, which by its escape produces the effervescence or foaming of the soda water.

The explosive effect of gunpowder is due to the elements composing it, in accordance with the chemical affinities existing among them. By igniting the powder a portion of the solids assume a gaseous form, by which their volume is greatly increased ; hence the explosion.

The circumstances favorable to chemical combinations are, first, that the bodies be brought into contact, and that they be either highly heated, generally fused, or dissolved in solution. Thus tartaric acid and carbonate of soda must be dissolved together in order to produce the soda water prepared in this way. In gunpowder the elements are thoroughly mingled, but the chemical reaction does not occur till a certain degree of heat is applied to it.

Chemical union is generally promoted by reducing the elements to a powder, or finely dividing them. As when silver is to be dissolved in nitric acid, the process is materially hastened by rolling the metal into a thin sheet or by cutting it into bits.

It will be remembered that whenever a chemical union takes place, the component elements unite in certain definite proportions called the combining numbers, or equivalents of each element. A list of these elements and their combining numbers were given in the last article.

Chemical names of compound substances are composed of the names of the simples united, and by certain variations in the last syllable, together with particles prefixed, the exact composition of every substance is readily known.

All acids end in *ic* or *ous*, and each points out the composition of the acid. Thus *ic* means an acid formed by uniting more oxygen with the base, than where the name ends in *ous*.

Sulphur*ic* Acid, for an illustration, is composed of sulphur *one* equivalent or 16 parts by weight, and *three* equivalents of oxygen, or three times eight, making twenty-four parts.

But sulphur*ous* acid is composed of one equivalent of sulphur and two of oxygen, one less equivalent of oxygen, observe, than the sulphur*ic* acid. The reader will readily perceive the convenience of this mode of notation, and easily fix in his mind the signification of the different endings. The same in nitr*ic* acid ; there are five equivalents of oxygen, whereas in nitr*ous* acid there are but four. Other similar endings will be explained farther on.

PHOTOGRAPHIC EXHIBITION AT THE SOCIETY OF ARTS.

THE first exhibition of pictures produced by the agency of solar radiations is an event which must not be allowed to pass without especial notice. The art of photography has now been before the world since January, 1839,—or, fourteen years have elapsed since Daguerre and Talbot announced their discoveries, that the delicately beautiful images of the camera-obscura, might be made to impress themselves upon solid tablets chemically prepared.

In the Great Exhibition of 1851 there were gathered together a considerable variety of photographic drawings from all parts of Europe and America—and there the public appear for the first time, to have become aware that sun-pictures might be produced which would exhibit a high degree of beauty, in addition to that truthfulness which could not be obtained by any other method. Out of this has grown a remarkable degree of interest, and it has,

in many cases, amounted to a real enthusiasm, in favor of photography. What has been done since Talbot and Daguerre published their processes in 1839?—Talbot's camera pictures were mere shadows, and obtained only by an exposure of an hour or more in the brightest sunshine—and Daguerre's silver tablets could not be photographically impressed in less than twenty minutes. We find in this exhibition pictures as intense as sepia drawings or ordinary engravings—which have been produced in a few seconds—and daguerreotype portraits can now be obtained in the fractional part of a minute. We have already, from time to time, in the *Art-Journal*, developed the history of the progress of the art, and regarding it as capable of an infinitely higher excellence than it has yet attained, we desire to promote its advancement by every means in our power.

With these feelings we enter then upon a detailed examination of the pictures now exhibited. Where all the pictures are of the same general character, however much they differ in excellence, it cannot be expected that we can do more than select groups of subjects for our remarks.

From Nos. 1 to 72 in the catalogue are a series of photographs sent by the Royal Commissioners of the Great Exhibition—the photographers by whom they were executed being Mr. H. Owen and M. Ferrier: Mr. Owen's pictures obtained on paper, and those of M. Ferrier on albumenized glass. These gentlemen, we believe, are only responsible for the first, or negative, image. We know, that upon the question of copying—or printing, as it is called,—these photographs, a long, and not very agreeable discussion arose, which ended, however, in its being decided that they should be copied in France. This series was intended to serve as truth-telling revivers of the important event of the Industrial gathering, by realizing selected scenes; and this set of photographs was to be presented to foreign commissioners, and other distinguished men who lent their aid in the Great Exhibition. It grieves us, as it must every man of taste in the Royal Commission, to see productions, obtained at a considerable cost, in every way so faulty as those now exhibited. If we except, from this censure, a few of Mr. Owen's pictures, it is not that we desire to screen our countryman from criticism; some of Mr. Owen's paper photographs are good—none of them are, however, equal to other specimens which Mr Owen has in this exhibition, taken and *printed* (an important point) by himself. Of all the pictures produced on albumenized glass by M. Ferrier, we can scarcely select one which is pleasing—the subjects have been viewed from their worst points: the statue by Morachetti—Richard Cœur de Lion—is thrown out of all proportion, and stands a miserable distortion of a man and horse, instead of the noble group it was. The Libusa—George of Bohemia—and the Bavarian Lion we can scarcely recognise; and by the side of photographic copies of the same statues which we received, previously to the opening of the Great Exhibition, executed by A. Locherer, of Munich, they sink to the lowest degree of mediocrity. Let us hope that these photographs will not be allowed to circulate on the Continent as the productions which the photographers of England regard with any favor. We believe, from an examination, that much of the ill effect is due to defective copying of the negatives—in some there is apparent the most evident carelessness; but arrangement and position belonged to the original artists, and they must share the censure so generally cast upon this group.

Turning from this unpleasant and unfortunate series, we are attracted by the large views of the *City of Vienna*, by M. Pretsch, 98, 99, who is also an exhibitor of several other pictures. In those views, extensive and wonderful as they are, there is a want of that softening tone which marks distance so beautifully in nature, and unpleasant spottiness prevails over the pictures, arising from the circumstance of the time of the exposure of the sensitive paper in the camera having been insufficient for the more full development of the shadows. Many of the views of single buildings,—as "The Imperial Palace," "The Cathedral of Poitiers," 444, 446, and the copies of statues, by the same, are as fine in their general character as anything in the collection.

Count de Montison has a very curious and most interesting series, 654 to 674, embracing many of the birds, beasts, and a fish, copied in the Zoological Gardens by

the collodion process. Here we certainly have put to the test the sensibility of the arg ntiferous collodion. No one could fail of remarking, when looking at the noble head of the lion, upon the couching tiger, on the giraffe, the hippopotamus, the birds, and the portrait of the living fish—a pike we believe—gliding in its transparent bath, that the utmost celerity of action must have been attained to produce results such as these.

Mr. A. L. Cocke exhibits several pictures (73, 83, and 89), pleasing in the subjects selected, and very judiciously treated. The same may be said of Mr. R. C. Galton's "The Porch, Addingley Church" (74), and "Landscape, Worcestershire" (77.)

There are few works in this exhibition more pleasing in their general character than the interiors by Mr. H. Owen, of Bristol. (140, 223, 225, 283, &c.) are portions of "Redcliffe Church" and of "Bristol Cathedral," and when we consider the difficulties of the subjects—having to deal with the "dim religious light" stealing its way through the stained windows, and casting long and dark shadows from the columns along the Gothic aisle—it is quite surprising that photographs possessing so much nice detail, and such gradation of tone, should have been produced. A very attentive examination of these pictures convinces us that had Mr. Owen superintended the printing of his own photographs of the Great Exhibition, the result would have been far more favorable than that which has called for our previous remarks.

Several excellent photographs by M. E. Becquerel, have been contributed by Mr Little. Among the finest of these we may name "The Cathedral of Bruges," "The Roman Theatre at Arles," "The Court of the Palace of the Doges at Venice." In all of them there is evidence of the most careful manipulation, and the closed attention to the conditions of light and shadow. Wax-paper, it is stated, has been employed by M. Becquerel, and certainly the results obtained speak greatly in favor of it in practised hands. The productions, which are numerous, by Mr. R. Fenton, also on waxed paper, are of a most interesting character. We are best pleased with the general effects in the following: "A Street at Tewkesbury," (103) "Southam Cottage Porch," (91) "The Kremlin, Moscow," (135) and "Part of Tintern Abbey," (239). Upon a close examination of any of these, and the other examples produced by the same photographers, it will be apparent that much of the hardness of outline which is objected to in the results of other processes is removed; that there is a more harmonious blending of the high lights, middle tones, and deep shadows, although these last are mostly far too dark; and that the distances are, for the most part, better preserved than in those pictures copied from paper negatives unwaxed. They approach more indeed to the character of pictures obtained on glass plates. As Mr. Fenton is a most enthusiastic cultivator of his art (the success of the present exhibition is mainly due to his exertions; and the establishment of the Photographic Society the result of his advocacy); he will excuse us for suggesting that he would do well in future to avoid subjects involving *very high lights*,—particularly many points of light,—and *very deep shadows;* the whites and blacks in contrast give a mottled character to some of his photographs. He must also venture beyond the formula prescribed by M. Le Gray, and either seek to give increased sensibility to his waxed paper tablet, or expose it for a much longer time to the reflected radiations.

Mr. Buckle, of Petersborough, obtained the most distinguishing mark of approval from the Jurors of the division including Photographs, in the Great Exhibition. He exhibits a similar set of photographs on the present occasion; many of them, we believe, obtained from nearly the same point of view as those which he showed in the Crystal Palace. They are, with few exceptions, views around and in Peterborough. "The Quadrangle of Arundel Castle" is a very choice production; the subject was a good one, and by judicious management and careful manipulation, Mr. Buckle has made the most of it. In several of his photographs Mr. Buckle has carefully introduced clouds in his sky, by artificially removing the opacity from some portions of his negative sky. This is a liberty quite allowable, since it is impracticable to obtain this pleasing result in the time required for the development of such

details as the bas-relief in the photograph named.

Not unlike in character to the pictures produced by Mr. Buckle, are those of Mr. A. Rosling. "The Deodara Pine," (314) "The Mumbles, near Swansea," (317) "Swansea Pier," (308) "Yorkshire Farm House," (330) may be mentioned as special examples of a style remarkable for the delicacy of detail, and general softness of effect. We think the color of the pictures might be materially improved without in any way sacrificing the minute beauties which cannot but be admired.

The photographs contributed by Mr. Stewart, all of them views in the Pyrenees, (177, 180, 191, and 194,) have been produced by a process involving some new methods of manipulation. For the benefit of our photographic readers, we reprint a portion of Mr. Stewart's description of his process, as communicated to the *Athenæum* by his brother-in-law, Sir John F. W. Herschel.

MR. STEWART'S PROCESS.

"The following observations are confined to negative paper processes, divisible into two—the *wet* and the *dry*. The solutions I employ for both these processes are identical, and are as follows:—

"Solution of iodide of potassium of the strength of 5 parts of iodide in 100 of pure water.

"Solution of aceto-nitrate of silver, in the following proportions: 15 parts of nitrate of silver; 20 of glacial acetic acid; 150 of distilled water.

"Solution of gallic acid, for developing a saturated solution.

"Solution of hyposulphite of soda; of the st ength of one part hyposulphite of soda, to from 6 to 8 parts water.

"For both the wet and the dry processes I iodize my paper as follows:—In a tray containing the above solution I plunge, one by one, as many sheets of paper (twenty, thirty, fifty, &c.) as are likely to be required for some sime. This is done in two or three minutes. I then roll up loosely the whole bundle of sheets, while in the bath; and picking up the roll by the ends, drop it into a cylindrical glass vessel with a foot to it, and pour the solution therein, enough to cover the roll completely (in case it should float up above the surface of the solution, a little piece of glass may be pushed down to rest across the roll of paper and prevent its rising.) The vessel with the roll of paper is placed under the receiver of an air pump, and the air exhausted; this is accomplished in a very few minutes, and the paper may then be left five or six minutes in the vacuum. Should the glass be too high (the paper being in large sheets) to be inserted under a pneumatic pump receiver, a stiff lid lined with India-rubber with a valve in the centre communicating by a tube with a common direct-action air-pump may be employed with equal success. After the paper is thus soaked *in vacuo* it it removed, and the roll dropped back into the tray with the solution, and then sheet by sheet picked off and hung up to dry, when, as with all other iodized paper, it will keep for an indefinite time.

"*Wet Process.*—To begin with the *wet* process. Having prepared the above solution of aceto-nitrate of silver, float a sheet of the iodized paper upon the surface of this sensitive bath, leaving it there for about ten minutes. During this interval, having placed the glass or slate of your slider quite level, dip a sheet of *thick* clean white printing (unsized) paper in water, and lay it on the glass or slate as a wet lining to receive the sensitive sheet. An expert manipulator may then, removing the sensitive sheet from the bath, extend it—sensitive side uppermost—on this wet paper lining, without allowing any air globules to intervene. But it is difficult, and a very simple and most effectual mode of avoiding air globules, particularly in handling very large sheets, is as follows:—Pour a thin layer of water—just sufficient not to flow over the sides—upon the lining paper, after you have extended it on your glass or slate, and then lay down your sensitive paper gently, and by degrees, and floating as it were on this layer of water; and when extended, taking the glass and papers between the finger and thumb, by an upper corner, to prevent their sliding, tilt it gently to allow the interposed water to flow off by the bottom, which will leave the two sheets of paper adhering perfectly and closely, without the slightest chance of air-bubbles;—it may then be left for a minute or two, standing upright in the same position, to allow every drop of water to escape; so that when laid flat again, or plac-

ed in the slider none may return back and stain the paper. Of course, the sensitive side of the sheet is thus left exposed to the uninterrupted action of the lens, no protecting plate of glass being interposed—and even in this dry and warm climate I find the humidity and the attendant sensitiveness fully preserved for a couple of hours.

"To develop views thus taken, the ordinary saturated solution of gallic acid is employed, never requiring the addition of nitrate of silver; thus preserving the perfect purity and varied modulation of the tints. The fixing is accomplished as usual with hyposulphite of soda, and the negative finally waxed.

"*Dry Process.*—In preparing sheets for use when *dry* for traveling, &c., I have discarded the use of *previously waxed paper*—thus getting rid of a troublesome operation—and proceed as follows:—Taking a sheet of my iodized paper, in place of floating it—as for the wet process—on the sensitive bath, I plunge it fairly into the bath, where it is left to soak five or six minutes—then removing it wash it for about twenty minutes in a bath, or even two, of distilled water, to remove the excess of nitrate of silver, and then hang it up to dry—in lieu of drying it with blotting paper. Paper thus prepared possesses a greater degree of sensitiveness than waxed paper, and preserves its sensitiveness, not so long as waxed paper, but sufficiently long for all practical purposes, say thirty hours, and even more. The English manufactured paper is far superior for this purpose to the French. To develop these views, a few drops of the solution of nitrate of silver are required in the gallic acid bath. They are then finally fixed and waxed as usual.

"In exposing for landscape, I throw aside all consideration of the bright lights, and limit the time with reference entirely to the dark and feeble-lighted parts of the view; with 3¼ inch lens the time of exposure has thus varied from ten minutes to an hour and a half, and the action appears to me never to have ceased."

The concluding remarks of Mr. Stuart are by far the most important in his communication. The fact that after a certain degree of opacity has been obtained on the paper in the camera it may be exposed for a long period without in any sensible degree becoming more opaque, has not been previously so fully developed. By this prolonged exposure the aerial perspective and gradation of tints are preserved, and the details of deep shadows brought out. We cannot but regard Mr. Stewart's photograph "Scene in the Pyrenees," as the finest in the exhibition.

Near these, and striking by their large size and bold style of treatment, are the photographs by Mr. B. B. Turner. In these are many excellencies; the details in the "Old Farm House" are very finely made out, and yet grand breadth of effect secured; the "Scotch Firs" are too decided for our taste, being cut too sharply from the clear sky; but the "Church Oak," (175) is decidedly a beautiful picture. The "Photographic Truth," (193) should have been called the "Photographic Fallacy," the unnatural depth of the shadows in the water, is one of those curious points, of which several similar may be observed in this collection, showing the difficulty of equalising the action of the luminous and of the chemical rays. The works of Mr. Shaw of Birmingham, exhibited by Mr. Cundell, are choice examples of well-selected subjects. The photographic pictures exhibited by Mr. P. H. Delamotte, Mr. R. J. Bingham, Mr. Sherlock, Mr. Jones, Mr. Barker, Mr. Sandford, and others, do not require any special remark from us. They have many beauties, and some of the defects which we have already named; and in examining these in detail we should only be repeating what we have already said.

The works of F. Flacheron—who works by a modification of the Roman process, described in a former number of the *Art-Journal* by Mr. Thomas—possesses many beauties, mainly due, however, we suspect, to the transparent atmosphere in which he operates. Mr. Claudet has contributed photographs from H. Le Secq, J. Bianchi, M. Lodoisch, M. Ferrier, M. Piot, G. Le Gray, which exhibit the several styles adopted by these Continental photographists. The "Views in France" (675 to 683), by E. M. Regnault, prove the advantages of a good chemical knowledge, as insuring by correct manipulation a successful result.

The finest examples by far of pictures

produced by the use of albumen on glass are those of Messrs. Ross and Thomson of Edinburgh. The "Interior of Holyrood" (637), "Entrance of Holyrood" (638), "Melrose Abbey" (640), and the "Views of Edinburgh," claim most especial commendation—their other photographs obtained by the same process are not at all deficient in power; but in those we have named, there is a nearer approach to the point we desire to see reached, a truer reflex of nature than in most of the photographs exhibited. If, in some cases, the exposure had been sufficiently long to effect a full development of the parts in shadow, there would have been but little left to desire.

Sir W. Newton exhibits several views of the Undercliff, Isle of Wight, &c.; their chief peculiarity being that he employs the same paper for obtaining the positive picture as for the negative, and by so doing, he is enabled to produce good positives even by artificial light. The advantage of an artistic eye is very evident in all the photographs exhibited by Sir W. Newton.

Mr. P. W. Fry, to whom we owe to a very consirable extent the present improved practice of photography by the collodion process, is the exhibitor of several most interesting pictures, obtained during a recent residence in the Pyrenees. The truthfulness of these pictures are not their only claim to attention—they are from paper negatives—and many of them possess many peculiar photographic beauties.

Mr. Henry Fox Talbot has contented himself by sending a volume of photographs which illustrates the progress of his investigations, and is therefore of great historical interest. His claim, however, as the originator, is now contested by Captain Boscawen Ibbetson, who exhibits (177) "Le Premier Livre Imprimé par le Soleil," dated 1839; and he has pressed his claim by a letter in the *Journal of the Society of Arts;* the evidence is not, we fear, sufficiently conclusive to shift the laurel, and it must never be forgotten that an earlier claim than any is allowed on all hands in the person of Mr. Thomas Wedgwood, who published his process in 1802. Beyond this book, Mr. Talbot and Mr. Henneman have sent some of the earliest calotypes. Several of them published in the *Pencil of Nature*, which serve to show that, in the infancy of the calotype process, there were produced photographs which will endure comparison with the best of the more recent results. "The Stable Door" (162), "A Haystack" (136).

The Collodion Processes have several able exhibitors. Mr. Archer, Mr. Fry, Mr. Horne, Mr. Goodeve, Mr. De la Motte, Mr. Berger, Mr. Sims, Mr. A. Rosling, Dr. Diamond, and others, have illustrated all its best points. Mr. Horne's portraits are excellent of their kind, and Mr. Archer's views deserve much commendation. Mr. A. Rosling's examples, of the power of the art in producing minute objects has been put to the test in the copies of the "Illustrated London News" obtained by this process—these, though remarkably minute, can be read distinctly, and when magnified, it is found that the page has been reproduced in all its peculiarities.

Dr. Diamond's types of insanity show a very important application of the art, and we understand the photographic process is about being adopted by the medical men attached to our lunatic asylums, for the purpose of communicating to each other information connected with these lamentable aberrations of mind.

There are several other exhibitors we could have desired to notice did our space allow. This exhibition may be declared to be an exceedingly good one—as the first. We are told that another exhibition is to be formed in May. We cannot but fancy that the lovers of the art will be wise to pause before they decide on a second exhibition within four months. It cannot be other than a repetition, since, even if new pictures are obtained it is not likely they will be free of the defects now observed. A considerable amount of exact experimental examination must be undertaken by those and they are very few, who can try experiments before any result of sufficient importance to interest the public can be obtained. The exhibition was opened by a short, but appropriate paper, "On the Present Position and Future Prospects of Photography" by Mr. Rodger Fenton. We agree with him in nearly all his remarks; but we believe the problems suggested for solution have obtained a far more exact solution than Mr. Fenton seems to

be aware of. Each of his questions as to the agent active in producing photographic drawings—its relation to light, heat, and electricity—have been severally answered long ago. It may be that the deductions from the researches made, have not been entirely satisfactory; but there are very few points connected with natural phenomena, which have received so conclusive a series of replies as that which is connected with the chemical agency of the sun's rays. All the researches of Scheele, Ritter, Seebech, Berard, Niepce, Talbot, Herschel, Draper, Becquerel, Arago, and Hunt, proving the distinct character of the phenomena of luminous and actinic action, and the inferences of seven of these experimentalists, are decidedly in favor of an agency connected with, but distinct from, light. Researches commenced without any preconceived hypothesis upon these points would still prove of the highest value.—*London Art-Journal.*

OPTICS.*

PART II.

MIRRORS.

SECTION I. THE PLANE MIRROR.

ANY smooth surface which reflects light is a mirror, whether it be a sheet of water, a looking-glass, or a polished piece of metal. That portion of the science of optics which treats of the reflection of light by means of mirrors, is called Catoptrics.

Mirrors are of three kinds, the plane, the convex and the concave. The first is flat, or has its surface a perfect plane like the common looking-glass.

The second curves outwards—or is bulging—and reflects images from a rounded surface.

The third is curved inwards—or is hollow—and reflects light from a hollow surface.

The plane mirror has its proper example in the common looking glass, commonly made of a plate of glass covered with an amalgam of tin and mercury, which makes them opaque. Rays of light passing through the glass are arrested by the amalgam and thrown back, and the glass merely serves for preserving the surface of the amalgam in a smooth and clear state. The rays of light in passing through the glass, suffer some degrees of refraction, and consequently give a less perfect image than a pure metallic mirror.

For this reason it is that the glass mirror cannot be used in photography for taking portraits. The refraction of the light almost invariably distorts the features; contracts or enlarges them, or makes some parts more prominent than they should be at the expense of those which should be the most so. For views, however, the glass mirror is quite as good as the metallic, and the refractive powers of the glass have less effect upon the general outline and detail.

The term speculum is generally used to denote metallic mirrors, but it is sometimes applied to those of glass.

Parallel rays falling obliquely upon a plane mirror are reflected parallel.

Converging rays are reflected from a plane mirror with the same degree of convergence.

Diverging rays are reflected equally divergent from the same mirror.

When any object is placed before a plane mirror, the image which is formed appears to be as far behind it as the object before it.

If we throw a ball against a wall perpendicular to that wall it would rebound to

* Continued from page, 97, Vol. 5, No. 2.

the point from which it started, but if we throw it obliquely it will rebound obliquely in the opposite direction and at precisely the same angle, obeying the natural laws, that the angles of reflection and incidence are equal. But if light was to pass from a person to the surface of the plane mirror, that person would see an image of himself directly opposite and as far behind the surface of the mirror as he is before it. The ray passing from the person to the mirror, and that from the mirror to the image form together what is called the passage of reflection, and it is this that makes the distance of the image appear as far again from the eye as it really is. If you walk towards or from the mirror, your image approaches or recedes, but with double your velocity, because the reflected and incident rays are contracted or extended by the movement.

Any object which reflects light is called a radiant.

The point from which rays diverge, is called the focus of divergent rays, and the point behind the reflecting surface from which they appear to diverge is called the vertical focus.

A person may place himself before a mirror in such a manner as to see the image of a second person without seeing his own, because the light striking a reflecting surface is reflected at the same angle.

A person may see his whole figure in a mirror half his own length, but if it is less than half he cannot do so. In all cases an image seen in a mirror is reversed, but the image in one may be reflected into another and appear naturally. This principle of reversion is fully shown in the daguerreotype plate, which is a mirror, the image there fixed by the operator bearing the same relative position towards the original object, that the image in a mirror does to its object.

SECTION II.

CONVEX MIRRORS.

These reflect light from a rounded surface, and disperse the rays—they cause parallel rays to diverge; diverging rays to diverge more, and converging rays to converge less. Any polished convex body is a mirror, and there is no mirror of this description so perfect and powerful as the eye. So great is its power for diminishing objects, that on a surface of less than half an inch in diameter, a landscape of many miles in extent and embracing thousands of objects are distinctly delineated at the same instant.

All convex mirrors are curvilinear, or in other words arcs or segments of circles. Curves are formed of a number of straight lines, or points, infinitely short and inclining to each other, and each of these lines or points may be considered as a plane mirror, and the whole convex surface as comprising innumerable diminutive plane mirrors, placed at angles with respect to each other, but forming a curvature in general arrangement. All rays that fall perpendicularly upon this convex surface, in the direction of its supposed centre will be reflected back in the same direction; but all other parallel rays will fall obliquely, and be subject to the general laws of reflection.

Objects viewed in a convex mirror appear smaller than they are in reality, on account of the angle formed by the reflected ray being rendered more acute by the convex than by the plane mirror, and because the convex surface reflects rays from points nearer to each other; the angle subtending to the eye being much less than that from the plane mirror.

The visual angle being diminished by distance the farther an object is removed from a convex mirror the smaller will be the image reflected by it, and as the convex surface causes rays of light to diverge, images appear nearer to that surface than to that of a plane mirror; and as the different points of an object are not equally distant from the surface, the image will appear curved. The greater their convexity, the more will the image of the object be diminished, and the nearer will they appear to the surface.

These facts have given rise to many curious as well as useful inventions, both for the amusement of the family circle and for the advancement of science and art.

SECTION III.

CONCAVE MIRRORS.

In their effect, concave mirrors are directly contrary to the convex; they reflect light from a hollow surface, they collect

rays of light and cause divergent and parallel to converge, and converging rays to converge more. While convex mirrors diminish the images of objects, the concave magnifies them.

The surface of a concave mirror, like that of a convex, may be considered as composed of numerous small planes, but inclined towards instead of from each other. Parallel rays instead of being reflected parallel, as in the case of a plane mirror, or divergent, as in the convex, they converge and meet in a point, called the focus, and this focus is situated half way between the surface of the mirror and its centre of concavity.

The centre of concavity of a concave mirror is an imaginary point, situated at the centre of the circle formed by continuing the line of convexity from one given point of the mirror to that directly opposite.

When the incident rays are divergent, the focus is removed further from the surface of the mirror. If they diverge from a point more remote from the centre—making a less angle with the perpendicular than the parallel, they will also make a less angle on the opposite side of the perpendicular, and meet in a point between the focus and the centre. If rays diverge from the centre they will be reflected back to the same point, because they are perpendicular to the centre. When they diverge from a point between the centre and a focus they converge to a point on the other side of the centre, but if diverging from the focus they are reflected parallel.

Rays that approach the mirror converging, meet in a point between the focus and the mirror, and when they diverge from this point they are reflected divergently from the surface of the mirror.

From the vast distance of the sun from the earth her rays are considered parallel, but they converge to a point, as the focus of parallel rays in concave mirrors. This fact developed the burning glass, the camera, the telescope, &c. The greater the concave surface, and the more perfect the reflector, the more powerful will be its effects in concentrating the sun's rays. The heat of the focus of some mirrors, that have been constructed, was sufficient to melt metals, and even earth.

We have said that when incident rays are parallel, the reflected rays converge to a focus; on the contrary, incident rays proceeding from a focus are reflected parallel. This dispersion of divergent rays is the reverse of collecting parallel rays into a focus as is done by means of the burning glass.

It is only when an object is nearer to a concave mirror than its centre of concavity, that its image is magnified; for when the object is farther from the mirror, this centre will appear less than the object, and in an inverted position.

"Thus if a man place himself directly before a large concave mirror, but farther from it than its centre of concavity, he will see an inverted image of himself in the air between him and the mirror, of a less size than himself, and if he held out his hand toward the mirror, the hand of the image will come toward his hand, and coincide with it, of an equal bulk when his hand is in the centre of concavity, and he may imagine that he can shake hands with his image.

"If he reaches his hand farther, the hand of the image will pass by his hand and come between it and his body; and if he move his hand toward either side, the hand of the image will move toward the other, so that whatever way the object moves, the image will move the contrary way.

"This appearance of the image in the air, between the mirror and the object, has been productive of many deceptions, which, when exhibited with art, and an air of mystery, have been a source of gain to public show-men. The images of objects have been exhibited in this manner so as to surprise the ignorant and please the scientific."

From Cosmos.

AMERICAN NEWS.

Translated from the French by Ambrose Andrews.

THE question of the velocity of electricity has very much occupied the attention of philosophers for the last twenty years. In 1834, Mr. Wheatstone first attempted to ascertain and express this velocity by numbers, but succeeded only in establishing an inferior limit which fell short of the actual velocity of the fluid. He also operated upon ordinary electricity, that is, of *tension*, and —what is especially important for us to learn,—upon the velocity of the voltaic current. In 1837, Mr. Jacobi took up the investigation, pursuing his experiments upon a telegraphic line in Russia. In America, Walker and Mitchel, in their turn, labored in that line of research, while in France, M. M. Fizeau and Gonnelle did their utmost to resolve definitively this grand problem.

Mr. Gould appears not to have been fully satisfied with the anterior attempts, and has lately instituted new experiments to the end of fixing upon the velocity of the electric current with more certainty. We will not, in the present stage of this enquiry, enter upon the discussion of the relative value of those experiments, the description of which has been given in the *American Journal.* It will suffice at present, to record the results obtained, in order to subject them to a rigorous and enlightened appreciation at some future time.

Wheatstone's estimate of the velocity of electricity, 260,000 kilometres.

Pouillet, velocity of the galvanic current in copper, ten thousand times greater than that of the light, 3,000,000,000.

We think that the author ought to have kept this estimate to himself, it is so evidently the result of preconceived theoretical ideas, besides which it is very poorly expressed.

Jacobi,		10,670
Walker,.....	in iron,.....	25,800
	in copper,.....	30,600
Mitchel,.....		48,300
Fizeau and Gounelle,	in iron,.....	101,710
	in copper,.....	177,110
Gould,.....	in iron,.....	20,090
	in copper,.....	25,583

The circuit which Mr. Gould used to experiment upon was from Seaton to Washington. Its length was 1682 kilometres 45. After having worked out the results of his experiments by the method of the lesser squares Mr. Gould paused at the number 23 989 kilometres, as in all probability the measure of the velocity of electricity, or the space that it traverses in a second.

Our confidence in the experiments of M. M. Fizeau and Gounelle is still entire, and we fear that Mr. Gould has not escaped the false or uncertain representations which M. Fizeau has, by conclusive evidence exposed, in the experiments of Messrs. Walker and Mitchel.

AMERICAN INDUSTRY.

The following account of the results of the canalization of Niagara has been communicated to us by a recent traveler.

"It is not the ten millionth part of the river that is turned from its course, and, behold the astonishing results! The finest line of canal in all America, immensely provided with a never-failing supply of water, and hundreds of mills and factories, in vigorous operation, all at almost no expense.

"I visited one of these factories, which appears to me to be an exceedingly curious enterprise. It is for the manufacture of flour barrels, for, in the United States, where sacks are rarely used, barrels are used instead. Trunks of the oak tree, after being softened by steam are placed horizontally under an enormous knife, or clever, which cuts them into boards of appropriate thickness, at a single stroke. These boards are then cut lengthwise into narrow strips of uniform breadth for the staves, by two circular saws; they are then fashioned and smoothed by four re-

volving planes, arranged into barrels by a sort of revolving, (*chain sans fin*) then the heads and hoops—also made by machinery—are smoothed off in the twinkling of the eye with the most entire mechanical precision.

"I waited a long time in the hope of obtaining an explanation of the entire machine from the proprietor, who is himself also the inventor, and, who from the first, took special care to assure himself that I was not a rival competitor. He was a young man of about 25 years, a good natured joyous liver, and already father to several children. He was laboring roughly with his coat off, like one of his own workmen, but at the same time with well polished shoes.

"I was full of astonishment and admiration to behold with what rapidity and with what beautiful facility all these operations were executed. Without the least embarrassment or confusion, without any effort, with three men and three children, a rough piece of oak, was transformed into an excellent flour-barrel, all ready for sale in ten minutes."

This reminds us that it is now several years since a Frenchman, by the name of Menneville invented a system of machines for the formation of barrels. From numerous and well calculated experiments it was found, that with his machinery (*outillage*) the cost of handiwork would only be from 30 to 40 cents per barrel, instead of 3 or 4 francs. All the efforts of M. de Menneville to procure the adoption of his invention have, unfortunately, thus far proved unavailing, so that here again do we find ourselves outstripped by the new world.

From the Scientific Daguerrean.

PICTURE MAKING.—No. III.

BY D. D. T. DAVIE, PHOT.

THE best method of holding the plate for buffing, that which makes it most secure and convenient, is the one recommended in picture making No. 1, a block with knives or claws on two sides which fastens the plate by means of a thumb screw at one side of it. There are nevertheless many wise men still living, and the Daguerrean Art seems to be sought after and practiced for a livelihood by a learned class of men, at least one with a clear head and sound mind; who has been accustomed to using the block which I have recommended on seeing plates stuck on a block with wax, or the plate turned inside out, in order to secure it on Peck's blocks would unhesitatingly come to the conclusion that such an operator was a block headed professor. Reader, please excuse my indignation. It gives me pain to see a man or a monkey riding an ox when an ass is at his service. I cannot pass this subject and leave unnoticed another very peculiar apparatus for holding plates. The block with a handle to it and a grapple at two diagonal corners which catches the plate and so disfigures it that it is scarcely fit to melt over, much less portraying upon it the features of a beautiful damsel. In this age of improvements daguerreotoypists ought to be ashamed to use such trash. Brother artist, there is a better way, and if you were very discerning you would see it, or if the time you spend in grumbling about your next door neighbor was devoted to improving your place and fixtures these anticipated scare crows would soon be thrown from your rooms. In conclusion I will state that buffing is a nice process, and I wish it might have more attention and skill devo-

ted to it. Galvanism in picture making is closely allied to buffing, it is perhaps the most pleasing process in the chemical or mechanical parts of picturing. The beautiful coatings that are almost instantaneously given to the plates by that surprising agent (electricity) renders it truly delightful to the man of taste. There still exists a variety of opinions respecting the propriety or utility of galvanizing plates, but nearly all have yielded to its influence and adopted it. I look upon the battery as a very important agent in daguerreotyping. I would as soon think of making hay without sunshine as daguerreotypes without galvanized plates; none but those who have successfully used it can appreciate its worth The battery is to the daguerrean what large ideality was to Raphael in the productions of his gems of art.

The science of galvanism is well worth knowing, yet but few have taken the trouble to learn it. All may however become thoroughly acquainted with the whole theory and practice in a short time if they will give attention to it.

There are many different kinds of batteries in use. Some are very good and others are good for nothing. In relation to the amount of electricity required for galvanizing plates, there seems to be but little knowledge among daguerreotypists; it really is amusing to a man of science, or one who is posted up on this subject, to travel through the country and examine the various batteries that are used for galvanizing plates, many of them seemed to be arranged or thrown together by chance, and work accordingly; perhaps the negative current is much too powerful for the positive, or both may be too powerful, or both too weak, or something else will be to pay. The theory of galvanism in most cases seems to have been altogether neglected.

The daguerreotype plate is very sensitive, consequently it requires but little strength or power of battery, if the solutions are right; and the more simple a battery is constructed the better, if it only produces the required amount of electricity, and the positive and negative currents to act in harmony with each other.

I would recommend the following simple and cheap battery, a copper cup and glass in the bottom, also a zinc. (Morse Telegraph Zincs answer well) placed in the cup on the glass, the glass disconnects the current from the zinc to the cup, and thus you have both currents of electric fluid at your disposal, and you may arrange them as convenient as you choose. The copper cup will be filled to the top of the zinc with a solution of water one hundred parts, sulphuric acid one part. The zinc should be amalgamated with mercury every night, and the excess of mercury will be well drained off by morning. All of the connecting poles of the battery should be carefully brightened every morning before it is used. The same acid solution may remain in the copper cup for many days or even weeks, but it will occasionally require strengthening. The following is a very convenient mode of arranging the poles of the battery; connect a copper strip three fourths of an inch wide with the cup, and bind it over your solution cell in a goose-neck shape, and on to the end of that solder a cross bar or strip of copper nearly as long as your cell, and hang your strips of pure silver on this cross bar, as many or as few as you chose; this, however, should be governed by the size of the plate to be galvanized, as a large plate requires more negative as well as positive electricity.

We now come to the silvering solution. This solution has been thought by many to be almost beyond control, or that it required much skill and attention to keep it in working order. This is not however the case; all of the difficulties in galvanizing plates are unnecessary and may be avoided if men will but open their eyes. I admit there are a great many blockheads in the daguerrean business, but there is not so stupid a fool but that he could perfect himself in galvanizing plates; the whole thing is as simple and comprehensive as that two and two make four.

After a long and tedious series of experiments in preparing the silvering solution, I hit upon the following mode of compounding. If you wish to make two gallons of solution, first saturate one pint of water with cyanide of potassium, then saturate that with oxide of silver, put your water (nearly two gallons) in your cell and add of the cyanide of silver until your plate is sufficiently coated, in one minute or in less time if you chose. Good results may always be expected by this process. This

solution, by using, will continue to grow weaker, consequently it must be strengthened occasionally with the silver, prepared according to the above, and as the cyanide will evaporate continually, it is necessary occasionally to add a small quantity, one or two ounces; this must however be determined by the appearance of the plate. When there is not enough cyanide, the plate will have a cold deep blue appearance, and if there is an excess of cyanide the plate will appear white or milky, and it will buff very hard. When there is a lack of cyanide, there will often appear on the plate streaks, clouds, black specks, &c. &c.

From the London Art-Journal.

FRENCH ART-COLLECTIONS AND INSTRUCTION.*

A REPORT on the Arrangements and Character of French Art-Collections, and System of Instruction in Schools of Design in France, prepared by R. N. Wornum, Esq., Librarian, and Keeper of the Ornamental Casts of the Department of Practical Art, has been submitted by him to the superintendents.

FRENCH ART-COLLECTIONS AND SCHOOLS OF DESIGN.

SECTION I.—*Systems of Education.*

1. Agreeably to my instructions I have visited the principal Art-Collections of Paris and some other chief towns of France; and from my own experience, and information received, I believe there is no collection whatever in France analagous to the Museum of Ornamental Manufactures recently established at Marlborough House, nor does there appear to be any collection whatever of ornamental casts, as such, accessible to the students of any School of Design. There are collections of specific manufactures, such as the Ceramic Museum, or Pottery and Porcelain collections of Sèvres; and there are many collections of marbles and plasters illustrating the history of Architecture or the plastic art generally and partially; such as the collections of the Louvre and the Ecole des Beaux Arts, which, as regards the sculpture and architecture of the ancients, are very extensive.

2. There are, further, in France, many general collections of curiosities, as the Archæological and other local Museums, in which ornamental art itself, and manufactures generally of certain periods, are partially illustrated; but, as the object of these collections is chiefly archæological, they do not serve that specific purpose which an express collection of ornamental art, or of manufactures generally, with a view to the illustration of the progress and vicissitudes of taste would accomplish.

3. There does not appear to be any collection of ornamental casts in France;—the Schools of Design are quite without these valuable, or, indeed, essential aids to the formation of a comprehensive knowledge, or even a correct taste, in ornamental art. What are termed Magazines of Plaster are attached to the various schools, but they are on a small scale as regards variety of styles, and are rarely accessible to the students.

4 These magazines are, in fact, mere store-rooms, their contents consisting, for the most part, of many repetitions of the same casts, in order to meet the requirements of the students in the periodical competitions; for in France, the pupils, in competitions, always draw or model from the same example; but on all occasions the

* We are indebted to the courtesy of the Director of the Department of Practical Art for this important document, which it is intended to lay before Parliament during the next session.

access of the student to the collection is limited to his use of one example at a time. It is brought from the store when required for study, and is replaced when done with. Thus the Student of a French School of Design has not the advantage of seeing fine examples of art always before him, nor has he the opportunity of comparing the characteristics of various styles, and of forming his own taste from any peculiar or original predilections which he might have. The effect of this system is very palpable in French designers, and it is certainly one of the principal causes of the very decided uniformity of taste exhibited in almost all French ornamental work.

5. The system in the English Schools of arranging this class of property on the walls of the class rooms is an immense advance on the French system; and when the various small collections of our schools are completed, as far as is reasonable, and properly classified, they cannot fail to produce good and great results, in enlarging the mind of the designer, and effectually excluding anything of a national mannerism, which so strongly characterizes the French School of Ornamentists.

6. Even in the school of St. Pierre, of Lyons, formerly so strongly held up to this country as a model, there is scarcely an ornamental cast to be seen, while there is a very good collection of the figure always accessible. It is much the same at Paris in the School of the Rue de l'Ecole de Medecine, where the casts are crowded one upon another in a dark magazine, and brought out one by one when wanted, and then as soon as done with stowed away again in their inaccessible repository. At Rouen the same system prevails, but here the store-room or gallery is accessible to the pupils; the casts are, however, disposed carelessly on the floor without the slightest attempt at classification, and the collection is very small. At other schools, such as the Martiniere at Lyons, or that of M. Lequien in the Rue Menilmontant, at Paris, where the collections are disposed on the walls, the number of examples is so small that the collections are quite insignificant; they are not to be compared with those of even the smallest provincial schools in this country.

7. It may seem strange to our views that ornament should hold so very unimportant a place in the French Schools of Design, but this is because we have mistaken the object of these French schools; there is no School of Design in France that meets the enlarged view of this matter lately promulgated in England. Most of the French schools are mere drawing and modelling schools, and do not profess to be anything else. As there is no Gallery of Ornamental Art in France, so there is no School of Ornamental Art in France; indeed, ornament as a distinct art, is not taught in France; and design itself, as we understand the term, is learnt only in the private *ateliers.* The various French schools, all confounded with us in the vague category of Schools and Designs, have totally different objects in view. Some are mere Drawing Schools, others are Fine Art Academies, others Elementary Schools of Arts and Trades, and a very few, such as Chalon-sur-Marne, Angers, and Aix in Provence, bonâ fide schools for the complete education of special classes of artisans.

8. The two principal schools of Paris, that of the Rue Menilmontant and that of the Rue de l'Ecole de Medecine, Ecole Gratuite de Dessin, &c., are mere drawing and modelling schools practically. Ornamental casts are made use of in the schools, but ornament as an art is not taught; no lectures are given, though design is so far practically illustrated in the latter school, that a professor makes drawings of ornamental objects on a large canvass in the presence of his class.

9. When there are so many schools and so many museums as in Paris, it may be difficult, or even a matter of indifference, to establish any one school which shall comprehend everything bearing on the matter of ornamental objects on manufacture, or be so perfect in its organization as to be in practice exactly what it professes to be in theory We naturally find a more comprehensive scope in the provincial than in the metropolitan schools, because a variety of institutions necessarily leads to a subdivision and specialty of functions. Much that is left wholly to the private *ateliers* in Paris, constitutes, theoretically, an important part of the business of a provincial school, as at Rouen or Lyons.

10. Rouen, whose school has been now established 110 years, has its special class

for what the French term *Indiennerie* or *L'Indienne*, that is, printed stuffs, more especially cotton prints, such as chintzes, &c., one of the staple manufactures of this town. But still the school of Rouen has been generally, not specially, useful to the town; the restorations of St. Ouen may be mentioned as an example.* Notwithstanding the specific object of the school, the manufacturers of Rouen employed almost exclusively designers from Alsace; and even now a pupil who has gone through the special elementary studies of the school, has invariably to pass one or two years in the atelier of some designer before he can become practically efficient in his profession; for what the school teaches is simply flower-painting. Lyons, in the school of St. Pierre, Ecole des Beaux Arts, goes a little beyond Rouen, having established a class for *La mise en carte*, or "putting on," that is, drafting the pattern on to the ruled paper; but very little avail is made of this class. There is the same necessity at Lyons for the pupil to pass some years in the atelier of the practical designer, notwithstanding he may have gone through the whole routine of the two special classes established with a view to advance the silk manufacture; namely, the flower-painting class, and this drafting class.

11. The school of Lyons, originally established with a view to educate designers for the silk trade, soon lost its special character, and merged into a general school of art, the Fine arts having now completely absorbed the Industrial by the admission of its own professors; this is otherwise a self-evident fact from what is going on in the school. The human figure is the engrossing object of study, and the school has been long exclusively known as the Ecole Royale des Beaux Arts. In England a "School of Design" means a "School of Ornamental Art," in France an "Ecole de Dessin," signifies neither more nor less than what the words imply —a drawing school.

12. The French Schools of Designs are not Schools of Ornamental Art even in theory, much less in practice; of course, ornamental models are made use of in the practical exercises of the pupils as well as any other models calculated to develop the faculty of drawing or coloring, but not for their own sakes as examples of a distinct art, or the art *par excellence*, which it is the object of the pupils to acquire. The drawing of ornament is considered an elementary exercise; the special study with the object of immediate practical utility is supposed to consist in the grouping of flowers, clearly ignoring ornament, and assuming that flowers, as a matter of necessity, must constitute the material of an ornamental design for stuffs.

13. With such practical experience pointing out the invariable results to all those who devote themselves to designing for stuffs, it is perfectly reasonable that a knowledge of ornament should be acknowledged, at least tacitly, by custom, as quite a secondary accomplishment to a skill in flower-painting, or any fashionable technical facility of the day.

14. It would appear that the current statements respecting the Lyons School of Design are so contrary to the real facts of the case that some visitors at least have confounded the great school of the "Martinier" with the "School of Design." (I except Mr. Dyce's excellent Report, which gives a thorough statement of the case as regards the Lyons school; but in 1838 it may have appeared more important to that gentleman from there being so much less to compare with it at that time than at present.)

15. The great school of the Martiniere at Lyons is a very important establishment, but the object of its foundation was quite distinct from that of the foundation of any of our Schools of Design. With us the motive was to educate *Designers* in order to improve the character of our ornamental manufactures, and to render our manufacturers independent of foreign countries. The object of the Lyons school was not to produce designers of any kind, but to aid in the education of generally indigent workmen. The point of ornamental design is not touched at all, nor is there any drawing-class in the school except for mechanical or machine drawing.

16. I may, perhaps, be permitted to

* The Rouen school is of a two-fold character: the classes for general Art-instruction, as the elementary, the antique, the living model class, and the class for l'Indienne, are between 12 and 5; and the practical classes for workmen, in geometry, machinery, and construction, between 8 and 10 at night.

speak more at length of this school, though schools, any further than they may be connected with special Collections or Museums, are not a part of my business on this mission; however, the object of schools best explain the nature of their collections.

17. The *Martinier* is an Ecole des Arts et Metiers; it is gratis, and gives instruction in morals, writing, grammar, mathematics, physics, chemistry, the theory of silk-manufacture, machine-drawing, modelling, and moulding. This school derives its name from its founder, or rather the cause of its foundation, Major-General Martin, a native of Lyons, who acquired a large fortune in the service of the English East India Company. He died in 1830, bequeathing his fortune to his native town, subject to the disposition of the Royal Academy at Lyons. This body organized in 1833 the now celebrated school for Arts and Trades known as the *Ecole de la Martinier*. It is established in an old Convent of the Augustines, and accommodates on an average about 400 pupils.

18. The nine classes enumerated above show that no specialities are taught in this school, its scope is purely general, with a view to supply Lyons with efficient workmen and overseers of factories, by virtue of a general training and good ground knowledge of essentials; all classes are compulsory.

19. A very great feature of the school is the class for mechanical drawing; the immense room of this class will accomodate at once as many as 300 pupils. The wooden flooring is, as it were, tesselated, in such manner as to mark out the various groups and their numbers, in circles, around the model to be drawn.

20. No drawing from the flat is permitted in this class, or indeed at the school at all; the first exercises are from wire models and solids; finally the pupils draw from every species of machine, and always without the aid of instruments; they must become familiar with the forms of machines before they know their uses, these are explained afterwards in class demonstrations by the Professor. Of course, to carry out efficiently such a system implies a great outfit, and the Institution possesses a large museum of machinery, which is being continually made more perfect by the assiduous labors of M. Girardin, the Professor of Mathematics.

21. The *Ateliers de Travail*, another department of this school, are purely for general training, to give a species of universal mechanical aptness. All pupils must pass through these workshops, which consist of one large room in three divisions, for practical exercises in turning, joinery, and iron filing; all work is regulated by the eye alone; the filers have to imitate accurately certain geometrical solids, and in all three classes prizes are given for the best work. The time exacted to be spent in these workshops is sixty hours in the session, and as much more may be spent there as the pupil pleases in hours of relaxation. They are places of favorite resort with many pupils.

22. The modelling and moulding class of this institution is another prominent feature; this is called the class of Practical Sculpture, but what is called artistic drawing or painting is not taught. The object of this class is to furnish the town with competent plasterers and masons, that is, men who shall understand and appreciate the ornamental forms they are to carry out in their work. There are competitions also in this class, and according to the French custom all the pupils model, or mould, the same thing in a given time. In the room or gallery devoted to this class the collection of models or ornaments belonging to the Institution is disposed on the walls, an advantage which the pupils of the original Lyons School of Design have never yet had. But the Martiniere even in this respect conveys a far more lively impression of efficiency than the genuine school of St. Pierre does, which is certainly little more than a mere Fine Art Academy in practice, whatever it may be in theory.

22. I was informed that most of the good chemists and foremen of factories of Lyons have been pupils of the Ecole de la Martiniere.

24. All inquiries in France seem to lead to one conclusion, that *industrial art*, to use a French expression, is there entirely left to private enterprise for its development; all schools devoted to it are elementary, in practice at least, if not in theory; and I have it from very good authority, that the rule is, that the profession

of a designer for manufactures, in all cases of eminence, has been taken up as a *pis aller* by the artist after he has already failed, or imagined he has failed, in the higher walks of fine art, and very rarely from any predetermination to make such a branch of art the business of his profession. This may be more literally true of general ornamental designers and decorators than with the designers for ordinary fabrics; however, in the latter case it is only the same thing in a lower grade; the ordinary French designer has probably twice failed in a higher walk. This is a state of affairs which could not be if the art of the ornamentist were treated as an *art* instead of only a *profession* in France. With whatever ostensible object a French youth may enter a School of Design, his secret ambition is infallibly to become an artist; and it is only when he fails in his aim that he consents to follow industrial art; and this state of affairs is the chief cause of the very monotonous uniformity of style which invariably prevails at a given period in France; the taste or fashion of the moment, with all the advantageous qualities of a mere ephemeral caprice, usurping the place of sound principles; and this likewise explains why French works of ornamental art are generally so very much better executed than conceived; the executive faculty is in perfection, but the critical, theoretical, or historical skill is lamentably wanting, and what one does all do.

25. All this is the result of a system which nothing but well-selected museums of ornamental art of all ages and countries will cure.

26. Let us examine the great Ecole des Beaux Arts itself, one of the national institutions of France of which the French may well be proud. It is from this school, and not from any School of Design, that all the great decorators and ornamentists of France have proceeded; and yet according to M. le Baron Taylor, a great authority, all, both professors and pupils, have a hearty contempt for ornament; a statement one can readily believe when one sees how inidfferently its various examples of ornamental marbles and plasters have been disposed of; either buried in some podium too low to be properly seen, or fixed at such a height in the walls as to be altogether invisible as regards their ornamental details. An intelligent *employe* of this school, who has been particularly occupied with these matters for the last five and twenty years, never once saw a pupil make a drawing from a purely ornamental cast or marble. The human figure is the great object of study, and a good knowledge of the figure is the *passe partout* of the French designer. A showy group of figures will cover many ornamental blemishes; or the good designer of the figure may get his ornament done for him by somebody else, without in any way derogating his own reputation as a designer for "*Industry.*"

27. This school is established on the most liberal scale of expenditure, both for its staff and its collections (figures and architecture chiefly); so much so, that, as I was informed by Baron Taylor, the same authority mentioned above, every pupil who attains the rank of a pensioner of the French Academy at Rome, that is, who has gained the "grand prix de Rome," costs the State 30,000 francs for his education; and taking those who have failed in being so fortunate as to gain this great prize, the expense to the State will still average between 12,000 and 15,000 francs each; that is, dividing amongst them the whole annual cost of the establishment, locality, collections, and management.—There is, therefore, many a designer for "Industry" in France, whose whole qualification may consist perhaps in a skillful manipulation of the figure, whose education has cost the State some 500 or 600 pounds sterling,—a sum which has hitherto maintained entire schools in this country for a term of several years.

28. These disappointed aspirants often become admirable designers in some departments of industry, as in pottery, in porcelain, in silver and bronze, in all of which the figure is of infinite importance. The professors themselves recommend their pupils to "*take up industry*" when they find that they do not completely succeed in the higher walks of Art. And it is to this peculiar system that French critics attribute their, real or assumed, superiority of taste over all other countries; but if this be so, it is clearly much more owing to the shortcomings of other nations than any peculiar efficiency of the French system.

SECTION II.—*Collections, &c.*

29. The collections of marbles and plasters of the Ecole des Beaux Arts, but more especially of the latter, is of great extent, and is perhaps on the whole, as to its actual possessions, the finest in Europe, though the dispositions of the examples is such as to be altogether nugatory in some respects, and especially as regards ornament. This large collection, which has been undergoing the process of arrangement for the last quarter of a century, is still in an incomplete state, and has never yet been open to the public.

30. The principal features of the collection as now disposed in the so-called *Musee des Etudes*, are the accurately fitted architectural specimens from the great temples of Greece and Rome, fitted according to the exact measurements, at a great expense; the large collection of casts from Greek and Roman sculpture, and the remains of the Château de Gaillon, and many fragments of ancient marble from Rome, chiefly collected there by the late M. Dufourny, a French architect, in the latter part of the last century.

31. The ornamental specimens collected by M. Dufourny in Rome, have formed the nucleus of almost every classical collection of ornament in Europe. They came into the possession of the Ecole Royale des Beaux Arts in Paris, by Government purchase about the year 1828, some few years after the death of M. Dufourny. And the present Musee des Etudes has been in course of formation from that time; it was much increased by specimens sent from Rome by M. Ingres in 1834; but it was not till 1838 that a systematic arrangement of the whole was commenced, under the directions of M. Duban, the architect. It is, however, only during the last three years that the work has been seriously prosecuted, and it may occupy yet a year before the whole is definitely arranged.

32. There is an ample space in the great saloon of the museum, but so little has the idea of ornament obtruded its lf in the arrangement, that no attempt whatever has been made to make the slightest individual or progressive display of ornamental art; the examples of which are scattered and dispersed over the whole building in the saloons and courts; and in all cases either too low or too high to be seen. They are preserved certainly, as old curiosities, but not as objects desirable to be studied.—Nearly all these small ornamental fragments belong to the Dufourny collection, but unfortunately no catalogue of them has been preserved. The present keeper of the collection, M. Priest, is preparing a catalogue, but the majority of the fragments will rest wi hout the same.

33. As an architectural museum, the collection is great in classical specimens, and perhaps unique, and the arrangement is perfectly satisfactory. In the Greek and Roman saloons respectively are placed, in the centre, groups of the most remarkable sculptures from the Louvre and other great collections; and around the walls are inserted the architectural specimens, among which portions and capitals from nearly all the renowned temples of Greece and Rome form very striking features,—such as large specimens of the Parthenon, the Erectheium, the temple of Minerva Polias, the facade of Pandrosium complete, with the Canephoræ, and the choragic monument of Lysicrates complete; and from Rome the great capitals complete, with their entablatures, from the temples of Antonius and Faustina, Mars Ultor, Jupiter Tonans, the Pantheon, exterior and interior, and a large portion of the Arch of Titus. The Dufourny collection was valued at about 2000*l.* only, and this has grown by the energy of the French government during the last twenty years into the present great museum, now estimated at 20,000*l.* sterling. Still it is remarkable, that so great a collection by the vice of a purely architectural arrangement, should be of so little account as an ornamental museum. It has the one great drawback of nearly all French museums, an arrangement for a mere general effect; use, indeed every higher consideration, is sacrificed to a general *coup d œil*, to a mere empty display. The contents appear to be there to set off t e locality, instead of the locality to display the contents. These strictures, however, apply to the collection as an ornamental museum, not as an architectural one. And when we consider the estimation in which ornamental art is held in France, or design *pour l'Industrie* in general, among the greater and the rising French artists, there

is nothing remarkable in this general neglect of purely ornamental specimens of art in a mixed collection of the figure and the architecture.

34. After the Ecole des Beaux Arts, one of the most remarkable institutions in Paris having relation to the arts and manufactures, is the great *Conservatoire des Arts et Metiers;* but here the Arts, that is the ornamental, are in a still more obscure condition than the Ecole des Beaux Arts. Considering, however, that this institution is professedly for the encouragement of the mechanical arts and trades, it is scarcely here that we should expect to find any special fostering of the ornamental art.

35. There are three great features which distinguish this noble institution: its magnificent lecture rooms or theatres, its vast collection of machinery, and its library and collection of brevets or original drawings of inventions. The *Salle de Portefeuille* of this institution contains about 12,000 drawings of machinery, and 20,000 brevets of inventions, all of which are accessible to the public at any time, and free of cost, to make drawings or tracings from. The library contains about 15,000 volumes of a general character, but chiefly relating to the industrial arts: it possesses an alphabetical and a classified catalogue in manuscript: these books are disposed in a magnificent hall, in the Byzantine style of architecture, which has been recently very richly decorated, so that even here we find the striking *coup d œil* for which Paris is so renowned in its public buildings; but in this case, as the books do not suffer by the magnificence of their apartment, it merits our unqualified admiration. Of the unrivalled collection of machinery which, through the politeness of Professor Tresea, I was enabled to examine in detail, a catalogue, prepared by the conservator, M. Morin, has been already published;—a copy is in the library of the Department at Marlborough House.

36. Of the two lecture theatres, the larger, a very noble room with which we have nothing to compare, will accommodate 1200 visitors, the smaller only 250. The lectures or demonstrations are on—geometry, mechanics, physics, chemistry, agriculture, and political economy. The institution contains also a school for mechanical drawing, such as the great class at Lyons, and according to M. Tresca, it is now well attended, and is steadily growing in importance.

37. However, whatever may be the extent and merit of the specific collections of the various great institutions of Paris, the centre of attraction in all matters relating to arts, antiquities and curiosities, is the vast aggregate of collections in the palace of the Louvre. We have here distinct museums of marbles, plasters, paintings, drawings, prints, enamels, pottery, glass, bronzes, naval and other curiosities and antiquities, foreign and French; but still no express museum of ornamental art or manufactures. These various collections are made use of by students, but not so much as one would have supposed, considering the value of the collections, the vast extent of the city of Paris, and the general taste of the French for objects of *vertu;* of course, I do not profess to give any accurate statistics of these matters, as I do not speak from documents but simply from the incidental personal information of the officers of the institutions. The number of students of all denominations who daily attend the Louvre is about 200; at least three-fourths of these visit the picture galleries, and nearly the whole of the remaining fourth, the gallery of casts or *musee des platres;* for the Louvre contains a collection of plaster casts as well as its great museum of antiquities, or marbles, opened about fifty years ago under the title of the Musee Napoleon.

38. The antiques are rarely studied; the students prefer drawing from the plasters. This collection is not numerous; there is no catalogue of the casts, which do not appear even to be numbered. There is at present no catalogue sold of the marbles or *antiques*, nor has there been since the death of the late accomplished Count Clarac. This celebrated collection is much more remarkable for its extent than its merit. The system which prevails of completely restoring mere fragments of figures has made it difficult in some cases to decide whether the examples come more fairly into the category of ancient or modern works; they belong strictly to neither. In ornamental art there is extremely little, and the greater part of that little, with the exception of an occasional vase or cande-

labrum, is condemned to some lofty recess, or banished to an obscure wall of an outer court. In the figure, the collection contains three examples of highest renown:—The Venus of Milo (Melos), the Diana a la Biche, and the Borghese Warrior, or the so-called Fighting Gladiator, all well known favorites in the Schools of Design in this country.

39. The other principal collections of the Louvre are—the Musee des Emaax, the Musee Grec et Egyptien, the Musee des Dessins, the Musee de le Marine, and the Musee de la Renaissance.

40 Of the museum of enamels, jewellers' and painters', a mixed collection of objects of all kinds containing decorations in enamel, there is a very excellent catalogue by the conservator, Count de la Borde, which constitutes a valuable history of the whole subject of enamels (a copy has been placed in the Library of the Department). This collection contains many fine examples of maiolica ware; but, consistent with the besetting vice of French collections (it is the same with the Greek and Egyptian Museum), the objects are in their arrangement so completely sacrificed to the general effect and arrangement of the apartment, to a mere architectural *coup d'œil*, that it is painful to have to run one's eyes over them; they are extremely badly lighted and crowded together in upright presses placed against the walls; the building, not the collections, is the show. While the objects are crowded in small dark presses against the walls, the centres of the spacious apartments are left unoccupied except for the constant promenade of visitors, who stare at the gorgeous ceilings and columns and pass through the apartments, certainly without, by their own observation, being aware of what they contain. As far as my experience went, the rule was to stare at the decorations, and to pass through without giving a single glance at the objects of the collections; and this is no fault of the people, but of those who have condemned those objects to the dark recesses where they do not interfere with the general scheme of the apartment.—The Museum of the *Arts et Metiers* is perhaps the only great collection in Paris which is not open to this objection of faulty arrangement, owing to the excessive decoration of the localities, or the purely architectural disposition of their contents.—Even in the picture galleries in the newly decorated saloons, containing the great masterpieces of the Italian and Spanish and French schools, this defect is very prominent; but more so in the French than in the Italian, owing to the more subdued character of French coloring. The magnificent picture by Gericault, of the wreck of the "Medusa," is much injured in its effect by the very gorgeous character of the ceiling immediately above it, and with which it has not the slightest harmony.

41. The present aspect of the Louvre Picture Gallery certainly presents a striking contrast with our arrangement of such matters in this country. The various pictures are at length pretty well classified into schools, the French now having a gallery to itself, with, as in the Italian and Spanish gallery, a tribune as it were, in which all the masterpieces of both galleries are assembled together; and it would be difficult to imagine a more splendid *coup d'œil* than the great saloons containing the French, the Italian, and Spanish masterpieces, now present. Luxury is added to magnificence in the Italian saloon, in the shape of an enormous velvet ottoman, or four sided couch, sufficient to accomodate some twenty persons at once, and affording at the same time the finest view of the pictures. It might be assumed to be folly to advocate the introduction of such luxurious magnificence in our National Gallery, with a public stream of all classes four days in the week, while the Gallery of the Louvre is open to the public on Sundays only, when people are supposed to be on their best behavior; but it must be borne in mind that the pupils are admitted throughout the week at Paris, as well as all strangers at all times upon merely presenting their passports on entering; and considering the ever-changing concourse of curious strangers at Paris, it virtually amounts, as far as numbers are concerned, to a daily admission of the public.

42 A catalogue of this portion of the Louvre pictures, the Italian and Spanish, has recently been prepared by the conservator, M. Villot, on the plan, (alphabetical, biographical, and historical), adopt-

ed for the enlarged catalogue of the National Gallery. A copy has been placed in the library of this Department.

43. Students are permitted to make copies and studies from all objects in the museum, and there is an apartment set aside expressly for study, into which all such objects are removed as cannot be sufficiently or conveniently studied in their cases; this is, however, a privilege rarely made use of; no fee is charged, all that is required is the permission of the director of the National Museums, M. Nieuwerkerke, or of the conservator of the special collection concerned.

44. The peculiar mode of arranging and crowding small objects in the Louvre collections in upright presses renders such removal imperative in most cases, if a thorough examination of the article is desired. Much of this necessity and much vexation and disappointment to the curious visitor might be obviated if small articles were disposed in flat places or armoires in a strong light near the windows, and so disposed that both sides might be seen; this might involve the necessity of more space, but in most cases more than sufficient space is actually wasted in an unnecessary central promenade.

45. Another collection of the Louvre, already named, affords some matter of criticism; that is, the *Musee de la Renaissance*, formerly known as the Galerie d' Angoulême of French Sculpture: It is the remains of M. Lenoir's *Musee des Monumens Francaise*. This is a collection of great interest and value, but ornament is again neglected, it is much too exclusively a figure collection, there being remarkably few ornamental specimens; though the very nature and name of the collection, and still more so the manner of its division into separate rooms named after the various distinguished sculptors of France of that period, naturally leads one to expect here an extensive display of French ornamental art, as most of the artists of that time were, more or less, distinguished for their skill in ornamental sculpture.

45. The first apartment is called the *Salle de Francheville*, and contains specimens of that sculptor and of Prieur; the second, the *Salle des Anguiers*, with specimens of the sculptors of that name; the third, the *Salle de Jean Goujon*, with examples of that celebrated sculptor, and of his very able rivals, Germain Pilon and Prieur: the great taste and ability for ornament of Pilon are very conspicuous. The fourth is named after *Jean de Douay*, better known as Giovanni da Bologna. This apartment contains also the original bas-relief of the Entombment by Daniele da Volterra, and some interesting specimens of the enamelled ware of Luca della Robbia. The fifth room is called the Salle de Michel Colombe, and contains the bas-relief of St. George, made by that sculptor for the Cardinal d'Ambose for his chateau at Gaillon. In this apartment is also a remarkable statue in alabaster of Louis XII., made for the same Cardinal, and also for the Chateau de Gaillon, in 1508, by the sculptor Demugiano at Milan. One of the attractions of this museum is the excellent skill with which, in several instances, figured draperies have been rendered in marble or alabaster—especially by Germain Pilon, in his busts of the three Kings, Henry, II., Henry III., and Charles XI. In this museum is also contained in a distinct apartment, repeated in plaster, the celebrated chimney-piece of Bruges, carved in wood, in 1529, by an artist whose name has not been preserved. This magnificent work was moulded at Bruges some ten years ago, by the orders of M. Thiers, and fitted up at great cost in the Louvre by the late Moulder to the Museum (M. Jacquet.) It covers the complete side and half of the ceiling of a large room, and affords some very bold and admirable specimens of carving illustrative of the spirit of the Cinquecento, which it would be very desirable to procure for the collection of ornamental casts of the Department.

47. This museum concludes the list of special collections of the Louvre, which have immediate reference to art;—the Musee de la Marine is of a mixed or scientific character rather. There can be no doubt that the numerous collections of Paris afford great advantages to the French designer, but it is very evident that he makes little use of them compared with what he might and would, if his attention were particularly called to them, either by their titles or arrangement; or still more, compared with the use he would make of a specific collection of ornamental manu-

factures brought together as such; that is, as models and incentives to emulation on his part, and not scattered about in various museums as mere general objects of art and *vertu*, or, what is still less attractive to the artist, as mere matters of archæological curiosity. This is the case with nearly all museums hitherto established; and many are misrepresented by their titles, as, for instance, the collection of enamels in the Louvre, containing all kinds of miscellaneous manufactures in any way decorated with enamels, contains specimens of very many arts, besides that of the enameller, yet it would be overlooked by most students not in immediate search of examples of enamelling.

48. The Museum of the Hotel de Clugny is the nearest collection to a museum of ornamental manufactures in France. This collection contains nearly 2000 objects or groups, classified pretty closely in the catalogue according to the nature of the manufacture, &c.; as, for instance, sculpture in all departments,—stone, ivory, wood, &c.; painting, glass-painting, enamels, pottery, glass, jewellery, clock-work, locks, arms and armor, offensive, defensive, and for the chase; iron work, various, engraved and chased; tapestry, church ornaments, embroidery; mosaics, bronzes, &c.

49. The Museum founded by the late M. du Sommerard contains a long list of objects, but they extend over very limited spaces of time only, the greater portion belonging to the sixteenth century. The museum which was founded, that is made a public Museum, in 1843, consists professedly of monuments, objects of furniture and art, of antiquity, the middle ages, and the Renaissance, collected by the late M. du Sommerard; and is actually an historical museum. The objects are preserved in it because they belong to a certain time, and not because they are specimens of manufacture or of good taste. A museum of this class containing objects which are preserved by virtue of their period, and these periods all belonging to the past, comes clearly, like the Museum of Norman Antiquities of Rouen, under the category of archæological collections, and does not meet the designers' desideratum of a practical Museum of Ornamental Art. In the first place, the historical arrangement being the principal end, the specific classification, according to the progress and development of ornamental art, the very essence of an Art-museum, becomes quite secondary, if possible at all, amongst a miscellaneous collection of objects of all characters, simple or ornamented, and arranged promiscuously, according to their period; manufactures of every description of the same period being classed together, and in the Hotel de Clugny very much crowded together. The classification in the catalogue does not aid the inspection of the objects, as they are not placed in the numerical order of the catalogue.

50. The museum is open to the public, as is the case with most of the French collections, on Sundays only (from 11 until 4 o'clock): on Wednesdays, Thursdays, and Fridays the admission is by ticket only, but for strangers their passports are sufficient. Tuesdays and Saturdays are reserved for students, and on Monday the museum is closed. Permission to study is granted by the curator; no fees are charged: the locality of this museum is extremely ill-adapted for its purpose.

51. The arrangement of this museum, however, is probably not one of the causes which will account for its being made little use of by designers or students of ornamental art. Fashion, the humor of the day, is what every manufacturer, and consequently designer in Paris, obeys or studies in all efforts at original design. Hence the atelier of the practical or fashionable designer or manufacturer, as the case may be, is the only legitimate school of design with the young French aspirant. Whatever may have been the Art-school in which he was brought up, and however accomplished he may be as a draftsman or painter, he has never studied ornament as an art, has no knowledge of its historic developments, or if any only the three vague divisions of Classic, Ogival (or medieval) and Renaissance, without the slightest exact knowledge of the real characteristics even of these. His only resource therefore is to limit his efforts, as is very common in France, to the drawing or modelling of the figure, or to pass a year or two in the atelier of some fashionable designer; but here, instead of acquiring any thorough knowledge or æsthetic appreciation of ornament, he becomes familiar only with the

peculiar predilections of the master of the atelier, or at the utmost of the current fashion for the moment in that particular fabric. A Frenchman knows well what other Frenchmen are doing; but none are more ignorant of what their neighbors are doing than the French, or perhaps generally more indifferent. If I am right then in my exposition of the character of French Art-Education, and the extent and nature of the field of its practical or after operations, it is clearly extremely limited in its ornamental scope. What the French were doing in the time of Louis XII. or Francis I., owing to the example among them of Italian artists, or still more universally in the time of Henry II. or Henry IV., they are in the main doing this day, and have been doing, nearly ever since, with the exception of the temporary vicissitude during the reign of Louis XIV., and his immediate successor, and the brief classical mania under the influence of David. At this moment, notwithstanding a few isolated efforts in favor of Greek and Roman examples, or of the Gothic or the Ogival, the style in vogue in the time of Henry IV., the so-called Renaissance, is perhaps more fashionable and more universal than ever; simply because the great school of ornament with the French designer is merely that by which he is immediately surrounded. What the French artist is thoroughly educated in, is the figure, and in the figure and in floral design he pre-eminently excels; in the skill also with which he executes such details as he introduces he is excellent, but any other pretensions to superiority are unfounded.

52. The meeting of the public taste, and a general very successful treatment of floral designs as well as some of the pure mannerisms of French ornamental manufactures, are neither the merit nor the fault of the designer, but are due to the influence of the manufacturer or merchant for whom the article is made; this influence is very great, and is admitted to be legitimate by the French artists generally.

53. The manufacture of bronzes may serve to illustrate our purpose.

No *factories*, properly speaking, for bronzes exist in France; except in cases of great works, bronzes are extremely rarely commenced and finished in one establishment. Great works are only commenced and finished in the same establishment because they are not portable; but these are not always so finished, the labor is sometimes subdivided as it was among the ancient Greeks.

54. In Paris at the present day, a bronze undergoes six stages before it is finished; directed in the first instance by the dealer or manufacturer as he may be called, whose great qualification is a supposed knowledge of the public taste; for the French manufacturers profess to follow, not to lead, the public taste, but they venture to humor it or modify it.

In the first place the designer makes the model according to order; as a second stage this model is submitted by the designer to the manufacturer, who, if needed, gives it the form of advice or suggestion, what is termed the public sentiment. If the model should happen to be of a mixed design of which figure and ornament are both prominent, the rule is that it is the work of two artists, one for the figure, the principal, and an assistant for the ornament.

In the third stage it passes to the founder, who moulds in pieces and casts. It then, fourthly, passes into the hands of the *ciseleur* or chaser, who finishes (in very cheap works this stage is omitted, or the process very much neglected.)

The pieces afterwards are handed over to the fitter, *monteur en bronze*, who adjusts and puts all the pieces together. And sixthly and lastly, it comes into the hands of the bronzist or *metteur en couleur* to be tinted or bronzed. The work is now complete, and has probably passed through these various stages in so many distinct establishments, even in localities wide apart; and so far is this system of the sub-division of labor carried in Paris that one man is capable of carrying out the work of one of these stages only, and probably has not the least notion of the labor that the work has already undergone, or will undergo before it leaves his hands.

55. I was informed that M. Miroy has the only positive bronze factory in Paris, that is, in which all the processes are carried on from the original model to the final coloring, or *mise en couleur;* but those who carry out the various stages are just

as ignorant of the processes performed by their fellow-workmen as if the processes were carried on in separate establishments.

56. An éleve or apprentice is bound for certain periods, and only to one department; these periods are generally five, three, or two years, and during the whole of these five years, or whatever the term may be, the apprentice is trained *only to one description of work*, as finisher, fitter, stainer, which ever he may have chosen in the first instance.

57. One great secret of French success in some of their manufactures of this class is the high price which the manufacturer willingly pays for a good model; he is thus secure of having the best that can be got. M. Miroy assured me that he had paid as much as 6000 francs (240*l.*) for the model of a clock of which the highest selling price when complete was only 2000 francs, or 80*l.*

58. There is still one important collection to which I have as yet only casually alluded, I mean the Sevres collection of pottery and porcelain, which is yet unapproached in any other country.

59. This museum contains not only specimens and models of Severes manufacture, but a very considerable display al o of the pottery and porcelain of the principal seats of this manufacture throughout the world, and this has been accomplished at a comparatively trifling expense. This collection has been now thirty years in forming, under the superintendance of M. Riocreux, the conservator; it is now valued at 500,000 francs, or 20,000*l.* sterling, and has not cost the French government more than one-tenth of that sum; the increase owing almost entirely to presents and exchanges for French manufacture.

60. An elaborate description of this museum abundantly illustrated has been published for some years, the joint labor of the late director of the manufactory, M. A. Brongniart, and the present conservator of the collections, M. D. Riocreux. But this valuable and extensive collection is ostensibly and professedly purely scientific; that is to say, though it necessarily contains many and very various beautiful objects of art, they were none of them procured nor are they preserved as such; neither form, composition, nor design, nor any historical consideration or archæological interest whatever, have in any way influenced the formation of this museum. That it is therefore not a museum quite calculated to display or illustrate this manufacture in relation to art or the progress of taste is not surprising; the principle of its arrangement is purely scientific or perhaps rather technical; its object is to illustrate the physical development of the ceramic art, the nature and order of discovery of *pastes* and *glazes*. Whether the artistic element should be altogether subordinate to the technical, if the two cannot be combined, in a museum of specimens which naturally show results not processes, perhaps may fairly be questioned; for the technical after all is matter of scientific investigation, while such objects as must consti ute a ceramic museum impress the mind immediately in relation to uses and forms, and it is the form or general appearance which first and most constantly engages it.

This technical arrangement of the museum is, however, quite consistent with the principle which governs the institution; though many of the most able designers of France have been and are engaged in the institution, M. M. Feucheres, Clodion, Dieterie, Klagmann, and many others, the direction has always been in the hands of a chemist, a purely scientific man, a fact that has not failed to draw serious censures from some French critics. However, the object of this institution is purely scientific, and the arrangement of the examples is in accordance with this object. M. Brongniart preferred any fractured sp cimen of pottery which showed what it was made of to the most magnificent work of art if it were so perfect as to keep its composition a secret.

61. This great museum, or at least the first and most important division of it, that of pottery and porcelain (the second being glass and enamels), is arranged into three classes, again subdivided into nine orders, as follows:—

Class I.—Potteries, soft paste.
Order 1. Terra cotta.
Sub-orders *a*. Plastic ornament, &c.
b. Utensils.
c. The mat or unglazed.
Order 2. Potteries, soft paste, lustrous.

Order 3. Potteries, glazed.
Order 4. Ditto, enamelled (maiolica.)
CLASS II. Potteries, hard paste, opaque.
Order 5. Crockery, (delft-ware, Faience.)
Order 6. Stone-ware (crouch-ware.)
CLASS III. Potteries, hard paste, translucid.
Order 7. Hard porcelain, Chinese.
Order 8. Soft porcelain, natural.
Order 9. Ditto artificial.

Such is the system of distribution of some thousands of specimens, every order and sub-order having its own geographical and chronological classification and series spreading over the whole period of the history or the extent of the explored globe. Every order represents a universal museum of its class. This may be very advantageous in a scientific point of view, but it completely negatives even the possibility of a general view of the progress or development of taste, or even of the elimination of the distinct notion of the peculiarities of taste of any particular place or time. It is therefore not a system to be adopted in a museum expressly organised for the sake of illustrating the history or inculcating accurate and sound views in the matter of ornamental art. I do not presume to find any fault with the distribution at Sevres, but simply to state the fact of its being hardly an example of arrangement to follow in a museum of ornamental art.

62. Besides the veritable collection of ceramic specimens, this institution has preserved plaster casts of all or nearly all its most remarkable productions, not only in the shape of figure groups but also the vases of any pretensions. But perhaps the most remarkable portion of this collection of casts are some exquisite models of figure-pieces by all the principal modellers of France, who have been employed in this institution. We have here the French talent displayed in its forte, and as these models are procurable for about 30 francs each, it would be most desirable to procure a selection of them for the museum of Marlborough House, as excellent specimens of the treatment of the figure for works of ornamental art. The most recent productions of the institution also are procurable in plaster, including the principal works exhibited in the Sevres room in the Great Exhibition of 1851 in London; prominent above all others is the large and magnificent vase of *coup de travail* by Feucheres, with its admirable bas-relief of the arts around the outer side. A large plaster cast of this beautiful work may be had for 12*l*. It would be a fine example of modern art to contrast with some of the ancient vases possessed by the Department.

63. Glass and glass-painting coming under the general definition of ceramic manufacture, are both matters of important consideration at Sevres; and this summer were exhibited there some very remarkably large panes of plate glass, painted by MM. Apoil and Bonnet for the church of Dreux, valued at 10,000 francs or 400*l*. each; single panes of glass ½ inch thick 5½ feet high, and about 5 feet wide, the largest pieces of glass that have yet been fired.

64. Such are the principal museums of Paris and its vicinity accessible to the designer, which in any way illustrate Art and Manufacture at once. It results, therefore, that no express collection with similar objects in view as that at Marlborough House yet exists in France, for the provincial galleries are naturally further from fulfilling this object than the metropolitan. Lyons, considered the second city in the Empire in general matters, and, in point of the value of its manufactures, second to none, possesses only such ordinary Art-collections as are common to it, with many much smaller provincial towns. The Palais des Beaux Arts, besides its school, contains a picture-gallery, with a distinct saloon set apart for the works of Lyonnese masters, and a museum of antiquities, founded in 1805 by the Comte de Sathonnay. This museum contains casts, bronzes, marbles, jewellery, and a good collection of ancient glass. A catalogue of the collections is not yet prepared.

65. Rouen also can boast its several collections of some importance, but they are all of a general artistic or archæological character. The great museum is in the Hotel de Ville, and here also is the library, at present in the charge of M. Pottier, which possesses some valuable

illuminated manuscripts and other objects of art, prints, &c. It is open daily, and students are allowed to copy, and even to trace from, the works contained in it, with the special permission of the librarian. The museum, or rather picture gallery, contains a variety of objects besides pictures—as drawings, sculpture, ancient casts, and architectural models; comprising many busts of distinguished moderns, native of Rouen; modern pictures (presented by the minister of the interior), and good copies from the works of celebrated Italian masters. This gallery is open daily, and artists have the privilege of copying the works contained in it. There is no catalogue to be had at present.

The Norman museum, in another part of the city, is purely an archæological collection, and has more local interest than any real art or historic value. The arrangement is historical, but the whole collection, in pure relation to art is insignificant. It possesses, however, one remarkable series of casts, which it would be very desirable to have moulded for the museum of Marlborough House. It is the series of bas-relief representing the meeting of Henry VIII. and Francis I. on the Field of the Cloth of Gold, carved on one of the wings of the Chateau de Bourgtherould in Rouen.

These casts were made some time ago, and they are now in a much better state of preservation than the original bas-reliefs of the facade. The original work was evidently very careful and elaborate; and it was executed immediately after the event, the sculptures have great interest in point of costume, which appears to have been very minutely attended to.

SECTION III.—*Summary.*

66. Then, notwithstanding the great variety and richness of French Art-collections, and the much-lauded Schools of Design and Art-education of France, it has no specific Museum of Ornamental Manufactures, with the express view to the development of ornamental taste and knowledge; its schools are almost exclusively of an elementary art character, in practice, whatever some few of them may be in theory; the figure, on almost all occasions, engrossing the attention of the student, when not drawn in the first instance into a specific course of training by having already decided on some particular branch of art in which the figure is unnecessary; as, for instance, architecture.

67. The only specific training for what is called a designer in this country for printed or woven fabrics, appears to be a course of flower-painting. If it may be taken for granted that results can arise only from a great system, this may be at once admitted; but, on the other hand, we may fairly examine what pretensions the French have to claim great results. Their superiority in the treatment of the figure is generally admitted, their great skill in execution, in manipulation, whether in modelling, chasing, carving or painting, is equally generally admitted; and their great skill in floral design must likewise be admitted. But, on the other hand, if we look for any great power or versatility of composition in ornament, or any comprehensive æsthic grasp of the subject, we look in vain. We find everywhere a uniform national mannerism; the same sentiment and treatment of details, whether for a floor, a wall, or a ceiling; whether for textile fabrics or for common hardware; whether for silver, wood, or stone. The great body of designers are nearly all engaged in merely varying the order or combination of the same group of details.

68. The French success is in exact accordance with what is promised by their system of education, and they fail only where failure is due; partly due to absolute neglect, and partly to an overweening confidence in a prescriptive general superiority, which, after all, is much more imaginary than real.

68. The Great Exhibition of last year brought the various European nations more closely into comparison in matters of art than they were ever before, and many defects, and many merits, formerly unsuspected, were brought palpably to light: of the former none were more evident than the very limited range of French taste in ornamental design; while at the same time their unrivalled excellence of manipulation was equally manifest; but here ends their claim to superiority. However admirable in themselves may be such works as some of those in silver exhibited by M. Fro-

ment-Meurice, or in wood, by M. Fourdinois, our admiration very much abates when we find that they have the self-same sentiment in common with the great mass of all the good and bad French productions of their time.

70. We have generally had the credit of steadily imitating French institutions, and perhaps we have been hitherto too much of imitators. It is from no want of an effort that our schools of ornamental art are not like the French; we certainly did all we could to make them so; but we judged of the French schools rather according to what they were supposed, or intended to be, than what they are,—mere drawing-schools; and though striving to be imitators, we have gone beyond them in these educational institutions.

71. There is no institution in France analogous to that established in Marlborough House, though the lively jealousy of the French in anything approaching a rivalry in what they may consider a prerogative of their own, will doubtless cause one shortly to be established; the agitation for such an institution has already commenced. The establishment of a Museum of ornamental manufactures, with a special library and gallery of casts, is a great step in the right direction, for which we are at least not indebted to the spirit of imitation. We have set the example to Europe in this respect, and if the scheme of this promising institution be only thoroughly prosecuted, neighboring nations will be compelled to follow it. This is no imaginary rivalry, but it is not less wholesome than real. So watchful has the Great Exhibition made the designers of France, that some of the most eminent among them met together in Paris almost as soon as the news itself of the opening of Marlborough House with an explanation of its objects reached that capital; and a comprehensive scheme for an Industrial Art College on the same plan was drawn up and arranged in the form of a petition to the President, showing the urgent necessity for the immediate foundation of such an institution.

72. To remove any doubt as to the origin of this agitation, or the nature of the scheme propounded, I submit the plan, and the source of the scheme, as explained in the very words of the exordium of the petition in question, dated July last:—

"To Monseigneur the Prince Louis Napoleon Bonaparte, President of the French Republic.

"The 'Artistes-industriels.'

"Monseigneur,

"The Exhibition of London, in making once more notorious the artistic superiority of French industry, has renewed the ardor of foreign rivalries.

"England, to relieve herself from the necessity of being tributary to the artistes of France, has become convinced that she ought to create and develop within herself instruction in, and the practice of, the fine arts as applied to industry.

"With this object numerous schools have been founded, and in addition, quite recently, a Museum of Ornamental Art has been *solemnly inaugurated in London by Her Majesty Queen Victoria.*"

&c. &c. &c.

The petition, which is drawn up with considerable ability, in the details, bears the signature of three distinguished French artists of the class which they term "Industriel," namely, MM. Jules Klagmann, C. E. Clerget, and C. Dussurgey. The scheme consists of three propositions:—

1. The organization of a special exhibition of the works of industrial artists (that is, designers and decorators generally).
2. The establishment of a museum of the fine arts as applied to industry.
3. The foundation of a central school of the arts in relation to the same object.

It may be some matter of slight congratulation to ourselves that Marlborough and Somerset House combined have already anticipated all these propositions, though the exhibition of designs and manufactures is as yet limited to the students of the several schools attached to the Department.

I now conclude this report, with a sincere hope and confident anticipation that this promised rivalry will tend to the more healthy development of both institutions.

R. N. WORNUM.

From La Lumiere

ON THE DANGERS RESULTING FROM THE USE OF MERCURY.

TRANSLATED BY AMBROSE ANDREWS.

To the Editor of La Lumiere:

MONSIEUR,—For the purpose of rendering a service to the fraternity of daguerreotypists, I beg leave to publish the following observations upon the insalubrity, and the dangers of the process which we practice, and on the means of guarding against them.

During the first years of this new art there had not been sufficient time to experience the deleterious effects of mercury, and no one seemed to give it a thought, and, not having myself for a long time experienced any symptoms of this poison, I never thought it necessary to use the least precaution to guard against the effects of it. But after twelve years of continual labor in the midst of the vapors which incessantly escape from the mercury bath, I began to perceive that we could not, with impunity, forget that this metal exerts a powerful action upon the human body, capable of ruining the strongest constitution.

For some time past, several operators, have, to my knowledge, been obliged, by the advice of their physicians, to abandon daguerreotyping, at least until they should become completely restored.

Therefore, it is beyond all doubt, that the practice of daguerreotyping is attended with great dangers, and we cannot use too much precaution to protect ourselves against them. And, first, it will be necessary to remain no longer than is absolutely necessary, near the mercury, which ought to be placed high up, in a very airy place, and under a cone which should communicate with the chimney or the outside of the room by means of a pipe, passing through the wall, or the top of the window. This means is now, I believe, pretty generally employed, but it is far from being sufficient, and I will now proceed to indicate a preventive which appears to me to be more efficacious. It is that which I am going to adopt in my new establishment in Regent-street, and which I shall task myself to organize in all respects in conformity with the lessons which long experience has taught.

The wall of the little room which I shall devote to the operation of mercury, shall have an opening of three feet wide, by two feet high, destined to receive a cage which shall be fixed to this opening from the outside, large enough to contain several mercury baths. This cage to have two openings through its whole length, one at the top the other at the bottom, in order to allow free passage to a current of air, without communicating with the apartment. The current of air will be kept up by the heat of the lamps inside of the cage, which is to be hemetrically closed on the side, connecting with the apartment by means of two shutters, sliding in a grove. Whenever I need to introduce or take out a plate, I slide back one of the shutters, only just so much as may be necessary to pass the arm and hand through, immediately after which the shutters are to be again closed. These shutters are to be furnished with two panes of glass, in order to look through into the interior of the cage, when we wish to regulate the heat of the mercury, &c. By placing the mercury upon tin boilers filled with water, and heating them with spirit-lamps,—or better still jets of gas; we can then always have the most favorable temperature, for fixing the mercurial vapors and we shall never be liable to transcend that point. I have employed this kind of boilers with success for several years past. I saw them for the first time in 1843, being used by M. Eynard of Genoa.

This cage, of which I have just spoken, should be all of slate, and the lower horizontal stone, that is, the floor,—should have a groove all around in order to conduct the mercury which becomes condensed, to one of the corners, where, by means

of a small slit it may drop through into a vase placed underneath for that purpose. By this means, we can prevent the mercury from diffusing itself through the atmosphere of the room where it would be rising in vapors; and this we must not forget, that mercury is continually giving off vapors in all temperatures, for the proof of which I have only to indicate an experiment which any operator can easily repeat; and that is, after exposing a plate in the camera, to place it over an entirely cold mercury bath. After several hours, the image will be as well developed as if the mercury had been heated to the degree of boiling water.

I will not enlarge upon this subject, hoping that my letter may suffice to call the attention of all operators to the best means for guarding against the pernicious action of mercury, and that each may publish, for the benefit of all, the results of his researches. Dr. Clavel, to whom we are indebted for some excellent articles published in your journal on the phenomena of light, is, by his especial knowledge in medicine more capable than any other of giving useful advise to daguerrectypists, and I hope he will do so, and thereby allow us to profit by his experience.

A. Claudet.

COMMUNICATIONS.

The manly and noble tone of the following letter, commends it to the serious attention of every daguerrean. Mr. Hesler speaks the sentiments of a true lover of his art, and we wish all were of the same way of thinking.

Galena, Feb. 20, 1853.

FRIEND SNELLING—I perceive by the Dec. No. of your Journal, that you have awarded to me the prize for the greatest number of subscribers to the Photographic Art-Journal, for the year 1852.

Now, I am really surprised and grieved at this; not that I object to the prize, for it is a liberal one, but because it speaks so poorly of the efforts of my fellow-artists in the great cause of the promotion of our art.

What little I have done to increase the circulation of the different works published on the art, has been purely to promote its influence and usefulness, and the subscribers I succeeded in getting for the Journal did not lead me for a moment to think that it was the largest subscription or anything like it, such a thought as competing for that prize, *way off* here in the north-west corner of civilization never entered my brain. My motive was a far different one—none other or less than the instruction of daguerreotypists, and thereby the advancement of our beautiful art. I see no reason why *ours* may not become as it really is, the "Art of Arts." But to accomplish this, we must do away with that mean, selfish, low, sordid disposition so often manifested by many who daub in, and are a curse to it. Among these, too, are many who pretend to some standing, and who have fine showy rooms to dazzle and delude their customers.

As I look upon it, there is a great responsibility resting upon the leading members of the art, and if they would see the art improve they must put their shoulders to the work. But, some will say, "I do work to sell all the pictures I can, and make all the money I can, and this is my duty. I paid for learning what I know and if others get it they must pay me; and besides, if I give all my experience and research to others, they will stand an equal chance with me and may get some of my business." Ah! this is the sticking point, and the very feeling that keeps the art

down, and that has brought so much shame and reproach upon it.

It is not the dollar or the fifty cent, or the twenty-five cent pictures, that have done it, for there will be quacks in all professions do what you may, and, I think in this case the low price pictures have done much good in various ways. It has brought the art and its influence within the *reach of all* classes, and thousands and tens of thousands have had daguerreotypes taken at the low prices that would never have thought of it at higher prices, and what has been the result? When a person has got a low price picture and worth only the first price of the material used in its manufacture, this person compares with others better and worth something. Now, will he be satisfied with the poor one, when he can get a better at a higher price? Certainly not, his taste for the beautiful is aroused and he will not rest satisfied until he has the best the art will give him, cost what it may; before he had ever got a likeness taken it was the *price* that prevented but now the *price* is *no object.* It is the picture he wants, and, if necessary, will work his fingers off to get it. Now, those who pretend to make pictures worthy of the art, and that will commend the attention of the refined tastes, must see to it that no pictures leave the establishment unless as good as they are capable of producing, and charge a price accordingly. They should use all means in their power to cultivate and elevate the artistic taste of the community for which they labor. They should improve every opportunity to instruct and refine those engaged in the art—don't be afraid they will rival you, and then undersell you, for no man can make a *true daguerreotype* unless *he has* a *soul* that possesses the true dignity of a man and the image of his Maker; and such a man will not sell pictures for less than they are worth, nor will the community ask him to. Therefore, instruct and try to elevate every artist that may come under your influence; make him feel that his calling is a noble one—and if he is a man he will come up to the mark, if not, he will sink to his level, and be forced to seek some other employment more congenial to his sordid taste.

Now, if we cannot reach all we would verbally—we must reach them through the very excellent journals published on our art—and then we must have them circulated and read,—and in this way, each one, if he will, can *do something* to promote the art and raise his own standing in society and the world.

In making likenesses and pictures we should have some other aim in view besides the mere paltry gain in dollars and cents, and the mere gratification of the present. We *should remember* that we are *working* for *future generations*—that after we have passed off this busy scene of bustle and strife, our *works will live* and our influence be felt, in proportion to the good we have done. Let us then *arouse* and with one *mighty effort* of untiring labor and zeal, and DISINTERESTEDNESS, make the Art produce such results as shall shine co-equal with the glorious orb of day through all future generations.

In making likenesses we must study the character of the subject and present it in its most beautiful and striking form. To accomplish this we must study nature and portray truth, for ours is the art of truth and perfection if rightly used. Yet in it we have just dawned on the morning of life, we are not even in our boyhood, and how preposterous and foolhardy it is for some to say, "we have arrived at *perfection*," such a picture is perfect. I wish I could say so, and hope to live to see the day when I can. But as yet I have never seen a perfect daguerreotype. God speed the day when such a result will come forth, and what little I can do to bring this result speedily about, will most cheerfully be done to the utmost.

Yours,

ALEX. HESLER.

Philadelphia, Feb. 24, 1853.

H. H. SNELLING,

Dear Sir—In reply to your letter dated Feb. 21, I would state, that in conferring with my friends, they advise me to apply for a patent before giving out my secret, which is entirely mechanical, and as I have not at present the means, to wait till I have them. But I will communicate an arrangement of my own to you, which you are at liberty to give to the art through your journal. Stereoscope pictures are generally taken on two medium plates, and af-

terwards cut to the quarter size. I take a quarter plate, buff it lengthwise, and have the lengthway holder parted in the middle by a very narrow piece, so that I can put two slides in. In taking the picture I remove one slide, take the picture on that side, replace the slide and take the other picture on the other side. In this manner I have the two pictures on one plate; you perceive the advantage is—*both pictures have the same coating, the same mercury, and the same gilding.*

Should you wish to publish my former letter, as well as this, you are at liberty to do so.

Yours, very respectfully,
CHARLES M. ISING,
No. 46 North Eighth-st.

New-York, Feb. 26, 1853.

FRIEND SNELLING—I believe there has been many ways tried to prevent daguerreotypists from inhaling the fumes af the hot mercury, among others, having a *tin case* made and placed over the top of the mercury bath with pipe attached leading into a chimney; this no doubt takes off some of the vapor; but still we swallow much more than does us good, as any Operator will testify. The best method that I have heard of, was communicated to me by Mr. Meeks, an Operator from Rio Janeiro, who having suffered from the ill effects of inhaling the hot mercury, was recommended by his physician to adopt the following manner of using it: to have a tin case made as described above, place it about two inches above the top of ths mercury bath, and have the inside of the case gilded with gold leaf, this he says attracts the vapor of mercury, and it adheres to the gold leaf. We all know that a ring or the guard chain of the Operator becomes coated with mercury by working in the same room containing the bath. It is worth a trial, and any gilder will do it for a trifle, and the cost will be nothing compared with the health of the Operator. Trusting that by inserting the above you will benefit many, as well as confer a favor,

Yours, respectfully,
CHAS. R. MEADE.

We shall give in our next an engraving of a new apparatus, with a descripti n, manufactured by Mr. E. Anthony, intended to obviate the difficulty spoken of in this communication, which we hesitate not to say will be adopted by every daguerrean who values his health. Mr. Meade will accept our thanks for his valuable suggestions.

UNALTERABLE GLUE.—Every one who has frequent occasion to use glue knows to his cost that continued reheating and resolution in the end destroy the adhesive properties of this substance. The reason of this peculiar alteration is not understood. M Dumoulin having turned his attention to this subject, has succeeded in obviating the inconvenience by the following process which he thonght of sufficient importance to bring before the consideration of the Paris Academie des Sciences:—"Take one kilogramme of Cologne glue; dissolve it in one litre of water in a glazed pot by means of a gentle heat, that of a water-bath being most eligible, taking care to agitate or stir it from time to time. As soon as all the glue has become melted pour into it very gradually, and by small portions, 200 grammes of nitric acid of 60 degrees strength. This addition produces an effervescence due to a disengagement of hyponitrous acid. When all the acid has been poured in, the glue pot is to be removed from the fire and its contents allowed to cool." M. Dumoulin has preserved glue thus prepared for more than two years in an uncorked flask. It had undergone no alteration. Glue thus prepared is particularly useful for attaching paper to drawing boards, and for serving as a chemical lute, in addition to the many other purposes to which it may be applied.

GOSSIP.

THE approaching World's Fair in New York will, we venture to say, contain an exhibition of daguerrean and paper photographs such as the world never saw before. There has been a studied silence upon the part of the European press in regard to the American daguerreotypes exhibited at the "Exposition of all Nations" in London, that does them little credit.

We see daguerreotypes, by English, French, German and Italian artists, extolled to the skies, while those exhibited by Americans are either passed over in silence, or receive that faint praise, which is better calculated to create contempt than a just and impartial admiration. This too is done when the very writers themselves must acknowledge to their own hearts the superiority of the American daguerreotypes, and with the fact, also staring them in the face, that to Americans the highest prizes were awarded.

We must, under the circumstances, consider, that the minds of these writers are either most egregiously warped by partiality or national pride, or are incompetent to judge of the true merits of a good picture. They have the choice between the two corrollaries—let them chose; we shall be perfectly satisfied with the adoption of either one or the other.

The art of photography has arrived at a new era, and the year 1853 will bring forth results both pleasing and surprising to the whole world. There will be exhibited at the World's Fair in New York such daguerreotypes as were never dreamed of by the most enthusiastic lovers of the art. We may go even farther, and say, that daguerreotypes will be on exhibition, that will ravish the eye of the artist and fill the mind of the connoisseur with astonishment—daguerreotypes so true to nature, so exquisite in their development and finish, so refined in their position, and so tasteful in their arrangement that European critics, if any visit the exhibition, will be obliged, from the moral force of truth, to render to our artists that degree of admiration and praise, which has been so justly their due for the last ten years.

We do not in these remarks allude, in the least, to the heliochromatype—there may be specimens presented—if they are, we will vouch for it Europeans will find that in this branch of the art we are also their superiors.

On this subject of heliochromie, there seems to be a misconception of our views, on the part of most of our readers, which we may as well endeavor to correct here. We are not doubtful as to the practicability of producing daguerreotypes, or any other photographic picture in the natural colors; on the contrary, we have for the last eight years insisted that there was no reason why it could not be done; but we believe also, that like many—in fact every invention both mechanical and chemical—other inventions it is utterly impossible for any one man, we care not who he is, to perfect it. Did Daguerre perfect the process he discovered? did Fulton perfect the steam engine; or Whitney the cotton-gin; or Talbot the calotype; or Galvani the galvanic battery; or Morse the electric telegraph? We might ask the same question in regard to every invention of the human mind from

the creation of the world to the present day, and shall invariably receive the same answer. These are our reasons—and we think they are well founded and substantial—for the belief that is in us. We are not skeptical from any motive or feeling of hostility to any one individual, and those who are foolish enough to imply otherwise, from the remarks we have heretofore made, have our pity not our censure.

Give the first principles of this discovery to our American minds, allow hundreds to delve into its mysteries, and they will accomplish more in one week towards its perfection, than a single mind could in ten years.

As in the daguerreotype, so also in photography upon glass and paper, do the Americans excell the Europeans. The present results of Mr. Whipple's Crystalotype surpass anything of the kind yet exhibited. The rapidity and success with which Mr. Whipple manipulates, brings the crystalotype within the reach of the cheapest monthly magazines as an illustration, and at a cost much below the steel engraving Their truthfulness to nature, and their greater uniformity of appearance, their delicacy of tone and color, and their clearness of outline must commend them to our publishers as illustrations to their works.

In a few weeks those enterprising publishers, Putnam & Co., will issue a volume illustrated by the crystalotype; we shall also illustrate the next number of the PHOTOGRAPHIC ART JOURNAL with these pictures, when our readers can judge for themselves as to the truth of our assertions, that the year 1853 will commence a new era in the art of photography, far excelling any other that has gone before.

— It will be seen by the following extract from the National Intelligencer, that Mr. Hill has exhibited his Heliochromatype to a committee of the U. S. Senate, for the purpose of obtaining a special patent in his favor, and that the committee have reported favorably.

"The Committee on Patents and the Patent Office, to whom was referred the memorial of Levi L. Hill, in reference to his alledged discovery in Helio chrome, or sun painting, so denominated by said Hill, ask leave to submit the following report:

"Mr. Hill, having been before the committee, explained to them the history and principles of his invention, and submitted to their inspection numerous specimens of the productions of his art or invention. The committee have formed the opinion that those specimens afforded sufficient proofs that the inventor has solved the problem of photographic coloration. The committee had in their hands the plates, unprotected by glass or by any other covering, and saw them freely rubbed and otherwise tested, confirming in their minds the fact of the invention and the durability of the pictures. It is believed that most of the philosophers, both in Europe and America, long since gave up as hopeless the search after this branch of science, which has now been discovered by one of our citizens, in one of the wild valleys of the Catskill mountains, far removed from the schools of art. The committee learn that Mr. Hill has arrived at this discovery, by which the works of nature may be copied in their original hues, through three years of persevering toil. *The committee is informed by Mr. Hill that his discovery has not yet been perfected in its practical details*, which is not surprising, it being but little more than two years since he obtained his first results. But the beauty of the results to which the process has already attained would seem to afford evidence that it will be perfected at no very distant day.

"The prospective utility and importance of this invention are very apparent in its application to portraits, landscapes, botany, morbid anatomy, minerology, conchology, aboriginal history, the reproduction of valuable paintings, and to various ornamental purposes. The committee are satisfied of Mr. Hill's claim to originality and priority of invention, and deem it but just and right that he should be suitably protected and encouraged; and they deem it more

particularly so seeing that a rival claim has been set up in France since the announcement of his discovery was made. The means by which this process is carried out being strictly chemical, it would seem that the existing patent laws would not afford the inventor the security required. Owing, however, to the short period remaining of the present session of Congress, and the press of business, the committee have been unable to devise any better or more efficient mode by which to recognise the claim of Mr. Hill, than by recommending that his memorial, together with this report, be placed on the records of the Senate."

Now, we suppose we shall be considered as caveling if we attempt to find fault with this report, but we shall do it nevertheless. We consider it a very lame affair, and that it should never have gone before the public in its present state. So far as relates to Mr. Hill's priority and originality we do not object, on the contrary, every candid mind will admit that he has just claims, and that these claims entitle him to that protection which he seeks, and which cannot be afforded to him by the existing patent laws of our country. But we do object to the idea that this report conveys to the unthinking mind, and which will lead the majority of our people to expect to realize what no one man can accomplish. We have, however, an admission from Mr. Hill in this report that will go far to prove that we have not spoken unadvisedly in the remarks we have made in regard to the perfection of the process, and which will not tally with some of his published assertions. We allude to the portion we have italicised.

One question we would like to ask; why is it that Mr. Hill waited until the last week of the session before he made application to the senate for a special patent? Why did he wait until he must have known that it would be utterly impossible to get an act passed at this session?

— A manipulator out west writes us thus:—

"Please discontinue my subscription to the Photographic Art-Journal. I have now taken it two years, and it has done me no good," &c.

Now observe the contrast: here is a letter from another subscriber, and we are pleased to say, that where we get one like the first, we receive fifty of this stamp. It cannot be otherwise, than that among a community of men, there may be found those who can derive no good from anything; such men usually find themselves very much in the background in the course of the year. We are pleased to see by our subscription list that it is still increasing, and that some of those who discontinued at the commencement of the second year, have again become subscribers. Sober second-thought is generally the best.

Peoria, Ill., Feb. 19, 1853.

Mr. Smith: Sir.—I here enclose five dollars, my subscription for the Photographic Art Journal for 1853; which I consider well worth the money. I commenced the first year of its publication, and I am well satisfied that I have received the worth of my money so far, and I have no reason to doubt as to the future. I have always been able to find interesting and instructive matter contained in all the numbers, well worth the attention of all true lovers of the art; and, to make a long story short, no practical daguerreotypist should be without this Journal. Every one can find some useful hints, that will assist him in his manipulations. It is possible that some have got so far advanced that they consider they have learned all that is to be learned. But I am happy to say for one, that I am not one of those fortunate—or unfortunate, as you may see fit to call them. I have thought of writing something for the Journal, but not being accustomed to the task, and not being able to add anything to what has already been said, I have not made any attempts. Perhaps I may at some future time. I intend to visit New

York this summer, if so, I will call at number 19. Yours, as ever,

R. M. Cole.

Don't be bashful. Every one can say something that will be interesting to his neighbor, and when it is on his mind he should speak or write it out. We shall always be pleased to receive communications for the Journal from any of our subscribers.

— The Washington Gallery.—Under this title there has been formed at the Art-Union rooms one of the best collections of pictures ever exhibited in New-York. It is called the Washington Gallery from the fact that Leutze's *Washington crossing the Delaware* and the *Washington at Dorchester Heights* by the same artist, are the most prominent paintings in it. There are, however, works of others of our best and most popular artists, including Durand, Hicks, Elliott, Cropsey, Kensett, Rositer, Baker, and others; the entire collection consists of some two hundred and fifty pieces. A brilliant party were assembled at the gallery on the opening evening by private invitation, and were entertained by the Committee, with Mr. Cozzens at its head, in the most elegant and hospitable manner. The exhibition which is for the benefit of the New York Gallery, will be immediately opened to the public, and we shall endeavor, on an early occasion, to speak at some length of its prominent features. It cannot fail to be resorted to by crowds of visitors, for we recall no similar exhibition which could compare with it in point of attractions.

— We find in a late number of *The Scientific American* an article by James Campbell of Dayton, Ohio, giving the results of some experiments made to produce colored daguerreotypes from which we make the following very interesting extracts:

"M. Becquerel and Niepce de St. Victor have proved that if chloride of silver containing a slight trace of copper be exposed to the prismatic spectrum, or to rays of different colors, while undergoing this reduction, it is susceptible of coloration after a protracted exposure. From this it would seem that this process might be much accelerated, if we were careful to aid nature in her operations, instead of trying mere hap-hazard experiments, not based on rational theory. I will show by a few experiments that this may be done, and to avoid being too prolix, will, at present, speak of the chloridated silver plate, unaccelerated by iodine, bromine, fluorine, chrome, or their compounds.

"If the plate, covered with the enamelled chloride of silver prepared by Niepce's process, be exposed to a current of hydrogen while receiving the image, the process will be much accelerated, and the image will be impressed in from half an hour to an hour; according to the amount of gas passed into the camera, the light, temperature, electric state of the atmosphere, &c, instead of requiring from three to five hours, as in the original process, and the colors of the picture will be impressed on the plate in all their original beauty. This experiment may be very easily performed, it only requires a few grains of zinc in a small vial, containing dilute sulphuric acid. The vial and its contents may be placed in the camera, and the hydrogen being nascent, is in its most active state, and as it is perfectly transparent, it permits the light to act on the plate, while it is itself engaged in reducing the chloride, which it is only capable of doing in sunlight.

"The hydrogen, probably from its affinity for oxygen, hastens the decomposition of the organic matter, and assists in reducing the chloride, thus acting as a deoxydating and dechloridating agent. There is, however, sufficient hydrogen contained in the combined organic matter, to effect the reduction of the chloride, hence it is probable that the excess merely hastens the decomposition.

"Following this train of investigation, I have tried many other reducing agents both liquid and gasseous. The most important liquid agents tried have been, the proto-

sulphate and nitrate of iron, ferrocyanide of potassium, protochloride of tin, and the fluorides of potassium and sodium. The principal gaseous agents tried are hydrogen alone and in combination with carbon and sulphur, ammonia, sulphuric ether in vapor, chloroform vapor, sulphuret of carbon, chloride of sulphur, hydro-sulphuret of ammonia, and sulphurous acid. As very remarkable results followed from the application of the gases, I will speak of them more particularly. Sulphurous acid has a strong tendency to abstract oxygen from organic bodies, it also unites with chlorine, in sunlight, and so do light and heavy carburetted hydrogen, the latter, indeed, without the influence of light. Sulphurous acid abstracts oxygen from organic bodies, with which it combines, forming sulphuric acid, and sulphuric acid renders chloride of silver unchangeable to light by destroying the organic matter with which it is combined. I hence inferred that it might be used for the double purpose of reducing and fixing the picture. That it is a powerful accelerator is certain; the fixing requires further experiment.

"Pictures may be obtained with this gas in half an hour, by passing it nascent and in sufficient quantity in the camera and the colors are preserved. There is, however, sometimes a little sulphur deposited under the enamel, which gives the light parts of the picture a yellowish cast.

This color may sometimes be removed by heating the plate. Carburetted hydrogen acts still quicker, probably from the free carbon which results from its decomposition being a powerful reducing agent, and as the carbon is not left under the enamel it probably passes off under the form of the volatile chloride of carbon. I obtained one picture in five minutes, by passing into the camera the gases generated from the distilling alcohol and sulphuric acid in a retort The gases formed were olefiant gas and sulphurous acid, mixed with a little light carburetted hydrogen and sulphuric ether. The colors were very fairly represented, but not as good as I had previously obtained; I considered this experiment as very encouraging, but having only lately tried, have not repeated it by itself without the agency of electricity.

"As electricity is a powerful agent in decomposing chemical compounds, it might be naturally inferred that it would aid in this process. I have often tried it but without, until lately, any important results. Dry chloride of silver is not decomposed by electricity, yet its decomposition by light, and other agents may by it, be much accellerated, and I did not at first use a sufficiently powerful current. I now render the plate a part of the conducting medium which terminates at the positive pole, and terminate the poles in water, to which some saline constituent has been added, and by the decomposition of the water am enabled to judge the power of the current. By using the gases at the same time that the plate is thus excited, I have been enabled to take pictures in from four to five minutes, which would otherwise require from three to five hours for their production. These pictures are developed under a hard, tough enamel of chloride of silver, cannot be rubbed out by the fingers, and will even bear considerable buffing, and, if the enamel is thick, are improved by the operation. I have not been able to permanently fix the picture, but it will keep a long time, if not exposed tôo often and too long, to the light. From the above experiments it seems that a prolonged exposure is not necessary to produce coloration, hence agents of great energy may be employed in reducing the chloride.

"That coloration may be produced, it is important, I think, that the picture by whatever process it is taken, be positive, and complete on its removal from the camera. For fixing, it is important that all the organic matter be destroyed, and then, I believe, it will be fixed I am at present engaged in experimenting with iodine, bromine, fluorine, sulphur, chrome, and copper, and their compounds, deposited on the silver plate by electric action, or otherwise, but have not, as yet, any results sufficiently matured to publish, though I have produced coloration. Great care is requisite in preparing the enamelled plate of chloride, and some experience is required to judge at what state of its preparation it is most sensitive to light, yet any artist can, after a few experiments, prepare it.

— We copy the following from a Sacramento (Cal.) paper, bearing our testimony to the high abilities of Mr. Vance as an

artist. His California views are classed among the best and most beautiful ever taken by the daguerreotype process.

We feel pride in offering to our distant readers so striking a picture of an actual event as that with which they are here presented. Nature furnished the original image, through the lenses of the daguerrean operator, from which a *fac simile* representation has been made. To R. H. Vance, Esq., acknowledgedly eminent as a daguerrean artist, are we indebted for this graphic delineation, taken from a point on the levee immediately opposite the mouth of J street, and at an hour when its moving elements were rife with pleasure and amusement. The view extends to the corner of Eighth street, which is marked by the nearest left hand tree. One block beyond, but invisible, stands the public plaza. From this point, coming down, the waters deepened, till they reached Fifth street, where they gradually commenced falling off, although their volume was amply sufficient to float all manner of small craft to the levee. Near this point their depth may be observed by a glance at the long boots of those wading in. The north side of the street is the left, and the prominent block at the corner is the only structure, with one or two exceptions, until the eye extends to Eighth street, that was not consumed by the fire. Ludicrous as many of the scenes here exhibited may appear, they give only an idea of the nature of our holiday sports. The great mass of boats, at times so thickly crowded together as effectually to block up all passage, confined their operations principally to the upper portion of the street, and are not, consequently, shown in the engraving. That the reader's mind may have fully before it an idea of the fun which prevailed, we could not, perhaps, do better than copy our description of it—written at the time when ample opportunity was afforded of witnessing and participating in all its enjoyments:

New Year's Day.—The water was higher in the city on New Year's day than it ever was before, enabling the largest sized yawls and sail boats to navigate the streets with perfect ease. In consequence, those who ventured out at all, went in boats—in some cases, from the first floors of their houses, and in others from the second story windows. J street, with the exception of several sidewalks towards its western end, was completely submerged, and covered, at times, with from three to five hundred boats, of all sizes, classes and descriptions. Rafts, store boxes, bedsteads and wagon beds, were in requisition as "floats" No one who could muster anything in the shape of a vessel, but launched it fearlessly upon the bosom of the flood. In this manner the day was celebrated; and a happier time seemed never to have been enjoyed, if one could judge from the continual shouts of merriment and laughter that saluted the ears, from early dawn throughout the hours of the day, and to the latest waning of the night. Peal after peal, cry after cry, went up, on witnessing the collisions between scows, the races between row boats, and the upsetting of nondescripts. The different express offices transacted their business through the common medium of boats, which were distinguishable from each other by floating flags and erected signs. Those having letters to send abroad handed them from their doors and windows, and received their epistles in the same way. It was a pleasant sight to behold the tiny vessels glide under a lady's window and receive from her fair fingers the missive whose contents might be of love, but if so, was whispered in written characters to some lucky admirer *beyond* the waters.

— We have been told that it has been asserted by Mr. Hill that we sought his favor, and that he could produce letters from us that would silence the course we have taken in regard to his discovery. If this gossip is true we are sorry that Mr. Hill should think for a moment that he could intimidate us by such a threat. We are not aware that we have ever written a line that would compromise us to any measure, and we will venture to say that if he will publish any of our letters to him without taking the same liberty with them that he did with some published among his certificates, nothing will be found contained therein to convict us of "shuffling" or that

will cause us to "regret the conduct we have pursued."

To show the advances were first made by Mr. Hill himself to obtain our co-operation in his proceedings, we take the liberty of publishing the following letter, which under any other circumstances we should not do. Mr. Hill has made so many remarks on this subject and commented so severely—and with such injustice—that we feel obliged in self-vindication to make it public. We have not the least unkind feeling towards Mr. Hill, as we have said before very often, and if he still continues to consider us his "enemy" we cannot help it. There is not a move we would not make, consistent with our conscience, to assist him in his trouble, but, as we have never denied him the right to say what he pleases in regard to us, so long as he does not injure our moral character or influence, we will not yield ours as a journalist to comment on his course as we please.

It will be seen by this letter that we had good grounds for some of our remarks—and we have more letters of the same stamp—particularly our assertion that he was under moral obligations to make no contracts, of a speculative or monopolizing character.

Notwithstanding this obligation, *we* know that he has positively entered into *written* contracts—in one instance—for a whole state, we are told, and we can produce the proof. With this fact staring us in the face, what reliance can be placed upon other assertions.

In our enthusiasm for the great discovery, and the hope still fluctuating with fear, we have written on the subject of the Hillotype. We sincerely hoped—because our heart desired its consummation—that Mr. Hill would succeed in perfecting his process; but we feared his limited knowledge of chemistry—for he certainly cannot consider himself a great philosopher—would prevent that most devoutly to be wished disideratum, and not desiring to crush his endeavors or to weaken his hold on the sympathy of the public we did not speak our mind fully. For this leniency what have we received? Sly thrusts that in a measure have crippled our influence; for, strange as it may appear, there are daguerreotypists who are afraid to subscribe for the Photographic Art-Journal from a supposition that by doing so they will be refused a share of Mr. Hill's discovery. We now wish to be distinctly understood that the only difference between Mr. Hill and ourself is that he has a most enthusiastic hope that each week will bring about—in his hands—the perfection of his discovery; while we, entertaining the hope that his may be realized, doubt that he has the ability to accomplish it; and that he will at last be obliged, like Daguerre, to commit it, in its present state, to the hands of his worthy contemporaries.

Before we close this subject we must speak of the system of spies entertained by Mr. Hill. We are not aware that he sanctions it, but we know there are men in his immediate interest, who prowl around among daguerreans, obtain the expression of their opinions from themselves or others, and make report to Mr. Hill in person; "in order," as one of these wretches remarked to us not long ago, "that Mr. Hill may know who are his enemies, and treat them accordingly." Now, if this is honorable proceeding, we do not know what the term means.

In conclusion, let us say that these remarks are made strictly in self-defence; we do not assert that all the words attributed to Mr. Hill proceeded from his own lips; he may never have entertained even the ideas put into his mouth, but as they are promulgated as his, they are as capable of doing us injury as if they actually were spoken by him. If they are not, he has

now full opportunity to disavow them. When shall we be relieved from the obligation of writing in this strain of Mr. Hill and his discovery? We sincerely regret it; then why put upon us the necessity? Daguerreans may think they are doing Mr. Hill a service by circulating these reports and speaking harshly of us, but they only oblige us to do a disagreeable task, and the result is of no benefit to any one.

Westkill, Greene Co., N. Y.
April 8th, 1850.

Friend Snelling—Allow me to introduce to you my friend and pastor, Rev. S. Jones.

He can tell you better than I can write, the business in hand.

I want, I need your co-operation, and to save time I request you to read this to Mr. Anthony and Mr. Brady.

To keep myself *free*, (and I *cannot* act in any other way) I am driven to my present course. It will require some months for me to perfect my discovery. When I say this, I mean the *manipulations*—the 55 specimens I now have will never be surpassed. They will be appreciated at a future day. One of my principal difficulties lies in a want of *pure* plates. The least scum is fatal. Even an amount which would hardly be noticed in a daguerreotype prevents a result. With rottenstone, alcohol, and clean cotton I never fail—but the marks are injurious—they show that I am on the track, and have no fears. Had I taken my own course, three months ago, I would have been far in advance,—I have been bored—not to death—but fairly out of my health, which latter has caused a loss of nearly two months.

Now, my mind is fixed, I make no contracts till I am out—and, then, only such as will enable me to carry out my original design of furnishing the process to the entire respectable part of the daguerrean world, at fair rates.

A few, with whom I have been intimate, say, that this step will be regarded by many as proof of humbuggery. For this, I care nothing, even if it so turns out—for "truth crushed to earth will rise again," and what I am now doing is from honest motives, and with good prospective views. I feel it a duty to write this much to *you and your friends*, not doubting that you will use this letter as confidential. A kindly notice in your Journal will be duly appreciated, but pray do not involve me with the *sharpers*.

If Mr. Anthony, (and perhaps Mr. Brady) can purchase some of the books for sale without loss to themselves it will be remembered. I will furnish you with notes of my progress, after two or three weeks, if you wish. Thank you for your kindness so far, I hope to be able to make returns hereafter.

Yours, in great haste,
L. L. Hill.

— Messrs. Brady and Lawrence of this city opened their new daguerrean halls on Monday, March 14. As it is too late to give a description of these openings in the present number, we shall do ample justice to them in our next.

— The Crystal Palace for the World's Fair in New York will be opened about the 10th of May, and we have understood that nearly every room in the hotels and boarding-houses, have already been taken by persons desirous of being present at the opening.

— We take the following just tribute from the London Art-Journal:

Portraits of George Washington and Henry Clay. Engraved by A. L. Ritchie. Published by R. A. Bachia & Co., New York, and Lloyd Brothers, London.

These portraits may be accepted as honorable examples of the progress which art is making in the United States; they are full-length subjects, and are published separately, although we have classed them together, because executed by the same hand. The likeness of Washington is copied from Gilbert Stuart's fine portrait, the composition and arrangement of the figure and accessories are the work of P. F. Rothermel, of Philadelphia: the print

is altogether excellent, rich and powerful in tone, and b illiant in effect; if the shadowed parts in the background had been a little less heavily printed, this latter quality would have come out still more advantageously; the black drapery of the figure, powerful as it is, being scarcely sufficient to detach its wearer from the surrounding objects. The portrait of Henry Clay pleases us better as a whole; the countenance is remarkably demonstrative of the intellectual vigor of this distinguished American, and the attitude of the figure is firm but graceful. The engraving, if less forcible than the other, is more harmonious and generally effective.

It is gratifying to find our brethren of the United States thus proceeding in the right course as regards art.

MALACHITE FOUND ARTIFICIALLY.—Heinrich Rose, the celebrated analytical chemist of Berlin, has mentioned the following process as being capable of simulating in appearance, whilst it is identical in composition with natural green malachite. Precipitate a solution of sulphate of copper in the cald by carbonate of soda or of potash, allow the precipitate which is voluminous at first to cohere, finally dry it, and wash it. By polishing, the characteristic appearance of malachite may be brought out.

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the BEST FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense.

E. ANTHONY.

THE

PHOTOGRAPHIC ART-JOURNAL.

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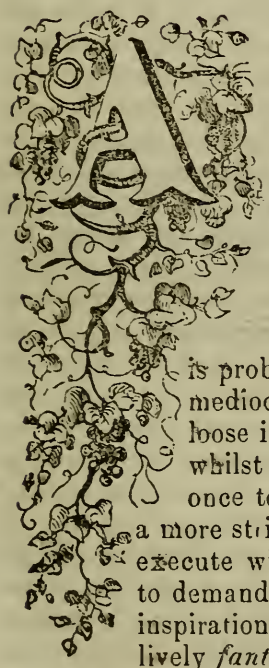
From La Lumiere.

PHOTOGRAPHS AND LITHOGRAPHS.

Translated from the French by Ambrose Andrews.

THE ALBUM OF ANCIENT AND MODERN ARTISTS; BY MESSRS. MOURLLERON, FRANCAIS, NANTEUIL, H. BARON AND EUGENE LE ROUX.



AFTER having studied the resources and the progress of photography, critics are for the most part fully agreed in their appreciation of the future consequences of this invention upon, and the *role* that it is to play in the arts. It is probable, say they, that mediocrity will have to loose its chance of thriving whilst real talent, forced at once to interpret nature in a more strictly literal manner, to execute with still more care, and to demand of the imagination inspirations of more grand and lively *fantasies*, will give to the arts of design a new and stronger impulse, and a higher value. And this inevitable and fast approaching effect of the daguerrean invention, has, by some theoretical writers, been summed up in the following words:—Destruction to the inferior and elevation to the superior grades of art.

Like all anticipated, and hastily formed theories, these exaggerated predictions, remaining still confused in the public mind, have, by imaginary conflicts of interests, and by opposing passions in one way or another, engendered prejudices, and developed germs of antagonism, which for that very reason are not without danger.

And the object which we now propose to ourselves, in conformity with the interests of our co-laborers, is to reconcile every hypothesis with sober truth, to attract the sympathies of the artists towards ourselves by rendering homage to their labors, by setting forth in strong light the signal services which they have rendered to us, by proving to them, that their works—which are objects of salutary emulation, for our photographers—have only to gain in the estimation of amateurs, from the advent of heliography.

And is it in truth, really too late for us to resort to this kind of study? No; photography on paper has taken its rank, and has to dread no comparisons: like engraving or lithography, it has its own press and its own editors, and the moment is at hand when daguerrean impressions shall be placed within reach of every amateur, and shall be also assimilated with other articles and purposes of ordinary commerce.

We would much sooner attain to those conditions of success, if the different styles and kinds of photography,—instead of remaining classified with, and confined among the products of science at the optician's and the practical chemist's—were to be exhibited, not as the results of curious experiments, but as objects of art, at the print publishers establishments. For our part, we recognise in that a new and legitimate branch of profit for their commercial industry; the *Album* of M. Blanquart Evrard, the *Monuments of Italy*,

published in numbers, by M. Eugene Piot, veritable prints, given with a peculiar and original value, and which cannot in any manner hinder the sale of other collections. This is a point easy to be established, in explaining wherein consists the concurrence between the two principles, and in showing the points of difference between a photographic proof, for example, and a good lithograph—the kind of work, which at first view appears to approach nearest to our proofs on paper.

In order to establish these relations and distinctions, we have had to wait an occasion, when we could signalize some lithographic work of brilliant superiority, in order to characterize more clearly what belong to one, as well as what belongs to the other of these branches of art. *The Album of Ancient and Modern Artists*, appears to us frankly to mark the separation. We shall try to render full justice to this publication, which is the most perfect work which lithography has ever accomplished until this day; to our artists, we shall characterise it as a masterpiece of taste and of execution, and they will find there not only models to copy,—for the assimilation of them would be impossible, —but sources of new and noble inspirations.

Art has already exercised on photography a notable influence; it has taught to her the science of effect; the manner of composing a picture, and divers processes whereby even in the literal interpretation of nature we may elevate the impression which results from the sentiment of color. Amongst our practitioners, the ablest ones are those who have been painters, and who in the employment of the camera-obscura have sought the application of their acquired knowledge. If artists like Françaís, Mouilleron, Nantuel, &c., give themselves up to the daguerrean process, it is because they find there the efficient employment of their rare qualities, and in a few months they surpass all their competitors. Let this be said *en passant*, that it may be better understood, that this special form of art is far from being daily mechanical, as has by certain persons, been supposed.

It would be difficult for us to know, if these translators of *the ancient and modern artists*, have preoccupied themselves with daguerreotype; but had they proposed to themselves the task of realizing, in a complete synthesis, that which photography knows not how to seek after, and to which she cannot attain they could not have better succeeded. Photography might answer that she also can take possession of her peculiar domain, from whence she cannot be dislodged. In all that class of subjects which swarm with details, such as monuments loaded with arabesques; cross-ways of old towns; views of grand cities taken as it were, on the wing, &c., photography is placed incontestably beyond all competition.

We have seen landscape painters lost in admiration before views taken in winter in the midst of forests, views where the picture was made up of a prodigious mass of crushed brambles, broken limbs and trunks of trees, grounds bristling with herbs and minute little branches. We have seen painters contemplating in amazement certain effects which had been deemed unattainable, but which by photography were produced with clearness and a simplicity of means which art had never before known, but the secret of which belongs henceforth to her. Thus will this invention become for them an indefinite field of profitable observation, a precious source of documents. And let it not be forgotten that from day to day, this new art is penetrating more and more into the domains of life, of rapid movement displaying mysteries there of which the wildest imagination had scarcely dreamed. A fifth or a tenth of a second of time sufficing to seize nature "on the wing," as, a running horse, a flying bird, sailing vessels on the rolling waves, the angry billows, tempest tossed, unfurling their foaming surge on the pebbly shore, the wandering cloud, smoke from the chimneys ascending in fantastic curls, all, all are transfixed with an infallibility which seems altogether superhuman.

At the view of these prodigies, what are the thoughts of those painters who are worthy to bear the name? "What treasure is here!" they exclaim, and like Isabey and Gaudin, they make haste to form for themselves a little museum of those marine views, and others of that class of precious daguerrean sketches, above designated, which shall serve to facilitate the progress of painting.

True art, to be worthy the name, proposes to itself an ideal end ; like poetry, it should speak to the imagination, and even when confined to copying nature faithfully, to seize a certain dreamy impression of her, which awakens in the soul of the spectator an individual sentiment. Thus invention, the creative faculty, will have nothing to fear from the photographic process ; so far from it, artists will much more freely dare to discard from them their old more formal manners. But all those petty views of meagre trees elaborately wrought up yet void of all effect, all those "countryfied" views of common-place sites, done cold and insignificantly in chalk, all those vignettes of heterogeneous objects huddled together, helter-skelter, will be no longer tolerated in the presence of nature rendered with simplicity, and mathematical truth ; even by the most infamous photographer. And as for all those villianous portraits, done in crayon at low price, all those little pictures smiling with affected grimace, which are hawked about the streets ; all those clumsy and vulgar images of our great men, &c. shall entirely disappear ; even now photography is beginning to visit these barbarous montrosities with condign justice.

Is it nothing then, that photography has rendered all this service to true art? And does she not, and will she not from this time forth merit much from the painters?

On the other hand, in erecting as a tribute to the modern school this lithographic monument,—of a perfection, charm, and poetic fancy never attained before—those artists in their turn, seem willing to surrender the class of difficulties above indicated, to the photographers. And we here make it our duty to admire, and a happiness to applaud, such brilliant results in this article, which we consecrate to all forms of art, sincerely wishing to reconcile all interests in one harmonious emulation, which should redound to the mutual advantage of all.

One word upon the work itself, and the spirit which presides over it. Six young painters, who are at the same time skilful and spirited designers, undertook to erect a monument to those of their brother artists whose talents and skill were among the most illustrious of their epoch; those charming *novateurs* for whose pictures there is such competition among amateurs, but which for the most part are excluded from the galleries of the Luxembourg,—that gallery designed for living artists, but almost exclusively *escheated* to those now dead, and whom the commissioners of the gallery have forgot to inter.*

The principle ornaments to this crown are, Decamps, Bonington, Diaz, Rousseau, Corot, Baron Leys, Isabey, Leleux, Gavarni, Meissonter, Baron Français, Tassaut, Jadin, Marilhat. From among the most attractive paintings of those artists, an exquisite choice has been made, and the six artists named at the head of this article, and who are evidently six of the most marvellous lithographers of this sublunary world, have undertaken the fraternal task of translating the *chefs d'œurre* of their rival friends. They even determineded, in this indulgent tribute, to surpass themselves, and they have in truth admirably succeeded in doing it.

The *Album of Ancient and Modern Artists*, which marks the utmost limit (*apogee*) to the lithographic process, has already furnished two volumes containing in all fifty plates. We only speak of the second volume, as it is only that which we have before us. An explanatory text, indicates the subject and gives the description, as well as the names of the owners of the original paintings.

These gentlemen seem to have had the intention of resolving a double problem. To render lithography superior to engraving, and to demonstrate that one may ever exercise his *creative faculty* while copying with fidelity. Of these two difficulties, the first must sooner or later be resolved, for drawing on stone presents a fineness, a smoothness, a softness, and a firmness altogether, which nothing can equal ; but,

* The gallery of the Luxembourg, is, by a government regulation, appropriated to paintings of the highest order of excellence by living artists purchased from them and placed in the gallery, where they remain during the lifetime of the artist, and on his decease are removed to the Museum, another gallery consecrated exclusively to works of the illustrious dead. The above words are an imputation upon the Government Commissioners in disregarding the last part of the regulation ; which would seem to operate as an unjust exclusion of living talent. Forgetting to inter the dead, here means, the neglect to transfer their works from the Luxembourg to the museum.—*Translator.*

during the process of printing off, these precious qualities would partly disappear, and whether it was by the vicious quality of the paper, the negligence of the printers, or the inexperience of the designers, the proofs struck off were from some cause, the subject of a series of deceptions. Our elder brothers, the lithographers, like ourselves, were held in check by the difficulties of striking off the proofs. But, at last, the printing establishment of M. Bertants, (in lithography we count the printers for something) has finally succeeded in giving a true and complete result, and has demonstrated all the superiority of which lithography is susceptible in giving back to us an emenation of the thought, the mind, of the artists, in a manner far more beautiful, far more free, and far more direct than engraving.

The second problem to be resolved—that of putting in action the creative faculty while faithfully copying—is within the reach of but few persons. Place a painting by Leys or Corot before a camera and the instrument will copy it with entire precision. But it will not equally interpret it, it will complete it, it will add nothing in the way of commentary upon what the painter had expressed, nor even upon what he had slightly indicated; in a word, the daguerreotype will never realise a second creation, as M. Mouilleron has done in copying the "*Charity*," by Leys, and as Français has also done in designing a copy of Corol's "*Morning*." I may deceive myself, but to me these two prints really appear to be the richest gems in the casket. Français has also done another landscape "*After the rain*" copied from a painting by Rousseau, which is of equal value: it is hardly possible for one artist to place himself more intimately in the stead of another, nor more completely to fill the place of another, or more completely to elucidate the intentions of the original painter than Français has here done. Few are the artists who more keenly offend the prejudices and the old routine of ordinary amateurs than Rousseau. The lithographs of Français, after the pictures of this master, are veritable imitations; and yet, they are such as even those who have heretofore had but little sympathy or feeling for that painter's works, will easily bring themselves to admire after having assimilated themselves to them, in contemplating the precise, clear, elegant translation of Français.

That pliancy of talent is a gift of nature, which is possess d in a very high degree by Mouilleron, and Français. The first has rendered Isabey's *Grand Court*, with a touch so involuntary and so peculiarly his own, that one might think that he was looking at an original design of that master, —not such as he could make but such as one might dream of in accordance with the style of his painting. Less sensitive, but perhaps more firm by his nature, M. Celestin Nanteuil, attains analogous resul s by the action of his will. The *Conversation*, after E. Isabey, is a charming picture where the master with all his coquettry appears simplified without being impoverished. M. Diaz, on the contrary, under the hands of the same designer, is amplified, by enriching himself. In contemplating this design one easily forgets M. Diaz and takes to regretting Titian. Probably the designer had unconsciously made himself a critic. Be that as it may, he has entered fully into the manner and spirit of his model, in copying *Suicide* after M. Tassart: a picture representing two women emaciated by famine and struggling with the vapors of burning charcoal at the extremity of a garret. The *Temptation* displays his talents to us in its most lively allurements. We must also cite the *Watering place*, a very original and vigorous painting by Jadin, and rendered by M. Français with an intensity of tone, quite superior to the ordinary potency of lithography. It is hardly possible to see more clearly through shadows so profound.

M. Baron's picture of *The Lecture* is a subject of grace and the most perfect elegance. Seated on a rustic bank in the midst of flowers, under the shady trees of a large park, a lady is listening to a lively cavalier who is reading verses; the young man, dressed in the costume of the times of Louis the XIII., is seated in an admirably reclining posture; the local tones of this beautiful painting is of that sort of mildness which is not incompatible with and does not exclude firmness. And as to the drawing, even that is worthy the collection; and to say this, is, indeed, to say all. Baron alone could so well interpret the painting of Baron. We admire still

more the second design by this same master: *Women fishing with hook and line.* Both figures are truly charming; the blonde, dressed with perfect taste, recalls to mind by the costume, the attitude, and the head dress, the statues of the times of the renaissance. As to the brunette, who holds the fishing-rod and follows with her eyes the line as it glides down the current of the stream, she stands a little awkward or constrained. However, M. Baron delights in displaying his admirable tact and delicate taste in his management of these violent postures even where the personage is in repose.

Two designs, one after Géricault, the other after Decamps, do honor to the skill and the flexibility of Eugene Le Roux. The first represents a *Train of Horses* which Roman slaves are leading to a circus; the second, *Turkish horsemen* crossing a ford. It were difficult to make us feel the difference of style, of sentiment, and of execution which separates two schools, more plainly than do these two pictures. Gericault, with his studied passion, his academic vigor, his premeditated positions in the composing of his piece; Decamps, with his delirious infatuation for flashing lights and gorgeous colors; with his original *fantasie* and ardent vivacity of poetic imagination. The sky is splendid, the horses are proudly strutting about in the marshes and running brooks, and the whole painting is bathed in a golden vapor.

The shores of the Seine, a small landscape by Bonnington, rather cold and empty, shows nevertheless, the progress which has been accomplished within the last twenty-five years by our landscape painters. The subject of this picture is a mere study from nature, and however able may be the lithograph, the picture fades and seems dead by the side of a photographic view of the same site. And this will always be the case when the artists superadds nothing to nature; when, after contemplating her, he perceives not in her a sentiment which animates and idealises her.

Thus, one of the essential consequences of the daguerrean invention is, to constrain artists to think, to translate for the eyes, the ecologue, the drama, the poem, or the dreaming romance. It is to this power of the imagination, this interior radiancy of poesy, that M. Corot owes his high qualities of style, and the charm which he diffuses over his compositions, the execution of which, it must be said, is not always satisfactory. Thus, when an artist who is both a designer and a painter,—like Frangais, Baron, Nanteuil, Anastasie, &c.,—interprets a work of this kind, and accomplishes it, without denaturalising the character of it, there results from this double inspiration a perfect picture, which is evidently superior to any mere copy, however mathematically exact.

But intelligences capable of attaining to that high order of excellence are very rare, and this confirms our assertion in regard to the influence of photography in and upon the art; it will annihilate mediocrity, but contribute to the glory of artists of exalted talent, and force them to elevate themselves more and more into the regions of spirituality and of thought.

Therefore is it necessary that painting and designing become in a manner more absolute, not the *end* of the artist, but the *means;* the language which he makes use of to influence the crowd. And, here, in this connection, let us observe, that in tracing back the progress of human knowledge we find that it sometimes ascends to very singular and entirely unforseen causes. For several years under pretext of *naturalism*, art, in order to escape from conventional modes and the routine of the schools, has been thrusting itself from one excess to another, and there has been a constant tendency to materialize itself—that is, to become a dry copyist of material nature—and to change the whole world into one vast studio of still life. Who shall place limits to these mechanical tendencies? The invention of a mechanism which pushes all those tendencies to their utmost extreme, and which substitutes itself for art which sees nothing beyond, which forces the mere designer either to quit the trade, or become an artist of invention, of sentiment, in a word, by the expression of an idea.

Beside, *materialism*, so convenient for servile souls, and so antagonistic and antipathetic to our instincts, upon which the workers of daguerrean mechanics by concentrating all their energies, finally succeed in throwing over it a breath of life, forcing them to express what they themselves

feel. While, therefore, art sometimes makes bungling mechanics, the machine of Nipce and of Daguerre sometimes also unfolds real artists who are already contributing much more to complicate the conditions of the problem.

We welcome the *Album of the Ancient and Modern Artists* as a manifest confirmation of the opinions which we have frequently put forth, in relation to the arts of design and of the influence of heliography. This collection illustrates the most recent and the most intelligent tendencies of the young school; of that school which lives, which searches, which labors, which loves its art, and which makes it to be beloved. By the gracefulness of subjects, by the able interpretation of originals, by the exquisite delicacy of its execution, this *Album* is placed beyond all competition, above all rivalship, and our heliographers, to whom we recommend this work, may examine it with profit. We are happy, in this journal—entirely devoted to the general interests of the arts, the only one where we can judge without reserve, and praise without being suspected of having some original work to recommend,—to offer our fraternal sympathies to artists who have followed with a lively interest the labors of the Heliographic Society.

FRANCIS WEY.

DRESS—AS A FINE ART.*

BY MRS. MERRIFIELD.

PART 2.

WE fear from Mr. Planche's extracts that the evil was perpetuated by the poets and romance writers of the Norman periods; and we are sure that the novelists of our own time have much to answer for on the score. Had they not been for ever praising "taper waists," tight-lacing would have shared the fate of other fashions, and have been banished from all civilized society. Similar blame does not attach to the painter or sculptor. The creations of their invention are modelled upon the true principles of proportion and beauty, and in their works a small waist and foot is always accompanied by a slender form. In the mind of the poet and novelist the same associations may take place; when a writer describes the slender waist or small foot, he probably sees *mentally* the whole slender figure. The small waist is a *porportionate* part of the figure of his creation. But there is this difference between the painter and sculptor, and the novelist. The work of the first two address themselves to the eye, and every part of the form is present to the spectator, consequently, as regards form, nothing is left to the imagination. With respect to the poet and novelist, their creations are almost entirely mental ones; their descriptions touch upon a few striking points only, and are seldom so full as to fill up the entire form; much is, therefore, necessarily left to the imagination of the reader. Now the fashion in which the reader will supply the details left undetermined by the poet and novelist, and fill up their scanty and shadowy outlines, depends entirely upon his knowledge of form; consequently, if this be small, the images which arise in the mind of the reader from the perusal of works of genius are confused and imperfect, and the proportions of one class of forms are assigned to or mingled with those

* Continued from page 151, Vol. 5, No. 3.

of others, without the slightest regard to truth and nature. When we say, therefore, that writers leave much to the imagination, it may too frequently be understood, to the *ignorance* of the reader; for the imaginations of those acquainted with form and proportion, who generally constitute the minority, always create well-proportioned ideal forms; while the ideal productions of the uneducated, whether expressed by the pencil, the chisel, or the pen, are always ill-proportioned and defective.

The most efficient method of putting an end to the practice of tight lacing will be, not merely to point out its unhealthiness, and even dangerous consequences, because these, though imminent, are uncertain—every lady who resorts to the practice hoping that she individually may escape the penalty—but to prove that the practice, so far from adding to the beauty of the figure, actually deteriorates it. This is an effect, not doubtful like the former case, but an actual and positive fact; and therefore, it supplies a good and sufficient reason, and one which the most obtuse intellect can comprehend, for avoiding the practice. Young ladies will sometimes, it is said, run the risk of ill health for the sake of the interest that in some cases attaches to "delicate health;" but is there any one who would like to be told that, by tight-lacing, she makes her figure not only deformed, but positively ugly? This, however, is the plain unvarnished truth; and, by asserting it, we are striking at the root of the evil. The remedy is easy; give to every young lady a general knowledge of form, and of the principles of beauty as applied to the human frame, and when these are better understood and acted on, tight-lacing will die a natural death.

The study of form, on scientific principles, has hitherto been limited entirely to men; and if some women have attained this knowledge, it has been by their own unassisted efforts—that is to say without the advantages which men derive from lectures and academical studies. In this, as in other acquirements, the pursuit of knowledge, as regards women, is always attended with difficulties. While fully concurring in the propriety of having separate schools for male and female students, we do think that a knowledge of form may be communicated to all persons, and that a young woman will not make the worse wife or mother, for understanding the economy of the human frame, and for having acquired the power of appreciating its beauties. We fear that there are still some persons whose minds are so contracted as to think that not only studies of this nature but even the contemplation of undraped statuary, are derogatory to the delicacy and purity of the female mind; but we are satisfied that the thinking part of the community will approve the course we recommend. Dr. Southwood Smith, who is so honorably distinguished by his endeavors to promote the sanatory condition of the people, strenuously advocates the necessity of giving to all women a knowledge of the structure and functions of the body, with a view to the proper discharge of their duties as mothers. He remarks on this subject: "I look upon that notion of delicacy which would exclude women from knowledge calculated in an extraordinary degree to open, exalt, and purify their minds, and to fit them for the performance of their duties, as alike degrading to those to whom it affects to show respect, and debasing to the mind that entertains it.

At the present time, the knowledge of what constitutes true beauty of form is, perhaps, best acquired by the contemplation of good pictures and sculpture. This may not be in the power of everybody; casts, however, may be frequently obtained from the best statues; and many of the finest works of painting are rendered familiar to us by engravings. The *Art-Journal* has done much in diffusing a taste for Art, by the engravings it contains from statues, and from the fine works of English Art in the "Vernon Gallery." Engravings, however, can of course represent a statue in one point of view only; but casts are now so cheap as to be within the reach of all persons. Small models of the "Greek Slave" are not unfrequently offered by the Italian image-venders for one shilling; and although these are not sharp enough to draw from, the form is sufficiently correct to study the general proportions of the figure; and as this figure is more upright than statues usually are, it may be found exceedingly useful for the above purpose. One of these casts, or, if possible, a sharper and better cast of a female figure

should be found on the toilette of every young lady, who is desirous of obtaining a knowledge of the proportions and beauties of the figure.

We believe it will always be found that the beauty of a figure depends not only upon the symmetry of the part individually, but upon the harmony and proportion of each part to the rest. The varieties of the human form have been classed under the general heads of, the broad, the proportionate, and the slender.

The first betokens strength, and what beauty soever, of a peculiar kind, it may display in the figure of the Hercules, it is not adapted to set off the charms of the female sex. If, however, each individual part bears a proportionate relation to the whole, the figure will not be without its attraction. It is only when the proportions of two or three of the classes are united in one individual, that the figure becomes ungrateful and remarkable. The athletic—if the term may be applied to females—form of the country girl would appear ridiculous with the small waist, and the white and taper fingers and small feet of the individuals who come under the denomination of slender forms. The tall and delicate figure would lose its beauty if united to the large and broad hands which pertain to the stronger type. A small waist and foot are as great a blemish to an individual of the broad variety as a large waist and foot are to the slender. "There is a harmony," says Dr. Wampen, "between all the parts in each kind of form, but each integral is only suited to its own kind of form" Were this fundamental truth but thoroughly understood, small waists and small feet would be at a discount. When they are recognised *as small*, they have ceased to be beautiful, because they are disproportionate. Where every part of a figure is perfectly proportioned to the rest, no single parts appear either large or small.

The ill-effects of the stays in a sanatory point of view have been frequently pointed out, and we hope are now understood. It will, therefore, be unnecessary to enlarge on this head. We have asserted that stays are detrimental to beauty of form, we shall now endeavor to show in what particulars.

The natural form of the part of the trunk which form the waist is not absolutely cylindrical, but is flattened considerably in front and back, so that the breadth is much greater from side to side than from front to back. This was undoubtedly contrived for wise purposes, yet fashion, with its usual caprice, has interfered with nature, and by promulgating the pernicious error that a rounded form of the waist is more beautiful than the flattened form adopted by nature, has endeavored to effect this change by means of the stays, which force the lower ribs closer together, and so produce the desired form. Nothing can be more ungraceful than the sudden diminution in the size of the waist occasioned by the compression of the ribs, as compared with the gently undulating line of nature; yet, we are sorry to say, nothing is more common.

By the pressure of the stays, the arch formed by the lower ribs is entirely closed, and the waist becomes four or five inches smaller than it was intended by nature. Is it any wonder that persons so deformed should have bad health, or that they should produce unhealthy offspring? Is it any wonder that so many young mothers should have to lament the loss of their first-born? We have frequently traced tight-lacing in connection with this sad event, and we cannot help looking upon it as cause and effect.

There is another effect produced by tight lacing, which is too ungraceful in its results to be overlooked—namely, that a pressure on one part is frequently, from the elasticity of the figure, compensated by an enlargement in another part. It has been frequently urged by inconsiderate persons that, where there is a tendency to corpulency, stays are necessary to limit exuberant growth, and confine the form within the limits of gentility. We believe that this is entirely a mistake, and that if the waist be compressed, greater fullness will be perceptible both above and below, just as when one ties a string tight round the middle of a pillow, it is rendered fuller at each end. With reference to the waist, as to everything else, the *juste milieu* is literally the thing to be desired.

It has been already observed, that a small waist is beautiful only when it is accompanied by a slender and small figure; but, as the part of the trunk, immediately beneath the arms is filled with powerful muscles, these when developed by exer-

cise, impart a breadth to this part of the figure, which, by comparison, causes the waist to appear small. A familiar example of this, in the male figure, presents itself in the Hercules, the waist of which appears disproportionately small, yet it is really of the normal size, its apparent smallness being occasioned by the prodigious development of the muscles of the upper part of the body.

The true way of diminishing the apparent size of the waist, is, as we have remarked above, by increasing the power of the muscles of the upper part of the frame. This can be only done by exercise; and, as the habits of society as now constituted, preclude the employment of young ladies in household duties, they are obliged to find a substitute for this healthy exertion in calisthenics. There was a time, when even the Queens of Spain did not disdain to employ their royal hands in making sausages; and to such perfection was this culinary accomplishment carried at one period, that it is upon record that the Emperor Charles V., after his retirement from the cares and dignities of the Empire, longed for sausages "of the kind Juana, now in glory, used to pride herself in making in the Flemish fashion."

This is really like going back to the old times when—

"The Queen of Hearts she made some tarts."

In our own country, some fifty years ago, the young ladies of the ancient city of Norwich were not considered to have completed their education, until they had spent some months under the tuition of the first confectioner in the city, in learning to make cakes and pastry; an art which they afterwards continued when they possessed houses of their own. This wholesome disicipline of beating eggs and whipping creams, kneading biscuits and gingerbread, was calculated to preserve their health, and afford sufficient exercise to the muscles of the arms and shoulders, without having recourse to artificial modes of exertion.

It does not appear that the ancients set the same value upon a small waist as the moderns, for in their draped female figures, the whole circuit of the waist is seldom visible, some fold of the drapery being suffered to fall over a part, thus leaving its exact extent to the imagination. The same remark is applicable to the great Italian painters, who seldom marked the whole contour of the waist, unless when painting portraits, in which case the costume was of course observed.

It was not so, however, with the shoulders, the true width of which was always seen; and how voluminous soever the folds of the drapery around the body, it was never arranged so as to add to the width of the shoulders. Narrow shoulders and broad hips are esteemed beauties in the female figure, while in the male figure the broad shoulders and narrow hips are most admired.

The costume of the modern Greeks is frequently very graceful, and it adapts itself well to the figure, the movements of which it does not restrain. The prevailing characteristics of the costume are a long robe reaching to the ground, with full sleeves, very wide at the bands. This dress is frequently embroidered with a graceful pattern round the skirt and sleeves. Over it is worn a pelisse which reaches only to the knees, and is open in front; either without any sleeves or with tight ones, finishing at the elbows, beneath which are seen the full sleeves of the long robe. The drapery over the bust is full, and is sometimes confined at the waist by a belt; at others it is suffered to hang loosely until it meets the broad sash-like girdle which encircles the hips, and which hangs so loosely that the hands are rested in its folds as in a pocket.

The drapery generally terminates at the throat under a necklace of coins or jewels. The most usual form of head-dress is a veil so voluminous as to cover the head and shoulders; one end of the veil is frequently thrown over the shoulder, or gathered into a knot behind. The shoes, apparently worn only for walking, consist generally of a very thick sole, with a cap over the toes.

The modern Greek costumes suggest several points for consideration, and some for our imitation. The dress is long and flowing, and high in the neck. It does not add to the width of the shoulders: it conceals the exact size of the waist by the loose pelisse which is open in front; it falls in a graceful and flowing line from the arm-pits, narrowing a little at the waist and spreading gently over the hips, when the skirt falls by its own weight into large

folds, instead of curving suddenly from an unnaturally small waist over a hideous bustle, and increasing in size downwards to the hem of the dress, like a bell, as in the present English costume.

The ladies' evening dress with much pretension to elegance, exhibits most of the faults of the modern style of dress. It combines the indecently low dress, with the pinched waist, and the hoop petticoat. In the figure of the woman of Mitylene, the true form and width of the shoulders is apparent, and the form of the bust is indicated, but not exposed, through the loosely fitting drapery which covers it. In the figure of the Athenian peasant the loose drapery over the bust is confined at the waist by a broad band, while the hips are encircled by the sash-like girdle in which the figure rests her hands. The skirt of the pelisse appears double, and the short sleeve, embroidered at the edge, shows the full sleeve of the under drapery, also richly embroidered. In the second figure from the environs of Athens, we observe that the skirt of the pelisse, instead of being set on in gathers or plaits, as our dresses are, is "gored," or sloped away at the top, where it unites almost imperceptibly with the body, giving rise to undulating lines, instead of sudden transitions and curves. In the dress of the Arcadian peasant the pelisse is shortened almost to a spencer or *cote hardie*, and it wants the graceful flow of the longer skirt, for which the closely-fitting embroidered apron is no compensation. The heavy rolled girdle on the hips is no improvement. The dress of the Algerine woman, bears a strong resemblance to the Greek costume, and is very graceful. It is not deformed either by the pinched waist, or the stays. In the tenth century the French costume somewhat resembled that of the modern Greeks; the former, however, had not the short pelisse, but in its place the ladies wore a long veil, which covered the head and reached nearly to the feet.

The Greek and Oriental costume has always been a favorite with painters; the "Vernon Gallery" furnishes us with two illustrations; and the excellent engravings of these subjects in the *Art-Journal* enable us to compare the costumes of the two figures while at a distance from the originals. The graceful figure of the "Greek Girl,"* painted by Sir Charles Eastlake, is not compressed by stays, but is easy and natural. The white under-drapery is confined at the waist, which is short, by a broad girdle, which appears to encircle it more than once, and adds to the apparent length of the waist; the open jacket, without a collar, falls gracefully from the shoulders, and conceals the limits of the waist; every thing is easy, natural, and graceful. M. de Stackelberg's beautiful figure of the "Archon's Wife," shows the district whence Sir C. Eastlake drew his model. There is the same flowing hair—from which hang carnations, as in the picture in the "Vernon Gallery"—the same cap, the same necklace. But in the Baron's figure, we find the waist encircled with a broad band, six or seven inches in width, while the lady rests her hand on the sash-like girdle, which falls round the hips.

Turn we now to Pickersgill's "Syrian Maid:"† here we see the artist has taken a painter's license, and represented the fair Oriental in stays, which we believe are happily unknown in the East. How stiff and constrained does this figure appear, after looking at Sir C. Eastlake's beautiful "Greek Girl;" how unnatural the form of the chest! The limits of the waist are not visible, it is true, in the "Syrian Maid," but the shadow is so arranged, that the rounded form to which we have before alluded, and which fashion deems necessary, is plainly perceptible; and an impression is made that the waist is small and pinched.

We could mention some cases in which the girdle is omitted altogether, without any detriment to the gracefulness of the figure. Such dresses, however, though illustrative of the principle, are not adapted to the costume of real life. In sculpture, however, they frequently occur. We may mention Gibson's statue of Her Majesty,‡ the female figure in M'Dougall's "Triumph of Love,"§ and "Penelope,"‖ by Wyatt. But the drapery of statues can, however, scarcely be taken as a precedent

* Engraved in *Art-Journal*, for 1850, p. 263.
† " " " for 1850, " 75.
‡ " " " for 1846, " 139.
§ " " " for 1849, " 8.
‖ " " " for 1849, " 184.

for that of the living subject, and although we mention that the girdle is sometimes dispensed with, we are far from advocating this in practice,—nay, we consider the sash or girdle is indispensable: all that we stipulate for is that it should not be so tight as to compress the figure or impede circulation.

In concluding our remarks on this subject, we would observe that the best means of improving the figure are to secure freedom of motion by the use of light and roomy clothing, and to strengthen the muscles by exercises. We may also observe that singing is not only beneficial to the lungs, but that it strengthens the muscles and increases the size of the chest, and consequently makes the waist appear smaller. Singing and other suitable exercises, in which both arms are used equally, will improve the figure more than all the backboards in the world.

PRACTICAL TREATISE ON PHOTOGRAPHY UPON PAPER AND GLASS AND METALLIC PLATES.*

TRANSLATED BY MRS. A. L. SNELLING, FROM THE FRENCH OF M. AUBREE, CHEMIST,

Associate member of the Linaen Society, Chemical and Physical, of Paris.

IT is to render the execution of photography upon paper, sure and easy for persons least experienced in the chemical manipulations that we wish to tender the efforts of men who endeavor to make this art attain to the most useful applications in the industrial economy. The first condition for entering into this novel order of things, is to relieve the operation from the cares which arise during the exposition.

1. The means of operating upon dry in place of wet paper disembarrasses the operator from the difficult operations which have to be made during the time of exposition.

3. A simple preparation such as can be easily fabricated and can be given to the operator and which will save him the trouble of preparing it.

The papers prepared by the means described hitherto, could not be brought to the dry condition without taking afterwards, under the action of gallic acid, a uniform coloration which burned the photographic image by making it disappear completely. Serum has the property of parrying this inconvenience; we shall proceed then in the following manner for the preparation.

We will use, after filtering it, the clear part of the milk which may be procured by beating up in the serum the white of an egg to the half pint; then we shall boil it, in order to take away all solid matter and filtrate it anew; after which we dissolve in the cold solution 5 parts for every 100 in weight of iodide of potash. The paper to be prepared must be very thick, and plunged entirely into this substance for two minutes, afterward hung up to dry by means of two pins, by the two corners, upon a cord stretched horizontally.

This preparation is made by daylight without any particular precaution; the paper is good immediately, as well as six months after, and very certainly much later still. When it is made use of, it must be subjected to a second preparation, which is made by candle light, and as quick as possible after the exposure (exposition); it is still, however, fit to give good results many days afterwards, avoiding then, as much as possible, to leave it at a high temperature.

We proceed then for this preparation as we have decribed it in our communication in the month of January 1847, by covering

* Contiuued from page 133, Vol. 5, No. 4.

a glass with aceto-nitrate of silver, 2 parts of crystalizable acetic and 10 parts of distilled water. We lay upon this substance one of the surfaces of the paper which we leave to imbibe it, until it becomes perfectly transparent which we must make certain of by taking it up and looking at it by means of the candle; after which we dry it between many sheets of very white blotting paper (printer's paper is very convenient) and it must be left in this paper-book till the moment it is to be placed in the frame, behind a sheet of paper very neat and dry and between two plates of glass as in the wet operation described beforehand.

The exposition, to which we proceed later or on the morrow, varies by reason of the light and of the power of the object-glasses from one to five minutes.

Afterwards (*de retour chez sor*) we deposit the part of the paper which has been presented to the light upon a saturated solution of gallic acid. The image is formed little by little, and ends by acquiring as powerful a tone as can be desired. It is then washed with a great deal of water, then passed through a solution composed of one part of bromide of potash and 20 parts of water, in order to dissolve the unreduced salts of silver, then worked anew, to take away all trace of this bromide, whose action, if continuing, will destroy the image,—and at last dried between many sheets of blotting paper.

PREPARATION OF THE DRY PAPER BY ALBUMEN.

The paper prepared by the albumen has properties analogous to those of the serum, only one degree inferior; it preserves itself good for an indefinite time after the preparation of iodine; but after having been submitted to the acetate of silver, it will not last beyond the next day.

The proofs which the preparation gives which we are going to describe are admirable, but less fine than those upon glass, they have more charms because the opposites are less glaring, and we find in them more harmony and softness.

We think it is a great triumph for those who seek for the improvements of the art in these results of photography.

We beat into a foam the white of eggs, in which we have poured 30 drops of a solution of iodide of potassium and two drops of a solution of bromide of potassium for each white of egg.

We let it remain until the foam of the albumen is reduced to a liquid state; then filter it through a silk paper or a clear muslin, receiving the albumen into a large vessel below. We place upon the solution the paper which we wish to prepare, and leave it there some minutes. When it is tinged with the albumen we raise it by one of the corners and let it drain and dry by hanging it by one or two corners to a loose string.

The preparation with the acetate is in all points similar to that described above for the paper prepared with the serum, taking care not to dry between two blotting papers until the paper shall have acquired a complete transparence.

Placing it in the frame for exposition is done in the same manner, and the image developed in the same manner by gallic acid as well as the remainder of the operation, but the exposition lasts longer, four to five minutes generally.

PREPARATION OF THE POSITIVE PAPER BY ALBUMEN.

The positive paper prepared by albumen gives the proofs less brilliant, but of a tone more rich, and of a fineness and a transparency much more agreeable—it is prepared in the following manner:

Throw the whites of eggs 25 parts to 100 by weight, into water saturated with chloride of soda (kitchen salt very white.) Beat the eggs to a foam, and filter it as in the preceding preparation, only here you leave the paper upon the albumen but a half minute.

Hang it then to dry, which it will do in six or eight minutes; deposit it afterwards in a dish containing 25 parts of nitrate of silver and 100 parts of distilled water.

The paper is left upon the bath at least six minutes, afterwards dried upon a dish, as we have described in our communication mentioned in the month of January 1847.

PHOTOGRAPHY UPON GELATINE.

Means of obtaining the negative, very pure and transparent, being able to reproduce them a great number of times on ordinary photographic paper.

In order to prepare the film of gelatine

upon which I make my negative proofs, I dissolve in 100 grains of water 6 grains of gelatine of good quality (that which we meet with in trade and which is used in preparing alimentary jellies, I have found to succeed best.) This paste ought not to contain salts soluble in water. It should be also as much as possible, free from fat matter. To make the solution I soak the gelatine in the distilled water during ten or fifteen minutes, I heat it slowly by an alcoholic lamp and shake it continually till the dissolving is complete. If it foams I raise it with care by means of a bit of joseph paper which I bring to the surface. I pass it through a linen wet previously and well squeezed, and I skim from the surface where they have formed some *striae* proving, without doubt, greasy matter which escaped the first skimming. I take of the gellatine thus prepared, measured in a graduated tube, a determinate quantity, and I strain it evenly upon a glass plate placed horizontally; a bed of 1 50 m m. is sufficient; this quantity is nearly equal to 20 inches of solution for the surface of a half plate, having 13.5c upon 17.5c. A greater thickness would not be injurious, but a more feeble one would have some inconveniences.

Before cooling the gelatine upon the glass plate apply to the surface a first film by means of a linen cloth impregnated with a solution of gelatine, a little more extended than the preceding; afterwards heats lightly the glass plate by means of an alcoholic lamp; then cool the solution of gelatine which will then spread evenly upon the plate, heat again, but moderately, the underpart of the glass plate to reduce the gelatine to a fluid and then leave it to cool.

The plate thus prepared I plunge into a solution of acetate of silver, holding the surface covered by gelatine below and inclining it in the solution until that is completely wet; I turn up the glass plate again and immerse it completely in the solution, then I pass, by repeated applications and in different directions, a very soft brush over all the gelatine surface, to remove all the bubbles of air which could possibly adhere to it; and before taking it away, I blow upon the surface to find if the solution has been absorbed equally by every part. I draw away the plate, and holding it a little inclined, I pass the brush which has previously served me, over all the surface taking care to cover the edge of the passage preceding by the edge of the passage following. I afterwards wipe the bottom of the plate, and place it horizontally—so that the surface can be dried again, which requires 5 to 6 hours.

I usually prepare the plates in the evening when I wish to use them the next morning, and in the morning when I wish to use them in the evening. It is important that there should not be too much free liquid at the surface of the plate only as we wish to employ it, for the preparation spreads to the places where it before existed. This preparation should be made in the shade of a solar lamp The plate to be covered with the solution of acetate of silver should not be exposed to the glare of day.

The solution of acetate of silver is prepared by making a saturated solution with acetate of silver, to which is added half of its weight of water. Admitting that 100 parts of distilled water, at an ordinary temperature 0. 5 gr. of acetate of silver to prepare 7.50 lit. of the solution which I use, I dissolve 3. 5 grs. of acetate of soda in 15 grains of water; I dissolve equally 3.03 gr. of nitrate of silver in 10 grains of water; I add the solution of nitrate of silver to the solution of acetate of soda, and I place the acetate of silver which is precipitated upon a filter. I wash this precipitate with running water, then I pass several times through the filter 0.50 lit. of water, when nearly the whole of the acetate will be dissolved. I add afterwards 0.25 lit. to the half litre of saturated solution.

In this operation 3 grains of acetate of silver is formed the 0.75 lit. ought not to contain but 2.50 grs. but I put in a little more to make allowance for what may be lost in the solutions and washing.

Acetate of silver being easily altered by the solar light, I make this solution as much as possible in a dark place, I preserve it in a bottle covered with black paper and filter it at the time I wish to use it.

I expose to the vapor of iodine the plate prepared as below in the same manner as the daguerreotype plate, only for this exposition, we must note the time, for we cannot judge the color of the surface; only the time of exposition is shorter than

for the silver plates. The iodide plate is placed in the frame of the black camera and then I cover the side not gelatined with a card covered with black cloth. It is best to allow an interval between the coating with the iodine and the exposure to the focus of the black camera; the plate gains sensibility by this.

I have several times employed plates 5 or 6 hours after coating with the iodine; they had lost nothing of their impressable property.

The sensibility of these plates is about four times less than that of plates prepared with iodine and bromine. In a room well lighted, the exposition may require from twenty to a hundred seconds; portraits in the shade can be made in two minutes with the object-glass. I have tried the effect of the vapor of bromine upon these plates, and I have known that it has rendered them more impressionable. I have not made sufficient experiments, however, to prove the certainty of the results.

To develop the image, I plunge the plate into a solution of 0.1 gramme gallic acid to 100 grs. of water, I let the proof remain in the solution until the shades appears to me to become intense enough. This immersion can last an hour or an hour and a half; with a more concentrated solution of gallic acid, it will require less time, but it will be more difficult to regulate its action. In the first moments of immersion it forms a positive image on the surface of the gelatine. This image becomes more and more sombre; but viewed by transparency, the parts corresponding to the blacks will be very clear.

To fix the proof, wash it in common water, then immerse it for fifteen minutes in a solution of 1 gr. of hyposulphite of soda, dissolved in 100 gr. of water, wash it anew in common water, and then plunge it for some time into a solution of 1 gr. of bromide of potassium to a hundred grains of water.

I wash the proof in common water and leave it there fifteen or twenty minutes; then I wash it in distilled water and allow it to dry in the open air. We have then a very neat negative image from which some positive proofs can be obtained in the sun with the ordinary photographic paper in two or three minutes, possessing all the vigor of the negative proof.

It is well to renew at every operation, the solutions of gallic acid, of hyposulphite of soda, and of bromide of potassium.

In this operation, if we unite the solution of gallic acid with the sulphate of protoxide of iron we obtain fine positive proofs.

INSTANTANEOUS FORMATION OF THE IMAGE IN THE CAMERA, BY M. BLANQUART EVERARD (DE LISLE).

The fluoride of potassium, in addition to the iodide in the preparation of the negative proof gives instantaneous images by exposition in the dark camera. To be assured of the extreme sensibility of the fluoride I have experimented upon the quickest preparation in photography; that some plates of glass albuminated and simply iodureted, requiring an exposition at least sixty times longer than that upon paper.

In adding the fluoride to the iodide and replacing the distilled water upon the sheet of glass by a wash in a solution of fluoride of potassium I have obtained instantaneously the image exposed in the camera

I have even obtained the same result, but in some in action less powerful, without the addition of the fluoride to the albumen, and by only immersing the sheet of glass in the bath of fluoride after its passage through the aceto-nitrate of silver.

NEW PROCESS FOR OBTAINING PHOTOGRAPHIC IMAGES UPON SILVER PLATES; BY M. NIEPCE DE ST. VICTOR.

In occupying myself with the experiences of M. Edmund Becquerel, and seeking to fix the colors which nature gave them, I have discovered that we can obtain some definite daguerrean proofs without using either iodine or mercury.

It is sufficient to plunge a plate of silver into a bath composed of chloride of soda, sulphate of copper, sulphate of iron, and sulphate of zinc (the two last are not indispensable for the effect) by leaving it in the solution a few seconds, then washing in distilled water and drying the plate over an alcoholic lamp.

We apply against this plate the obverse side of an engraving, cover that with a glass, and expose it half an hour to the sun, or two hours to the diffuse light, then raise the engraving. The image is not always visible; but on plunging the plate

into liquid ammonia, the image always appears in a distinct manner (the cyanide of potassium and the hyposulphite of soda producing the same effect.) The ammonia sustaining all the parts of chloride of silver which have been preserved by action of the light, leaves in tact all those which have been exposed ; wash in water. After perfectly uniting, it is necessary that the contact of the ammonia be not prolonged beyond the time necessary to remove the chloride of silver which has not been modified by the light.

The proof, after this operation, presents the same aspect as the daguerrean image, regarded in the position in which it is s en, in a distinct manner, that is to say, that the shades are given by the metal, and the lights by the parts which, having been modified by the light, are similar.

We can employ for the daguerrean proof, the chloride of gold if we wish to fix the image and give it more vigor than it would have without it.

I am assured that we can obtain the daguerrean image by exposing the plate of chloretted silver in the dark chamber one hour in the sun, or two or three hours to a diffuse light, then plunging the plate into the ammonical water. Consequently, the image is developed without being obliged to submit it to the mercurial vapor, which in this case will not produce any effect.

NEW PROCESS OF PHOTOGRAPHY UPON PAPER, WHICH PERMITS US TO OBTAIN DIRECT POSITIVE PROOFS ; BY M. F. BOUSIGNES.

All paper being uniform, and slightly glazed, can be made perfectly applicable to this process. The papers made by Canson and Lacroix of England, has given me the best results.

Take three sheets of paper and successively plunge them in distilled water, and then extend them upon the face of the frame, taking care to make them adhere upon all points by means of a piece of very fine linen ; we then place the others upon this, which should be chosen from its appearing to be the most proper to receive the luminous imprint. These last serve only to preserve the adherence and the humidity of the other.

When this humidity has disappeared, suffer to fall upon the paper four or five drops of a solution of neutral silver which should be rapidly extended by means of a pencil over the whole surface. All traces of this solution disappears in a few moments after submitting the paper to the action of a slight vapor. In this state the paper will be treated in the same manner as the metallic plate. The vapors of the iodine and of bromine will give to it a great sensibility, but it will be necessary to expose it for a long time to the vapors of this last substance. The following is the best time for exposing it to the vapors.

First: Iodize, 15 seconds, coat over bromine, 35 seconds, and then iodize 10 seconds.

The paper is then placed in the frame and exposed to the light, which operates upon the paper almost with the same rapidity as upon the plate of silver. The mercury is then applied to develop the image.

If the manipulation has been properly conducted and the exposition to the light conveniently regulated, we obtain a positive image with a beauty comparable to that given by the daguerreotype and by a means very superior considering the softness of its tints to those of the ordinary process by gallic acid.

UPON THE PROCESS OF PHOTOGRAPHY UPON PAPER (POSITIVE PROOF) BY M. BONSIQUES.

1st. It is essential to reject all the papers which may not have sufficient conconsistency, or which may be too much sized or too porous. For the rest, the first preparation which will be easily detinguished by the quality of the paper. It will be necessary to plunge it into water to preserve a uniform whiteness and prevent any change during the process. The French papers, containing amadine are, in general, very sensitive.

2nd. *Solution of silver.*—We know that the salts of silver are sensible to the light, it is then necessary to prepare them and keep them in an obscure place. We do not believe that this solution should be concentrated to give more sensibility to the papers. The numerous experiments which I have made, on the contrary, give the certainty that the sensibility augments in a measure as the solution is diluted.

Nevertheless, there is a limit beyond

which we cannot pass. We can take some term, say 5 grammes of neutral nitrate of silver to 30 grammes of distilled water.

3d. *Iodine.*—The paper submitted to the vapors of iodine becomes covered with a violet colored coating; or with a metallic white. These two effects take place when the nitrate of silver has not extended evenly upon the paper, or when it imparts too much moisture to the surface.

4th. *Object-glasses.* As it ordinarily happens that the image is clearer in the centre than the extremities, it is best to use lenses capable of producing images greater than those that we wish to obtain; for example, a half plate object-glass for a quarter plate. The parts removed from the centre will then be clear and will obviate by this means the difficulty of having too often but partial results.

5th. *Exposure to the light.*—If we wish to content ourselves with a negative proof, the time of the exposition will be important; for if twenty second suffices to obtain it we can be able in forty, fifty, or a hundred minutes to show that we have not failed in our experiment. The image rendered visible by the mercury will be always very fine; but the time which is required to produce a positive result is less easy to determine. If the sheet of paper submitted to the mercurial vapor take a general black tone, it is a proof that the exposition has not been sufficiently prolonged; if, on the contrary, the paper preserve its whitness, it has been too long exposed.

We may with great facility obtain by this process proofs upon glass by using gelatine, albumen, &c. after the methods published by M. M. Blanquard Evrard, Niepce de St. Victor, &c.: but, the results, although very fine, do not compensate for the labor in the preparations.

TO BE CONTINUED.

From La Lumiere.

PHOTOGRAPHY.—A PHYSIOLOGICAL SKETCH.

Translated from the French by Ambrose Andrews.

MANY and various have been the physiologies written within the last few years, and among the rest society itself, has, so to speak, been sketched and analyzed. All classes from the porter to the diplomatist, from the grissette to the lady of rank, have been analytically drawn with more or less truth and spirit by the pens of our observers. Nevertheless, there is still one class of men whose physiology has not been given, it is the photographers. Surely this class of our population—which came suddenly into existence in the midst of French society and acquired such truly gigantic proportions, living its own life, having its own manners and customs, its character and physiognomy—ought especially to have its portrait separately drawn. This is what we will attempt to do, offering our incomplete sketch to other and abler pens, who may perhaps make more out of it and accomplish a better picture than we can ourselves.

I.

It is now some 25 years since, like a flower from the rays of the sun, photography sprung into existence. The Prometheus of our age, who snatched a ray of heavens pure light and made from it this charming art, was Nicephore Niepce, a mortal man, who was left to die,—not indeed like the Prometheus of old, chained to a rock, but in a an obscure retreat neglected and unknown; leaving his nameless child, the infant art, to be adopted by another, who raised her, developed her

powers and her aptitude, and giving her his own name, presented her to the world Since that time how she has grown, and what progress she has made! How in strength and beauty has she increased, and, —as the good Mr. Hill said the other day, —how she has multiplied! Photography, Talbotype, Calotype, Catalysotype, Heliochromie, all are born of *Daguerreotype.*

But soon this word was felt to be insufficient, for after all, it only recalls the name of one man, and applies only to the chief of this family of arts, and so *Photography* was selected as not only applicable to the whole family but also calling to mind its celestial origin.

Photography then, is fairly established among us, and wherever there is a little sun and air,* there it may be found. First, it installed itself in the attics, and on the roof-tops, and there it was that many of our finest and grandest results have been obtained; then it entered the cabinets of the men of letters, the studios of the artists, the laboratories of the savans, the parlors of the millionaires, and even into the boudoirs of our charming idlers! It has inscribed its name on every street corner, on doors of every grade, from the most sumptous facades of the Boulevards and promenades, down, and is even seen at the present time, vacilating along the streets on the jolting sides of our omnibusses! Whichever way you turn your eyes, there may you read, Daguerreotypes! Photographs! Portraits!

Photography signifies to draw or paint from the sun. Two thousand years ago, for such an invention as this, a man would have been deified; and, that at least, would have been some honor. Three hundred years ago for the same thing he would have been burned; which not only were no honor, but in spite of his intimate relations with the sun would have at least, proved of peculiar inconvenience.

This illustrates the astonishing march of ideas which are thus found, in the space of a few ages to be allied to two of the widest possible extremes. The ancients regarded the man who accomplished great and surprising things as coming down from heaven: in the middle ages and a little later, they were loooked upon as coming up from hell. In our day, they are regarded and treated as simple mortals, and this just medium argues much in favor of our own times. There are persons, however, even now, who will maintain that it simply and plainly proves, that we have more of pride and less of faith than our fathers, since we find the most wonderful and extraordinary things as simply natural, and believe man to be capable of doing all without a single ray from on high, or a single blast from below. Let it be understood, however, that we pretend not to solve questions like this, which reach to the loftiest, and, consequently to the most controverted points in philosophy, which is itself an interminable controversy.

We have said that photography has invaded every story from the proudest parlors, up to the roof-tops, and we may add, that it is also finding its way into every grade in the social state, which will naturally lead us to indicate the divers classes which have become established in the photographic population of Paris, where we have photographers upon photographers almost without number. We think that persons, competent to judge, will approve of our characterising four grand families—as a naturalist might say,—in the photographic race: to wit, the *photographer proper*, the *photographic artist*, the *amateur*, and the *scientific photographer.*

In considering these classes we will proceed in their numerical order, and cause the types which personify each of these categories, to pass before the critical camera, and according to our best we will show you such proofs as shall enable you also to recognize and study them along with us.

II.

THE PHOTOGRAPHER PROPER.

Let us in the first place make some general preliminary reflections on the word *photographer.* There is often a great deal in a word, especially in our day, when so many are more ready to look at the form rather than to the idea; to the expression more than to the thought. Some men have owed their entire fortune to a word; some have been indebted to it for

* Our author has made a pun here, without knowing it. If he lived in the United States he would be more apt to appreciate how many *little sons and heirs* are dependent upon this natural son of France.—*Ed. Pho. Art-Journal.*

their happiness. Some by a word have become celebrated, and many more for a single word have suffered death. And this is what we may behold every day. At times a word has sufficed to light up interminable wars, and to endanger the existence of empires But when that word is to become a title, then a still higher importance attaches to it. For example, how often do we see excellent books abounding with wise thoughts and useful teachings, books which should redound to the glory of their author, but which, nevertheless, for no other reason than an ill-chosen title, are never read. Then again, we may often see others with little else than the title to recommend them, enjoy for a time at least, a *furor* of popularity.

We deem it useful therefore, to return to the word which we shall so often have to repeat. Photographer, then, represents to us every individual who makes the practice of photography his trade, his art, or his pleasure. But even this word has itself scattered discord among the photographic tribe, who, it ought to seem, are well adapted to live in harmony and peace. It has given birth to two contending factions, both equally sure of being in the right. One of these, the least numerous, but the most ardent, will have it, that we should say *photographist*, the other being content with *photographer*.

Much as we have desired to keep aloof from these philological strifes, we are nevertheless, compelled to choose between them. As may have been already seen, we have—we humbly confess it—arranged ourselves on the side of the majority, and our excuse is that *photographer*, having in fact, firstly, and quite naturally too, presented itself to our pen we have so written it: It is shorter and more simple, which, in our eyes, are two good reasons. Besides, in reasoning and proceeding after the manner of Bacon, according to analogy, we have thought that inasmuch as it is our usage to say geographer, stenographer, lithographer, not geographist, lithographist, &c., so we may without presumption simply say photographer.

This then being settled, let us proceed with our physiological sketch of that type which we have denominated the photographer proper, who is still by many vulgarly called daguerreotyper.

Who among you, O readers, hath not, in order to avoid a sudden shower, or a creditor, or some other importunate; or while awaiting an omnibus, or, it may be, even to enjoy good-naturedly for a few moments, a little idle curiosity (*flanerie*) has not paused before one of those show frames which stare us in the face from both the right and left sides of some vulgar door in which are generally exhibited the faithful images of a gendarme, a young girl in her first communion dress, a *monsieur* of doubtful quality, and two or three families grouped tenderly together, with a smile upon their lips, and in more or less graceful attitudes, and has not read in the middle of said frame, this inscription written in barbarous letters,

DAGUERREOTYPE PORTRAITS,

FROM TWO FRANCS UPWARDS TAKEN HERE.

Resemblance warranted perfect.

And who among you, while glancing from the corners of the eye along the dark entry at the extremity of which is seen the first steps of the stairway, full of shadowy mystery, has not felt curious to penetrate into the photographer's sanctum. This is almost always found situated away up in the last story of the house; and in truth it seems appropos, that the co laborer with the sun should enstall himself as near as possible to the sky.

Pungent smells of chemicals, announce the termination of the ascension. The chamber into which we enter, communicates with a terrace which serves as the theatre of one of the most essential places of the operation, to wit, the sitting. This apartment which is called the saloon, is furnished with more or less elegance. On the table are heaped pell-mell, portraits of all sizes and all prices. The walls also are covered with them. Empty frames, embroidered blank cartoons and medalions, fill up the intervals. As to the dark closet, that is the *sanctum sanctorum*, which none but the initiated must enter.

It is easy to comprehend that the cleanliness of the stairway and the elegance and richness of the furniture in the photographers saloon, will vary according to the quarter that he inhabits and the popular value placed upon his works. And thus we might lay it down in mathematical proportions as follows:

A photographer of such, and such a street is, to a photographer of such, or such a boulevard, as 2 francs are to 55 francs. However the same general disposition, the same plan, the same number of stories will be found in most of the various grades of establishments, and only put carpets on the stairs, a crystal knob on the door, furniture mounted with velvet, in the saloon, satin paper on the walls, and you will have an idea of what will be seen either in *Vivienne Street*, or the *Boulevard des Italiens*.

Now that we have sketched the dwelling-place, let us study him who inhabits it.

Physically, the photographer is like any body else. He has not for example, his own peculiar air, fashion, *tournure*, which distinguishes the painter. His stained hands, alone would reveal his incognito, to the indiscreet eyes of the curious. The nitrate of silver marks them with a sign which is every day renewed.

In general, the photographer proper is a philpsopher. Before having become a practitioner, he had been in some other business, and not unfrequently had he tried his hand at many things; he is not therefore, unacquainted with every day life. Very likely he is a *bon-vivant* and enjoys a hearty laugh over his glass of wine, and would willingly sing you a song, making himself a merry guest and frequently also a generous host. At evening, after a hard days work at the camera, the polisher, and the bromine box, he would gladly meet you at a well supplied table, and largely inhale the rejoicing perfumes of a savory supper, where the vapors of champagne would make him forget those of iodine, bromine and mercury. But should you allow yourself to betray any astonishment at his neglect of his toilette; were you to cast furtive looks of disdain at his spotted and stained pants, he might have the wit to say to you in reply. "Sir, these pants are worth to me 200 francs per day," and very likely he would tell you true. There are many such photographers whose run of customers is such that you must take your number and await your turn, before you can get your portrait taken; and every six months or a year they can purchase a house if they like.

Who says then, that there is no such thing as becoming rich in our day!

Are you an advocate and have no cases? console yourself! Are you a doctor and nobody comes to be cured? despair not! Have you—after passing 14 years of your life in study, and dreaming away 10 more, —perpetrated a tragedy, a drama, or a vaudeville, which has been hissed and irretrievably damned? take courage! Are you an actor and have always been left in the background among the subordinates and supernumeraries, (*utiles*) hope! Are you a journalist and nobody reads you; or a financier menaced with ruin; finally, whatsoever road you may have chosen, if while seeking fortune you meet with only misery! Pause! Calm yourself and behold! There she now stands reaching out her arm to you! Go at once and become a photographer!

III.

THE ARTIST PHOTOGRAPHER.

The artist photographer is one who having consecrated his life to the study of an art, as, for example painting, architecture, engraving, &c., has recognized in photography a new means of translating his impressions; of imitating nature in its richness, its beauty, and its *poesie*, and to reproduce the great master pieces which human genius has scattered over the world. Ordinarily he is a painter, but whatever he is, he is always a man of intelligence and talent.

The mere unmodified quality of artist, suffices to stamp a peculiar characteristic to his person, to his works, and to his habitudes, which strongly display themselves in the home of the recently converted artist photograper.

If you enter his private studio, you will be at once struck with the amiable disorder which is the inevitable consequence of that peculiar activity of mind which belongs to him who inhabits it. Photographic papers which may be prepared and may be not, cameras, basins, flasks, drawing papers, pencils, palettes, lay-figures, easels, &c. all concur in making the eye feel, at the sight of this strange medley, something of what the ear feels while listening to a symphony where instruments of various kinds and degrees of power, mingle their dissimilar sounds in one harmonious whole.

High on the walls are suspended paintings, sketches and designs, proofs on plates

and paper, of portraits, of views of academies, of fragments, &c. The eye wondering at and wandering amidst this characteristic disorder, pauses at times upon some half destroyed proof, and looks in vain to find some point of merit. Not a single detail particularly well rendered, not a single striking expression, no fine effect of light, no mass of broad deep shade, nothing, in short, which shows why the artist preserves so preciously, the torn and blotted fragment.

But in the operating rooms of the artist photographer fully initiated and installed, there is no longer found this invariable disposition of the mere artists private home, which we have attempted to give in the above sketch. Fancy alone reigns over the privileged dwelling-place where two arts live together on terms of mutual intelligence, and making mutual concessions to each other with entire cordiality.

At times the painters' studio is entirely separated from the photographic operating-room, and then at times they make but one. Sometimes the dark closet is reduced to such narrow limits that it resembles a placard concealed in the recess of the wall. Again, at other times, it is a vast laboratory, having its windows carefully covered with yellow screens where one may freely walk about, receive visits, and follow the different phases of the operations very much at his ease.

The artist photograper travels in the summer.

When you go to seek a few days of calm and repose far away from Paris, if, in your solitary rambles of a fine morning in September, you perceive at the turn of the road which climbs the hill, or at the borders of a wood, or on the banks of some poetic stream, a man dressed in a gray *blouse*, his head covered with a broad brimed hat, having before him a strange looking instrument mounted on three legs, and which seems to point as an artillerist would point a cannon ; fear not to approach him ; go and accost the unknown. You will find him no enemy, but right good company, an agreeable and spirited talker, who will question you concerning the country, the points of view, the monuments, &c., and in return, he will give you—all the while continuing his operations—the news of Paris, of the sciences, &c. only if you observe him to take out his watch, or an hour-glass, or if he begin counting the seconds by marking time, then interrupt him not, for you would endanger his work. He is an artist photographer!

Are you in one of our provincial towns, in a square before the gigantic facade of an old cathedral? After your morning reveries more or less incoherent, with your back against the tavern wall at the corner of the square, seated cross-legged and with spy-glass at your eye, you are contemplating in exstacies the admirable workmanship which could chisel and indent, and so animate this mass of stone, transforming it into a fantastic world, and you query in your mind if the most able painter could ever reproduce these marvelous details which your eye is at every moment discovering. Suddenly a window is thrown open just over your head, the noise of which disturbs you, and looking up to see who has come to trouble your beatitudes ; again, it is our artist photographer, who, like yourself has been admiring the charming tracery of that work, and is now going to make precisely that reproduction which you had judged impossible. Having found no better place of shelter than that chamber, and no better point of view than that window, he levels his camera and the work is done!

How fraught with interest, are those fine collections of proofs which he thus brings back from his travels! What marvels he thus accumulates in his portfolios of cartoons!

The artist photographer being free ; having to render no account to any one but himself for the employment of his time, he naturally attains to a much higher degree of perfection in his productions. With what admirable tact he knows how to give his productions the diversified effects of nature, so as to impart to the various subjects their characteristic charm. For instance, if he wish to reproduce a monument, he knows at what hour of the day the shadows are given with the greatest amplitude and clearness ; if a landscape view is to be obtained, he knows when it can be done with most of brightness and transparency ; if a portrait is to be taken he knows when the most of delicacy and grace can be imparted to the individual face. With what ability he choses his points of view, and

how well he composes his accessories and his draperies! Nor does he withhold his care even from the least of his manipulations. His proofs are indeed artistic works; productions truly of intelligence and talent.

The artist photographer, as may easily be comprehended will adopt such and such a style, such or such a class of subjects and will work at such or such processes, according as he finds them most congenial with his tastes and turn of mind, and having once found them, he will be ardent, and full of passion and constant in his pursuit of them. Hence, he will be seen giving himself up exclusively to the reproduction of monuments, or of views, or of portraits, or of composition subjects, as groups after the antique and from nature; he is a decidedly faithful partizan to his chosen process, whether it be albumen, or paper, or collodion. He has an affection also for a particular tone, and this invariably he gives to his proofs. Thus it may be almost, if not quite as easy to recognize the artist in his photographic proof as it is in his painting.

Very often the artist photographer has styles and processes entirely peculiar to himself and publishes his discoveries in pamphlets, yet, we cannot class him with the scientific photographer. When we come to speak of this type, it will be seen how great a difference we shall make between the two. But if there exists in the photographic race, vigorous and decided types of character, it is above all in the class of artist photographers, that they are to be found; and it is easy to comprehend that this would be so; for those who preserve their independence, yielding only to their own taste, fancy and inspiration will preserve also their own originality.

The artist makes his name known among his brother painters; he is extensively instructed and has a vast intelligence; but he has also his caprices, his eccentricities and foibles—and who has not, especially in the privileged world of the arts. Hence, it will not be surprising that whilst he uses photography with ardor, the greatest displeasure you could do him would be to impute it to him. If you are discreet on this point, he will show you his proofs triumphantly, he will speak of his vast improvements, of his new method of proceeding; he will talk to you at length of the minute observation he has made, and he will work himself into emotions of enthusiasm! But beware how you check his flight, by making any allusion to his new auxiliary. If you chance to say, "how goes photography?" he will turn his back upon you and say, "Sir, I am a painter! and not a photographer." But if you are one of the initiated and approach him as with confidential revelations as to the great advantages you have yourself derived from photography, you will find him a ready listener and he will receive your advice with thanks, but if he maintain silence as to his own experience, then above all ask him no questions. Photography is to him as a mistress, cherished and concealed; he will sometimes speak of her himself with pleasure but allows no others to speak of her to him. And if by some fatal chance you intrude into his sanctuary where he sequesters and adores her; then woe be to you! Every look is the thrust of a poignard to his jealous heart; every step an offence which he never will forgive!

Another place of the artist photographer, is where he freely sets aside painting, and resigns himself exclusively to the charms of photography. He also has great talents, and he would increase them to a much higher degree. He belongs already to the first class, but aspires to stand at the very head. But he also has his foibles. For instance, he will do admirable things, he will produce some of the greatest marvels, and then proclaim loudly that these are only some of his failures! and then, comparing them with the labors of his brother artists he will take the occasion vauntingly to say—to whoever will listen to him—"Thus do you see, their very best are only equal to the poorest things I do." And this is his system, his self-applause, for there is system in that as well as in anything else.

But we pause, these two rough sketches will suffice. Our task was to sketch the outlines of our photographer characters, not exactly to dissect them. In the gentle hand of physiology the crayon should not be converted into the scalpel, nor should it sketch the features too coarsely, or make the model in the least degree more than simple truth demands, else it indites a calumny instead of drawing a portrait.

Ernest Lacan.

From La Lumiere.

THE PHOTOGRAPHER'S DRESSING-ROOM.

Translated from the French by Ambrose Andrews.

AT the announcement of this title, more than one reader will smile; ladies will cast down their eyes and blush, while others with more curiosity than discretion, will expect to learn some amusing mystery. All will find themselves mistaken, and in order to silence the premature suppositions, we will say at once, that the photographer's *cabinet de toilette* is the same as that of every body else. Nothing more, nothing less, will be found there, than is found everywhere: and indeed therein consists a wrong, because it ought in fact, to contain sundry other articles besides.

To the ordinary cosmetics and perfumery, the photographer should superadd a vial of *hydrochloric acid*, a vial of the solution of *salt of oseille*, a vial of the *solution of soda*, or the *hyperchlorite of soda water*, (*eau de Javelle*), etc., etc These are not the aromatics sold by the Chardins, and the Oubigans, but are found at any of the manufactories of chemical substances.

All these perfumes,—and that is to say drugs—ought to have a special usage, and it is to their judicious employment that I wish to call the readers attention.

Obliged by his profession to be continually dipping his hands into liquids whose chemical properties are such as inevitably to produce spots and stains on the skin, the photographer on going out from his operating room bears with him everywhere in spite of himself, the indellible marks of his occupation. In a saloon of a hundred persons of divers professions you may instantly recognise him. His fingers will be black, and even his entire hands will frequently be spotted and tattooed with divers colors.

At the same time nothing is easier than for him to avoid these distinctive marks which make him known to every body. Now these spots are owing to chemical compounds, the origin, nature, and properties of which, are defined by science. And whereas, science tells how they are produced, she will also tell us how they may be destroyed.

But perhaps some one will be ready to say "All persons are not chemists, nor dyers either," the appropriate answer to which would be, that that being the case, it will be rendering a service to the victims, to come at once to their aid, by offering them the requisite instruction, and it is that which I will now attempt to do, according to my best, in the most brief and simple manner possible.

And, first, I reject all employment of finger covers, india-rubber gloves, &c. They only prevent the mischief in part, and, besides, they have the greater inconvenience of obstructing the free use of the fingers, rendering the most skillful hands clumsy and awkward.

I class the spots or stains by color in the following order of succession, blues, yellows, and blacks, under the last, of which I range the violets, and the browns, which are chemically derived from it.

Blue stains come from a salt of iron with cyanide of potassium coming in contact with the skin. In this way, true Prussian blue has been made unintentionally. Now, Prussian blue is soluble, in the caustic alkalies. Therefore, these stains can be made to disappear, by rubbing the part stained with a weak solution of potash, or of caustic soda; ammonia will also remove it.

Yellow stains are owing to a sub-salt, or oxide of iron. When they are recent, they disappear more easily than when they have already been standing for some time. In the first case, oxalic acid, or even the salt of *oseille* will suffice to remove it; in the second case *hydro chloric acid* diluted to some two or three times its volume with water; will always be effectual.

Black stains may be of two natures. If they are owing to the contact of a salt of iron with gallic acid—which constitutes ordinary ink—they may be made to disap-

pear with hydrochloric acid, prepared as above stated. If they are owing to the action of the salts of silver upon gallic acid, then by moistening them with hydrochloric acid, they may be brought under the head of ordinary stains from the salts of silver, of which we now proceed to speak.

All the silver will color the skin black. In time this color passes to violet, then to brown, then to a sort of fawn color, and, finally it disappears altogether. To destroy this stain in alcohol the employment of a solution of iodine has been recommended. Although this application is often efficacious, it yet has the defect of giving to the skin a yellowish fawn color, so much the more disagreeable, as it obstinately remains during several days. The infallible remedy is the cyanide of potassium. Spread over the spot in powder, then moistened with water and rubbed well upon it, it will always cause the spot to disappear. The cyanide of potassium being a violent poison, it will be well, in order to neutralize the mischevious effects which might result from its becoming insinuated under the nails or into any little cut or scratch, to wash immediately after with a little *eau de chlore*, or a little *eau de Javelle*. These two substances, by decomposing the cyanhidric acid annihilates the poisonous action of the cyanide employed.

Finally, though your hands be completely surcharged with these photographic stains, and as various in tones and colors as the painter's palette, they can, nevertheless, always be rendered white and clean by following the method I have now pointed out, and which may be summed up as follows:

1st. A wash of hydrochloric acid destroys the yellow color which was produced by the salts of iron; and it also brings all the salts of silver into the state of chlorides.

2d. A soda wash or the wash of any other caustic alkali, will remove the blue color which comes from the above described Prussian blue formation, and it will also neutralize the little acid which may be remaining on and after the preceding washing.

3d. A wash of cyanide of potassium, removes all stains and tints which may be owing to the salts of silver.

4th. Finally, by way of sanitory precaution, a wash of *eau chlore* or of *eau de Javelle* to be used after the cyanide of potassium.

The hands are then white and clean, and it only remains to soften them by emollient soaps and the ordinary means. It ought to be obvious to all that they should not abuse these washes, and that it is much better to apply only to the parts stained than on the entire hand by which you would avoid weakening and wearing the skin needlessly.

Such then are the mysteries of the photographer's *cabinet de toilette*; and was I not right in saying at the commencement that they were not of a nature either to provoke a smile, or wound the susceptibilities of our readers.

L. K.

Impurity of Commercial Cyanide of Potassium.—This salt, now so important as a means of conducting the operation of electro deposition of metals, and in photography has recently been made the subject of investigation by two French Chemists, MM. Fordos and Gelis, from which it would appear that nearly fifty per cent. of the so called cyanide of potassium of commerce is extraneous matter. Referring to this discovery, the French chemists very justly remark that some easy means of discovering this contamination in a substance the use of which increases every day must be desirable. Such a plan they have discovered, it being founded on a consideration of the fact that every equivalent of true cyanuret of potassium, or 66 parts by weight, absorbs two equivalents or 252 parts by weight of iodine. From which it follows that in proportion as the commercial cyanuret absorbs less than this quantity, so is it contaminated. The decomposition here mentioned is perfectly well known to chemists and was first described we believe by Wohlce and Serullas. It consists in the formation of iodiuret of potassium, and ioduret of cyanogen.

THE TALBOTYPE AS NOW PRACTISED, AND ITS MODIFICATIONS.

IN the historical section the description of the *calotype*, as published by Mr Fox Talbot, is given. While these sheets have been passing through the press, Mr. Henry Fox Talbot has announced his intention of making the country a free gift of all his patents, reserving only the right of taking portraits for sale. Since the name of Daguerre has been given to the process invented by him, it appears but just that the name of Talbot should be employed to designate the process which he introduced, all which is now so universally employed. This claim of Mr. Talbot's no one can dispute. He first communicated it to the public on the 5th and 19th of February, 1841, in the Literary Gazette; and on the 10th of June, in the same year, Mr. Talbot communicated his process to the Royal Society. It has, however, been so materially improved, and admits of so many variations, that the present mode of working demands our separate consideration.

MR. CUNDELL'S PROCESS.

The first important published improvement on the calotype was due to Mr. Cundell, whose process was published in the Philosophical Magazine for May 1844, from which we extract the following:—

1. To produce a calotype picture, there are five distinct processes all of which, except the third, must be performed by candle-light: they are all very simple, but, at the same time, they all require care and caution. The first and not the least important is—

2. *The Iodizing of the Paper.*—Much depends upon the paper selected for the purpose; it must be of a compact and uniform texture smooth and transparent, and of not less than medium thickness. The best I have met with is a fine satin post paper, made by "R. Turner, Chafford Mill." Having selected a half-sheet without flaw or water-mark, and free from even the minutest black specks, the object is to spread over its surface a perfectly uniform coating of the iodide of silver, by the mutual decomposition of two salts, nitrate of silver and iodide of potassium. There is a considerable latitude in the degree of dilution in which these salts may be used, and also in the manner and order of their application; but as the thickness and regularity of the coating depend upon the solution of nitrate of silver, and upon the manner in which it is applied, I think it ought by all means to be applied first, before the surface of the paper is disturbed. I use a solution of the strength of seventeen grains to the ounce of distilled water.

3. The paper may be pinned by its two upper corners to a clean dry board a little larger than itself; and, holding this nearly upright in the left hand, and commencing at the top, apply a wash of the nitrate of silver *thoroughly*, *evenly*, and *smoothly*, with a large soft brush, taking care that every part of the surface be thoroughly wetted, and that nothing remain unobsorbed in the nature of free and running solution. Let the paper now hang loose from the board into the air to dry, and by using several boards time will be saved.

4. The nitrate of silver spread upon paper is now to be saturated with iodine, by bringing it in contact with a solution of the iodide of potassium: the iodine goes to the silver, and the nitric acid to the potash.

5. Take a solution of the iodide of potassium of the strength of 400 grains to a pint of water, to which it is an improvement, analagous to that of M. Claudet in the daguerreotype, to add 100 grains of common salt. He found that the chlorinated iodide of silver is infinitely more sensitive than the simple iodide; and by this addition of common salt, a similar, though a less remarkable, modification is obtained of the sensitive compound. Pour the solution into a shallow flat-bottomed dish, sufficiently large to admit the paper, and let the bottom of the vessel be covered to the depth of an eighth of an inch. The prepared side of the paper, having been previously marked, is to be brought in con-

tact with the surface of the solution, and, as it is desirable to keep the other side clean and dry, it will be found convenient, before putting it in the iodine, to fold upwards a narrow margin along the opposite edges. Holding by the upturned margin, the paper is to be gently drawn along the surface of the liquid until its lower face be thoroughly wetted on every part; it will become plastic, and in that state may be suffered to repose for a few moments in contact with the liquid: it ought not, however, to be exposed in the iodine dish for more than a minute altogether, as the new compound, just formed upon the paper, upon further exposure, would gradually be redissolved. The paper is therefore to be removed, and, after dripping, it may be placed upon any clean surface with the wet side uppermost until about half dry, by which time the iodine solution will have thoroughly penetrated the paper, and have found out and saturated every particle of the silver, which it is quite indispensable it should do, as the smallest portion of undecomposed nitrate of silver would become a black stain in a subsequent part of the process.

6. The paper is now covered with a coating of the iodide of silver; but it is also covered, and indeed saturated, with saltpetre and the iodide of potassium, both of which it is indispensable should be completely removed. To effect the removal of these salts, it is by no means sufficient to "dip the paper in water;" neither is it a good plan to wash the paper with any considerable motion, as the iodide of silver, having but little adhesion to it, is apt to be washed off. But the margin of the paper being still upturned, and the unprepared side of it kept dry, it will be found that by setting it afloat on a dish of clean water, and allowing it to remain for five or ten minutes, drawing it gently now and then along the surface to assist in removing the soluble salts, these will separate by their own gravity, and (the iodide of silver being insoluble in water) nothing will remain upon the paper but a beautifully perfect coating of the kind required.

7. The paper is now to be dried; but, while wet, do not on any account touch or disturb the prepared surface with blotting-paper, or with anything else. Let it merely be suspended in the air; and, in the absence of a better expedient, it may be pinned across a string by one of its corners. When dry, it may be smoothed by pressure. It is now "iodized" and ready for use, and in this state it will keep for any length of time if protected from the light. The second process is that of exciting or

8. *Preparing the Paper for the Camera.*—For this purpose are required the two solutions described by Mr. Talbot; namely, a saturated solution of crystalized gallic acid in cold distilled water, and a solution of the nitrate of silver of the strength of 50 grains to the ounce of distilled water, to which is added one-sixth part of its volume of glacial acetic acid. For many purposes these solutions are unnecessarily strong, and, unless skillfully handled, they are apt to stain or embrown the paper: where extreme sensitiveness, therefore, is not required, they may with advantage be diluted to half the strength, in which state they are more manageable and nearly as effective. The gallic acid solution will not keep for more than a few days, and only a small quantity, therefore, should be prepared at a time. When these solutions are about to be applied to the iodized paper, they are to be mixed together, in equal volumes, by means of a graduated drachm tube. This mixture is called "the gallo-nitrate of silver." As it speedily changes, and will not keep for more than a few minutes, it must be used without delay, and it ought not to be prepared until the operator is quite ready to apply it.

9. The application of this "gallo-nitrate" to the paper is a matter of some nicety. It will be found best to apply it in the following manner:—Pour out the solution upon a clean slab of plate-glass, diffusing it over the surface to a size corresponding to that of the paper. Holding the paper by a narrow upturned margin, the sensitive side is to be applied to the liquid upon the slab, and brought in contact with it by passing the fingers gently over the back of the paper, which must not be touched with the solution.

10. As soon as the paper is *wetted* with the gallo-nitrate, it ought instantly to be removed into a dish of water; five or ten seconds at the most is as long as it is safe at this stage to leave the paper to be acted upon by the gallo-nitrate; in that space

of time it absorbs sufficient to render it exquisitively sensitive. The excess of gallo-nitrate must immediately be washed off by drawing the paper gently several times under the surface of water, which must be perfectly clean; and being thus washed, it is finished by drawing it through fresh water, two or three times, once more. It is now to be dried in the dark, in the manner described in § 7; and, when surface-dry, it may either be placed, while still damp, in the camera, or in a portfolio, among blotting-paper, for use. If properly prepared, it will keep perfectly well for four-and twenty hours at least, preserving all its whiteness and sensibility.

11. The light of a single candle will not injure the paper at a moderate distance; but the less the paper, or the exciting solution, is unnecessarily exposed, even to a feeble candle-light, the better. Common river or spring water answers perfectly to *wash* the paper, distilled water being required for the silver solutions only.

The third process is that of

12. *The Exposure in the Camera*, for which, as the operator must be guided by his own judgment, few directions can be given, and few are required. He must choose or design his own subject; he must determine upon the aperture to be used, and judge of the time required, which will vary from a few seconds to three or four minutes. The subject ought, if possible, to have a strong and decided effect; but extreme lights, or light-colored bodies, in masses, are by all means to be avoided. When the paper is taken from the camera, very little, or more commonly no trace whatever, of a picture is visible until it has been subjected to the fourth process, which is

13. *The Bringing-out of the Picture*, which is effected by again applying the "gallo-nitrate" in the manner directed in § 9. As soon as the paper is wetted all over, unless the picture appear immediately, it is to be exposed to the radiant heat from an iron, or any similar body, held within an inch or two by an assistant. It ought to be held vertically, as well as the paper; and the latter ought to be moved, so as to prevent any one part of it becoming dry before the rest.

As soon as the picture is sufficiently brought out, wash it immediately in clean water to remove the gallo-nitrate, as directed in § 10; it may then be placed in a dish by itself, *under* water, until you are ready to fix it. The most perfect pictures are those which "come out" before any part of the paper becomes dry, which they will do if sufficiently impressed in the camera. If the paper be allowed to dry before washing off the gallo-nitrate, the lights sink and become opaque; and if exposed in the dry state to heat, the paper will embrown; the drying, therefore, ought to be *retarded*, by wetting the back of the paper, or the picture may be brought out by the vapor from hot water, or, what is better, a horizontal jet of steam. The fifth and last process is

14. *The Fixing of the Picture*, which is accomplished by removing the sensitive matter from the paper. The picture, or as many of them as there may be, is to be soaked in warm water, but not warmer than may be borne by the finger; this water is to be changed once or twice, and the pictures are then to be well drained, and either dried altogether, or pressed in clean and dry blotting-paper, to prepare them to imbibe a solution of the hyposulphite of soda, which may be made by dissolving an ounce of that salt in a quart (forty ounces) of water. Having poured a little of the solution into a flat dish, the pictures are to be introduced into it one by one; daylight will not now injure them; let them soak for two or three minutes, or even longer if strongly printed, turning and moving them occasionally. The remaining unreduced salts of silver are thus thoroughly dissolved, and may now, with the hyposulphite, be entirely removed by soaking in water and *pressing* in clean white blotting-paper alternately: but if time can be allowed, soaking in water alone will have the effect in twelve or twenty-four hours, according to the thickness of the paper. It is essential to the success of the fixing processes that the paper be in the first place thoroughly penetrated by the hyposulphite, and the sensitive matter dissolved; and next, that the hyposulphite compounds be effectually removed. Unless these salts are completely removed, they induce a destructive change upon the picture; they become opaque in the tissue of the paper, and entirely unfit it for the next, which is

15. *The Printing Process.*—The picture being thus fixed, it has merely to be dried and smoothed, when it will undergo no further change. It is, however, a *negative* picture, and if it has cost some trouble to produce it, that trouble ought not to be grudged, considering that you are now possessed of a matrix which is capable of yielding a vast number of beautiful impressions. I have had as many as fifty printed from one, and I have no doubt that as many more might be obtained from it.

16. The manner of obtaining these impressions has been so often described, and there are so many different modes of proceeding, that it may be sufficient to notice very briefly the best process with which I am acquainted. Photography is indebted for it to Dr. Alfred Taylor. His solution is made by dissolving one part of nitrate of silver in twelve of distilled water, and gradually adding strong liquid ammonia until the precipitate at first produced is at length *just* redissolved.

17. Some paper is to be met with, containing traces of bleaching chlorides, which does not require any previous preparation; but in general it will be found necessary to prepare the paper by slightly impregnating it with a minute quantity of common salt. This may be done by dipping it in a solution in which the salt can barely be tasted, or of the strength of from thirty to forty grains to a pint of water. The paper, after being pressed in clean blotting-paper, has merely to be dried and smoothed, when it will be fit for use.

18. The ammonia-nitrate of silver is applied to the paper in the manner described in § 3; and, when perfectly dry, the negative picture to be copied is to be applied to it, with its face in contact with the sensitive side. The back of the negative picture being uppermost, they are to be pressed into close contact by means of a plate of glass; and, thus secured, they are to be exposed to the light of the sun and sky. The exposed parts of the sensitive paper will speedily change to lilac, slate-blue, deepening towards black; and the light, gradually penetrating through the semi-transparent negative picture, will imprint upon the sensitive paper beneath a *positive* impression. The negative picture, or matrix, being slightly tacked to the sensitive paper by two mere particles of wafer, the progress of the operation may from time to time be observed, and stopped at the moment when the picture is finished.

18. It ought then, as soon as possible, to be soaked in warm water, and fixed in the manner described in § 14.

20. In these pictures there is a curious and beautiful variety in the tints of color they will occasionally assume, varying from a rich golden orange to purple and black. This effect depends in a great degree upon the paper itself; but it is modified considerably by the strength of the hyposulphite, the length of the time exposed to it, by the capacity of the paper to imbibe it, and partly, perhaps by the nature of the light. Warm sepia-colored pictures may generally be obtained by drying the paper, by pressure, and making it imbibe the hyposulphite supplied in liberal quantity.

The paper of "I. Whatman, Turkey Mill," seems to give pictures of the finest color, and, upon the whole, to answer best for the purpose.

If the chemical agents employed be pure, the operator, who keeps in view the *intention* of each separate process, and either adopting the manipulation recommended, or improving upon it from his own resources, may rely with confidence upon a satisfactory result.

This calotype paper is so exceedingly sensitive to the influence of light, that very beautiful photogenic copies of lace, feathers, leaves, and such like articles, may be made by the light of a common coal-gas flame, or an Argand lamp. The mode of proceeding is precisely that described for obtaining the ordinary photogenic drawings by daylight, only substituting the calotype paper, which should be damp, for the common photogenic.

When exposing the prepared paper to the light, it should be held about four or five inches from the flame, and the time required will be about three minutes.

MODIFIED PROCESSES.

But little remains to be added to this very clear and satisfactory description of the Talbotype process,—to which, indeed, is mainly due the perfection to which it has arrived both at home and abroad.

There are, however, a few modifications which must be noticed, as tending to simplify the details in some cases, and to im-

prove the general effects in others. In the main, however, it will be found that Mr. Cundell's process of manipulation is almost as good as any that can be adopted: and that gentleman certainly merits the thanks of the patentee, and of all photographic artists.

Many modifications of Mr. Talbot's mode of manipulating have been introduced with very variable advantages. I have, however, found that nearly every variety of paper requires some peculiar method to excite it to its maximum degree of sensibility. A few of the published methods may be noticed, as under different circumstances they may prove useful.

Mr. Robert Bingham, who has operated with such success, adopts the following process.—

Apply to the paper a solution of nitrate of silver, containing 100 grains of that salt to 1 ounce of distilled water. When nearly, but not quite dry, dip it into a solution of iodide of potassium of the strength of 25 grains of the salt to 1 ounce of distilled water, drain it, wash it, and then allow it to dry. Now brush it over with aceto-nitrate of silver made by dissolving 50 grains of nitrate of silver in one ounce of distilled water, to which is added one-sixth its volume of strong acetic acid. Dry it with bibulous paper, and it is now ready for receiving the image. When the impression has been received, it must be washed with a saturated solution of gallic acid, and exposed to a steam heat, a jet of steam from the spout of a tea-kettle, or any convenient vessel. The image will be gradually brought out, and may be fixed with hyposulphite of soda. It will be observed that in this process the solutions of nitrate of silver and of gallic acid are not mixed before application to the paper, as in Mr. Talbot's process.

Mr. Channing, of Boston, very much simplified the calotype process. He directs that the paper should be first washed over with 60 grains of crystalized nitrate of silver, dissolved in 1 ounce of distilled water, and when dry, with a solution of ten grains of the iodide of potassium in one ounce of water: it is then to be washed with water, and dried between folds of blotting-paper: the sensibility of the paper is said, and correctly, to be much improved by combining a little chloride of sodium with the iodide of potassium: 5 grains of the latter salt, and rather less than this of the former, in an ounce of water, may be employed advantageously.

To use this paper of Mr. Channing's, where time is an object, it is necessary to wash it, immediately before it is placed in the camera-obscura, with a weak solution of nitrate of silver, to which a drop or two only of gallic acid has been added. The picture is subsequently developed by the gallo-nitrate of silver, as already described.

Blanquart Everard, Sagnez, and some others, have recommended that in the preparation of the highly sensitive photographic papers no brushes should be employed. They pursue the following plan: the solutions are poured upon a perfectly flat piece of glass, and the paper carefully drawn over it, and, if necessary, pressed closer by another plate of glass.

A plan of iodizing paper has been proposed by Mr. Jordan, which offers many advantages. Iodide of silver is precipated from the solution of the nitrate by iodide of potassium, and this precipitate being lightly washed, is redissolved in a strong solution of the latter salt. This solution is applied to the paper, and the paper allowed to dry; after this it is placed face downwards upon some clean water; the iodide of potassium is removed by this, and a pure iodide of silver left on the paper.

If the paper carefully and properly iodized is washed with a very dilute solution of the aceto-nitrate of silver, that is to say, with a solution composed of 10 grains of nitrate of silver to 1 fluid ounce of distilled water, and 10 drops of a concentrated solution of gallic acid be added to another ounce of distilled water, and the two mixed, it will last for three weeks or a month. It may be used dry in the camera, and afterwards developed with the gallo-nitrate in the usual manner. It will, however, require an exposure in the camera of from ten to twenty minutes, and is, therefore, only useful for still objects; but for buildings, landscapes, foliage, and the like, nothing can be more beautiful.

Le Gray recommends as a highly sensitive paper for portraits the following.—

Distilled water	6200	grains.
Iodide of potassium	300	"
Cyanide of potassium	30	"
Fluoride of potassium	1	"

Papers are washed with this, and then with his strong solution of aceto-nitrate of silver, which is described in the section devoted to the wax paper process.

M. MARTIN'S PROCESS.

M. A. Martin, who is aided by the Imperial Academy of Sciences of Vienna in his endeavors to improve the photographic processes, and render them available to the purposes of art, has published the following as the best proportions in which the solutions should be made, and the order of their application.

For the negative picture—

First.	Iodide of potassium	½ oz.
	Distilled water,	10 fluid oz.
	Concentrated solution of cyanide of potassium,	7 drops.
Second.	Nitrate of silver,	7 drachms.
	Distilled water,	10 fluid oz.
	Strong acetic acid,	2 drachms.
Third.	A concentrated solution of gallic acid	
Fourth.	Good spirits of wine.	
Fifth.	Hyposulphite of soda,	1 oz.
	Distilled water,	10 fluid oz.

For the positive pictures—

First.	Chloride of sodium,	168 grains.
	Distilled water,	10 oz.
Second.	Nitrate of silver,	1 oz.
	Distilled water,	10 oz.
Third.	Hyposulphite of soda,	1 oz.
	Distilled water,	40 oz.

Nitrate of silver 30 grains, dissolved in ½ oz. of distilled water, to be poured into the solution, in a small stream, while it is constantly stirred with a glass rod.

Martin particularly recommends the application of the iodine salt first to the paper, drying this, then applying the argentine solution, and drying rapidly. I have urged the necessity of this on several occasions: the advantages are, that the iodide of silver is left on the very surface of the paper ready for the influence of the slightest chemical radiation.

The use of organic matter in facilitating the change of the silver salts very early engaged the attention of Sir John Herschel; and from time to time, following his suggestions, others have employed various organic matters, albumen and gelatine being the favorite substances. These have been principally used for the purpose of spreading photographic preparations on glass—which we shall have particularly to describe: at the same time they are stated to have been employed with much advantage on paper by some photographists. For the negative pictures, Gustave Le Gray gives us the following directions and particular information:—

First Operation.—Dissolve three hundred grains of isinglass in one pint and three quarters of distilled water (for this purpose use a water bath).

Take one half of this preparation while warm, and add to it as under:—

Iodide of Potassium.....	200 grains.
Bromide of ditto.....	60 "
Chloride of sodium.....	34 "

Let these salts be well dissolved, then filter the solution through a piece of linen, put it, still warm, in a large dish, and plunge in your paper completely, leaf by leaf, one on the other, taking care to prevent the air-bubbles from adhering to the paper.

Put about twenty leaves at a time into the dish, then turn the whole, those at the top to the bottom, then take them out one by one, and hang them by one corner with a pin bent like the letter S, to dry spontaneously.

When hung up, attach to the opposite corner a piece of bibulous paper, which will facilitate the drying.

When the paper is dry cut it to the size required, and preserve it in a folio for use; this paper may be made in the day-time, as it is not sensitive to light in this state.

The bromide does not, in this case, act as an accelerator, as it does on the silver plates of the daguerreotype, because, instead of quickening, it retards the operation a little; its action is to preserve from the gallic acid the white of the paper, which would blacken more rapidly if you employed the iodide of potassium alone.

Second Operation.—Prepare, by the light of a taper, the following solution in a stoppered bottle: distilled water, 6 fluid

ounces, crystalized nitrate of silver, 250 grains.

When the nitrate is dissolved, add 1 ounce of crystalizable acetic acid: be careful to exclude this bottle from the light, by covering it with black paper. This solution will keep good until the whole is used.

When you wish to operate, pour the solution upon a porcelain or glass slab, surrounded with a glass or paper border to keep the liquid from running off. I usually take the solution out of the bottle by means of a pipette, so as to prevent the distribution of any pellicle of dust or other impurity over the glass slab.

Take a sheet of the iodized paper by two of the corners, holding them perpendicularly, and gently lower the middle of the paper upon the centre of the slab; gradually depress until the sheet is equally spread; repeat this operation several times until the air-bubbles disappear; take also the precaution to keep the upper side of the paper dry.

In order to prevent the fingers from spotting the paper, pass a bone paper knife under the corner of the sheet, to lift it from the slab between that and the thumb.

Let the sheet remain upon the slab until the formation of the chloro-bromo-iodide of silver is perfect.

This may be known by the diappearance of the violet color which the back of the paper at first presented; it must not be left longer, otherwise it would lose its sensitiveness.

The time required to effect this chemical change is from one to five minutes, depending upon the quality of the paper.

Spread upon a glass, fitted to the frame of the camera, a piece of white paper well soaked in water; upon this place the prepared sheet, the sensitive side upwards.

The paper which you place underneath must be free from spots of iron and other impurities.

It is also necessary to mark the side of the glass which ought to be at the bottom of the camera, and to keep it always inclined in that direction when the papers are applied; if this precaution is neglected, the liquid collected at the bottom, in falling over the prepared paper, would not fail to produce spots. The paper thus applied to the glass will remain there for an hour without falling off, and can be placed within that time in the camera.

When I am going to take a proof at a distance, I moisten the sheet of lining paper with a thick solution of gum arabic, and can thus preserve for a longer time its humidity and adhesion. I can also in this case make use of two glasses between which the paper is placed, according to the direction of M. Blanquart Everard; but it is necessary to take great care that the plates of glass are perfectly clean, and to have them re-polished if scratched.

I employ for this purpose, blotting-paper to clean them, as well as my plates; it is much superior to linen and absorbs liquids and impurities that adhere to it. I never spare the blotting paper, for I would rather use a leaf too much than be uncertain about the cleanness of my glass.

When the sheet of lining paper adheres well to the glass, it should not be removed, but only moistened afresh with water, after which you may apply another sheet of the sensitive paper.

In preparing several sheets of the sensitive paper at a time, it is not necessary to wash the slab for each sheet; you need only draw over it a piece of white paper to remove any dust or pellicle formed.

When your operations are finished, you may pour back the aceto-nitrate of silver into a bottle, and reserve it for another time.

The necessity of employing M. Gray's papers in a wet state is their most objectionable quality, but certainly the results obtained by strict attention to his directions are often exceedingly beautiful. For developing the image the following is recommended, which does not, however, differ essentially from the developing processes already described.

Make about a pint bottle of saturated solution of gallic acid, having acid in excess, and using distilled water; decant a portion into a smaller bottle for general use, and fill up the other bottle; you will thus always have a clear saturated solution.

Pour upon a slab of glass, kept horizontal, a little of this liquid, spreading it equally with a slip of paper, then apply the paper which has been exposed in the same manner as described for the negative paper, being careful to keep the back dry. Watch its development, which is easily observed

through the back of the paper; you may leave it thus as long as the back of the image does not begin to spot.

When it is rendered very vigorous, remove it quickly to another clean slab, and well wash it in several waters, occasionally turning it, and gently passing the finger over the back; by this means you remove any crystals of gallic acid which might spot the picture.

The appearance of the image at the end of this process will enable you to judge if it was exposed in the camera the proper time.

If it becomes a blueish grey all over, the paper has been exposed too long; if the strongest lights in the object, which should be very black in the negative, are not deeper than the half tints, it has still been too long exposed; if, on the contrary, it has been exposed too short a time, the lights are but slightly marked in black.

If the time has been just right, you will obtain a proof which will exhibit well-defined contrasts of black and white, and the light parts very transparent. The operation is sometimes accelerated by heating the gallic acid, and by this process the dark parts of the picture are rendered very black.

To fix these negative proofs, a very strong solution of hyposulphite of soda, about 1 ounce of the hyposulphite of soda to 8 fluid ounces of water, is employed, and the picture is allowed to remain in it until every trace of yellowness is removed from the paper.

CALOTYPE PROCESS ON WAXED PAPER.

The most successful operator with waxed paper has been M. Le Gray, to whom we are indebted for this and several other improvements. In a work lately published by this photographer, he has entered into the question of the phy-ical agencies which are active in producing the chemical changes on the various preparations employed. Throughout the essay, he evidently labors under an entire misconception of the whole of the phenomena, to which, indeed, it is clear he cannot have directed his attention. His manipulatory details are very perfect, but his scientific explanations are not to be received as correct expressions of the facts.

First Process: to wax the Paper.—This process divides itself into several parts, waxing the paper being the first. For this purpose he takes the paper prepared by Lacroix d'Angouleme, or, that of Canson Brothers of Annonay. A large plate of silvered copper, such as is employed for the daguerreotype, is obtained and placed upon a tripod, with a lamp underneath it, or, upon a balneum mariæ. The sheet of paper is spread upon the silver plate, and a piece of pure white wax is passed to and fro upon it until being melted by the heat, it is seen that the paper has uniformly absorbed the melted wax. When this has thoroughly taken place, the paper is to be placed between some folds of blotting paper and an iron moderately hot, being passed over it, the bibulous paper removes any excess of wax, and we obtain a paper of perfect transparency.

Second Process: To prepare the negative Paper.—In a vessel of porcelain or earthenware capable of holding 5 pints and a quarter of distilled water, put about 4000 grains of rice, and allow them to steep until the grains are but slightly broken, so that the water contains only the glutinous portion. In a little less than a quart of the rice solution thus obtained dissolve:

Sugar of Milk,.....	620 grains.
Iodide of Potassium,.....	225 "
Cyanide of Potassium,.....	12 "
Fluoride of Potassium,.....	7 "

The liquid, when filtered, will keep for a long time without alteration.

When you would prepare the paper, some of this solution is put into a large dish, and the waxed paper, sheet by sheet, is plunged into it, one over the other, removing any air-bubbles which may form. Fifteen or twenty sheets being placed in the bath they are allowed to soak for half an hour, or an hour, according to the thickness of the paper. Turning over the whole mass, commence by removing the first sheet immersed, and hooking it up by one corner with a pin bent in the shape of the letter S, fix it on a line to dry, and remove the drop from the lower angle by a little bundle of blotting-paper. M. Le Gray then remarks that French and English paper should never be mixed in the same bath, but prepared separately, as the "English paper contains a free acid which immediately precipitates an iodide of starch

in the French papers and gives to them a violet tint. The paper being dry is to be preserved for use in a portfolio; even in this state it is not absolutely insensible.

Third Process: to render the waxed paper sensitive.—Make a solution of

Distilled water,.....2325 grains.
Crystalized nitrate of silver, 77½ "
and when this is dissolved add of
Crystalized acetic acid,..186 grains.

Papers prepared with this solution will keep well for a few days. M. Le Gray, however, recommends for his waxed paper and for portraits, that the quantity of nitrate of silver be increased to 155 grains: the paper must be used moist.

The method of preparing these papers is to float upon an horizontal plate of glass either of the above solutions, and taking a piece of the iodized paper to carefully place it upon the fluid, taking great care that no air-bubbles interpose. The paper must remain a short time in contact with this sensitive fluid until chemical combination is effected. Four or five minutes are required for some papers, and eight or ten seconds are sufficient for other kinds. When a violet tint appears this should be removed.

For those papers which it is desirable to keep for some time, as during a journey, it is recommended that into one vessel of porcelain you put about five or six millitres of the strong aceto-nitrate above described, and into another some distilled water: you plunge completely both sides of the waxed and iodized paper in the first fluid, and allow it to remain about four or five minutes; withdraw it, and plunge it immediately into the bath of distilled water in which let it soak for not less than four minutes. When these papers are carefully dried they may be preserved for some time for use, and by lessening the dose of nitrate of silver this period may be considerably prolonged. It will of course be understood by all who have followed the processes described up to this point, that the papers which are prepared for keeping are not those which are the most sensitive; hence it is necessary to expose such a much longer time in the camera than those prepared by the stronger solution of silver. The more sensitive variety, under ordinary circumstances of light, will require an exposure in the camera of about twenty seconds, the less sensitive demanding about 10 or 15 minutes, according to the circumstances of light.

Fourth Process: the development of the Image.—The picture is developed by the aid of gallic acid dissolved in distilled water. Le Gray finds the following to be the best proportions:—

Distilled water,.....40 fluid ozs.
Gallic acid,.....60 grains.

The paper to be plunged into this solution, and allowed to remain until it is fully developed. The time will vary from ten minutes to two hours or more, according to the intensity of the rays incident on the paper when in the camera. The development of the image is much accelerated by the addition of 15 or 20 drops of the aceto nitrate of silver.

Fifth Process: Fixing.—It is found convenient often, when on a journey, to give a temporary fixedness to the pictures obtained, and to complete the process with the hyposulphite at any time on your return home. A wash of 360 grains of bromide of potassium to two quarts of water is the strength which should be employed. The process of fixing with hyposulphite consists, as in other preparations, simply in soaking the paper until the yellow tint of the iodide has disappeared: the details are particularly given at page 216, in the chapter on fixing photographs.

M. FLACHERON'S PROCESS.

The productions of M. Flacheron, which were seen in the Great Exhibition, excited much interest, and the process by which these were obtained in the Eternal City was eagerly sought for by photographic amateurs. In the Art Journal for May, Mr. Thomas has communicated the process by which the photographers of Rome produce their best effects; and as this is very important, as being useful in hot climates, a sufficient portion of that communication is transfered to these pages.

"1st. Select old and thin English paper—I prefer Watman's: cut it in such a manner that the sheet shall be the sixteenth of an inch smaller than the glass of the paper-holder on every side, and leave two ends at diagonal corners to the sheet by which to handle it.

"2ndly. Prepare the following solution:

"Saturated solution of iodide of potassium 2 1-2 fluid drachms: pure iodine 9 grains: dissolve.

"Then add, distilled water 11 1-2 ounces, iodide of potassium 4 drachms, bromide of potassium 10 grains, and mix. Now filter this solution into a shallow porcelain vessel somewhat larger than the sheet of paper to be prepared. Take a piece by the two diagonal ends, and gently place the end of the marked side nearest to you, upon the surface of the bath; then carefully incline the surface of the sheet to the liquid, and allow it to rest two minutes, if French paper, one minute, or until the back of the paper not wetted becomes tinted uniformly by the action of the dark-colored solution. Raise it up by means of the two ends occasionally in order to chase away any air-bubbles, which would be indicated by white spots on the back, showing that the solution in these parts has not been absorbed. Hold the paper by one of the ends for a minute or so, in order that the superfluous moisture may run off, then hang up to dry, by pinning the one end to a string run across a room and let the excess drop off at the diagonal corner. When dry the paper is ready for use, and quite tinted with iodine on both sides. It will keep any length of time, and much improve by age.

"3rdly I will presume that four sheets are to be excited for the camera, and that the operator has two double paper-holders, made without a wooden partition, the interior capacity of which is sufficiently large to admit of three glasses, all moveable. The third as will be seen, is to prevent the two pieces of excited paper coming in contact with each other.

"Prepare the following solution:

"Take nitrate silver 2 1-2 drachms; acetic-acid 4 1-2 drachms; distilled water 3 1-2 ounces: mix and dissolve.

"Now take four of the glasses of the paper-holders perfectly clean, and place each upon a piece of common blotting-paper to absorb any little excess of liquid. Pour about 1 1-2 drachms, or rather more of the solution just prepared, into a small glass funnel, into which a filter of white bibulous paper has been placed and let the solution filter drop by drop upon glass No. 1, until about 1 1-2 drachms have been filtered in detached drops, regularly placed upon its surface; then with a slip of paper, cause the liquid to be diffused over the whole surface of the glass. Take a piece of prepared paper, and place it, marked side downwards, upon a glass just prepared, beginning at the end nearest you, and thus chasing out the air. Draw it up once or twice by its two diagonal corners; allow it to rest, and prepare glass No. 2 in a similar manner. Now look at glass No. 1, and it will be preceived that the violet tint of the paper has become mottled with patches of white, which gradually spread, and in a few seconds the paper resumes its original whiteness, which is an indication that it is ready for the camera. It will be found to adhere firmly to the glass. Do not remove it; but hold the glass up to allow the excess of fluid to run off at one corner. It must not be touched with blotting-paper, but replaced flat on the table. Serve Nos. 2, 3, and 4, in like manner. Take four pieces of common white paper, not too much sized; free from iron spots, and cut a trifle smaller than the prepared sheet; soak them in distilled water; draw out one piece, hold it up by the fingers to drain off the superfluous moisture, and place it gently upon the back of the prepared paper. With another piece of glass kept for the purpose, having the edge rounded, and large enough to act uniformly upon the paper, scrape off gently the excess of liquid beginning at the top of the sheet, and removing with the rounded edge of the scraper, the liquid to one of the corners. Repeat this operation twice. Both the excited and superimposed paper are thus fixed to the glass. Two glasses and papers being thus prepared, take the clean glass No. 5, and place it upon No. 1: press gently: the moist paper will cause it to adhere. Take up the two glasses thus affixed and place them upon glass No. 2, in such a manner that the supernumery glass No. 5 shall be in the centre. The whole will form a compact body, and having polished the surface and wiped the edge, may at once be put in the paper-holders * * *

"4thly. With a Ross's, Chevalier's or Lerebours' single lens, three inches diameter, and half an inch diaphragm, the object

to be copied, well lighted by the sun, the paper will require from four to six minutes' exposure.

"5thly. Take out the three glasses, which will still firmly adhere, separate them gently, and remove the piece of moistened paper, which must not be used again. Now lift up the prepared paper by one corner to the extent of half the glass, and pour into the centre about one drachm of a saturated solution of gallic acid, which will immediately diffuse itself. Raise also the other corner to facilitate its extension; and serve the others in like manner. The image takes generally from ten to twenty minutes to develop. Hold up the glass to a candle to watch its intensity. When sufficiently developed remove the negative from the glass. Wash it in two or three waters for a few hours, dry with blotting-paper, and immerse each separately for ten minutes in a bath of hyposulphite solution: then wash and dry.

"The iodide may be removed by means of hyposulphite of soda in the usual way; twelve months afterwards, or when convenient. 'If,' says Mr. Thomas, 'the process has been carefully conducted, four beautiful negatives must be the result. I was ten days working incessantly at Pompeii, and scarcely ever knew what a failure was.'"

Mr. Muller's Process.

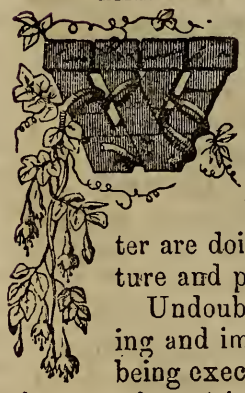
This gentleman has been practising photography with great success at Patna, in the East Indies. His process is as follows:

A solution of hydriodate of iron is made in the proportions of eight or ten grains of iodide of iron to one ounce of water; this solution is prepared in the ordinary way, with iodine, iron turnings, and water. The ordinary paper employed in photography is washed on one side with a solution of nitrate of lead (15 grains of the salt to 1 ounce of water); when dry, this paper is iodized either by immersing it completely in the solution of the hydriodate of iron, or by floating the leaded surface on the solution. It is removed after a minute or two and lightly dried with blotting-paper. The paper now contains iodide of lead and proto-nitrate of iron: while still moist it is rendered sensitive by a solution of nitrate of silver (100 grains to an ounce of water) and placed in the camera. After the ordinary exposure it may be removed to a dark room; if the image is not already developed, it will be found speedily to appear in great sharpness without any further application. It may then be fixed with the hyposulphite of soda in the usual manner.

R. Hunt.

FINE ART ITEMS.

AMERICAN ARTISTS IN ROME.



We take from a recent letter of Grace Greenwood's to *The National Era* the following account of what the American Artists who have been in Rome this winter are doing in the way of sculpture and painting:

Undoubtedly the most interesting and important work of art now being executed in Rome, (to Americans, at least;) is the Washington Monument, by Mr. Crawford, ordered, to her honor, by Virginia, and destined to be the chief ornament and pride of her handsome capitol. The entire hight of the monument is to be sixty feet. This includes the equestrian statue of Washington—sixteen feet in hight. Below this which is to stand on a square pedestal, sculptured with some admirable *bassi relievi*, are ranged the statues of six of Virginia's noblest sons—Marshall, Mason, Allen, Lee, Jefferson, and Patrick Henry. These figures are to be twelve feet in hight. On the lower range of steps surrounding the monument,

are to be placed six eagles, five feet in hight.

The only figures now finished, are the statues of Patrick Henry and Jefferson, and these are surely remarkable exhibitions of power—absolute triumphs of genius. Henry is represented in the lofty passion of his fervid and majestic eloquence—in the hight of that grand outburst of freedom and patriotism which electrified the land, and will yet thrill like a trumpet call through the hearts of his countrymen, while they prize their dear-bought liberties, or reverence the heroic past. You see not alone in this face, the fire and the force of the impassioned orator, but the sustaining strength of the hero, and the prescience of the prophet.

In striking contrast with this animated and powerful figure, is that of Jefferson. He stands in an attitnde of calm deep thought, girt about with all the native majesty of greatness—with all the dignity of the statesmen and patriot. He looks here what he was—the utterer of the profoundest political and moral truth ever proclaimed to the world. You recognize in him the moulding power and the controlling will of government, and you seem to read in his face, not alone the deep speculations of the philosopher and the large projects of the statesman, but the destinies of nations.

The drapery in both these noble figures is wonderfully well managed. The costume of the time of the Revolution, though far enough from the classic, was yet less stiff and meager than that of our day, and the artist has here relieved, or concealed much of the more ungraceful detail, by a skillful introduction of the cloak.

Separately and together, these statues strike me as among the finest productions of modern sculpture—as marked by most impressive dignity, by originality, force, and grandeur of sentiment. They are about being cast in bronze at Munich. Mr. Crawford is to make use of Houdon's bust of Washington as the most reliable likeness. The horse, though yet in a very rough state, promises to be a magnificent work. It is represented as just curbed up from a trot, not rearing—full of strength and fire, but not rebellious—a steed full worthy of his rider, and one which will inevitably suggest comparisons decidedly unfavorable to a certain weak-tailed charger, who holds his thin nose in the air from the top of Hyde Park gate.

The small studies for the remaining figures of this monument strike me as happy and truthful presentiments of character—are important parts of a noble whole and form a grand circle of supports and accessories to that peerless principal. Nothing ever so impressed me with the greatness of Washington as seeing such an arrangement.

The last finished work of Mr. Crawford is a *Flora*—an exceedingly graceful and beautiful figure. He is now putting into marble a charming group of the *Babes in the Wood.*

Mr. Story is engaged upon a labor of love, in modelling the statue of his father, the late Justice Story. He seems to me to be making a noble work of it. The head is exceedingly fine—the face wearing a mingled expression of benignity and strength, of calm thought and genial kindness, peculiarly beautiful. The figure is sitting—the attitude has the dignity of the judge, without rigidity or sternness—the judicial robe is managed most judiciously, and forms drapery as graceful as imposing.

Mr. Story has in his studio a little study for an ideal statue, the subject taken, I believe from Spenser—an Arcadian Shepherd Boy, piping—I am delighted with the youthful grace of this figure, and with the sentiment of the pure primæval music, if I may so express it, which speaks not alone in face, but in form and attitude even.

Mr. Richard Greenough is now modeling a striking and original group—a Shepherd Boy attacked while robbing an eagle's nest, and defending himself against the enraged eagle. The youth is crouched upon one knee and is just about to plunge his knife into the body of the bird, who has alighted on his shoulder. His attitude is full of spirit, and his face has a fine expression of strength and courage. I trust that Mr. Greenough's late sad loss, in compeling him to come to America, will not oblige him long to abandon a work which promises him so much.

Mr. Mozier has in progress several ideal works. The one farthest advanced is a figure of *Silence*, which, as yet, is chiefly

remarkable for the lightness and gracefulness of its drapery.

A very pleasing composition is a group called "Rejected Addresses,—a sitting figure of a little girl, holding her kitten, which a dog at her knee is striving in vain to conciliate. The attitude and look of the little girl are very pretty and arch, but the group is yet hardly in a state to be described in detail.

With some of the works of Mr. Ives I have been much pleased. If not an enthusiast, he seems a conscientious student in his art. If he does not produce works startlingly powerful and original, whatever he does he does well. He models with taste, feeling, and careful finish. His portrait busts seem to me remarkably good, and some of his ideal busts are remarkably fine. Of the latter, I like, especially, a head of Ariadne—full of beauty of a noble character.

Mr. Rodgers, a young sculptor of much talent and promise, has lately executed in marble, a figure of *Ruth*, which is very lovely; and one of a charming, and I think, entirely original subject—a little skater, making one of his first essays on the ice. This last, which is called "*The Truant*," delights me greatly, by a certain freshness of feeling there is about it, and by its grace, novelty and naturalness.

Mr. Bartholomew has two ideal pictures lately commenced, which cannot be judged of, except by their studies, which are very pleasing. This artist seems to excel in *basso releivo*. He has in his studio a beautiful monumental group, and a Homer, with his young guide, which is marked by force, grace, and delicate feeling.

Mr. Page is here, painting some admirable pictures, and talking grandly on art to his sitters and friends. He has some peculiar, but, I think, profoundly just ideas concerning portrait painting. He desires to know well his sitters, and requires to grasp somewhat more than the surface-life for his picture, which he makes a study of character, a revelation of soul as compared with other portraits; a reality instead of a like; a living presence, in place of a haunting, unsatisfying shadow. His pictures have about them that mysterious something of the sentient and the vital, which makes you half believe that the artist has wrested the creative secret from the jealous heart of Nature. You look to see the rich lights, a stir in the hair, the lips breaking into smiles, the breast softly heaved, the very blood beating along the veins.

Mr. Page has in his studio several copies from Titian, so marvellously true to that great master that it is difficult to believe them by any other hand than his. I am convinced that we have no painter possessed of so clear and profound a knowledge of his art as Mr. Page. He lives in it and through it; wanting the passionate energy of personal ambition, he does not pursue it ardently, but studies it with all the powers of a subtle intellect, and contemplates it with the calm devotion of a reverential spirit. By bringing so much thought and power to bear upon portrait painting, Mr. Page has done much to ennoble that branch of his art; but we yet look to see manifestations of his genius more original in character and universal in interest—something which shall be a full and worthy expression of himself—in which the artist will live as sole creator and first cause. One who can produce such ideal works as he has produced should not be absorbed for any length of time in mere portraiture—merging the imagination in the actual, the creative in the imitative.

Mr. Terry has in his studio several beautiful pictures, mostly on scriptural subjects all of which I am happy to hear, are to go to America. Mr. Terry's coloring is brilliant, but soft and rich; his composition is very effective, without being studiedly so, and his spirit is evidently pure and religious.

Into the sudio of Mr. Gibson, Miss Homer (the young American sculptor), has been admitted as a pupil, and receives from that artist, a most admirable master, all the advice she needs, all the encouragement a generous heart can bestow. She has already modeled the head of the *Venus of Milo*, a beautiful antique torso, and is now engaged on the *Cupid of Praxitcles*. It may gratify her many American friends to hear that great interest is felt in her, and warm admiration expressed for her genius, not alone by Mr. Gibson, but by many of the first artists in Rome. She is a marvel to them for her industry, her modest confidence, her quiet enthusiasm; for her fine feeling for and knowledge of

her art. They all say that the copies she has made—which by the way have been chosen as difficult studies—have been executed not alone with ease, and taste, and faithfulness, but in the truest and highest style of art. With the full confidence of Mr. Gibson, she is soon to model some of her own ideal compositions.—*N. Y. Tribune.*

DISCOVERY OF MARBLE STATUES IN WINDSOR FOREST.

It is often the province of a journalist to relate the discovery of statues and other valuable works that have lain hidden in the earth for centuries; and but for such incident they would in all probability never have been preserved, or descended to us. But whenever such treasures are exhumed, the mind naturally wanders away to the once favored cities of Greece and Italy, and reverts to that period when they fell before barbarism. Yet, strange as it may appear, and it is almost beyond belief, in Windsor Forest, miles away from any habitation, for many and many a long year have slept statues in marble of the rarest excellence; why, or at what period such works were, or could be cast aside, nothing is known; and how they come there is a question equally without a solution; yet so it is. The first knowledge that there were such treasures arose from one of the woodmen employed about the park stating his desire to have a figure that was lying, partly buried in the earth, in one of the covers, at the same time asking permission to place it on his garden walk. The request was granted, horses and chains went to work; it was dragged forth, and in a short space of time found a pedestal and a coat of whitewash at the woodman's home. As soon as it was placed, His Royal Highness Prince Albert, ever wakeful to the interests of Art, yet under the circumstances never dreaming it could be of any worth, proceeded to its new locality, when to his surprise he saw, as he pronounced it, a work of great beauty and value. With the taste and judgment of his Royal Highness, matters were not permitted to remain here, but going to the spot from whence the statue came, he saw sufficient to direct that further search be made. And no less than four other statues, a colossal group of three figures, and numerous fragments were revealed. It may be here stated that without a guide it is almost impossible to reach the parts of the forest where they have been so long. But our readers will remember the statue of His Majesty George III. at the end of the Long Walk; on arriving there, the thick wooded part has to be penetrated, bearing slightly to the left hand, and at the distance of about a mile, but there is no sign of path or track in any direction: two miles beyond this is the nearest house. To see them in such a place and at such a time, trees growing over and around them, with hazel wood springing up between, brought forcibly to the mind Stevens's discovery in central America; it was the same "picture in little." At this time Mr. Thornycroft was communicated with to report upon their restoration; that done, it was thought desirable to have them brought to London, and three of the statues and the largest group are now in his studio. With the exception of one, which is a Greek statue in Parian marble, they are all by the same artist—Pietro Francavelia, or, Latinised, Petrus Francavelius. Each work is inscribed with his name and dated. The subject of the great group, "Venus defending a Nymph from a Faun," is treated most masterly. It is the last dated of his works, and notwithstanding the consummate knowledge it displays in composition, drawing, and anatomy, yet there may be traced in it a slight leaning towards that affectation of grace, which so disfigures and distinguishes the works of his immediate followers, by whom the study of nature was abandoned. Her simple beauty was indeed too homely for men to contemplete who gave themselves up to what they misnamed *idealism*, but the realm of fancy has narrower limits than they in their ignorance supposed; and as a consequence, their conceptions were of a beauty which nature in her truth disowned, and in distempered dreams, forgetting her pure laws, they produced, as we too often see, the fantastic and artificial graces of the drawing-room, which so degraded Art. Francavelia rose superior to all this; he was worthy of his great master John de Bologna; and, as his statues of Moses and Aaron, at Florence, show, he feared not to attempt the solemn grandeur or the digni-

ty of Michael Angelo; and in one of the figures at Mr. Thornycroft's, the most mutilated, probably that of Samson forcing the hands bound behind with cords, the violent effort to free himself, gives great scope for muscular action and anatomical display, of which we have in this work an exceedingly fine example. One of the statues, judging from a quaint but not unusual device of a child blowing with flowers, indicated as mixing with the breath, the figure young in form, and partly in repose, is, it may be presumed, intended to represent Æolus. The most perfect is the Apollo, a statue full of youthful beauty; he is represented kneeling with one knee upon a rock, the left arm resting upon the lyre, the body leaning slightly forward; the head, surrounded by a wreath of bays, is turned towards the right shoulder, as if in the act of listening: the whole action of the figure is that of great ease and elegance. The sculptor's name seems to have taken various forms; thus we have Francavelius, Franchevilla, and Franca Villa; he was born at Cambray, about 1538, which place he left early in life to study in Italy, as already stated, and became the pupil of the celebrated John de Bologna. His productions are known and prized, both in France and Italy.

John Gibson, R. A., is one of the few English artists who have labored for a reputation rather European than domestic; his fame having deservedly penetrated every existing school: being indeed better known on the continent than by the bulk of the professed lovers of Art among ourselves. Having already published a biographical notice of this distinguished sculptor, we claim for ourselves in this instance the privilege of speaking exclusively of his works. Gibson has now for many years been a member of the Royal Academy, which infringed, we believe, one of its laws, in electing him while settled and practising his profession in a foreign country; he is also a member of the Academy of St. Luke. The fervor of his devotion to sculpture determined his residence at Rome, the *Alma Mater* of modern Art, and while he is an Englishman in the freshness of every home feeling, he is yet a legitimate son of ancient Hellas in all the rarest attributes of Greek sentiment. It is only from time to time that his works are exhibited in England, although the greater part of them are commissioned by Englishmen. His foreign patrons are few; the most distinguished of these are one of the Russian Grand-Dukes, for whom he executed a replica of his group of "Psyche born off by Zephyrus" and a statue of Cupid disguised as a shepherd—and Count Sherborn; a Bavarian nobleman, for whom he executed a statue of a Nymph. The Psyche was also repeated for the Prince Torlonia. We have said that Gibson does not frequently exhibit at the Academy: when however a work is seen there, the public is always startled by its classic severity; it has a chastening effect after a good deal of *rococo*. The statue of Huskisson was a work of this kind; it might be a companion to the Demosthenes of the Vatican, or a memento of some honorable Athenian who had deserved well of his country. A work recently exhibited excited some enquiry on account of the gilded border of its drapery. This kind of enrichment, however, is strictly consistent with the practice of the Greeks; it is supposed that the hair of even the Venus de Medici was gilded, as traces of gilding have been discovered, and the ears have been pierced for ear-rings These observations on the works of this distinguished artist are suggested by a selection of his Designs which have recently appeared in four numbers, engraved in imitation of the original drawings. Among the subjects in the first number are several designs, the original sketches of which are the property of her Majesty, as "A Girl and Child," "Phaeton driving the chariot of the Sun," which was also executed in marble for Earl Fitzwilliam, "Juno and Hypnos," executed in marble for her Majesty. The first mentioned is a drawing of exquisite simplicity; the principal figure is draped, holding up the infant in a manner producing a charming convolution of line. The group of horses in Phaeton is the most effective composition of its class we have ever seen. The fire of the subject is thrown into the horses, which are modelled throughout with the utmost care. The animals are most skillfully disposed, and their action sufficiently declares their headlong career. The subject has been many times treated in modern Art, but in this composition there are points which are

unexcelled in any recent effort. Other subjects are "Venus wounded by Diomedes while bearing off Æneas," "Cupid and Sappho," "Hero grieving over the body of Leander," "Suffer little Children to come unto Me," and a sketch of a nude figure remarkable for elegance of contour, and the natural grace of its movement. The second number contains a drawing of great originality, Æolus, Juno, and the Winds. The subject is from Virgil, the first book of the Æneid, those passages in which are described the interview between Juno and Æolus. The latter urged to send forth the winds to destroy the Trojan fleet—

"—venti, velut agmine facto,
Qua data porta ruunt et terras turbine perflant."

Juno and Æolus are on the right of the composition, while the left is occupied by the four winds rushing forth over the sea. The figure of Æolus describes power and command, and the expression of Juno is that of malicious excitement. The muscular forms of the Winds remind us of Michael Angelo. The subjects in Christian Art treated by this sculptor are few; there is however one here rendered from the passage, "And he shall give his angels charge over thee to keep thee in all thy ways." The figures are three, two angels instructing a child, who looks to them for an explanation of the text of the Scriptures which he holds before him. In "Achilles and Lycaon," a subject from the Iliad, the sketch of Achilles is a masterly performance, and "Eros and Anteros contending for the Soul," shows the greater power of Anteros, in a sketch remarkable for beautiful play of line. In "Venus protecting Helen from the rage of Æneas," we find a new feature in drapery and appointments. The artist makes a marked distinction here between the Trojan and the Greek costume, both of which are generally treated in one and the same manner; at least there is not the marked difference that we find here. Æneas wears a helmet shaped like a Phrygian cap, and surmounted by a bat-wing crest; a drapery depends from his shoulders, and from his waist falls a tunic skirt, below which the legs appear draped in the *braccæ* of the barbarous nations, as we see them on the column of Trojan, as they were worn by the Scythians and Gauls. If we are to undestand that an entire tunic is intended, the costume differs little from what is still worn by the Scythians of our time. The tunic and *braccæ* ("*unde der. breeches*"), are now in certain parts in Russia the same as they were two thousand years ago. "Desire pursuing the Soul," is a small drawing on grey paper of infinite sweetness and delicacy, reminding us of a flight of Cupid after Psyche. A drawing upon dark paper represents "A Girl Asleep;" the lights are touched in with white chalk: this is one of the few *genre* subjects we find in the series; it is admirable in effect. "Jocasta repressing the ire of Eteocles and Polynices," is a charming drawing in which Jocasta recalls in some degree the "Niobe." A version of Cupid and Psyche presents the figures disposed in a manner different from that which is usually seen; they are grouped upon a couch, Psyche resting upon Cupid; the figures are rendered with much sweetness. "Psyche borne by Zephyrus," is a production of transcendant beauty and forms a fitting pendant to Flatman's "Pandora." This work was executed for the late Sir George Beaumont, and repeated for one of the Russian Grand Dukes, and for the Prince Torlonia. The composition is brought forward in the finest sentiment of Classic poetry, and is equal in all the best attributes of the Art to any production modern or ancient. "Astyanax taken from his mother Andromache," is a composition of numerous figures, in which Ulysses appears taking the child from his mother, who has fainted; he is received by other Greeks, to be thrown from the walls of Troy. A monumental design of much beauty represents a female figure weeping over an urn, which she clasps before her. The idea is original, and the figure is draped with much taste. "Antigone discovered by the dead body of her brother Polynices." The subject is from Sophocles. "Ulysses forcing Polyxena from Hecuba to be sacrificed," is composed of four figures—Ulysses, holding the right hand of Polyxena, who clings to her mother, behind whom an attendant is weeping. This would form a bas-relief of great beauty; it is throughout charmingly balanced, and the upper line of the composition is most skillfully managed.

Of many of those designs we do not speak, but not because they are less worthy

than these we have mentioned. The power displayed as well in these designs as in the known works of the artist, rises to a standard the most difficult of access in the art. It is not given to any man to be uniformly felicitous in every effort, but it cannot be denied that these works by John Gibson are of a degree of excellence which raises them to a level with the best productions of the best period of the Greeks themselves. Having said this, it is not necessary for us to set forth that he is of the most eminent of his profession in the living schools of Europe.

OPTICS.*

PART III.

SECTION I.—REFRACTION OF LIGHT.

THE rays of light falling through the air perpendicularly, upon a transparent surface, passes on in a straight line through the body, but if they, in passing from one medium to another of different density, fall obliquely, they are bent from their straight course, and this bending is called refraction.

If light passes from a rarer into a denser medium it is refracted *towards* a perpendicular in that medium. If it passes from a denser into a rarer medium it is refracted *farther from* a perpendicular in that medium.

The surface which separates the two mediums is called the refracting surface. The ray of light which falls upon this surface is termed the incident ray, and that which passes through the refracting medium the refacted ray, and this always varies from the perpendicular according as the refracting medium is more or less dense. The angle formed by the perpendicular and the incident ray is called the angle of incidence, while that formed by the same perpendicular and the bent ray is called the angle of refraction, and these angles are never equal on account of the bending the rays undergo in their passage from one medium through the other.

Transparent bodies differ in their power of bending light, the refractive power being generally, in proportion to the density. For instance, water being more dense than air, its refractive power is greater, while glass, for the same reason is more so than water.

The chemical constitution of bodies, however, as well as their density, is found to effect their refracting power. It was discovered by Newton that inflammable bodies possess this power in an eminent degree.

The sines of the angles of incidence and refraction are always in the same ratio; thus, from air into water, the sine of the angle of incidence is to that of the angle of refraction nearly as 4 to 3, whatever the position of the ray with respect to the refracting surface. When a ray of light passes from a denser into a rarer medium, as from water into air, it is bent from the perpendicular; and the same constant ratio is found to exist between the sines of the angles of incidence and refraction. A ray of light cannot be refracted whenever the sine of the angle of refraction becomes equal to the radius of a circle, consequently light falling obliquely upon a transparent medium ceases to be refracted, and the incident rays are reflected. This is called total reflection.

Since the brightness of the reflected image depends upon the quantity of light, and in ordinary cases of reflection a portion of light is absorbed by the reflecting substance, those images which arise from total reflection are by far the most vivid.

The atmosphere is a transparent body, becoming more dense in proportion as it is

* Continued from page 163, Vol. 5, No. 3.

nearer the surface of the earth. This difference in density forms distinct strata in the air which vary in their refractive power, and this air forms a medium which has an important effect on light in its transmission, refraction, and decomposition.

The heavenly bodies appear higher than they are in reality, because the rays of light, instead of moving through the atmosphere in a straight line, are continually bent towards the earth in consequence of meeting with the different strata above spoken of as they approach the earth. It is supposed that beyond the atmosphere which surrounds the earth, there is, if not a vacuum, an atmosphere of a highly rarefied nature called ether. The refracting power of the earth is greatest at its surface and diminishes upward.

It is owing to this refractive power of the atmosphere that we do not see the heavenly bodies in their true position, and we actually see the moon and stars above the horizon before they have actually risen, and for sometime after they have set. The delightful twilights we enjoy are also the effect of the same cause.

Many singular effects are produced from unusual refraction, which, before they were properly accounted for, filled the minds of the ignorant with wonder and fear.

By unusual refraction is meant certain phenomena which appear to be caused by the unequal density of different portions of the atmosphere. It has been shown that the incident ray, by falling very obliquely, causes total reflection instead of refraction. It is supposed that both these are concerned in the production of these appearances, which occassionally occur, called looming, mirage, and Fata Morgana.

"When the rising sun throws his rays at an angle of 45° on the sea of Reggio, and the water in the bay is calm and unruffled, a spectator on an eminence in the city, who places his back to the sun and his face to the sea, sees, as if upon the surface of the water, castles, arches, columns and towers, palaces and churches, with balconies and domes; vallies and plains covered with herds and flocks; men walking and riding, and a variety of strange and grotesque figures rapidly succeeding each other. When the atmosphere is charged with vapors and exhalations to the height of about twenty feet, the same object, with less distinctiveness of outline will appear in the mists and vapors floating in the atmosphere, as if suspended there. If the air be only sufficiently charged with moisture to form the rainbow, the objects appear at the surface of the sea, and brilliantly fringed with the prismatic color."

The sailor at sea often sees far above him in the air the phantom of an approaching ship long before the real object is visible. We should say phantoms, for there are, generally, two, one inverted and the other erect directly above it.

The mirage which is common in hot climates on sandy plains, and which deludes the thirsty traveler with hopes of water near by, is attributed by some writers to partial or total reflection of the rays of light at the surfaces of atmospheric strata of different densities, and Dr. Wallaston has proved by simple experiments that the appearance of double images is owing to the refraction of rays through mediums of different densities.

SECTION II.

LENSES.

The substance most used for refracting the rays of light is glass, in various forms, so as to collect or disperse the rays of light some of which we will describe.

A plane glass, the most simple form, has two plane surfaces, parallel to one another.

A spherical lens has every point in its surface equally distant from a common centre.

A plane convex lens is bounded by a plane surface on one side and a convex on the other.

A plane concave lens is bounded by a plane surface on one side and a concave on the other.

A double convex lens is bounded by two convex sperical surfaces whose centres are on opposite sides. When the radii of its two surfaces are equal it is said to be equally convex; and when the radii are unqual it is said to be unequally convex.

A double concave lens is bounded by a concave surface on one side and a convex on the other, but these surfaces do not meet if continued.

A meniscus lens is bounded by concave and convex surfaces which do meet if continued.

The axis of all these lenses is an imagin-

ary straight line in which are situated the centre of their spherical surfaces, and to which their plane surfaces are perpendicular.

The most simple case of refraction is when the refracting substance is terminated by plane surfaces, parallel to each other This refraction takes place in the light which passes through glass windows ; but, owing to the thinness of the panes, the apparent varies from the true situation of the object thus seen When the two surfaces of a pane of window-glass are not planes, or are not perfectly parallel to each other, objects seen through it are more or less distorted.

A convex lens collects rays of light, and a concave lens disperses them.

The sphere of a lens is an imaginary circle of which its surface is a portion.

The radius of a lens is the radius of its sphere, and its axis is a line passing through its centre.

The focus is that point beyond the convex lens where the refracted rays meet. This point depends upon the form of the lens, and the refracting power of the substance of which it is formed. The less convex or bulging the lens is, the more obliquely will the rays at any distance from the centre, fall upon the surface, and the sooner, in consequence of their being more bent, will they meet the axis.

A concave lens disperses the rays. By holding a concave lens so as to throw the rays of light passing through it upon a flat surface ; this fact will be at once proved, and the rays will be seen to diverge in all directions.

Concave lenses are employed to receive converging pencils of rays and to restore them to their original direction ; thus, the concave and convex lenses in combination are applied to most important uses in the construction of optical instruments.

Convex lenses collect diverging rays and cause them to converge. Thus, the image of large objects at a distance may be represented in miniature at the focus of a convex lens, as is seen upon the spectrum of the photographic camera, for all the rays which pass through the lenses of the camera are concentrated upon a smaller space. These lenses also increase the intensity of the rays of light passing through them, sometimes—when constructed for that purpose—to a degree so intense as to cause the combustion of the substance upon which they fall, as in the case of the common burning glass ; metals are even melted and vitrified by the focus of a convex lens.

Whatever the object exposed to such a glass, it always presents the image of it, which you see instead of the object itself. In order to determine the place of the image the form of the glass as well as the distance of the image must be calculated. As to the first, the more convex the glass is, the nearer the image will be to its surface. When the object is very distinct, the image falls in the very focus, but the nearer you bring the object to the glass the farther the image retires from it, and that in conformity to a law in optics, by means of which you can always determine the place of the image for every distance of the object provided you know the focus of the glass, that is the distance at which it collects the rays of the sun, in a space sufficiently small to set on fire a body exposed to it. This point is easily ascertained by experience. The different denominations of the glass are derived from it, as when we say, such a glass has a focal distance of an inch, another of six inches, another that of twenty and so on.

Convex glasses represent the images of very distinct objects behind them, while concave glasses represent the images before them ; the former representing them inverted, and the latter in their real position ; in both the image is as many times smaller as the distance of the object from the glass exceeds that of the glass from the image. On this property of glasses is founded the construction of the telescope, microscope and camera-obscura.

DAGUERREOTYPE MANIPULATION.

THE daguerreotype differs essentially from the other processes of the potogenic art, inasmuch as the production of the image is effected on plates or surfaces of silver; in other words, silver plated on copper; the silver employed should be as pure as possible; the thickness of the two metals together need not exceed that of a card, the silver being of sufficient substance to bear the cleaning and polishing is all that is required.

To practise the daguerreotype with success, requires only a little patience and a due attention to the directions subsequently given.

The entire process is comprised in six distinct operations; which may be thus briefly enumerated—

1. Cleaning and polishing the plate.
2 Applying the sensitive coating.
3. Submitting the plate to the influence of light in the camera.
4. Bringing out the picture: in other words, rendering it visible.
5 Fixing the image, so that the light no longer acts upon it.
6. Covering the finished picture with a film, or thin coating of gold, which not only protects it, but greatly improves its distinctness and tone of color.

These processes we shall now fully explain; and we shall endeavor to do so as simply as possible, at the same time entering into all requisite detail; and we would impress upon our readers the necessity of proceeding with patience through each different operation, which, after a little practice, will be found very easy, while, if they be not attended to, failure will inevitably be the result.

And here we may observe also, that it is of the utmost importance to procure good and well-manufactured plates, as, should there be any imperfection in them, no pains or care taken in the polishing will be of the slightest avail.

3. 1st. *Cleaning and Polishing the Plate*—In some of the daguerreotype establishments the plates are polished in a lathe, or on a wheel—this method having the advantage of being more expeditious. The apparatus and materials he will require for the operation are the following:

Plate-block,
Spirit-lamp,
Gilding-stand or pliers.
One or two polishing-buffs,
Finest washed rotten-stone,
Alcohol, dilute nitric acid, or ammonia and nitric ether diluted with 15 parts of water,
Rouge,
And a quantity of the finest carded cotton wool, or long napped Canton flannel. These should be carefully excluded from all dust and dirt.

Plate-blocks or instruments for supporting the plate, while being cleaned and polished, consist of a flat board, a trifle smaller than the plate, so as to allow the edges of the latter to project about one-sixteenth of an inch all round. The plate is secured by two small pieces of brass, one of which is movable, and fixed by a screw attached to the opposite angles of the board. It is provided with a handle, by which the whole is conveniently held in the hand. In place of a handle a small clamp is sometimes substituted, by which it may be fixed to a table. There are various other forms of blocks in use preferred according to the taste of the operator.

The amount of cleaning a plate requires, greatly depends upon the state it is in. The plate is placed horizontally on the block, with its silvered side upwards, and the flame of the spirit-lamp applied, being more particularly directed beneath the mercury-spots, which will soon exhibit a dull appearance. The lamp is now removed, and the plate allowed to cool, when it is attached to the plate-holder. The readiest method of removing the scratches, is to have recourse to the rotten-stone and acid. Holding the plate-holder firmly in the left hand, take a small knot or pellet of cotton, with a little rotten-stone and ammonia water, and rub the plate over with a continuous circular motion, till all traces of scratches are removed; then wipe off

the rotten-stone with a clean piece of cotton, adopting a light circular motion; at the same time wiping the edges of the plate. Even the back should not be entirely neglected, but for this a small piece of fine tissue paper will be found very convenient. The finishing polish is now to be given with the buff and rouge. The buff is formed of a piece of wood, about eighteen inches long, and from two and a half to three inches broad, slightly convex from end to end. This is covered with buckskin, being first padded with some soft flannel. A handle may be fixed at one end.

4. *Rouge.*—This should be kept for use either in a muslin bag, or wide mouthed bottle, over which is tied a piece of muslin; or in sticks or balls, kept from the dust; a little of the powder being dusted on the buff, or rubbed on from the ball, or stick, the plate receives its final polish; the circular motion is changed for a straight one across the plate, which, if intended for a portrait, should be buffed the narrow way; but if for a view, the length way of the plate. The operation of cleaning the plates at first appears very tedious, and has deterred many from attempting this interesting art; but it is much more simple in practice than in description, and with a little patience and observation all difficulties are overcome. Great care should be taken to keep all extraneous matter from the buff, and when not in use it is better to wrap it up in some tissue paper. The plate should be buffed immediately before the sensitive coating is given (the next process to be described); particles of dust are thus effectually removed; the temperature of the plate is also slightly elevated by the friction, and the required tint is more readily obtained.

2d. *Applying the Sensitive Coating.*—the apparatus and materials required, are an Iodine box,

A bromine-box,

Iodine,

Bromine, or other sensitive mixture.

In the early days of the daguerreotype, iodine alone was used in preparing the plate; and though it still plays an important part, other preparations are used, called accelerating solutions, the discovery of which has alone enabled us to apply the daguerreotype successfully to portrait-taking. For whereas, when first described by Daguerre, it took from five to ten minutes to produce a tolerably good view; now, under favorable circumstances, splendid impressions can be obtained in the fraction of a second.

If the plate is to be iodized, it must be placed, immediately after being buffed, in the iodine box. This consists of a square box, which may be made of any hard wood, and containing a glass jar, covered by a sliding frame of wood suited to the different sized plates, and over this rests the lid. The box may be from four to six inches deep. Some iodine is scattered evenly over the bottom. The plate being dropped into the frame with its face downwards, the slide is shoved in, and the bright surface of the plate is very soon coated with a film of iodine of a fine yellow color; it is then removed and placed over the accelerating solution. The iodine operation need not be done in the dark, though a bright light should be avoided. Not so the next part of the process, viz: giving the plate its extreme sensitiveness: here great caution to prevent the slightest ray of light impinging directly on the plate must be used, and in examining the color reflected light should always be used. A convenient method of examining the plate is to make a hole about one inch square in the wall or door of your coating room, which is covered with a piece of tissue paper; by quickly turning the plate so that the paper is reflected on to it the color is very distinctly shown.

6. Various have been the different forms and contrivances suggested for the bromine pan, but that now in use among American operators is undoubtedly the best.

7. *The Accelerating Solutions*—These differ both in composition and action, some acting very quickly, others giving a finer tone of color, though they are not so expeditious in their operation, that is to say, not so sensitive to the action of light. They are all applied in a similar manner.

8. *Bromine Water.*—This solution has been much used in France, and we shall therefore give its preparation and the method of using it, in the words of M. Fizeau. "Put into a bottle of pure water, a large excess of bromine; shake the mixture well, and before using it, let all the bromine be taken up." An ascertained quantity of this saturated water is then diluted

in a given quantity of distilled water, which gives a solution of bromine that is always identical. M. Fizeau recommends one part of the saturated solution to thirty parts its bulk of water; but M. Lerebours finds it more manageable if diluted with forty times. In case pure distilled or rain water cannot be procured, a few drops of nitric acid, say six to the quart, should be added to the common water.

Method of Use.—Put into the bromine pan a given quantity of the bromine water, sufficient to well cover the bottom: the plate, having been iodized to a deep yellow, is placed over it: the time the plate should be exposed must be ascertained by making a few trials; it averages from twelve to forty seconds. When once ascertained, it is the same for any number of plates, as the solution, which of course would become weaker and weaker, is changed after every operation, the same quantity being always put into the pan.

9. *Chloride of Iodine.*—This is prepared by introducing into a glass vessel containing iodine, chlorine gas; the iodine is liquefied, and the above-named compound is the result. This is diluted with distilled water, and the plate submitted to it in the bromine pan till it is of a rose color.

10. *Bromide of Iodine.*—Make a solution of iodine in alcohol, into which add, drop by drop, bromine, till the solution is of a bright red color. This is then diluted with water till the color is reduced to a bright yellow. It is used in a similar manner as the before-mentioned preparations.

11. *Chloride of Bromine.*—M. Bisson, a French experimentalist, has found that bromine associated with chlo ine, prepared in a similar manner to the chloride of iodine described before (§ 9), a solution of bromine being substituted for the iodine, is a very sensitive solution. By means of it daguerreotype proofs are obtained in half a second, and thus very fugitive subjects are represented—for instance, the smile of an infant, a funeral train, nay, even men and horses in the act of walking.

12. There are many other accelerating substances, the most valuable of which is the bromide of lime, all of which have been described before in the Journal.

The Hungarian is a very favorite mixture in Europe, acts quickly, and with considerable certainty. The method of using is, to dilute it with from 10 to 15 times its bulk of water, putting a sufficient quantity into the pan to cover the bottom. The plate being previously iodized to a light yellow, it is submitted to the Hungarian mixture till it attains a light rose tint.

The processes we have been describing are, as we have before stated, carried on in the dark; and great caution must be used in examining, even by the feeble light allowed, the color of the plates, which, when attained, the plate is to be placed in one of the plate shields belonging to the camera.

13. 3d. *Submitting the Plate to the Influence of Light in the Camera.*—Experience alone will guide the operator as to the time the plate must be exposed to the action of the light, this being dependent on a variety of circumstances, as clearness of the atmosphere, time of the day, object to be taken, and degree of sensitiveness of the solution which has been employed, &c. He should be careful to see that the interior of the camera is clean and free from dust, for the small particles flying about attach themselves to the plate when the slide is removed, and thus cause the little black spots, by which an otherwise good picture is frequently spoiled. Care should likewise be taken to withdraw, as gently as possible, the dark slide in front of the plate, so as not to set any of these particles, which might be at rest in motion. The lens is the last thing to be uncovered. When, according to the judgment or experience of the operator, the plate has remained long enough, the cap is replaced on the lens, and the dark slide over the plate, which is then removed from the camera. If now examined, no picture will be found on the plate. The rendering this visible is the object of the next process.

14. 4th. *Bringing out the picture; or rendering it visible.*—The only apparatus required for this is the mercury bath.

This process is usually carried on in a dark room; but the bath may be so contrived as not to render this necessary, the dark frame fitting the camera, and containing the plate, being made so as to adapt itself to the top of the mercury bath, so that when placed in, the slide may be withdrawn as in the camera. When required to

be very portable, the legs are made to fold beneath the box. It is a very convenient plan, especially in traveling, to tie up the mercury in a piece of muslin; it can be placed just as readily over the bulb of the thermometer, and answers equally well. The temperature should never be raised above 170° Fahrenheit, from 65° to 80° is generally sufficient. The plate may be examined, from time to time, by simply raising the lid of the mercury box, and viewing it by a subdued light. Some boxes are fitted up with a bevel top with a small window of yellow glass for this purpose, but it is unnecessary. The picture being fully developed, is now taken out and examined: it must not, however, be exposed to too strong a light: if any glaring defect be perceived, it is better not to proceed with it, but place it on one side, to be repolished: if, on the contrary, it appear perfect we may advance to the next step.

15. 5th. *Fixing the image, so that the light no longer acts upon it.*—For this the following are required:

Two or three porcelain vessels, for small plates, the form is not material, and evaporating-dishes answer very well; but for large plates an oblong form will be found most convenient.

A Pair of pliers; or a gilding stand.

Hyposulphite of Soda, pure water, and a spirit lamp for heating it.—Having made a solution of hyposulphite of soda, the strength is not material, (about half an ounce of the salt to the pint of distilled water,) pour it into one of the porcelain vessels, put into another plain, and into a third, distilled water. The plate being immersed with its face upwards in the hyposulphite, the whole of the sensitive coating is immediately removed. The light has now no further action upon the plate: it is then to be removed from the hyposulphite and immersed in the plain water; the hyposulphite solution and plain water may be poured over it. It is then washed in a similar manner with water, and well examined, to see that not the slightest particle of dust remains on the surface. We now proceed to dry it.

16. The plate may be supported by the gilding stand, or held by the pliers; immediately after washing the plate for the last time and before it has had time to dry in the least; apply the spirit lamp to the back, at the corner held by the pliers, at the same time facilitating the operation with the breath; pass the lamp gradually downwards, finishing at the extreme corner. The last drop may be removed by a little bibulous paper; a single drop even of distilled water allowed to dry on any part of the surface is certain to leave a stain which no ultimate process can remove.

The daguerreotype may now be said to be finished; still it is so much improved by the sixth and last process, that it can hardly be considered complete without it.

17. 6th. *Gilding the Plate.* This process, for which we are indebted to M. Fizeau, may take place either before the plate is dried, or at any subsequent period of time. The only apparatus required, is the spirit-lamp and stand. The solution of chloride of gold is thus prepared:—Dissolve, in a pint of distilled water, 15 grains of crystalized chloride of gold; the solution will be of a golden tint In another pint of distilled water d ssolve 45 grain of hyposulphite of soda; pour gradually in very small quantities, the gold into the hyposulphite, stirring the solution at intervals; when finished, the mixture should be nearly colorless. Place the plate on its stand in a perfectly horizontal position, or hold it so with your pliers, and with its edges quite free; wet the surface with alcohol, letting any superfluous quantity drain off. Now pour on carefully, as much of the preparation of gold as will remain on the plate. The alcohol is of no further use than to facilitate the flowing of the gold mixture, over the surface. The under part of the plate is now to be heated as uniformly as possible with the spirit-lamp. Small bubbles will rise, and the appearance of the view or portrait, will very visibly improve; the process must not be carried too far, but as soon as all the bubbles disappear, the lamp should be removed, and the fluid poured off the plate immersed in distilled water, and dried by the method described before (§ 16.)

18. *Coloring Daguerreotypes.*—Neither the daguerreotype, or any other photogenic process, has yet arrived at that state of perfection as to enable us to represent objects in their natural colors. Various beautiful tints are frequently obtained, these depend upon different circum-

stances; but, hitherto, decided color is wanting. If we wish for color we must resort to mechanical means to obtain it. The best and certainly the simplest method appears to be the brush, which of course must be very fine. The colors which are applied in the state of a fine impalpable dry powder, are prepared and sold for the purpose. They should not be applied by any one who is not something of an artist; and, after all, it is entirely a matter of opinion whether the pencillings of nature can be improved by the hand of man.

19. A very pleasing effect is given to portraits and figures from life, and was first suggested by Mr. Claudet. It consists in the introduction of appropriate back-grounds, by simply placing the sitter in front of a painting, or rough sketch of a landscape, the interior of an apartment, &c. This adds very much to the interest of the picture, which otherwise is frequently dull, cold, and inanimate.

20. The following are a few hints which may be useful to the experimentalist. The glasses of the camera should be perfectly clean. We have before alluded to the necessity of removing all dust from this instrument (§ 13). The camera should never be so placed that the sun shines into the lenses. If a portrait is to be taken the sitter should be placed with his head resting against something, no matter how slightly, but just sufficient to keep it perfectly steady. The eyes should be fixed on some object a little above the camera, and care should be taken that the hands and feet, in whatever position, are not too forward or backward from the face when that is in good focus If any large surface of white is present, such as a shirt-front, lady's collar, handkerchief, &c., a piece of black stuff should be thrown over it and quickly withdrawn, when the process is about two-thirds finished; smaller parts of the dress, as the shirt-collar, wrist bands, &c., need not be interfered with.

The process may be conducted in the open air under a serene sky, but without sunshine. If sunshine be employed, a screen of blue glass should be used to defend the eyes. This colored glass does not materially weaken the power of the chemical rays. The best of all situations is a raised terrace, or the flat roof of a house.

From the Scientific Daguerrean.

CHEMISTRY.—No. IV.

BY GURDON EVANS, A. M.

OXYGEN. Standing at the head of the elementary substances of nature, in general dissemination, as well, perhaps, as in quantity, is *Oxygen*. Its combining proportion is *eight*, and its symbol O.

As a simple element it is a colorless, tasteless and inodorous gas, hence does not differ in appearance from common air. Its weight is a little greater than air, 1.11; air being 1. Its chemical affinity or disposition to unite with other elementary substances, to form compounds, is stronger than any element; hence it is found as a constituent of a wide range of compound substances.

Always a gas when alone, in its compounded states it enters into solids and liquids as well as gasses.

Of the air it forms twenty-one per cent., eight-ninths of water, and twenty-four forty-sixths of the solid flint rock. In the last compound three equivalents of oxygen are combined, and in the first, the combination is mechanical; hence the proportions are not in accordance with the definite proportions. Scarcely a compound can be mentioned in which oxygen is not found. It readily unites with most of the metals, forming the well known *rust* or

ogyd of the several metals. Iron rust, or the well known red, granular coating with which iron is covered when exposed to moisture, is an oxyd of iron. Similar coatings form upon zinc, copper, lead, and indeed upon all the common metals except gold and platina.

In the solid part of the growing plant oxygen exists to about forty or fifty-five per cent., and in all animal organism constitutes an important part.

The great affinity of oxygen for almost every other substance, renders it exceedingly difficult to obtain it in a pure state generally; there are, however, two or three of its compounds from which it is readily disengaged, and may thus be obtained for experiments.

The most expeditious mode of obtaining oxygen gas is by heating chlorate of potash in a glass or metalic flask. To the flask should be attached a tube of iron or glass, leading into a bag, or under a receiver filled with water, for the reception of the gas. A series of brilliant experiments may be performed with it, all of which depend upon the strong disposition which oxygen has to unite with other substances. 1. Place a bit of candle, with a spark of fire remaining in the wick, into a glass jar of oxygen and it will instantly burst into a vivid flame. 2. Immerse a piece of burning charcoal in this gas and it will burn with great intensity of light and heat. 3. Form a steel watch spring into a spiral coil with a sulphur match attached to the lower end, and upon lighting the match and placing it in the oxygen the steel will commence to burn with a light too brilliant for the eye to behold, and continue to do so till the spring is consumed or the oxygen exhausted. Most metals are readily consumed in a similar manner, giving a series of vivid lights varying in the color of the flame produced. Phosphorus burned in oxygen produces a light of great intensity. When iron or steel is burned in oxygen, they form a chemical union with each other, and the scales that fall down are an oxyd of iron. This brilliant light and intense heat is in fact only a result of the chemical union. This, indeed, is true of all burning or combustion, and *fire* (regarded by the ancients as a distinct element,) *is only a phenomena attendant upon vigorous chemical combinations.* Thus, when wood or coal is burned, the combination is only the heat and light evolved by the vigorous union of the oxygen of the atmosphere with the carbon of the fuel. From these facts oxygen may be regarded as the grand supporter of combustion. If it composed the whole of the atmosphere, instead of one-fifth, almost every substance, even the stove in which the anthracite is burned, would be instantly burned and destroyed; that is completely oxydized. Oxygen is quite as essential for the support of animal life as for combustion. At each breadth we receive into the lungs an amount of oxygen, a portion of which is thrown out in combination with carbon, forming carbonic acid, a substance to be fully described hereafter.

Combined with silver, forming oxyd of silver, this substance is of direct importance in galvanizing the daguerreotype plate. It also forms an essential part of good rouge, which is the red oxyd of iron very finely pulverized.

From the London Art-Journal.

M. GUIZOT ON THE FINE ARTS.*

ANY work proceeding from the pen of M. Guizot cannot fail to attract very general attention: in whatever he undertakes we are certain of finding strong indications that a master-mind has been engaged upon it; one that thinks deeply, argues rationally and acutely, criticises in a large and liberal spirit, and utters sentiments which are at all times honorable to human nature. He is one of the few public men whose high and just principles the political storms of France have been unable to shake, and whom the brilliancy of the new order of things which has arisen in that country cannot dazzle; and so retiring into private life from that public arena where his wisdom and prudence formerly assisted in directing the affairs of a great nation, we hear of him now only when he gives the world his thoughts on some matter, which, either scientifically, philosophically, or socially, is of universal interest; and there are few better able to deal with all or any of such subjects. To a mind so constituted as that of M. Guizot, it must have afforded unqualified satisfaction to be relieved from the turmoil and agitation of political factions, and to have the unrestrained liberty of following out those literary pursuits which seem to harmonise so well with it; and if France has lost in him an enlightened statesman, she, in common with other states, may yet acknowledge him an instructor of no ordinary mould and worth. He seems himself to have felt the enjoyment of such abstraction from great and onerous duties, for he thus writes in his preface to the work before us:—"The study of Art possesses the great and peculiar charm that it is absolutely unconnected with the affairs and contests of ordinary life. By private interests, by political questions, and by philosophical problems, men are deeply divided and set at variance. But beyond and above all such party strifes, they are attracted and united by a taste for the beautiful in Art; it is a taste at once engrossing and unselfish, which may be indulged without effort, and yet has the power of exciting the deepest emotions; a taste able to exercise and to gratify both the nobler and the softer parts of our nature—the imagination and the judgment, love of emotion and power of reflection, the enthusiasm and the critical faculty, the senses and the reason."

M. Guizot's love of Art, and the occupation of his pen upon matters connected with it, are by no means of recent date. "It was" he says, "between the years 1808 and 1814,—at a time when Europe was distracted by war, and when France, weary at home and too busy abroad, had ceased to think of liberty,—it was then that I learned to admire, to love, and to understand those marvels of Art which our victorious armies, in their march over the world, had amassed and brought back with them to the metropolis. I have now collected some of the enquiries which I then made on this subject."

He divides his book into two parts; the first and shorter portion treats of Painting, Sculpture, and Engraving, with reference to the nature of each, and of the relations and differences which unite or separate them. The second portion is devoted to descriptive criticisms of certain pictures of the Italian and French schools.

In dealing with the two first named subjects, he speaks of the nature and limits of each, the peculiar province of the painter and sculptor respectively, and the means each has at command for accomplishing his purpose. The sculptor and painter have only one property common to them both, and that is Design; in every other respect their paths are essentially distinct.

'The sculptor takes a mass of clay; his model is present to his eyes, as according to Plato, that of the archetypal man was in the creative mind of God; he walks in spirit round it, examines it on all sides, and

* "The Fine Arts: their Nature and Relations" By M. Guizot. Translated, with the assistance of the Author, by George Grove. With Illustrations drawn on wood by G. Scharf, jun. Published by T. Bosworth, London.

takes its dimensions thoroughly. He is acquainted, too, with its framework, with the form, the length, and the thickness of the bones; he knows how they are connected, and what the muscles are which clothes and moves them. His first act is to set up in imagination this scaffolding of bones; he then covers it with muscles, to which he gives the attitude and degree of motion necessary for his statue, and finally envelopes all with the flesh which is to give the proportions and the living form of man. It is thus that the gems of antiquity show us Prometheus over his awful work. When marble has been substituted for clay, and has been impressed by the hand of the master with the delicate form of the human features; when its surface has assumed the gentle undulations of flesh, and those forms which conceal, while they allow us to conjecture, the shape of what is below; when this is done, the man of stone will be found to differ from his living prototype only in substance, color, and weight, and, in fact, to possess even in detail all the outward characteristics of the human body."

This is a very beautiful description of the Sculptor's task in reference to design: the painter has a different method of accomplishing the same end.

"It is the aim of the painter, on the other hand, with the aid of colors, to place upon a plane surface figures which shall appear to the spectator as they would in reality if seen from a distance. Now the eye sees at once only one side of an object, and that side not a plane surface, but the part of the figure which is directly opposite to the eye, the outline of which is formed by the wavy line separating the visible or front side of the figure from the back part which is out of sight. At that outline the domain of the painter ends, it constitutes the form of his object, and henceforth his art consists in conveying to the portion of canvas contained within it, the same appearance that, in the real object, is presented by the contents of the corresponding outline.

"Thus painting rests on the same optical laws which, in Nature, enable us to judge of the distance, form, and prominence of things, from the changes of their outline, and the play of light and shade."

Passing from this exposition of the essential nature of the two Arts, the author proceeds to show what are the objects which peculiarly belong to each: Sculpture, he asserts, deals with "situations;" Painting with "actions." These definitions are not quite clear to our comprehension, neither does his argument, by way of explanation, sufficiently elucidate them, although we seem to understand what he would infer. The material in which the sculptor works—presuming it always to be marble—M. Guizot considers unsuited to the representation of violent actions; its weight, and even its color, "prevent the imagination from being deluded, even for a moment, into a belief in the movement of sculptured figures;" and he brings forward the Laocoon as an example to support his theory. He admits that action, "ay of terrible intensity," is apparent in that well-known group; "but still it is not the prevalent expression; the especial attention of the artist appears to have been to represent a man undergoing great external violence, but though suffering greatly, he is still calm, and the state of the muscles indicates that he is enduring rather than existing, for their whole action is one of contraction, and not at all of tension." The French sculptor, Puget, in his group of Milo of Crotona, has, in M. Guizot's opinion, fallen into a similar error in his attempt to express violent action. Now, if the writer's theory be a true one, Sculpture can only be regarded as a representation of dead forms, or, more properly, perhaps, of motionless forms, a conclusion we can by no means arrive at, when our recollection supplies us with so many examples, ancient and modern, that seem to want only the faculty of volition to cause them to descend from their pedestals.

And thus, as the aim of the sculptor is to represent *form* alone, he can only hope to succeed by endowing his work with truth and beauty; but M. Guizot argues for a principle which is somewhat at variance with our ideas of what Art should combine in itself to render it worthy of its legitimate application.

"It is useless for him to endeavor to attain a kind of truth out of his reach; but there is no limit to his attainment of beauty, for in the legitimate resources of his art he has the means of reaching the highest perfection of beauty; this end, therefore, being

peculiarly his own, he ought never to lose sight of, for in the pursuit of it his greatest triumphs will be gained. The sculptor, accordingly, must ever bear in mind that truth is to be united with beauty, or even rejected, whenever its adoption would involve a sacrifice of beauty. No alteration of form by which the beauty of his subjects is at all diminished can be tolerated, for he has no power of making up for such a loss by those illusive counterfeits of reality which often please, even when the subject itself is unpleasing."

It is scarcely probable, we should imagine, that a sculptor would undertake any subject involving such a sacrifice as is here pointed out; if he does, he disregards his reputation. Beauty is an essential element in Sculpture, but truth is no less so; each would materially suffer from the absence of the other.

We have no space for allusion to the remaining matters connected with this branch of Art, which the author speaks of; we pass them over with regret, as they contain many sound and striking observations, the sum of which is, that Simplicity is the object to be kept mainly in view by the sculptor:—simplicity in the choice of subject, in expression, in form, and in attitude: this is the fundamental law to be observed by him who not only would produce fine works, but would avoid perpetrating absurdities.

But if the sculptor is limited in the development of his art, it is far otherwise with the painter, his resources embrace everything that the sight can reach, and the imagination conceive; yet his difficulties increase with the extent of his range; "if his subjects are numerous, it is all the more difficult to make a wise selection from them; if the means at his command are many, it is the more necessary that he have skill to use them aright, where none are unimportant." M. Guizot observes that "the province of painting is so vast, that to pretend accurately to survey its extent would be absurd, and the means which she employs are so numerous, that it would be utterly impossible to lay down rules for the use of them all." With this conviction, he confines his remarks to some ideas on the fittest subjects for the historical painter, and on the principles and rules to be observed by him in executing them. He deprecates the notion of the painter attempting to imitate sculptured figures, as was the practice with some of the earlier great artists; for although the art of *Relief* is apparently best studied in Sculpture, from its absence of color, it is not really so, because such a study leads to "inordinate attention to drawing, to the neglect of light and shade;" matters as important to the beauty of a picture, as outline is to its correctness. He nevertheless advocates the practice of studying from sculpture, as a means whereby a sense of Form may be gained, and a power of drawing; together with that feeling of the Beautiful, and that sentiment of the Ideal, without which no really great works are produced. We could have wished that M. Guizot had entertained the subject at greater length; what he has said upon it is so judicious and instructive, that we are sorry he has not said more. We can scarcely accept his apology, arising from the extent of the range embraced by this art, for his limited observations.

Engraving is discussed in three or four pages only. He who practises this art is a translator, who "will probably learn better from the study of the antique than from that of pictures, how the lights and shadows, which are the effects of light, occur, and how they mix with one another." But even colors may be expressed by him; while he must bear in mind the importance of becoming thoroughly acquainted with the peculiar manner in which each individual artist worked, so as to preserve the essential styles of the various originals. The following remarks are the author's conclusion of the whole matter:—

"In whatever work he is engaged, the artist is subject to laws which are founded in his nature as a man, and in the nature of the substances with which he deals. To trace these laws will be the endeavor of every true philosophy (*philosopher*) of the Fine Arts. The student must commence his task by humbly following the steps of genius, and patiently examining into her method of action; he will thus endeavor to discover the direction in which she is tending, and when he is satisfied that he knows what genius is, the height she may attain to, and the methods by which she must reach that height, he will dare to take his place at her side, and illuminate her

path with that torch, which, but for her, he would never have been able to kindle."

Nearly three-fourths of M. Guizot's volume is devoted to criticisms of certain pictures of the Italian and French schools; by Raffaelle, Giulio Romano, Correggio, Andrew del Sarto, Paul Veronese, the Caracci, Guido, Domenichino, Carlo Dolci, Nicholas Pouissin, Leseur, &c. &c. These observations show the writer to be well versed in the philosophy of painting, and to possess a thorough knowledge of the spirit and style of the respective artists. Mr. Scharf's drawings, in outline, from many of the pictures thus subjected to criticism, are well rendered; they are charmingly engraved by Messrs Dalziel, Delamotte, Cooper, A. and S. Williams, and We Dickes. Mr. Grove has, upon the whole, commendably performed his task of translating the text, but it requires some little revision, especially with regard to the punctuation: nevertheless, the book is one which every student of high Art should desire to possess.

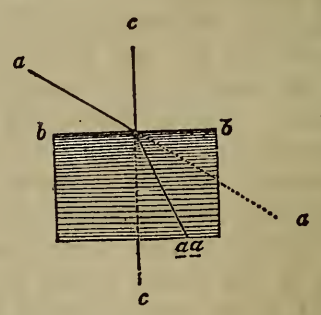
ON LENSES FOR THE PHOTOGRAPHIC CAMERA.

IT is, to the photographic artist, a matter of considerable moment that he understands the principles upon which his instruments are constructed. It has, therefore, been thought advisable to add a short chapter which should give a sufficiently popular explanation of the dioptrical phenomena with which we have especially to deal.

Upon the refractive power of the media employed, depends the perfection of the results we obtain; therefore, some of the phenomena of refraction, or *breaking back*, as the term implies, should be clearly understood.

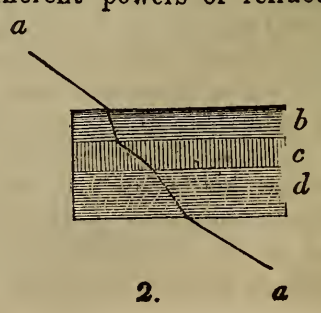
A ray of light passing through a vacuum progresses in a perfectly straight line, and we should, if we looked at a brilliantly illuminated point—where it possible—under such conditions, see it in its true position, the numerous rays coming undisturbed directly to the eye. But all matter, however attenuated it may be, has the property of refracting, or bending the ray of light; consequently we do not see the stars in their true position, owing to the refractive power of the atmosphere.

The most simple illustration of refraction is to allow a sunbeam *a*, passing through a small hole in the window-shutter of a dark room, to fall upon the surface of a fluid contained in a glass vessel, *b b*: instead of proceeding onwards to *a*, it will be found to alter its course at the surface of the fluid, and pass along the line to *a a*. Every substance has different refractive powers in virtue of its physical constitution; but a ray of light incident perpendicularly on a refracting medium, as the ray *c*, (Fig. 1) suffers no refraction. If



1.

we float, one upon the other, fluids, *b*,*c*,*d*, having different powers of refraction, we



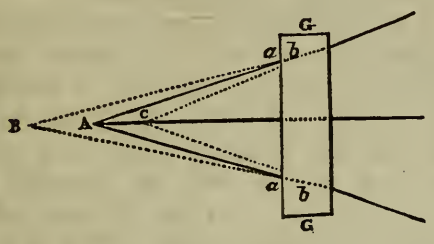
2.

shall then see the relative phenomena exhibited by the bending of the ray *a a*, in passing through them (Fig. 2). It will be evident that no great difficulty exists in measuring the refractive powers of different transparent bodies: and that hence we are enabled to tabulate those which have the highest and lowest refractive indices. A few of the most important are given in the following table:—

Air	1·000294
Water	1·336
Alcohol	1·372
Oil of cloves	1·535
Crown glass	1·534
Plate glass	1·542
Flint glass	1 830
Do. containing much lead	2·028
Diamond	2·439

This knowledge enables us to trace a ray of light through transparent bodies of any form, provided we can find the inclination of the incident ray to the surface, where it either enters or quits the body.

If parallel rays fall upon a plane surface G, of glass, they will retain their parallelism after passing through it as the ray A, (Fig. 3). The rays diverging from the



3.

point A, will be refracted by the first surface into the directions *b b*, and by continuing *a a*, and *b b*, backwards, we shall find they meet at a point beyond A: so that supposing the eye to be placed within the body G, the point A would appear removed to B. But when the rays undergo a second refraction by passing out of the second surface, we shall find by continuing the lines backwards that they meet at C; therefore a plane glass diminishes the apparent distance of the point of the diverging rays. If, instead of a plane glass we employ a piece equally curved, like a watch glass, it produces very little change in the form and position of objects.

Lenses are glasses ground to different forms, their surfaces being segments of spheres, and it is in obedience to the refractory power of the surfaces so produced that their peculiarities belong. The following figures represent the varieties.

4.

1 is termed a plano-convex lens.

2 is a double convex lens.

3 is formed of parts of two circles of different diameters, and is called a meniscus lens, or concavo-convex.

4 is a plano-concave lens.

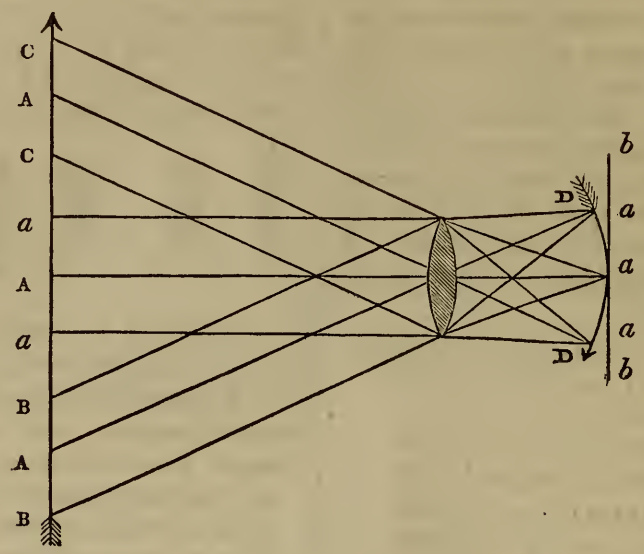
5 is a double concave lens. And

6 is a concave-convex lens, formed of parts of the inner surfaces of two dissimilar circles.

It is not necessary to examine the laws of refraction for all these forms; the phenomena will be fully understood by an examination of a few leading points. Whatever may be the form of a lens, the incident rays parallel to its axis pass through without suffering refraction, as A A A, *a a a*, Fig. 5. All other rays must have a certain amount of obliquity, and these all consequently suffer refraction, as the rays *a a*. Now the rays B B, and the ray C C, are refracted, and meet at D D; the line *b b* represents the focal image produced of the body from which the light proceeds.

In the last figure the image produced by the lens is represented as curved: a little consideration will show that it is not possible that such a curved surface as that represented could produce an image of equal distinctness over every part of a plane surface: the rays cannot meet, as they are refracted from curved surfaces along any straight line, as F F F; and supposing we receive on the surface of a lens a bright circular image, it will be brilliant and well defined around the centre, the light becoming fainter towards the edge, and at length passing into a cloudy halo, exhibiting the prismatic colors. This is called *spherical abberation*, and to it is due that want of distinctness which commonly is found around the edges of pictures taken in the camera obscura.

It is therefore important, in the selection of lenses, that we look for *sharpness of definition over the whole of a perfectly*



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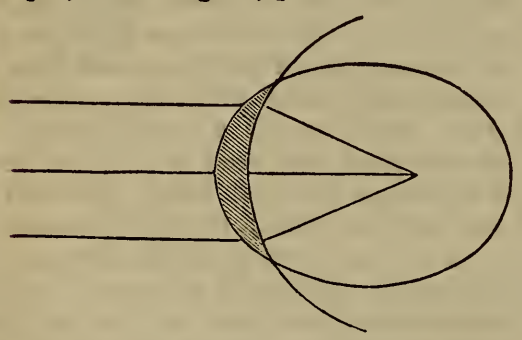
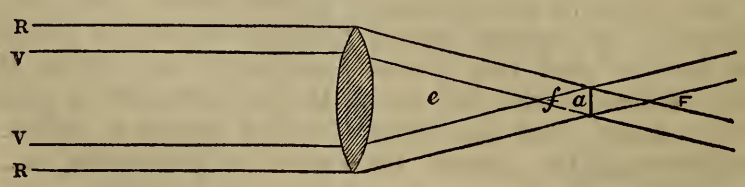
flat field. To manufacture a lens which shall effect this, is a task of some difficulty; but by attention to the two facts, that a lens, one surface of which is a section of an ellipse, and the other of a circle struck from the farthest of the two foci of that ellipse, as in Fig. 6, produces no aberra-



6

tion, much may be effected. A meniscus lens, therefore, with a convex surface, part of an ellipsoid, the focal distance of which coincides with its farther focus, and a concave surface, part of a sphere, whose centre is that focus, will meet all our requirements. The mechanical difficulties of producing such lenses are great, but they may, by cautious manipulation, be to a great extent overcome. There are other methods by which the aberration of sphericity may be corrected, but for a description of these the reader is referred to Sir John Herschel's *Treatise on Light*, in the Encyclopædia Metropolitana.

If we take such a lens as we have been describing, and stop its centre with a blackened disc, leaving only a small portion of the edge for the light to pass through, and throw its image on a screen, we shall find it will be bordered with fringes of color. At one distance *red* will prevail, at another *violet*. This is the result of *chromatic aberration*, and arises from the unequal refrangibility of the dissimilar rays. The red ray is less bent than the violet; consequently, supposing the rays R R to fall on the edge of a lens, they will converge to a point at F, whereas if the rays



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v v fall along the same circular line, they will, being more refracted, meet at *f*. Now if we place a disc at *e*, just the size of the cone of light, it will be edged with violet, but if we move it to *a*, the colored border will be red.

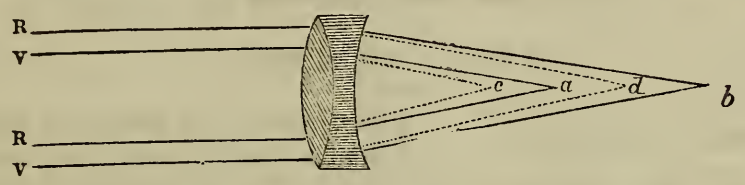
The indices of refraction for the several rays have been most carefully determined

by Fraunhofer, and for a standard medium a flint glass prism, they are respectively

Red.	1·627749	dark line B
Orange...	1·629681	C
Yellow...	1·635026	.....D
Green....	1·642024	.....E
Blue.....	1·648260	.....F
Indigo....	1·660285	.....G
Violet....	1·671062	.....H

Fraunhofer has determined the absolute values from the fixed dark lines which he observed in the spectrum: they represent, however, very closely the rays distinguished by their colors.

By referring to the table of the refractive powers of transparent bodies it will be seen that for a beam of white light, the difference between the most refractory flint glass and crown glass, in their refracting powers, is as 2·028 is to 1·534, and this proportion is maintained nearly, but not exactly, for all the colored rays: if, therefore, we have a crown glass lens, the refractive power of which will place the focus at *a*, for the violet rays, at *b*, for



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the red rays, and we grind to fit it a flint glass lens, the refractory power of which would place the foci of the rays at *c*, *d*, it will be seen that the result of such a combination would be the formation of a colorless image, at a mean point between them, by recombining the rays into white light. Such as is represented in the figure is the achromatic lens of a camera-obscura.

There is, however, a point to be examined in connection with the lens for photographic purposes, which is of the first importance, and which has not hitherto been sufficiently attended to. It is this. The luminous and colored rays of the spectrum and the chemical rays, are not coincident at any point of the spectral image, and the relation between the chemical power and the illuminating power, of a ray, is subject to constant variations.

It is often stated that the violet and blue rays are the chemical rays, and hence it is inferred, if the glass of a camera is corrected so as to make these rays, and the less refrangible red, to correspond, all is done which can be desired. It must be distinctly understood that the color of any particular ray has no direct relation to its chemical character. It is true, if the more refrangible rays are made to correspond with the more luminous rays, we approach the desired point, but we do not necessarily reach it. It has been said we may do so by overcorrecting a lens; but this is not the case, since beyond the limits of the chemical rays we have rays which have decidedly a protecting action, and if these are thrown into the field, the operation is retarded.

We commonly hear of a lens being slow or quick; this is purely accidental, arising entirely from the uncertainty in which all our optical instrument-makers remain as to the relation of the chemical and luminous forces to each other.

If the lenticular correction reaches and does not exceed the point of bringing the rays beyond Fraunhofer's line H, upon the field of vision, the lens will be a quick one, as it is called. On the contrary, if it does not reach, or if it goes beyond this, it will be slow in action. because either the *light* rays interfere, as is explained in a previous page, or those rays beyond the chemical spectrum to which attention has of late been directed by the very refined researches of Mr. Stokes.

For portraiture, and all purposes requiring great distinctness of outline and rapidity of operation, two achromatic lenses are usually employed. By this arrangement the focal distance is diminished; the image is much reduced in size, but then it is concentrated in every respect, and hence improved in all the necessary particulars. These lenses are, however, still open to the objection that they produce some distortion, which is only to be avoided by greatly reducing the size of the aperture through which the light falls on the lens, and this

necessarily involves increased sensibility in the preparations we employ. The distortion is not to the extent which has been represented, but it may, by careful examination, be discovered in the finest photographic portraits to a greater or less extent.

R. Hunt.

From the Scientific Daguerrean.

PICTURE MAKING.—No. IV.

BY D. D. T. DAVIE, PHOT.

THE SENSITIVE COATING.

THE tone, brilliancy and rotundity of sunlight pictures depends much upon this process. The plate may be cleaned, buffed and galvanized in the most skillful manner, yet unless it is properly coated, the result will be bad. On the other hand, if the plate is not properly cleaned, &c., the colors produced upon it by the iodine and bromine, are so different from what they should be, that the operator fails of succ ss, and often too without knowing the real cause of his trouble.

The peculiar coloring given to the plate by the iodine, depends much upon the condition of the last buff, for when the buff is in a good condition, and the plate is in every way well prepared, the first color given to it by the iodine will be a beautiful, clear, transparent yellow; and by continuing its exposure to the iodine, the color becomes deeper yellow, and finally it changes to a beautiful soft sky red; then to purple, and so on through all the variations, the color will appear very lively and sensitive. If the plate is poorly cleaned, buffed or galvanized, the coatings through all the changes will appear dull and heavy; instead of the bright, clear, yellow, red, purple, &c., you will have a greyish yellow, a dark, cold brown for red, and nearly a black instead of purple: in this case the impression when made will be flat on the plate, blue cold tone, abrupt light and shadows, and nearly destitute of perspective. As to the amount of chemical that should be used in order to produce the best results, it is a d sputed point among daguerreans; I believe, however, that all acknowledge that the tone of the picture depends much upon the amount of chemical used in producing it. Ligl t coatings, if rightly proportioned, will evidently work quicker and make a whiter picture than a heavy coating; on the other hand, a heavy coating requires more time in the camera, but makes a stronger, darker and heavier picture, with light and shade more beautifully blended than can be with a light coating: this class of pictures is almost universally made by our best artists in large cities. In the country where there is less cultivation of taste among artists as well as their patrons, the lighter coatings are almost altogether used, and white pictures are all the rage.

If you wish to produce a likeness very quick, it is best to coat light, say to a yellow over the iodine, and change it to a pink over the bromine, and re-coat over the iodine; one-third this coating is good for children groups, or infirm people. For light drapery, like a white or pink dress, you will best preserve it by coating over the iodine to a purple, and change it to a steel over the quick; and re-coat one-half. Another way of preserving light drapery is, to coat first to a deep yellow and change it over the bromine to a purple, and coat back over iodine once and a half as much as at first; this coating is, however, a great favorite with some of our best artists, and as fine effects as I ever saw were obtained in this way. Perhaps the following is as

sure, and upon the whole, as good a coating as any known for ordinary work: Coat the plate over iodine until it has a purple color, beginning to whiten somewhat, and change it over bromine to a white or steel, as it may be called, and back from one-half to two-thirds, according to your sitter; for a lady of light complexion and light dress I would coat back two-thirds; and for a gentlemen of dark complexion and dark clothes I would coat back nearly two-thirds; this is an easy coating to obtain, and if but one coating is to be used, this one perhaps is preferable. Some are coating according to the last mode, excepting that they coat back only one-third. There are two serious objections to this way: the first is, black drapery will have a brown or lightish appearance in the picture; secondly, the features will appear light and coarse, similar to a cheap engraving or lithographic print. The coating should be altogether dark, for if any light, no matter how little, comes in contact with the plate after it is coated, the picture is flattened and whitened in proportion to the exposure. The slides which hold the plate in the camera should be kept well blacked and cleaned, for this has much to do with the clearness of the picture, especially the drapery, for good black drapery cannot be produced with rusty old plateholders. Light to see to coat by should be admitted through an orifice or opening, 8 ⋈ 10 inches in one side of the coating room; this opening should be set with white or clear glass and that covered with oiled white paper or blue tissue paper answers well. By this process we have a more uniform light than is obtained through a door which is the more common way of coating.

The temperature of the coating room should be about 75 deg.; this is sufficiently warm for the bromine or quickstuff, but the iodine will require a warmer room for awhile in the morning, until the box is warmed. The chemicals for coating the plate require much attention; the process is exceedingly delicate and requires very careful management.

The plate when coated should never be placed in a cold slide or plateholder especially if the plate is in the least warm, for the contact will produce a moisture which will materially injure the picture, by giv-it a dull tone, or, perhaps, specking it badly with mercury, and often it causes the heavier shadows or darker parts of the drapery to have a blueness that hyposulphite or gilding will not remove. The slide, after it has received the plate ready for the camera, should be placed in a dark but warm place until it is wanted, and after it is placed in the camera, the slide should not be drawn until all arangements are complete and ready for the admission of light. Some may regard these suggestions as whimsical, but that will not change our mind in the least, for we have fully demonstrated by careful experiments and tests, the truth of the above suggestions. Our article for the next No. will be upon Light, a subject to which we have given much study, but we very much question our own ability to describe in a comprehensive manner all of the niceties of our experience. We will, however, make our best endeavors.

The light obtained from a very large window is good for the execution of portraits, care should be taken to place before the window a white screen, to project reflected light upon those parts that are in shade; without this precaution we obtain too sudden a transition from light to dark, which is not harmonious. A mirror so disposed as to convey the reflected rays upon that part of the figure in shade, give also a very beautiful effect. The model should thus be placed between the direct rays from the window, and those reflected by the screen or mirror.

GOSSIP.

IT is now some fifteen years since the daguerrean art was first introduced into this country by Mr. Gourard, and Professors Morse and Draper, yet it is but recently that the public have begun to look upon it as one of the most pleasing, instructive, and beautiful gifts of that allwise Providence, who manifests his blessings and benefits at the time most conducive to the welfare of his people. The sun, which was originally supposed to be intended merely to illuminate the world, has been, by degrees, discovered to be the great source of God's physical blessings to mankind. Through its influence, by the will of the Creator, we live and move, and have our being; through its influence we are indebted for all the delicacies and substantialities which give nourishment to the body and pleasing sensations to the senses; and to its influence do we owe the pleasant and touching remembrances of departed relatives and friends.

Painting and sculpture for ages engrossed the attention and tastes of the refined and curious, and have ever marked the progress of civilization, until the mind, became settled down into an almost dreamy state of satisfaction at the perfection attained, and seemed to feel satisfied that art could go no farther.

Daguerre and Niepce, however, arose and dispelled the illusion. They gave to the world a process which not only startled it from its slumbers, but made it stand amazed at the wonderful power of science, the magic influence of light. Multitudes arose to worship it, hundreds grasped at it with convulsive hands, as drowning men seize at straws; popular enthusiasm and attachment took hold of it, and a worthy and intelligent class at once, arose many of whom might otherwise have eaten the bitter bread of want and dependence. Thus it is that God, at the proper time, manifests his good will, and fatherly care towards his earthly children, and tempers the wind to the shorn lamb, to perpetuate the memory of his great works, and impress the mind with the grandeur of his omnipotence.

The true artist, in his reflections, will feel the full moral power and the celestial beauty of his art, and will acknowledge that its greatest charm is in the pure and lofty feelings it must create, and the holy ties it must perpetuate.

There is something more than mere mechanical skill to be developed by the photographic manipulations. The stamp of genius is as fully indicated by the daguerreotype plate as by the painted canvas, or the sculptured marble, and people are now becoming fully impressed with this fact. Notwithstanding the many hundreds of fifty cent, twenty-five cent, and even twelve and a half cent galleries that have sprung into existence—and which, like the mere daubs of auction pictures, disgrace only those who get them up—those of artists of deserved reputation are still thronged with seekers after the true and beautiful, both of high and low degree.

Thus it is that appreciation of true art is to be instilled into the mind, that taste and refinement are to be infused into the great mass of mankind, and as they become more widely spread the true photographer will find his position more elevated, his genius better appreciated, and his works more admired.

Is there not, therefore, something more than mere daily bread to be taken into consideration by the photographer? Is the mind, the heart, his position in society, and his reputation of minor importance? Must he remain content to be considered at the lowest round of the ladder of fame? Must he be satisfied with the number of shadowy images of fleeting humanity he may be able to dispense to the public? Can he rest at a mere daguerrean reputation? The soul truly impressed with the glorious perfection to which the photographic art may be brought will not so rest. Nobler sentiments will actuate its exertions, the lovely and beautiful will constantly rise up before it, and the sublime and terrible will increase the intensity of its devotion to that art which of all others may be said to be of Divine origin, since it is truly the production of Heavenly influences—

"Light born and limn'd by Heaven"

We can look around among the daguerrean artists of America and feel proud of a large portion of them for the excellence of their works; but alas! how few feel the full force of such sentiments as elevate the mind, soften the soul, improve the taste, and give dignity to the art. Is not the pride of purse superior, even among most of our best artists, to that of genius. Oh! how much oftener do we hear the boast of quantity than that of quality. "Experiments *are* expensive," but are they not the road to perfection? "Experiments *are* expensive," but are they not the road to true greatness in the art? But experiments *are not* so expensive as *failures*, they are not so expensive as want of *true excellence;* they are expensive, but not so much so as ignorance.

If we wish for evidence of the facts of these assertions, we have only to look around us and point out the men who stand highest in public estimation as first among their brother artists.

The exquisite beauty of the daguerrean art is yet to be developed! Who among the thousands of artists in America is to arrive first at this consummate skill? Certainly not those who are content to plod along in old beaten paths; certainly not those who will not *experiment;* most assuredly not those who have no enthusiasm or love for the art itself; not him whose soul is clogged with visions of dollars and cents; not him whose mind is given to envy, jealousy, slothfulness and world'y pleasure. No; none but those who look through "nature up to nature's God," and worshipping the sublime and beautiful, worship him who created them.

This brings us to speak of those auxilliaries to improvement and perfection, Art societies. We have had several established among us, but they seem to be sleeping. Awake them from their slumbers and give them that life which will ensure their prosperity and usefulness. In desiring to effect this object we will call attention to the following letter:—

Oswego, April 10th, 1853.

H. H. Snelling, Esq:—Dear Sir—As the time approaches for the annual meeting of the New York State Daguerrean Association, I will thank you to call the attention of the profession to it. It will meet at Auburn on the first Tuesday in May.

Let us have a full representation from all parts of the State as this will be a meeting of the greatest interest. Every member of the association will, by a resolution passed at the last meeting, bring or send a specimen of their skill, which collectively will present a point of great attraction. It is expected that some specimens of extraordinary nature and interest will be exhibited there.

Yours, Respectfully,
Geo. N. Barnard,
Sec. N. Y. S. D. Ass.

— The following from Mr. Hunt's late work will be interesting, undoubtedly, to our

readers, particularly those who contemplate going to England to operate.

THE following correspondence, important in the history of photography, appeared in the Times newspaper of August 13, 1852.

THE PHOTOGRAPHIC PATENT RIGHT.

We have been requested to publish the following correspondence between the Presidents of the Royal Society and the Royal Academy, and the patentee of the art of photography upon paper, with the view of definitely settling a question of considerable interest to artists and amateurs of photography in general.

No. 1.

London, July, 1852.

DEAR SIR,—In addressing to you this letter, we believe that we speak the sentiments of many persons eminent for their love of science and art.

The art of photography upon paper, of which you are the inventor, has arrived at such a degree of perfection that it must soon become of national importance; and we are anxious that, as the art itself originated in England, it should also receive its further perfection and development in this country. At present, however, although England continues to take the lead in some branches of the art, yet in others the French are unquestionably making more rapid progress than we are.

It is very desirable that we should not be left behind by the nations of the continent in the improvement and development of a purely British invention; and, as you are the possessor of a patent right in this invention, which will continue for some years, and which may, perhaps, be renewed, we beg to call your attention to the subject, and to enquire whether it may not be possible for you, by making some alteration in the exercise of your patent rights, to obviate most of the difficulties which now appear to hinder the progress of the art in England. Many of the finest applications of the invention will, probably, require the co-operation of men of science and skillful artists. But it is evident that the more freely they can use the resources of the art, the more probable it is that their efforts will be attended with eminent success.

As we feel no doubt that some such judicious alteration would give great satisfaction, and be the means of rapidly improving this beautiful art, we beg to make this friendly communication to you, in the full confidence that you will receive it in the same spirit—the improvement of art and science being our common object.

ROSSE.
C. F. EASTLAKE.

To H. F. Talbot, Esq., F. R. S., &c.
Lacock Abbey, Wilts.

No. 2.

Lacock Abbey, July 30.

MY DEAR LORD ROSSE,—I have had the honor of receiving a letter from yourself and Sir C. Eastlake respecting my photographic invention, to which I have now the pleasure of replying.

Ever since the Great Exhibition, I have felt that a new era has commenced for photography, as it has for so many other useful arts and inventions. Thousands of persons have now become acquainted with the art, and, from having seen such beautiful specimens of it produced both in England and France, have naturally felt a wish to practise it themselves. A variety of new applications of it have been imagined, and doubtless many more remain to be discovered.

I am unable myself to pursue all these numerous branches of the invention in a manner that can even attempt to do justice to them, and moreover I believe it to be no longer necessary, for the art has now taken a firm root both in England and France, and may safely be left to take its natural development. I am as desirous as any one of the lovers of science and art, whose wishes you have kindly undertaken to represent, that our country should continue to take the lead in this newly-discovered branch of the fine arts; and, after much consideration, I think that the best thing I can do, and the most likely to stimulate to further improvements in photography, will be to invite the emulation and competition of our artists and amateurs, by relaxing the patent right which I possess in this invention I therefore beg to reply to your kind letter by offering the patent (with the exception of the single point hereafter mentioned) as a free present to

the public, together with my other patents for improvements in the same art, one of which has been very recently granted to me, and has still thirteen years unexpired. The exception to which I refer, and which I am desirous of still keeping in the hands of my own licensees, is the application of the invention to taking photographic portraits for sale to the public. This is a branch of the art which must necessarily be in comparatively few hands, because it requires a house to be built or altered on purpose, having an apartment lighted by a skylight, &c., otherwise the portraits cannot be taken indoors, generally speaking, without great difficulty.

With this exception, then, I present my invention to the country, and trust that it may realize our hopes of its future utility. Believe me to remain, my dear Lord Rosse,

Your obliged and faithful servant,

H. F. Talbot.

The Earl of Rosse,
Connaught Place, London.

— As we stated in our last, Mr. Brady and Mr. Lawrence have opened, each, a new and elegant suit of rooms in this city. No two establishments could be more dissimilar in their appointments, but they are both of the most beautiful description so far as furniture, painting, and taste of arrangement are capable of making them such, while the daguerreotypes displayed will challenge comparison with any in the world.

— We insert the following letter as an example to be followed by the timid and modest, as well as many deservedly popular artists who have not yet manifested any desire to become competitors for the elegant Anthony prize to be awarded in Nov. next.

St. Paul, Min. Terr'y.
March 12, 1853.

Dear Sir —Not with any expectation of winning, but at the earnest request of Mr. A. Hesler, of Galena, and a desire that the extreme north-west of "Uncle Sam's farm" may be represented, I send you my name as competitor for the grand prizes you offer for the best and second best four daguerreotypes.

All cannot get the prize, and some *poor* pictures will make the *good* ones look *better*, so that I shall be doing somebody a service by sending. I believe in doing good. Respectfully,

Yours, &c.,
J. E. Whitney,
Dag. Artist.

— Rumor now has it that Mr. Hill has taken rooms in New York city, where he intends practicing Hillotyping; and also that he is disposing of rights for different parts of the country.

— We have seen some specimens of Mr. Carvalho's enamelled daguerreotypes, and think them much the best of any we have seen. They answer very well the purpose for which they are intended, and can readily be sent by mail in an envelop without serious injury. They are taken in this city by Mr. Gurney.

— New Way to make Mirrors.— *The Prattsville Advocate* states that on a recent visit to Rev. L. L. Hill, the alleged inventor of daguerreotypes colored by the action of light, Mr. Hill showed him a new way of making mirrors. He says: "Mr. Hill took a small glass, such as daguerreans use for covering their pictures, and in forty seconds it was transformed into a perfect mirror—*perfect in every respect.* We kept an eye upon it the whole time; the process was fully explained, and the result cannot be excelled. In his mode of 'silvering glass' there is not a particle of the usual amalgam of tin foil and quicksilver, but it is composed wholly of pure and unadulterated silver. The discovery was made while he was experimenting on glass, with a view of adapting

it to Helio-chromy, never dreaming of its beautiful application to the manufacture of mirrors. The expense of manufacturing mirrors, by this new durable method, will not, we think, exceed half the cost of manufacturing the kind now used; besides, they are *always perfect*, and no art of man can deface them, without breaking them to pieces. We hazard nothing in predicting that it will create an entire revolution in the art of making mirrors, and that in a few years, at most, there will not be a mirror of the kind now used, to be found in the country.

— We present our readers this month with a specimen of Mr. Whipple's Crystalotype process, in the portrait of Mr. E. Anthony, long and favorably known as not only one of the earliest but best daguerreans of this country. Mr. Anthony received instructions in the art during the first year of its application to portraiture, from Prof. Morse, and pursued it for several years, until the state or his health obliged him to relinquish it, when he commenced his present business as dealer in daguerreotype materials, in which he has gained a deservedly high reputation. His portrait has been selected by Mr. Whipple as an illustration, because he is more extensively known to daguerreotypists generally than any other person connected with the art, and therefore, the superiority of his invention will be more prominently brought before them. Mr. Whipple proposes making his process a joint-stock affair, to be conducted by several prominent gentlemen as trustees, and the share holders to consist of photographers throughout the country, who shall be equally interested in all improvements made therein, and share in the dividends. We cordially recommend his plan to our readers, who, by writing to Mr. Whipple at Boston, can gain all desirable information.

The following are some of the appliances and advantages of the Crystalotype process:—

By it, out-door views, such as Public Buildings, Blocks of Houses, Country Seats, Homesteads, &c. &c., can be taken as perfect as with the daguerreotype; daguerreotypes can also be copied, diminished to miniature, or enlarged to life size.

These pictures have all the distinctness with all the permanence of a steel engraving; and being executed in neutral tint, can be easily colored, and are therefore invaluable as the basis or outline of a painted portrait or miniature. They also form the best copies from which to execute lithographs or engravings; and can be used in place of such to illustrate books; they can also be used for scientific purposes and must eventually command the patronage of government.

After the first Crystalotype of any subject has been produced, they can be multiplied ad-infinitum, at the rate of several hundred per day—the last copy as good as the first—and where large quantities are executed at one time, at a less expense by far than work of the same merit can be done by any other process whatever;—in short, the Crystalotype is destined to supersede lithography, and wood and steel engraving almost entirely.

The Stock of the Company will be represented by 100 shares at $250 each—it will go into operation as a Manufacturing, rather than a Patent Right Company; that is, its object will be to manufacture pictures, and dispose of the same by means of Agents, rather than to sell rights to individuals to manufacture their own. The object of this is, to control the manufacture in order that the character and prices of the pictures issued may be sustained, and also enable the Company to make exclusive contracts with parties for special purposes; it is also intended that no parties shall be engaged in the manufacture or sale of Crystalotypes except Stockholders.

The holding of one share by a Photographist will entitle him to the dividends on the same—the agency for the Public Pictures of the Company, and the privilege of having his customer's daguerreotype copied—but a knowledge of the process, instruction in the same, and the right

to practise the art, will involve the purchase and holding of a second share by the same person, together with the giving of bonds neither to teach the Art or impart the secret to others,—in other words, the charge to any one party, for the right to execute pictures for their retail customers, will be $500.

As the company will provide, upon an extensive scale, everything necessary to produce good pictures at the lowest possible cost, it must, as a general rule, be for the interest of all photographists to send their daguerreotype to the company's manufactory to be copied in preference to being at the expense of a full right—the sale of the published pictures of the company (public men, views, &c.) and of their customer's crystalotypes will give a good business of itself, while the dividends upon the shares held will in time pay for them.

The number of shares will be but one hundred; and it is proposed that the operatives, Trustees, &c., shall all be stockholders, and there is already a call for crystalotypists to go abroad on account of pictorial magazines; and as there is a large extent of territory to cover, the sale of rights must necessarily be limited to one in each place, immediate application should be made by those who desire to secure them.

The following gentlemen have been named as Trustees:—

CALEB S. WOODHULL,
S. F. B. MORSE,
ED'W. ANTHONY.
} Trustees.

— A process upon glass by Hydrofluoric Ether was recently discovered by M. Le Gray, who directs as follows;—

"The Fluoride of Potassium and Soda dissolved in alcohol 40°, mixed with sulphuric ether, and afterwards saturated with collodion; I afterwards react with acetonitrate of silver, and thus obtain proofs in the camera in five seconds in shade I develop the image by a very weak solution of sulphate of iron, and fix with hyposulphite of soda. I hope, by this process, to arrive at great rapidity. Ammonia and Bromide of Potassium give great variations of promptitude. As soon as my experiments are complete, I will publish the result in an Appendix. This application upon glass is very easy. The same agents employed with Albumen and Dextrine, give also excellent results, and very quick.

I have also experimented with a mucilage produced by a fucus, a kind of seaweed, which promises future success. I hope, by some of these means, to succeed in taking portraits in three or four seconds."

— We call special attention to the advertisement headed "RARE CHANCE," in this month's number, offering for sale a Daguerrean Gallery in Charlotte, N. C. From the character of the gentleman advertising we can assure those who may feel disposed to purchase, that full confidence may be placed in his representations, and that a better opportunity never presented itself to a young man of limited means for not only securing a competency, but for saving money. Prices are good, and customers numerous and liberal. On this point we speak advisedly, as we happen to know the quantity of material annually used in the establishment.

— We are constantly in the receipt of applications for "first rate operators" until our knowledge of such "*rara avis*" out of employ is "used up." We would therefore request all whom it may concern to write us, giving their location, qualifications and references, and we will endeavor to provide for the wants of our friends who have more business than they can attend to themselves.

— Mr. Von Schneideau, of Chicago, has been to Washington to secure a patent for a new style of daguerreotype case, and on his return called to see us, and gratified us with the assurance that his business has continually improved since he settled in Chicago. His success is well deserved, for he is a careful and excellent manipulator.

— Messrs. Stevens & Butler, of Portland, Me., recently visited New York for the first time, and expressed themselves highly gratified with the New York daguerreotypes. They contemplate purchasing the right to Whipple's Crystalotype, for Portland. We trust our eastern friends will call upon John Sawyer & Co., of Boston, before they return home, for they will find Mr. Sawyer a most agreeable and obliging gentleman.

— J. J. B., Mich., and others, are informed that the "*Dictionary of the Photographic Art*" is not yet issued, but that it is passing through the press as rapidly as paper-makers, compositors, stereotypers, and press men will permit. We will print a few pages of it in our next to give our readers an idea of its style and quality.

— The model ought always to be placed in shade, and one side a little more illuminated than the other. It is a great want of elegance to place the head in the same position as the shoulders; if the face is full, the body should be placed three quarters round, and *vise versa.*

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the BEST FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense.

E. ANTHONY.

THE

PHOTOGRAPHIC ART-JOURNAL.

Vol. 5. MAY, 1853. No. 5.

PRACTICAL TREATISE ON PHOTOGRAPHY UPON PAPER AND GLASS AND METALLIC PLATES.*

TRANSLATED BY MRS. A. L. SNELLING, FROM THE FRENCH OF M. AUBREE, CHEMIST,

Associate member of the Linaen Society, Chemical and Physical, of Paris.

Academy of Sciences.

NOTE UPON PHOTOGRAPHY, BY M. BLANQUART EVERARD, (DE LISLE.)

ACCELERATING METHODS.

HAVING learned by an amateur who had been visiting Germany, that a skillful photographist of Munich, M. Laucherer, whitened the wall of his dark chamber to obtain more sensibility to the exposition. I have thought that we might be deceived in the character of the refractions of light in the camera. The experiments which I have made prove in effect, that the more care I take in preventing the reflection of light produced by the object-glass in the interior of the box, the more I diminish the photogenic action upon the sensible film.

Thus, I not only tapistry the dark camera with white paper, but more, I whiten the interior of the tube at the extremities where the objects are seen, and which the opticians garnish black. In this condition, I have produced upon a plate of silver, albumen or paper, the four results following.

1. Formation of the image in less time than by exposition in the dark chamber.

2d. Formation of the image by a light insufficient to obtain the same image in the dark camera.

3d. Uniformity in the impregnation, the white not being destroyed before the development of the shadow.

4th. Resistance infinitely less of the colors which resist the photographic action, such as red, yellow and green.

Thus, not only the results are better in view of the art, but the photographic power of the object-glasses is doubled by transforming the dark chamber into a white one.

It will be puerile here to deduce all the consequences which result from the experiments the most precious that can be desired in the state of improvement to which photography has attained upon silver, glass, and copper.

PREPARATION OF THE ALBUMINATED PLATES FOR THE EMPLOYMENT OF FLUORIDE, BY M. BLANQUART EVERARD. (DE LISLE.)

"The fluoride which gives an extreme sensibility to the preparations of the albuminated plates is very difficult of employment when the plates are prepared in the usual manner, this substance following the albumen on the plate and often compromising the result.

"The following preparation does not present this inconvenience:

"Use the albumen without mixing it with any chemical substance.

"Place the plate which you wish to albumenize upon a support and heat it by an alcohol lamp as long as the hand can bear the heat of the glass, then pour on the albumen to excess, and heat the water, but not enough to coagulate the albumen. Then

* Continued from page 210, Vol. 5, No. 4.

raise the plate from the support, pour off the excess of albumen, and place it in a basin containing acetic acid. Heat gently the bottom of this basin; the vapors of this acid congeals the albumen which then assumes a milky aspect.

When the effect is complete, heat it again, but with a very slow heat, then to dry it, lay the plate upon a marble slab in the open air.

"To iodize the albumen, plunge the plate into a bath containing 1 part of nitrate of silver, 25 parts of distilled water; then dry the plate placed vertically upon one of its angles. Then plunge it into a bath containing 1 part of iodide of potassium, 25 parts of distilled water, and leave it to dry vertically. The plates thus iodized are very durable.

"When they are prepared for exposition, it is sufficient to expose them to the aceto-nitrate, and add 1 or 2 drops of fluoride; we increase the sensibility by means of this fluoride. Experience only, can then direct us in the operation.

Society of Encouragement.

LETTER FROM M. HUMBERT DE MOLARD.

MONSIEUR LE PRESIDENT.—Since Mr. Niepce has initiated us into his albuminous preparation, it is incontestable that the triumph gained by photography upon paper is assured. Unfortunately this process with albumen upon sheets of glass is yet in a state of infancy, surrounded by uncertainties and difficulties, of which the principle is, without contradiction, the regular application of albuminous liquid to the surface of the glass.

"I have the honor to submit to this meeting of the society a model of a basin by the aid of which this film of albumen is applied with facility and exactitude. I would observe that since the two years it has been in use, as many of my colleagues as have tried it pronounce it to be productive of good results.

"The four views of Rome (large plates) executed at Rome by M. Eugene Constant, my coagitor, will not, I hope, leave any doubt in this respect.

"The two portraits (half size) by the same process upon glass, prove that we can soon by means of albumen operate upon animated nature and upon plates of large dimensions. The plates of glass besides being albuminated so long and becoming so hard, can, I think, receive a marked accelleration at first by the presence of camphor in the preparations, but more yet by degrees of coagelation more or less concentrated.

"The large plate portraits are made upon paper without sizing, purified at first by acids, and then rendered translucent by an alcoholic solution of diverse gums, elemi, copaiva, camphor, &c.

"This process, entirely new, will end, I hope, in giving the results of very superior fineness to those at present obtained by ordinary processes.

In order better to give the idea of the work preparatory to the process, I believe I ought to add here; 1, sheet of primitive paper without any preparation; 2, charged with the impressionable film, in a word, prepared to be placed in the dark camera; 3, a sort of key to this preparation.

"In short, I may observe, that all the proofs of which I have the honor to present to the Society are prints of views, or portraits executed in positives, by a process like that of the chloride of silver employed at present; nothing black—nothing crude. The gradation of the tints is observed to be very pure both in the foreground and in the distance, and presents to the eye the richness of the warm tones of the different colored sepias, the varied tints of which are innumerable.

Letter of M. Humbert du Molard to the Society of Encouragement, upon the Photographic Images he has obtained upon paper.

MR. PRESIDENT.—I have the honor of presenting to the Society of Encouragement, some daguerrean experiments, with a description of the diverse means by the aid of which they have been obtained.

I occupy myself only with animate nature, persuaded that the reproduction of inanimate nature will be nothing more than by-play, only that the plate of albuminated glass formed so hard, so impressionable to the light, will be brought to the condition necessary to vitality for the perfection of the portraits made in the shade.

All the proofs have been made after nature in thirty, forty, or fifty seconds, with an object-glass of 33 centimetres of focus.

At this time I use a light solution of

camphor in the acetic acid and introduce into it a very small quantity of albumen; this serves a double purpose, for the acetic acid weakens the albumen in its tendency to coagulate too strongly, and by the camphor, to introduce into it an element of elasticity; in short, to keep the film of the plate from the ardor of the solar rays.

The idea was good, for the results were capricious and exceptionable. Nevertheless, the true cause, the principal of acceleration was found; I am certain of it, and to succeed without agitating any longer, we have only to confide to the less energetic agents the mission of modifying the albumen accordiug to its natural tenacity.

All the deliquescent syrups, dextrine, cassonade, meal, molasses, serum of milk, mucilages of pepins, of grain, &c., have the power to attain this end. I shall probably cause a smile at the idea that the jelly of currants will do as well, and illustrate the truth, the saccharine acid of the one, the mucilaginous property of the other, and the gluten of the most part, act upon the albumen the better to dispose it to photographic manipulations.

The juices of dextrine, of amidon, of tapioca, &c. ought to be rejected on account of the insolubility of the capsules that these liquids hold in suspension, and which by transparency mercurialize the surface of the daguerrean image.

15 or 20 per cent. of molasses or of syrup, of cassonade, or of meal at 18 degrees of density, and 1 to 100 of iodide of potassium, added to the albumen, gives fine and rapid results.

If we wish to operate with the thick mucilages of quinces and other such substances, reverse the proportions. The mucilage is the principal, and 20 or 25 to a 100 of albumen, added with 1 to 100 of iodide of potassium, suffices to impart to the mass of liquid sufficient tenacity to resist several washes,

6 drachms of juice of quinces, plunged into 250 grains of cold water, give in one night a mucilage of a convenient thickness and of a convenient transparency equal to the albumen.

I always expose my sheets of glass to a heat of 40 or 45 degrees, at the same time I always submit it to the action of a double bath maintained at 45 degrees, or very near its state of coagulation. From this results an accelerating sensibility very marked, produced by the agitation of the molecules of the albumen.

Here is another process, different in its preparations from those employed at the present day.

The fine results which for a long time have been given me on paper have caused me to try the application of glass, and this is the result of my experiments.

I cover the glass with a film of albumen and then leave them to dry.

I coagulate them by an immersion in a bath of nitric acid chemically pure, of the strength of 7 or 8 degrees, and pass them into another bath of ammonia to neutralize the acid. These two immersions ought to be rapidly executed in the space of some seconds and without the least interruption. In this state the sheets of glass coagulated present an appearance slightly milky. We pass it through pure water, then place it upon one of its angles to dry.

Well dried, I place it upon a support, and by the aid of a soft pencil, I cover it with a film of a solution of iodide of silver, which is prepared in the following manner:

Distilled water,.....	25 grs.
Iodide of potassium,.....	40 "

Distilled water,.....	20 "
Nitrate of silver,.....	20 "

Pour gradually the solution of silver into that of the iodide of potassium. In a certain measure it forms an abundant precipitate, but does not prevent its solution in the iodide of potash to excess; I proceed and arrest the mingling of the silver which the iodide of potassium cannot longer dissolve with precipitation, in this state, this solution of iodide of silver ought to be limpid, and ought to be able, without difficulty, to support a small addition of water. It is in this compound of iodide of silver that I place a sheet of glass. The plate is plunged into the water where it soon takes a yellow tint from the effect of the iodide of silver which is instantaneously precipitated from its oxide.

TO BE CONTINUED.

DRESS—AS A FINE ART.*

BY MRS. MERRIFIELD.

PART III. THE HEAD.

THERE is no part of the body which has been more exposed to the vicissitudes of fashion than the head, both as regards its natural covering of hair, and the artificial covering of caps and bonnets. At one time we read of sprinkling the hair with gold-dust, at another time the bright brown hair of the color of the horse-chesnut so common in Italian pictures was the fashion. This color, as well as that beautiful light golden tint sometimes seen in Italian pictures of the same period, was frequently the result of Art, and receipts for producing both tints are still to be found in old books of "*secreti.*" Both these were in their turn discarded, and after a time the real color of the hair was lost in powder and pomatum. The improving taste of the present generation is perhaps nowhere more conspicuous than in permiting us to preserve the natural color of the hair, and to wear our own, whether it be black, brown, or grey. There is also a marked improvement in the more natural way in which the hair has been worn during the last thirty years. We allude particularly to its being suffered to retain the direction intended by nature, instead of being combed upright and turned over a cushion a foot or two in height.

These head-dresses, emphatically called from their French origin "têtes," were built or plastered up only once a month; it is easy to imagine what a state they must have been in during the latter part of the time. Mdme. d'Oberkirche gives, in her Memoirs, an amusing description of a novel head-dress of this kind. We transcribe it for the amusement of our readers.

"This blessed 6th of June she awakened me at the earliest dawn. I was to get my hair dressed, and make a grand toilette, in order to go to Versailles, whither the Queen had invited the Countess du Nord, for whose amusement a comedy was to be performed. These Court toilettes are never-ending, and this road from Paris to Versailles, very fatiguing, especially where one is in continual fear of rumpling her petticoats and flounces. I tried that day, for the first time, a new fashion—one, too, which was not a little *genante,* I wore in my hair little flat bottles shaped to the curvature of the head; into these a little water was poured, for the purpose of preserving the freshness of the natural flowers worn in the hair, and of which the stems were immersed in the liquid. This did not always succeed, but when it did, the effect was charming. *Nothing could be more lovely than the floral wreath crowning the snowy pyramid of powdered hair!*" Few of our readers, we reckon, are inclined to participate in the admiration of the Baroness so fancifully expressed for this singular head-dress.

We do not presume to enter into the question whether short curls are more becoming than long ones, or whether bands are preferable to curls of any kind, because, as the hair of some persons curls naturally, while that of others is quite straight, we consider that this is one of the points which must be decided accordingly as one style or the other is found to be most suitable to the individual. The principle in the arrangement of the hair round the forehead should be to preserve or assist the oval form of the face; as this differs in different individuals, the treatment should be adapted accordingly.

The arrangement of the long hair at the back of the head is a matter of taste; as it interferes but little with the countenance, it may be referred to the dictates of fashion, although in this, as in everything else, simplicity in the arrangement, and grace in the direction of the lines, are the chief points to be considered. One of the most

* Continued from page, 202, Vol. 5, No. 4.

elegant head-dresses we remember to have seen, is that worn by the peasants of the Milinese and the Ticinese. They have almost uniformly glossy black hair which is carried round the back of the head in a wide braid, in which are placed at regular intervals, long silver pins with large heads, which produce the effect of a coronet, and contrast well with the dark color of the hair.

The examples afforded by modern sculpture are not very instructive, inasmuch as the features selected by the sculptors are almost exclusively Greek, whereas the variety in nature is infinite. With the Greek features have also been adapted the antique style of arranging the hair, which is beautifully simple, that is to say, it is parted in the front and falling down towards each temple, while the long ends rolled lightly back from the face so as to show the line which separates the hair from the forehead, or rather where it seems as it were to blend with the flesh tints—an arrangement which assists in preserving the oval contour of the face—are passed over the top of the ear, and looped into the fillet which binds the head. The very becoming arrangement of the hair in the engraving, from a portrait by Parmegianino, is an adaptation of the antique style, and is remarkable for its simplicity and grace. Not less graceful, although more ornamented, is the arrangement of the hair in the beautiful figure called "Titian's Daughter." In both these instances, we observe the line—if line it may be called—where the color of the hair blends so harmoniously with the delicate tints of the forehead. The same arrangement of the hair round the face may be traced in the pictures by Murillo and other great masters.

Sir Joshua Reynolds has frequently evinced consummate skill in the arrangement of the hair, so as to show the line which divides it from the forehead. For some interesting remarks on this subject we refer our readers to an "Essay on Dress," republished by Mr. Murray from the "Quarterly Review." Nothing can be more graceful than Sir Joshua's mode of disposing of the hair when he was able to follow the dictates of his own good taste; and he deserves great credit for the skill with which he frequently treated the enormous head-dresses which in his time disfigured the heads of our country-women. The charming figure of Lady Harrington would have been perfect without the superstructure on her beautiful head. How stiff is the head-dress of the next figure, also after Sir Joshua, when compared with the preceding.

The graceful Spanish mantilla, to which we can only allude, is too elegant to be overlooked; the modification of it, which of late years has been introduced into this country, is to be considered rather as an ornament than as a head-covering. It has been recently superseded by the long bows of ribbon worn at the back of the head, a costume borrowed from the Roman peasants. The fashion for young people to cover the hair with a silken net, which some centuries ago was prevalent both in this country and in France, has been again revived. Some of the more recent of these nets are very elegant in their form.

The hats and bonnets have, during the last few years, been so moderate in size, and generally so graceful in form, that we will not criticise them more particularly. It will be sufficient to observe that let the brim be what shape it will, the crown should be nearly of the form and size of the head. If this principle were always kept in view, as it should be, we should never again see the monster hats and bonnets which some years ago, and even in the memory of persons now living, caricatured the lovely forms of our country-women.

A GENERAL REVIEW OF THE DAGUERREOTYPE.*

BY M. A. GAUDIN.

Translated from the French of La Lumiere by W. Grigg, A. B.

ON THE FIXING WITH THE BATH OF SILVER AND ON FIXING WITHOUT "MIROITAGE."†

By the operation of fixing with the chloride of gold, the proof receives a metallic varnish, which appears to be an alloy of gold and silver; the deposit of the gold in an excessively light layer dulls the silver wherever it is exposed; which increases the tone of the blacks; the rough composition which forms the lights of the proof acquires, also, more lustre in each of the infinitely minute prismatic angles composing its tissue; an unpolished surface of greater brilliancy, therefore, and a firmer adherence of this composition results, also, from the interposition of the metallic varnish.

I have endeavored, without success, to substitute platina for gold; but not so with silver. Certain argentiferous liquids, under the influence of the pile, give extreme solidity to a proof; the lights take an extraordinary brilliancy, and were it not for the extreme tendency to crystalize, and produce a rough deposit which is natural to silver, this would be the best process to follow; but this crystalization of the deposit lessens the lustre of the blacks, and covers them with a bluish veil as soon as it appears. The whites, on the contrary, are never dark or tinged with blue, as occurs on solarized portions; by the use of the chloride of gold, in this case, a beautiful milk white is obtained, which gives a very remarkable model to the lights; this is the reason why fixing with the silver bath is invaluable for solarized impressions, which, without its aid, would otherwise have to be cast aside.

To fix the plates with the bath of silver, the best way is to plunge them entirely into a glass dish, filled with a solution of the cyanuret of potassium, prepared as stated in the chapter treating on the silvering of the plates; but this method renders necessary the varnishing of the back of the plate, and the employment of a plate of silver kept in view in the same bath, and communicating metallically with the coal pole of a battery of Bunsen, without mentioning a host of other precautions for immersing the plate, and determining the moment of withdrawal.

This process being advantageous solely for solarized impressions, a much more simple method should be practised, which avoids the employment of a dish, of the varnishing, and of the silver plate. It consists in pouring upon the plate washed with the hyposulphite and rinsed without drying, a small portion of the argentiferous compound, precisely as though it were to be fixed with the chloride of gold. It will be necessary only to clean with glazed paper the points of the fixing stand upon which the plate rests, the back of the plate itself, and the screw of the stand, in order to maintain a metallic contact. Before applying the electric current, it will be necessary to work the mixture of the argentiferous liquid with the water left on the plate by blowing on its surface with some sort of a pipe. This done, a leaf of beaten silver, like that used in silvering, is to be applied to the surface of the liquid, and the wire from the zinc pole of a battery of Bausen having been wound round the screw of the fixing stand, the silvering of the plate will commence as soon as the leaf is touched by a silver wire communicating with the coal pole. If the current passes well, it will be perceived by the very rapid diminution of the silver leaf, which will be incessantly displaced during the operation, and if, after the complete dissipation of the leaf in the deposit, the silvering is not deemed to be of sufficient thickness, a new leaf should be applied. It is to be well understood that this leaf of sil-

* Contiuued from page 73, Vol. 5, No. 2.

† From the word *miroir*, a mirror, possessing the quality and power of reflecting.—*Translator.*

ver is nowhere to be in contact with the plate, otherwise the current would pass without attacking it.

When the plates have thus been fixed, a new proof can be taken upon them, after a simple polishing, but if it should remove the pellicle of silver, it will be necessary to go through with the ordinary operations, to remove the image imprisoned between the two layers of silver.

It might be possible to render the silver less subject to crystalization, and more susceptible of fixing the blacks like gold, without producing a roughness in these portions, by adding some other metal to the solution, such as platina, copper, and even gold; I have made several experiments with the copper, the result has been the reverse; pure silver fixes better than the alloy of silver and copper.

At the time I was occupying myself with this process I presented to the Academy of Sciences an impression strongly solarized, one half fixed with the chloride of gold, and the other with the bath of silver; the portion fixed with the chloride of gold was black and modeless, while that fixed with the bath of silver was of a milk white and modeled in full light.

Proofs simply fixed with the chloride of gold are always reflectives, that is to say, are only visible through the reflection of the ground; this is a great imperfection; I have ever been endeavoring to discover a remedy for it, and although success may not have answered my hopes, or attended my efforts, I have not renounced making further researches in order to arrive at a complete result.

Ten years ago, while experimenting on the employment of the chloride of copper, I chanced, in using it mixed with bromine water, to obtain an unreflective impression, the whites of which had the solidity and aspect of ivory; this proof, thus fixed, was not photogenic, for, a number of years after I discovered a fragment of it which had been constantly exposed to the light without having changed.

This time I intend trying the action of volatile bodies with the view of forming upon the silver a black sulphate, as I mentioned in a preceding article. In the meanwhile I will briefly describe the process by the acids which has frequently given me beautiful results for views, and which might be used with advantage for impressions designed for the stereoscope.

The inequality of chemical composition, which exists in a daguerrean proof, between the light portions and the black, contain certainly the germ of numerous methods for fixing without reflection; in the blacks there is pure silver, and in the lights a deposit of a double salt of silver and mercury on a base of iodine, of chlorine, or of bromine. The difficulty is to blacken the silver, while paying scrupulous regard to the most fugitive lineaments of the deposit.

The more energetic agents, contrary to all expectation, transform these images, without changing in any particular their finish; but it will be necessary to be able to apply them instantaneously upon every portion of the surface of the plate at once, and to arrest with no less precision their corrosive action. The chloride of copper is of this class.

To regulate at will this corrosion, I have thought of using the inert chlorides by themselves upon the silver, aiding them by the addition of acetic acid acted upon by heat.

Acetic acid alone, aided by heat, dissolves the silver, without attacking the deposit which forms the image; a light engraving is thus produced which is visible to the eye, although insensible to the most delicate touch. When the acetic acid has united with the alkaline chloride, a moment arrives when the silver, at first corroded by the acid, becomes covered with a deep brown deposit, composed of chloride of silver in a certain state; a surface dark and unpolished is thus formed, which possesses a perfect adherence, and enjoys considerable cohesion. A proof then is thus produced, deprived of all reflection, and fixed more solidly than ever; but these proofs have the grand defect of becoming black when exposed to the light. In this unlucky transformation it is the lights which deepen in color, a greyish deposit is formed upon their surface which invariably blackens in the light; the black coating of the chloride of silver undergoes a reverse change of color, its black tone draws more upon a red.

I have hoped for a long time to have been able to remedy this grave drawback. I have tried all the acid agents, the alkaline, metallic, reducing, sulphurous, dis-

solvent, and I have only terminated with the palliatine; it is only the silvering of these impressions with the acid bath by the aid of the galvanic pile, which places these proofs beyond the effects of light.

To prepare a fixing liquid, mix together 3 parts of chloride of calcium in a concentrated solution of 7 parts very strong acetic acid, adding thereto a few drops of sulphate of iron dissolved, or a very small lump of green copperas; this addition appears to give a more beautiful black.

For use, this liquid is to be dissolved in ten times its bulk of water.

Instead of hyposulphite, the white cyanuret of potassium is to be employed, in the proportion of 1 grain at the least, to 5 at the most, with one pint of ordinary filtered water. For this operation, the plate having been again placed upon its support with its angles bent up to hold the liquid, the solution of cyanuret of potassium is to be plentifully poured upon it, moving briskly from one end of the plate to the other; as soon as the plate appears white, the water is to be poured upon its surface in abundance to drive off the cyanuret; and, after having freed the plate of the excess of water by inclining it a little, the diluted fixing liquid is poured upon one of its angles, the same as though fixing with the chloride of gold. When the bubbles begin to form, it will be necessary to drive them off by striking the support with a metallic body producing a dry blow.

On continuing the heating, the image, which at first appeared negative, will gradually become positive in the reflection of the white, and will very soon take an extraordinary relief; it will be at this moment a chemical engraving, and it will be necessary to remove the lamp to allow the temperature to equalize.

On applying the lamp again, a rough appearance will very soon arise in one portion of the plate; it will be necessary to allow the heat to rest there in preference in order to obtain, immediately after, the deposit. When the whole plate is covered with it, the liquid should be carried to ebullition until it covers with a rough coating the delicate whites which are obtained with difficulty; the fire is to be removed only when all brilliant portions, by the reflection of the white, have entirely disappeared; the proof is then fixed without miroitage.

The inherent defects of this process are in having almost constantly an appearance of marbling, accounted for, on examining it, by the first corrosion of the fixing compound,—in destroying the *mezzo* tint, and especially in producing impressions sensitive to light. The two first of these defects renders this process difficultly applicable to portraits; but for views of narrow dimensions made with exceedingly small openings in a strong light, they are insensible. I have obtained views of Notre Dame of infinite delicacy, which, were it not for the general blackening on exposure to the light, might have been used by the jeweller for ornamenting caskets.

I have only succeeded in totally nullifying the influence of light on the proof by silvering them by the action of the file with nitrate of silver and ammoniacal acid.

The plate being placed on the support, observing the precautions mentioned in this chapter for fixing with the bath of silver, after having washed it with plenty of water, on withdrawal from the bath, aceto-nitrate of silver will be perceived upon its surface, which may be equalized with the blow pipe. In order to determine the deposit of the silver, a silver blade fitted to the coal pole of the battery is to be agitated in the liquid. By this means, the whites become covered with a crystalline deposit of silver as white as paper. During this time, it will be necessary to keep the eye fixed upon the blacks, and to withdraw the silver blade as soon as it is perceived that crystals of silver are also deposited here and there.

The argentiferous ammoniacal nitrate of silver is prepared by dissolving one part of nitrate of silver in 20 parts of distilled water, then adding thereto a few drops of ammonia. This will form a precipitate which will be dissolved by the addition of acetic acid in excess.

The action of the pile should be extremely feeble; the charge should be 1 part of sulphuric acid to 50 parts of water, and acetic acid at the 10th; great care should also be taken that the metallic communication be perfect between the zinc pole and the screw of the support on one side, and the points and the back of the plates on the other.

I shall not rest much at present upon the description of this process hoping very

soon to be able to give a more complete method, founded on the employment of bodies reduced to vapor, and of the blacks on a base of sulphur, which cannot be effected by the light.

SECTION VIII.

ON THE FRAMINGS AND ON THE REPRODUCTION OF IMPRESSIONS BY ELECTROCOPYING.

When the proofs have been fixed with the chloride of gold, it is important they should be removed from the fumes arising from the laboratories and from dwellings, to do this, the most simple method is to frame them, taking care to paste some gummed paper evenly around the entire plate, in order to prevent the access of all dust, and sulphurous emanations, especially when the impression is to cross the sea.

If the air deposited formed a continuous pellicle, there would not be so much to fear in the alteration of the impression; but the fact is quite otherwise; the silver is in a great measure exposed or alloyed with the gold, and very often the proofs become covered with an irisated veil which takes a brownish tone gradually increasing in intensity until it ends in the total destruction of the picture. I have just been examining a proof made seven years since which has entirely vanished; while others which I have had for ten years are in a perfect state of preservation; on examination, I found that the proof which had thus become completely tarnished, had not been as sufficiently protected with the gummed paper as those which were finely preserved

I suspect, too, that the last wash contributed to this effect, if ordinary water is employed, which often deposits an imperceptible coating of sulphate of lime; it will therefore always be preferable to use distilled water in the final wash.

The most curious application of daguerrean proofs, is, without contradiction, their reproduction by electrocopy. The precipitation of a metal by the aid of the pile upon the surface of the proofs, reproduces them with so much fidelity that their identity is rigidly manifest, with this difference, which is of great advantage, that the counter impression has the natural position if the proof was inverted, as almost always happens.

The counter-impression results merely from the texture of the metal deposited, which is brilliant in the blacks corresponding to the burnished silver, and unpolished in the clear portions, corresponding to the crystalline deposit forming the lights of the impression.

By this process impressions on a gold, silver, or copper, surface may be obtained. The great difficulty is to prevent adhesion which often causes the failure of the operation. If a gold or silver surface is desired to be obtained, it would be necessary, to avoid the too lavish employment of these precious metals, to commence the deposit with baths of gold or silver, and to thicken it afterwards with a bath of sulphate of copper. I am totally ignorant, whether in this case it would not be still more difficult to prevent adhesion, and, while in doubt, it would be better lightly to gild or silver the copper; and for this reason I shall confine myself to electro-copying with the sulphate of copper.

The primary precaution to be taken is to protect the back of the plate from the metallic deposit by covering it with varnish. A varnish made of india rubber softened in benzoin and dissolved in ether resists the bath perfectly well; I have employed it with success, but this preparation requires ingredients which cannot easily be obtained everywhere; it would be preferable to use the much simpler composition described in the work of M. le baron Gros, and which that skillful artist asserts, completely resists the silver baths, the most corrosive of all on account of their alkaline reaction.

Take some copal varnish, such as is sold by all paint dealers under that name; pour some into a cup, and mix with it some chrome yellow, until it attains a considerable consistency; the varnish thus thickened is applied in a light coat with a flat brush, the same as in varnishing a picture, and the plate is afterwards placed in a horizontal position, and left twenty-four hours to dry.

If there is any hurry, (and this twenty-four hours delay, brings the thought instantly to my mind) it will be sufficient to moisten the plate with the solution of collodion, which is to be found at the present day in the hands of every one, doubling the coat if one will not suffice; it is probable, however, that a single coat of concen-

trated collodion, and that of very ordinary quality, will be sufficient to insulate the back of the plate.

In order to obtain counter proofs in copper, which may remove nothing from the original, it is necessary that the latter has been fixed with the chloride of gold. With a pair of scissors, a thin strip of the copper is to be separated at the end, yet still adhering to the plate, and is ultimately to be joined to the wire of the zinc pole. The varnish being dry, the plate is to be passed through the hyposulphite of soda, then rinsed with plenty of water, and without waiting for the water to run off, the plate is to be immediately immersed with a single plunge into the vessel filled with a *concentrated* solution of sulphate of copper, perfectly clean, and more especially, free from all dust on its surface. It is only when the plate has been immersed in the sulphate of copper, that it will be necessary to effect the junction of the plate with the zinc pole of an element of Bunsen. If the communication be established before the immersion there would be great risk run of causing adhesion; at least such is the result of experiments I have expressly made.

It is well understood that the wire of the coal pole is to be in communication with a plate of copper, freed from all rust, &c., with some glazed paper, of nearly the same size as the proof to be reproduced; a cast-off plate, the silver side of which has been varnished, will fulfil this office perfectly well.

At the commencement of the operation, the two plates are to be kept in view at the greatest possible distance; but from the moment the proof appears covered with a continuous coating of copper, the plates are gradually to be brought nearer together, until the space between shall not exceed 5 1-4 of an inch; by this means, the deposit will form with greater rapidity.

In order to avoid a pulverulent and dark deposit, it has been recognized that the liquid should be kept continually saturated with the crystals of sulphate of copper in excess, kept in the upper portion of the bath in a sort of wooden hurdle; if the liquid should become agitated, it would be necessary to restore its clearness by adding thereto a little diluted sulphuric acid.

A single element of Bunsen will suffice on commencing, but it will be well, as soon as the first layer of copper is formed, to establish a battery of 3 or four elements, if it is desired to obtain a layer in a few hours. These elements should be in a good condition, the nitric acid should be employed concentrated, and the sulphuric acid diluted in 25 parts of water, for a carefully amalgamated series: with zincs divested of mercury, the acid should be diluted to a point where the hydrogen gas is disengaged in very fine bubbles, without tumultuous effervescence.

I have obtained a copper fit for detachment in a few hours, with two elements of Bunsen. A similar result is not always so easily obtained: ordinarily 12 hours are necessary, and even 24 hours with a single element.

The thickness of the copper deposited may be estimated by withdrawing it from the bath, and examining the size of the grain and the thickness on the edge of the plate; the weight perceived by poising in the hand is also an indication of the thickness acquired.

When the plate is deemed to be sufficiently thick to be detached without rupture, the proof is removed from the bath to be washed plentifully with water and to be dried in the blotting case and in the open air. Every application of heat puts an end to the adherence.

The proof being well dried, if the layer of copper deposited is not too thick, and if it is free from blisters, the whole is to be cut, the plate and copper deposited, as near the edge of the plate as possible with a pair of scissors, repeating the operation on each of the four sides; then, with a fine file, the copper leaf is to be detached, by working the file from the silver towards the copper around the whole circumference of the plate. When, by this means, the copper seems to be fairly loosened on every side, it is a good omen; if, however, the copper is very thin, it will be more necessary to perform this operation in a very delicate manner.

A narrow slit of copper having been detached the whole length of the plate, the blade of a wooden knife is to be interposed between it and the silver, and the copper with a slight effort is to be pressed upon the knife. If it is perceived that the copper is detached with freedom, continue to raise it gradually, but never roughly,

moving the knife forwards if necessary, under the thumb, in order to keep the power on the middle of the plate.

For a thick plate, the employment of the knife would be useless. It will suffice to compress both plates with the fingers of each hand.

If the first proof has succeeded well, a second may be taken from it, and perhaps a third. I say perhaps, because it is rare that adhesion does not take place, in preference, on proofs which have already given numerous casts.

These casts may be separated as thin as a sheet of letter paper; but for this, it is necessary to obtain a strong and very dense copper, which depends on the union of numerous other conditions determinable with difficulty. From my own individual experiments it has appeared to me that the commercial sulphate of copper gave a copper of much greater solidity than the pure sulphate; it was also better when the charge of the pile was strong, sufficient to disengage hydrogen gas at the surface of the copper, forming upon it vertical channels, well known to experienced operators. This will be a reason for forming soluble electrodes of waste plates, without even taking the trouble of varnishing the silver.

These copper casts may be perfectly well preserved, by protecting them, like ordinary impressions, from the injurious effects of the air by framing; but it is necessary to abstain from placing them in contact with any liquid; the breath even, condensing on their surface, very soon produces oxydation, which manifests itself in an appearance of green marbling.

In order to regulate the action of the pile, it will be advantageous to set a galvanometer near the wires, which is easy when a battery composed of a number of elements at a high power is employed. It will be sufficient to place an ordinary compass near one of the wires, fastening this wire with nails to the table, in the north and south direction of the compass. The communication being established the needle will deviate an undeterminable number of degrees; there will, therefore, be a certainty that the current is passing, and the angle of deviation will indicate by its contraction, the diminution of the current.

SECTION IX.

ON THE ENGRAVING OF PICTURES FOR THE REPRODUCTION OF PROOFS BY SUPERPOSITION.

Daguerrean proofs posses all the attributes desirable for engraving by the action of acids, being composed of an unchangeable coating, deposited upon a leaf of silver, which is easily corroded by many chemical agents.

By this means, the protected portions should correspond with the lights, and those corroded with the blacks, as the picture precisely requires, and as in the case with engravings with aqua fortis; the proof, moreover, impressed on paper, should be in the natural position. But there is much yet to be done by practice to realize the promises of theory.

This want of success arises, 1st. From the extreme delicacy of the dotting which forms the mezzotints, and, 2ndly, from the want of cavity of sufficient extent in the blacks.

In fact, an engraving fit for drawing off, is composed of deep furrows, produced either directly by the graver, or indirectly by the interstices of a grain deposited upon its surface, or by the dotted cavities in aqua fortis engraving. The blacks are due to the great multiplicity of these furrows upon one and the same point; while the corrosion of the acids upon a daguerrean proof will hollow it out to a great depth, without leaving any asperities within it, which are indispensable for retaining the printing ink. If, for example, there were open windows in the picture, forming blacks of some extent, the acid would hollow out a cavity of the same extent; but the bottom of this cavity would be smooth, and the ink would adhere but slightly.

M. Douné was the first who thought of engraving daguerrean proofs; his first experiments were very remarkable, and no one doubted that the art would soon reach perfection. He employed an expeditious and very simple process.

Upon a proof, taken on a plate of a very high number, carefully washed with hyposulphite, and dried with distilled water, he poured a mixture composed of three parts of pure nitric acid, and four parts of dis-

tilled water, after having surrounded the edges of the plate with a thick coat of engravers' wax, forming a sort of basin: in a short time a brisk effervescence, due to the disengagement of the nitrous gas during the dissolution of the silver; as soon as he deemed the graving sufficiently deep, he washed the plate in a plentiful bath of water.

He thus obtained extremely delicate engravings, from which forty impressions may have been taken; they were, nevertheless, wanting in vigor, for the reasons that I stated on commencing; they had a greyish tint almost uniformly.

It has since been thought of working the proofs by the pile, placing them in an acid or metalliferous bath, in communication with the coal pole of an element of Bunsen, which is the pole of oxydation, or of departure. Engravings of high finish have been the result, but so to speak, of an impassable texture, the impressions of which when drawn from the press, did not possess the appearance of copper plate.

To supply this, M. Fizeau thought of covering the engraving after the primal corrosion, with some greasy substance, filling up the most minute cavities, leaving the outer portions free, which he cut off with great care; in this state the proof was gilded with the pile, then disembarrassed of its greasy coating with some suitable dissolvent. After this operation, the portions already corroded, was vigorously attacked by the nitric acid, passing over those parts which had received the gilding.

By the aid of this improvement, M. Fizeau has been enabled, for proofs of statues taken in a bright light, to obtain plates of decided vigor; delicate views, submitted to the same treatment, have always been much inferior to proofs on paper.

It is doubtless the increasing improvement of proofs on paper which has caused the abandonment of the engraving of daguerrean proofs; the small number of middling impressions which may be drawn from them is, in fact, a great obstacle to this branch of art; it might be remedied by forming images upon plates of tempered steel, silvered with the pile. I thought of it more than ten years ago. I silvered a plate of tempered steel by rubbing it with a solution of chloride of silver dissolved in hyposulphite of soda; the proof succeeded, but not so the engraving, the silvering no doubt being imperfect. With the resources presented by the pile at the present day, it is certain that the production of such engravings should become greatly increased. It would be necessary, however, to employ the hand in order to give them vigor; this would be a rather difficult operation, which could only be performed with a diamond graver.

No effort has been made, that I am acquainted with, to reproduce a daguerreotype by lithography. Nevertheless, this art, on the other hand, would give every desirable vigor, since the blacks depend, in lithography, solely upon the chemical nature of the surface, and in no wise on its conformation; the following would be my mode of proceedure;

A piece of waxed silk of the size of the proof to be taken on stone, is to be covered with an excessively light coat of litrographic ink dissolved in alcohol. Upon this waxed silk a daguerrean proof, washed simply with hyposulphite, and rinsed with distilled water, is to be impressed with some force. I have met with perfect success in the operation with the waxed silk alone, which is a precedent of good augury. If the coating of lithographic ink is exceedingly light, the retentive property of the waxed silk must increase, and its reception of the impression will become still more facilitated.

The impression being successful, one great step will have been gained, nothing more remains than to reconvey to the lithographic stone, which, for this purpose, is to be finely polished with water and pumice stone, the waxed silk, covered with a few sheets of bibulous paper, is to be pressed in a screw press: for greater success, the stone should be warmed, and the whole is to be placed for a few hours in the press, in order to give the lithographic ink time to react upon the stone.

It is evident that whenever the photogenated coating covers the silk, the ink cannot act on the stone, and its dryness, moreover, will prevent its adhering to it, so that after the removal of the silk, the stone will remain unsullied wherever it has rested; all that is now necessary is that the plate undergo a slight acidulation with an excess of gum arabic.

As the case actually stands, the result

of this operation would be entirely different from that of the plate engraved by the acids.

Every portion of the silver exposed represented upon the waxed silk by a continuous coat of lithographic ink, will produce a space, covered with a greasy film of like extent, upon the stone, which will be black.

In order not to fall into the contrary excess, it will be necessary to spread the waxed silk with an *infinitely thin* coating of lithographic ink, to avoid crowding it, which might cause the blacks to encroach upon the lights.

This process appears to me to have a fair chance of success, and I shall not fail to prove it in my very next experiment.

SECTION X.

ON THE PRODUCTION OF PICTURES WITHOUT MERCURY BY MEANS OF CONTINUATING GLASSES.

The employment of continuators furnishes the most simple method of obtaining pictures from nature; unfortunately the necessary time of exposition is too long for taking portraits by this process, with iodine alone. With the compositions of which bromine forms an ingredients, no image at all appears; but the chloride of iodine and the red glass, on the contrary, may be associated together, and act with extraordinary celerity.

The coating of iodide of silver in the condition in which it is placed by the ordinary iodizing, is insensible to rays transmitted by a homogeneous orange yellow glass: I say homogeneous, because the glass often obtains views that are clearer than other portions, which allow the light to pass through white; it is therefore necessary before using the glass, to assure ourself that the direct solar light when transmitted through it and received on a sheet of white paper behind, shows no portion clearer than another.

The glass being considered perfect, is fitted to the upper part of a rectangular box closed with a cover sliding in a groove.

The orange-yellow glass may be used in two ways for the production of the picture; that is to say, either by finishing the image in the mercury box, after insolation with the yellow glass, or solely by insolation with the glass. The first method presents no advantage, since it complicates instead of simplifying the operation; it requires always an exposition in the camera which may be reduced three quarters, that is to say, which requires one-fourth of the time necessary for forming an image, according to the original process of Daguerre, with the iodide of silver and mercury; which is fifteen times longer than with the accelerating substances. To bring out the image without any intervention of mercury, the exposition in the camera should be ten times as long as when working with accelerators.

M. Edward Becquerel was the discoverer of the continuating action of certain colored glasses.

These glasses transmit rays only incapable of forming an image by their action alone, kept up as long as may be wished. These rays are deprived, he says, of every exciting faculty. He had demonstrated this truth on photogenic papers. M. Baron and myself have only applied this process to the daguerrectype.

Proofs brought out with the yellow glass without mercury are therefore objects of mere curiosity. They far surpass, however, mercurial proofs in the fineness of the grain, and often their tone, which generally is rather pale, acquires after fixing in the ordinary manner, an incomparable richness in the shading.

I ought to forewarn operators that success is not met with every time, often there is no appearance at all of any image. The plate must be polished in the most faultless manner, and the iodizing carried to a reddish yellow. This iodizing must be performed in perfect darkness, and a last coat must be given, after having glanced very rapidly over the plate; it will be easily understood that the last impression received will be strongly developed by the glass.

By reason of the length of exposition in the camera, which is ten times the ordinary time, this process can only be applied to views of monuments and landscapes.

On the termination of the exposition, the plate is to be passed from its tablet into the box, by the light of a taper, and even then taking care that the light does not fall perpendicularly upon it.

As soon as the box is closed, there is an

end to further trouble, and the pleasure of watching the birth and development of these images may now be enjoyed.

When the box has received its plate, it is to be placed in the sun, in such a manner as to cause the rays to fall perpendicularly upon the glass.

If the proof is to succeed, it will commence to show it at the end of a few minutes, but if ten minutes, or a quarter of an hour passes without any indication of the appearance of the image, the operation may be considered a failure. If successful, the proof reveals itself suddenly, complete in every part, and appears negative ; gradually, however, it becomes positive, and acquires considerable vigor.

This process has the singular advantage of permitting the greater development of certain portions by concentrating the solar rays upon them with a lens of great diameter. The action of the rays may be arrested also when deemed proper.

I intend constructing apparatus of small dimensions, composed of a simple wooden box, provided at one extremity with a lens of bluish glass, and having the plate on the other, which will thus find itself placed in anticipation ; a piece of ground glass, serving only to give an idea, if necessary, of the angle of vision ; a mercury box, a plate box, and a box with the yellow glass, will complete the apparatus, which, thus reduced, is extremely portable, and might become the source of agreeable pastime.

As I have observed in another chapter, *pure* red glass brings out the impression produced upon a plate prepared with the red chloride of iodine ; in this case, the time of exposition, instead of being tenfold the ordinary time, may, on the contrary, be ten times less than when working with the accelerators ; but it is necessary to follow up the action of the red glass with the mercury bath.

The plate should remain at least a quarter of an hour beneath the glass traversed by the direct rays of the sun ; this last process, by reason of its extreme celerity, would be applicable principally to portraits, for the success of which, the shortness of the time of exposition has much more influence than is commonly believed.

M. A. Gaudin.

TO BE CONTINUED.

OPTICS.*

PART IV.

SECTION I.—VISION.

ONE of the most wonderful senses of animal life is that of vision. Without it we lose one half the enjoyments of our existence. Without it the world to us would be all gloom and a dreary waste. It permits us to contemplate all the majestic works of God, not only upon earth, but in the vast regions beyond our own atmosphere.

The eye is, by turns, a microscope and a telescope, being adapted to the purpose of viewing objects very near, or of extending its field of sight far into the distance.

On examining the structure of the eye, we find it a beautiful optical instrument, made in strict conformity to the laws of science, and perfectly adapted to be acted upon by light, so as to form an image of the objects from which light is reflected. There is, probably, not a creation which so fully indicates a Great First Cause, an All-wise and All-powerful Creator as that of the eye, and to endeavor to argue from it the possibility of this world and all therein having been the effect of chance, would be as absurd as to assert that an engine got up its own steam and propelled the boat.

The eye when viewed superficially or outwardly, consists of the iris and pupil, but anatomical dissection has demonstrated

* Continued from page 234, Vol. 5 No. 4.

that it consists of many other parts. On looking at the eye, as it rests in the head of man, three distinct portions or divisions are perceived, the iris, pupil, and the white. The white part surrounds the iris and is call the sclerotic coat; this is continued inwardly within the orbit around the back part of the eye-ball, and is formed of a dense membrane, which includes, as in a bag, the other parts of the eye. It is perfectly opaque, and therefore is not continued over the front of the eye, but joins the transparent cornea which differs from it in being perfectly pervious to light, therefore serving like a window, to admit into the interior of the eye the images reflected upon it from surrounding objects.

Included within the cornea is the iris, a kind of colored fringe, either of a brown, dark, or greyish blue color. The pupil occupies the centre of the eye, and is a dark circular space of variable dimensions, through which the rays of light pass into the chambers of the eye.

The interior eye, besides consisting of portions of the exterior membranes, also contains the choroid coat which forms a lining to the sclerotic coat, and on its opposite surface is covered with a black pigment, on which lies the interior coat of the eye, called the retina, a delicate reticular membrane expanded over the posterior chamber of the eye and proceeding from the optic nerve, through which the sensation of sight is conveyed to the brain. The interior of the eye is filled with three substances called humors; the aqueous humor, the crystalline humor, and the vitreous humor. The first is the fluid situated immediately behind the transparent cornea, and chiefly in the point of the iris; the second is situated directly behind the iris, being a solid transparent lens, more convex behind than before; the third is a kind of viscous solid mass, of a medium consistence compared with the other two, occupying the posterior chamber of the eye, supporting the other parts, and contributing chiefly to preserve the globular form of the eye. Between the aqueous and crystaline humors is the pupil or opening in the iris through which light is admitted into the eye; and behind the iris the crystalline humor or lens is suspended in a transparent capsule, by the ciliary process which proceeds from the iris; thus, we find, that the eye has four coats or membranes as above enumerated. These are all situated in the cavities of the skull, called the orbits, and in shape are between an oval and a sphere. Various muscles are attached to various parts of the eye-ball and to the orbits, which by their contraction give a certain degree of lateral rolling motion to the eye, and thus assist in directing the sight at pleasure towards particular objects. Above and below the eye-ball are the eyelids provided with a fringe of hair, termed eyelashes, also moved by muscles, which serve to guard the eye from dust and screen them from a too intense light. There are also glands for the secretion of a fluid to moisten the cornea, and by the motion of the eyelids keep its surface clear, and in a state proper to yield perfect vision.

The great purposes of vision are to distinguish the magnitude, form and distance of objects. These are effected by means of what is called the visual angle, or the angle under which objects are seen; the intensity of light, shade, and color, the divergence of the rays of light, and the convergence of the optic axis.

SECTION II.—THE VISUAL ANGLE.

The field of view is the open space around us in which objects are seen, but it is not possible for the eye at one view to take in the whole circle of the horizon; for when a person stands with his face to the east or west, he cannot see the opposite horizon; nor can he, at one view, see both the north and the south, because the range of human vision is less than half the circumference of the horizon. The scope of the eye is not far from 45° or one-eighth of the circle, and within this range only the image of a distant landscape can be depicted upon the retina of the eye. The formation of this image upon the retina is similar in principle to that formed by the lenses of the camera upon the spectrum, thus it is that objects are not represented to us of their real magnitude but always smaller, and the more distant the object is the less it will appear in size. For this reason we cannot determine by the eye the real size of an object, but are obliged to call to our aid comparison of things unknown with such as are familiar.

All things appear different to different persons in consequence of the variable con-

structions of portions of the eye. Some are near sighted; others can see best when the object is more distant; the same figure will appear of different size to different individuals, and, consequently, it requires considerable practice to arrive at the actual knowledge of external things.

This fact is a sore inconvenience to the manufacturer and vender of photographic cameras, for in many instances where they take every pains and precaution, their skill may suggest, to please a customer, they often have the instrument returned as worthless when the fault rests entirely in the difference between the visual power of the two persons. Thus it is that a camera returned by one party as of inferior quality is pronounced perfect by another, a circumstance that has frequently come under our observation.

SECTION III.—FORE-SHORTENING.

The appearance of objects to the eye depends much upon their position A globe always presents a circular image no matter what may be its position, but an egg may appear oval or circular according as its image is presented to us.

The knowledge of the actual figure of objects which we have gained by previous experience is suggested to us by seeing them, and we think of their true figure rather than of the outline presented to the eye. Whoever attempts to draw from nature finds a difficulty in delineating objects as they appear. In drawing a row of trees of equal size as they would appear to a person standing at one extremity, the nearest tree must be represented larger. If any long straight object, as a beam, be placed with one of its ends directly to the eye, that end only will be seen; if the side be placed directly before the eye the whole length will be seen; in any intermediate position it will appear more or less shortened. The outline on the retina being similar to the shadow it would present on the wall in the direction of the person viewing it.

Painters term appearances when the surfaces or lines are not placed so as to face the spectator, fore-shortening. On looking upon an extended surface the distinct portions are fore-shortened in proportion as they recede from the eye; thus, as a man carries his view more and more forward, lines from the surface come to his eye more and more obliquely until at last the light coming from that surface seems to be on a level with the eye. By obtaining a proper understanding of this principal of fore-shortening we are enabled to judge better of the distance and size of objects situated at various points of view.

SECTION IV.—PERSPECTIVE.

The science of perspective teaches us to draw on a plane surface true pictures of objects as they appear to the eye in an oblique position.

Suppose a straight view of similar objects, as of a row of blocks or pillars be viewed by a person standing at one extremity midway between the rows; "then because objects appear smaller to the eye in exact proportion to their increased distance from it, the second block, if twice as far off as the first, would appear only half as large; the third, if three times as far, would appear one-third as large, and so on to any extent, and for any other proportions; and if the 1000th or any other nearer or more distant pillar subtended to the eye an angle less than the sixtieth of a degree of the field of view, it would be altogether invisible, even if nothing intervened between it and the eye. Then when the row ceased to be visible from the minuteness of the parts, or from the fact of the nearer objects concealing the more remote, it might be said to have reached its *vanishing point*.

"Now, it is very remarkable that in any such case of a straight line, or row of trees or pillars vanishing from sight, in whatever direction it points, *east* for instance, although the eye to see the near end of it would have to look about northeast, still the point intervenes, or in a picture, or transparent plane before the eye, where the line would vanish, would be exactly east from the eye, and not in the slightest degree either to the north or to the south of the individual; and, therefore, if there were two or more rows of pillars parallel to the first, but considerably apart from each other, still all would vanish or seem to terminate in the very same point of the field of view. The reason of this is easily understood. Let us suppose a line drawn directly east from the eye to a point directly opposite: and a line of trees also pointing east, is twenty feet north of the

spectator, and another line running in the same direction, is twenty feet south of him, then evidently for the same reason as the space between the top and bottom of the tree, that is to say, their height becomes apparently less as their distance from the eye increases, so will the space between each tree and the point corresponding to its place in the visual ray, or line along which the eye looks, become less, and the lines of trees really twenty feet apart from the visual ray, will, at a certain distance from the eye, viz. where twenty feet is apparently reduced to a point, appear to join it, and the three points will appear to meet in that point, beyond which they cannot be visible, and which is therefore called the vanishing point.

"When it is ascertained therefore, that a line in any natural or artificial object points 10 or 20 or any number of degrees north or south, or above or below, &c. the centre of the scene or picture, that is to say, the point of sight, or principal visual ray, then also is it known that all the parallels to that line have their vanishing point in that spot of the field of view, and a line supposed to be drawn from the eye to the heavens, or really drawn to the picture in that direction, marks the vanishing point.

"It is explained now, why in a long arched tunnel, a bridge, or a cathedral with many longitudinal lines on its floor, walls, roof, &c. all such lines seen by the eye looking along from one end, appear to converge to a point at the other, like the radii of a spider's web; and why, in the representation of a common room, viewed from one end, all the lines of the corners, tops and bottoms of windows, floors, stripes on the carpet, being parallel to each other tend to the same vanishing point and are cut off by fore-shortening.

"By far the most important vanishing point in common scenes is the middle of the horizon, called by painters the *horizontal line;* this in a picture properly placed, is at the exact height of the eye. Because in houses, the roofs, foundations, floors, windows, &c. are all horizontal, the vanishing points of their lines must be somewhere in the horizon, and if the spectator be in the middle of the street or of a building, and be looking in the direction of its walls, their vanishing point will be in the centre of the scene or picture; if he be elsewhere it will be at one side. In holding up a picture frame through which to view a scene suitable for a picture, it would be proper to raise it until the line of the horizon appeared to cross at or about one-third from the bottom; this fact becomes the reason of the rule in painting, so to place the horizontal line. In beginning a picture this line is usually the first drawn on the canvas, as marking the place of the vanishing points, of all level lines and surfaces, and the eye of the spectator is supposed to be placed in the middle of it, and generally about as far from the picture as the picture itself is long, such being the extent of view which the eye at one time conveniently commands.

"Dr. Arnott justly remarks, that 'much of the delight which the art of painting is calculated to afford, is lost to the world, because persons in general know not how to look at a picture. Unless the spectator place himself where he can see the objects in the perspective, so that he may fancy himself looking at them through a window or opening, everything must appear to him false and distorted. The eye should be opposite the point of sight of the picture, and therefore on a level with the horizontal line, and should it be at the required distance, which generally, is as great at least, as the length of the picture.'"

THE STEREOSCOPE.

From the interest which this very interesting optical instrument has excited, and the very intimate relation which exists between it and photography, since it is only practical to produce images suited for the instrument by the agency of the camera-obscura, it is thought advisable to devote a short chapter to some notice of it. It is not intended that any examination of the phenomena of vision, or of the application of the stereoscope to the explanation of single vision with a pair of eyes, shall be attempted; these questions would be somewhat out of place in the present manual, and would occupy too large a space if properly dealt with.

The stereoscope is before the world: a simple description, therefore, of the forms under which it may be conducted, and a sufficient explanation of its principles, is all that can here with propriety find a place. The name is compounded from two Greek words, signifying *solid*, and *I see*, and adopted from the fact that two pictures on a plane surface, will, when adjusted in the instrument, resolve themselves into one image, and that image will acquire an apparently distinct solidity, being represented as an object having three dimensions,—*length*, *breadth*, and *thickness*.

"The theory"—of single vision with a pair of eyes—says Mr. Wheatstone in his valuable Memoir 'On some remarkable and hitherto unobserved Phenomena of Binocular Vision'—"The theory which has obtained the greatest currency is that which assumes that an object is seen single because its pictures fall on corresponding points of the two retinæ; that is, on points which are similarly situated with respect to the two centres, both in distance and position. This theory supposes that the pictures projected on the retinæ are exactly similar to each other, corresponding points of the two pictures falling on corresponding points of the two retinæ." Leonardo da Vinci, in his Treatise on Painting, has some remarks on the peculiarity of vision, which bear in a singular manner on the phenomena of the stereoscope, to the effect, that a painting, though conducted with the greatest art and finish to the last perfection, both with regard to its contours, its lights, its shadows, and its colors, can never show a relievo equal to that of natural objects, unless these be viewed at a distance, and with a single eye; for if an object, as an orange, be viewed by a single eye, all objects in that space behind it, which we may suppose to be included in its shadow, are invisible to that eye; but open the other eye without moving the head, and a portion of these becomes visible: those only are hid from sight which are included in the space covered by the two shadows formed by two candles supposed to be placed in the positions of the eyes. The hidden space is so much the shorter according to the smallness of the object, and its proximity to the eyes. Upon this Mr. Wheatstone remarks:—"Had Leonardo da Vinci taken, instead of a sphere, a less simple figure for the purpose of his illustrations—a cube for instance—he would not only have perceived that the object obscured from each eye a different part of the more distant field of view, but the fact would also have been forced upon his attention—that the object itself presented a different appearance to each eye."

If any of my readers will be at the trouble to look at a simple solid form, keeping the head perfectly steady, with a single eye, and make an outline drawing of the image as seen—say, first with the left eye, and then with the right eye—it will be found that two dissimilar forms will be obtained analogous to those represented in the following diagram.*

By a little effort, it is easy, by squinting, to resolve these figures into one, when it will be found that an apparently solid image is formed from these dissimilar outlines of a solid.

The stereoscope of Professor Wheatstone is arranged to produce this in a more effective manner, the instrument,† consists

* See Phot. Art-Journal, Vol. 3, page 291.
† See Phot. Art-Journal, Vol. 3, page 173.

of two plane mirrors, so adjusted that their backs form an angle of ninety degrees with each other. These mirrors are fixed by their common edge upon an horizontal board, in such a manner that, upon bringing it close to the face, each eye sees the image reflected from the two ends of the instrument in a different mirror ; at each end of the board are panels in which the drawings are placed. The two reflected images coincide at the intersection of the optic axes, and form an image of the same apparent magnitude as each of the component pictures. This instrument is called the reflecting stereoscope ; and as it will admit of being made of any size, so as to allow of the introduction of large pictures, it offers many advantages. Mr. Wheatstone suggested in his memoir, already quoted, the use of an instrument constructed with prisms, which is analogous to the beautifully portable lenticular stereoscope of Sir David Brewster, described by him in the Philosophical Magazine.

This instrument consists of two semi-lenses, placed at such a distance that each eye views the picture or drawing opposite to it, through the margin of the semi-lens, or through parts of it equidistant from the margin. A lens being cut in two halves, these are fixed into a frame and adjusted to such distances that the centres of the semi-lenses correspond with the pupil of the eyes. The distance of the centre of one pupil from the other is at an average 2½ inches, and to this the semi-lenses may be adjusted ; but if the instrument is provided with the means of effecting a little change in this respect, it will often be found to be of considerable advantage.

"When we thus view," says Sir David Brewster, "two dissimilar drawings of a solid object, as it is seen by each eye separately, were actually looking through two prisms, which produce a second image of each drawing, and when these second images unite, or coalesce, we see the solid image which they represent. But in order that the two images may coalesce, without any effort or strain on the part of the eye, it is necessary that the distance of the similar parts of the two drawings be equal to *twice* the separation produced by the prism. For this purpose measure the distance at which the semi-lenses give the most distinct view of the drawings ; and having ascertained, by using one eye, the amount of the refraction produced at that distance, or the quantity by which the image of one of the drawings is displaced, place the drawings at a distance equal to twice that quantity ; that is, place the drawings so that the average distance of similar parts in each is equal to twice that quantity. If this is not correctly done, the eye of the observer will correct the error by making the images coalesce without being sensible that it is making any such effort. When the dissimilar drawings are thus united, the solid will appear, standing, as it were, in relief, between the two plane representations."

The lenticular instrument,* fitted for use, consists of a frame of wood or metal ; the two semi-lenses are fixed in brass tubes which are capable of being adjusted to accommodate the differences of sight in different individuals. At the bottom of the box, as seen through the opening, are placed the two stereoscopic pictures, which may consist either of diagrams, similar to those already represented, or of images taken by the daguerreotype, talbotype, or collodion processes. These photographic processes enable us to obtain such copies of external nature as are required to produce the magical results with which the stereoscope renders us familiar. It is required to take two pictures of a single object, at such a difference of angle as will produce the solidity which is evident in ordinary binocular vision, as the result of viewing two dissimilar images, under certain conditions, on a plane surface.

The two accompanying figures† represent a bust as viewed by each of the two eyes singly. If the experiment is tried upon a bust or statue, it will be found that one eye will see surfaces which are invisible to the other. Thus in these examples it will be quite apparent, upon examination, that the line of the cheek is more distant from the line of the nose in one than in the other image, and that a similar inequality exists in several other parts. By a little practice, any reader may, by squinting, resolve these two images into one, and thus produce the stereoscopic effect. Now the object is to place the camera in the position of the eyes, and thus

* See Phot. Art-Journal, Vol. 3, pp. 175.
† See Phot. Art-Journal, Vol. 3, pp. 176.

obtain the representation of two images, as viewed by each eye separately. This may be effected with a single camera, by adjusting it at a certain measured distance from the object to be copied, and having obtained one picture, move it round about twenty degrees, and take the second image. Two cameras with lenses of the same focal length may be employed, and are indeed employed, by M. Claudet and others, for the purposes of obtaining stereoscopic portraits, and it is found that with lenses of the same focus, the figures are sufficiently exact for all practical purposes, and produce the most perfect stereoscopic pictures. Sir David Brewster contends that it is not practicable to obtain sufficient exactness by either of these methods. He therefore proposes the use of a binocular camera, which he thus describes:—"In order to obtain photographic pictures mathematically exact, we must construct a binocular camera, which will take the pictures simultaneously, and of the same size; that is, a camera with two lenses of the same aperture and focal length, placed at the same distance as the two eyes. As it is impossible to grind and polish two lenses, whether single or achromatic, of exactly the same focal lengths, even if we had the very same glass for each, I propose to bisect the lenses, and construct the instrument with semi-lenses, which will give us pictures of precisely the same size and definition. These lenses should be placed with their diameters of bisection parallel to one another, and at a distance of 2½ inches, which is the average distance of the eyes of man; and when fixed in a box of sufficient size, will form a binocular camera, which will give us, at the same instant, with the same lights and shadows, and of the same size, such dissimilar pictures of statues, buildings, landscapes, and living objects, as will reproduce them in relief in the stereoscope."

There appears but one objection to the binocular camera of Sir David Brewster, and that is one arising from the circumstance of employing really the very worst portion of the lens; *i. e.*, the two sides. This, however, in practice, is not found to be of any disadvantage; the images are sufficiently perfect, although not so absolutely correct as those formed by the centre of the lens, and they are certain of being resolvable into a distinct image of three dimensions.

With the single camera, taking the precaution named, with two lenses of the same focal length, or with the semi-lenses, stereoscopic pictures may be obtained without difficulty.

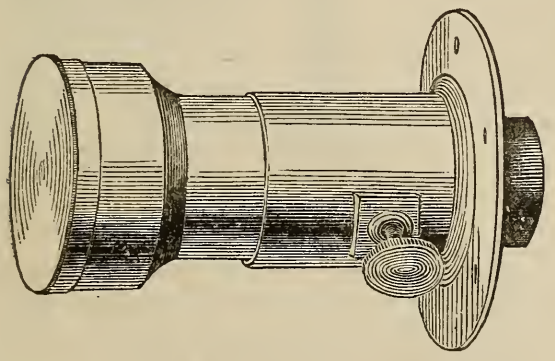
The magic result of the resolution of two plain pictures into one, possessing to the eye the most positive solidity, is so striking when witnessed for the first time, that it appears to be a deception of the senses. Even when fully accustomed to the phenomena of the stereoscope, there is an indescribable charm in the beautiful pictures, that they are gazed at again and again with increasing admiration. Living forms appear to stand out in all the roundness of life; and where colors have been judiciously applied to the daguerreotype or calotype portrait, it is not possible to conceive a more perfect realization of the human form than that which stands forth, prominently, from the back-ground of the stereoscopic picture. Statues, in like manner, are almost realized again in their miniature representations. Architectural piles are seen in all that exactness of proportion and gradation of distance, which is, in their minute reproduction, singularly interesting; and in landscapes, the stereoscope gives us a reformation of every image in apparently the most perfect solidity and truth of distance. In the stereoscope we have at once an instrument which enables us to study many of the phenomena of vision, and to reproduce loved and beautiful objects, or interesting scenes, through the agency of those rays by which they were illuminated, in that strange perfection which, in its mimicry of visible external nature, almost baffles the examination of human sense.—

R. Hunt.

GENERAL REMARKS ON THE USE OF THE CAMERA-OBSCURA.

THESE remarks will apply with equal force to all the processes by which views of external objects can be obtained; but they have more especial reference to those highly sensitive ones, the Daguerreotype, the Talbotype, and the Collodion processes.

It has already been stated that a single achromatic lens, producing a large image, should be employed for motionless objects, where time is not of consequence. For a building, a statue, or the like, it is not of much consequence whether one minute or ten may be consumed in the operation of obtaining its impression. With the human figure and animals the case is very different: the utmost concentration of the solar radiations is therefore required to ensure rapidity of action. This is effected by the double combination of lenses, which are usually mounted and adjusted as in figure 1.



It is often of the utmost importance, to obtain definition of the objects, that all extraneous rays should be cut off; this is effected by means of a diaphragm of stops, which can be obtained to fit any lens. With this adjustment any sized aperture can be obtained.

SECTION I.—BUILDINGS, STATUES, LANDSCAPES, AND FOLIAGE.

The great defect in nearly all the photographic pictures which are obtained is the extreme contrast between the high lights and the shadows, and in many an entire absence of the middle tones of the picture.

In the very beautiful production of Mr. Buckle of Petersborough, which we displayed in the Great Exhibition, there was a very remarkable degree of fine definition, united with a beautiful blending of the respective parts which constituted the picture. There was no glaring contrast between the lights. Those parts which were the most brilliantly illuminated were softened into the middle tones of the picture, and those again faded gradually into the deep shadows. In the works of M. Martin and M. Flacheron, whose processes I have given, the same harmonising of lights and shadows was generally found to exist.

The usual mistake with amateurs is that of selecting bright sunshine as the period for operating. It is thought, when a cathedral, for example, is brilliantly lighted up by sunshine, is the time for obtaining a photographic copy of it. A little reflection will convince the operator that this is the case only under particular conditions.

When the projecting parts of the building are flooded with sunshine, they cast the deepest possible shadows; consequently, in the photographic picture the prominent points would appear brilliantly white, and the shadows intensely dark.

It will be understood that I refer always to the *positive*, or completed picture.

A clear blue sky, reflecting its light upon a similar structure, produces less prominent illustration of the bold ornamental parts, and gives more light to those parts on which the shadows are cast. A photograph taken under such conditions of light and shade will be far more beautiful than the spotted productions which ordinarily result from the practice of operating when the sun is shining brightly on the object.

In the same manner, when the sun shines brightly on the leaves of trees, a very large quantity of light is reflected from their surfaces, the other parts appearing by contrast in almost absolute shadow. Hence, nearly all photographic views of forest scenery have more the appearance of scenes which have been sprinkled with snow than foliage glowing with sunshine.

An artist studies in his productions the most effective disposition of the lights and

shadows, and it is by the harmonious disposition of these that he succeeds in giving a peculiar charm to his productions. Nearly all photographic pictures, although they have the merit of strict truthfulness, appear to want this great beauty of art. This has mainly arisen from the circumstance that intense illumination has been sought for under the idea of producing the sharpest picture; and it is true that thus we do obtain a very perfect definition of outline. Many productions are remarkable for this, and indeed, reproduce with unnatural exactness all the minute details of the objects copied; whereas the human eye never sees this extraordinary sharpness of outline in nature; upon the edge of every object there are fringes of light which soften off their outlines, and subdue the general tone of objects, blending all harmoniously. Perhaps there is more than ordinary difficulty in producing this in a representation of nature which is effected by means of a lens. The artist may, however, do much: all times, even of bright illumination, are not fitted for producing a picturesque photograph. Nature should therefore be looked at with an artist's eye, and the happy moment chosen when the arrangements of light and shade give the most picturesque effects, and when these are in a condition to be correctly reproduced according to the laws by which actinic influences are regulated.

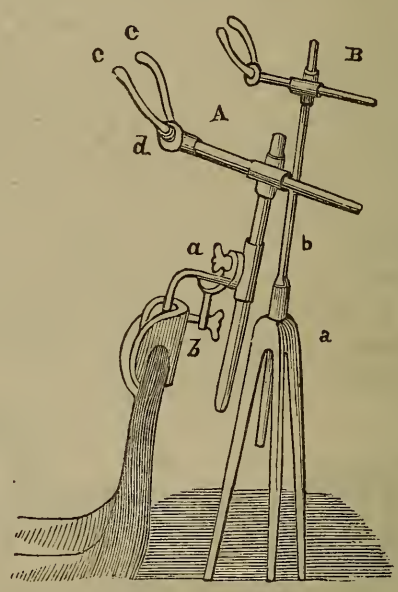
SECTION II.—PORTRAITS FROM THE LIFE.

It is important for the production of a correct likeness that as small an aperture as possible should be used. By doing this there is great loss of light, and consequently the necessarily prolonged time must be compensated for by greatly increased sensibility in the plates.

It is also important that arrangements should be made to cut off from the lens all light proceeding from extraneous objects: this is best effected by the modes adopted by Claudet.

The camera is placed, within an arrangement of curtains, which is capable of adjustment, so as to have any required opening in front of the camera. The whole of this screen being mounted on rollers is easily moved; therefore the operator has it in his power to adjust the opening, and to shut off all adventitious radiations, thus securing the effectiveness of the rays proceeding directly from the sitter, or the object to be copied.

The sitter should be placed in the easiest possible position compatible with the arrangement of the body as nearly as is possible in a vertical plane. This is necessary, as the parts which are nearest the glass suffer a very considerable degree of distortion and enlargement. Of course great steadiness is required on the part of the sitter during the few seconds he submits to the operation of the photographer. It is usual to support the head by a rest fastened to the back of the seat, as shown in fig. 2; but where the person can maintain a



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steady position without this, the result is generally the most satisfactory, the "rest" not unfrequently giving an air of stiffness to the sitter. In a great number of portraits a dark and unnatural shade is thrown under the eyes: this arises from the employment of a "top light." The light falling vertically produces the shadow of the brow over the eye, and gives a sombre character to the face. This is objectionable also, as being annoying to the sitter, who assumes in consequence a somewhat painful expression.

Those who have attended to the analysis of the spectrum, included in the second division of our subject, have become aware that the radiations from all colored objects are not alike. A long description would not render this so apparent as a single il-

lustration. The Frontispiece* represents, therefore, a female figure, to which purposely a blue face has been given, who carries on her head an earthenware vessel which has a general yellow color, and whose dress consists of the lightest colors, yellow, red, and green; an exact copy of a photograph taken from such a figure is placed beside it, and the result is, a very white-faced female, from the intense action of the blues, clothed in dark dress from the want of chemical action in the radiations proceeding from the gay dress of the original. Hence it is of the utmost importance, particularly to ladies, that they should be directed to avoid in their dresses, when about to sit for their portraits, such colors as would produce darks for lights, and the contrary.—*R. Hunt.*

* See "A Manual of Photography," 3rd edition, by R. Hunt.

From the Journal of the Photographic Society.

LONDON PHOTOGRAPHIC SOCIETY.

SECOND ORDINARY MEETING.

Tuesday, March 3, 1853.

SIR WILLLIAM NEWTON, Vice-President in the chair.—After the formal proceedings, a letter was read from the Society of Arts, and an extract from the Minutes of the Council of the Photographic Society The Honorary Secretary stated that a letter had been sent as a circular to all the gentlemen who exhibited photographs at the late exhibition of the Society of Arts, and he believed to all the Members of the Society, requesting them to contribute specimens of their art for the purpose of forming a circulating gallery, to be sent round the country so as to diffuse the photographic information as widely as possible. No mode seemed better calculated to advance the progress of the art, than that those members who had negatives, and were able to print them, should send choice specimens to assist in the formation of a Collection for the Society of Arts.

A letter was read from Mr. Fox, forwarding specimens of printing by the negative process; and also a letter from Mr. Fox, forwarding specimens of pictures produced by photography upon stone, and stating that the pictures were produced without any touching with a graver or other instrument.

[*The various specimens were handed round and inspected by the Members.*]

SIR WILLIAM NEWTON—Before I request Mr. Hunt to favor us with his communication this evening, it will be necessary for me to make a few observations. I see, at the head of the paper which I had the honor of reading at the last Meeting, the following notice: "The Council of the Photographic Society, in proposing to print in the Journal abstracts of papers read at the ordinary Meetings, or in giving the papers at length, do not thereby adopt the views or opinions of the authors. Therefore, as I am aware that the paper which I had the honor of reading is more particularly alluded to, it will be necessary for me to make a few statements in order that it may be clearly understood what my object was.

With respect to the remarks which were made at our first monthly Meeting as regards the touching the negatives:—

It may be in the recollection of several gentlemen present, that I confined my observation to the touching the skies only. However, I hope that during the present season I shall be enabled to lay before you some specimens taken from pictures, when I propose to show the positive taken before

anything has been done to the *negative*, as well as another positive taken afterwards, together with the negative itself. And my friend Sir Thomas Wilson, who is here, I hope will be able to do the same, for I have the pleasure of stating, that he is not only an excellent photographer, but an artist.

Again, I observed that when an artist (I do not mean to confine myself to the *professional* artist—in this I wish to be particularly understood) makes use of photography in order to obtain a sort of sketch or private study for compositions of figures, &c., I then stated that it was not necessary nor even desirable (*and I adhere strongly to this statement*) that every part should be *strictly* in focus; but, on the contrary, a broader effect was produced (and therefore better calculated for the *required object*) when such was *not* the fact; and this I stated as the result of *my own experience;* but I went on to observe, that for *every other purpose*, and especially for *architecture*, &c., it was *impossible to be too particular in getting the exact focus.*

I have thus alluded to the subject because some of my confreres in the Council have been a little startled at the novel recommendation; and it is certainly a new *application* of Photography, to be more desirous of obtaining a *general effect*, rather than too much atttention to *detail*. Therefore, in making this statement, I take the whole of the responsibility on myself, feeling perfectly assured that when my recommendation becomes more generally known and practised by artists, it will be better appreciated by all classes of photographers. However, I must request that my communication above alluded to may be read with attention, when it will appear that the foregoing statement relates only to producing certain effects, as sketches or private studies, for the artist or amatuer himself, and *not as specimens of photography*—(this I wish to be clearly understood)—because they are not specimens of photography, but merely studies from which artists may derive very important assistance and instruction.

It is unquestionably the duty of the Council to see that no false principles are inculcated in our publication. But as we are associated together for the purpose of communicating *our own mode of proceeding and experience*, and to assist each other in accordance with our *peculiar studies*, consequently, the reputation of each contributor will be a guarantee that he will not advance anything which is not the result of *his own experience*; and I think that we should be very careful not to appear to throw any doubt upon statements by any such persons, lest it should have the effect of preventing many gentlemen from imparting their knowledge and modes of proceeding.

I am desirous that the Members will be kind enough to read my statement with attention, and they will perceive that what I have there advanced was never intended to interfere with the mode of operation usually adopted by each photographer, but rather to *extend the use of photography to my own profession*, by a mode which I have found to be of much practical service and thereby to direct the attention of artists to a similar mode of proceeding; and I trust that we shall have many professional artists associated with us who will take up the camera; because, by the united exertions of the arts and sciences I am quite certain that Photography may be applied in a variety of ways not yet contemplated.

The following papers were then read:—

1. Mr. Robert Hunt, On the Principles upon which the Construction of Photographic Lenses should be regulated.

2. The Count de Montizon, on the Collodion Process.

I. BY MR. ROBERT HUNT.

The inquiry to which I direct attention involves the consideration of some of the first principles of Photographic action. We recognise in the effects of the solar radiations three distinct classes of phenomena, namely, Heat, Light and Chemical power, to which last the term Actinism has been applied. It may still be a matter open to discussion, whether these dissimilar phenomena are produced, as the result of modified conditions of one cause, or whether they indicate three distinct principles united together in their modes of motion only. At all events, in the present state of our knowledge, seeing that we cannot prove their identity, we are bound to hold our judgment suspended up-

on this point. I should state that the bias of my mind is certainly in favor of considering Heat, Light, and this Chemical principal as three distinct agencies or powers: but in this I am open to correction, so soon as the advances of science enable us to interpret the phenomena with a nearer approach to correctness than we can possibly attain to at present.

Now Light, or the luminous principle of the solar rays, produces those effects which we recognize in Vision, and all the phenomena of Color. Light must also be regarded as endowed with certain chemical functions. I am speaking now particularly of the *luminous principle* of the sun, the chemical functions of which are shown in its exciting powers upon vital forces in the vegetable world, and through them of effecting the decomposition of carbonic acid in plants. We also know that light has of itself, when separated from that which we particularly distinguish as the chemical or actinic principle of the sun's rays, the property of changing vegetable colors,—the rays complementary to the color of the surface being those which are active in discharging the tint. We know that some dyes are darkened and some lightened by exposure to sunshine, and this effect results from exposure to the action of the luminous principle alone. If we take the coloring matter of leaves, expressing their juice after infusion in, and bruising with a little spirits of wine, and, washing this solution of chlorophyll over paper, expose it to the action of the spectrum, bleaching first takes place, the green surface becoming grey, then a peculiar browning commences, and is carried on by a set of rays that are broadly distinguished from the strictly chemical rays. It is possible that these changes may be mixed up with some thermic influences belonging to the calorific rays which Sir J. Herschel has distinguished as the Parathermic rays.

We also have another set of phenomena produced by the luminous rays—that is, the phenomena of phosphorescence, as exhibited in Canton's and the Bolognian phosphorus. When exposed to the influence of the solar spectrum, the luminous effect has been attributed by M. E. Becquerel to the action of the chemical rays, because the action of the phosphoresence is produced upon these compounds, over a space which is coincident with the maximum chemical power of the prismatic spectrum.

These phenomena of phosphorescence are, I think, clearly indicated as belonging to the set of rays that have recently been developed by the investigation of Professor Stokes, situated far beyond the limits of the ordinary spectral image.

We have again the phenomena of heat producing all the ordinary calorific effects. Beyond which we know, that heat in its radiant state, particularly from dark hot iron, does effect certain chemical decompositions. Then we have this chemical principle, which is so especially engaged in all our photographic phenomena, to which the name of *Actinism*, as a provisional term, has been given, and to a certain extent adopted. This chemical agency of the sunbeam, upon which depends all the processes, whatever they may be, in photography, does not produce any of the phenomena of vision; it does not affect the optic nerve so as to produce the sensation of color, nor give us any indication of caloric action.

Now it is quite certain, from the experiments of Melloni in the first instance, and of others since repeated in this country, that we can separate to a certain extent those principles one from the other. By taking a slice of obsidian or of black mica, we may obstruct nearly the whole of the light of the sunbeam, but we do not stop more than one or two per cent. of its heat. If we take a piece of very bright green glass, colored with the oxide of copper, and wash it over on one side with a colorless solution of alum, we obstruct 95 per cent. of the heat rays, but we do not keep back more than two or three per cent. of the luminous rays. Then, it is well known that if we take a piece of intensely dark blue glass, colored by oxide of cobalt, we do not prevent the permeation of any of the chemical principle, though we interfere to a considerable extent with the passage of light. If we take a piece of yellow glass, particularly if the glass be stained with the oxide of silver, we find that though it does not obstruct any of the luminous principle of the sun-rays, it has the power of keeping back the whole of this chemical principle, and therefore of preventing the chemical changes in question from going on underneath them. There is a very remarkable

difference between the relative permeability of those glasses stained with the oxide of iron and such as are colored with the oxide of silver. Thus being enabled to separate and use those principles, as it were independently of each other, we are placed in a position to examine their various modes of motion.

Now I beg to direct attention to the prismatic spectrum. A ray of light falling upon a prism produces a spectral image, upon the examination of which depends the whole of our conclusions. Here we have a certain set of colored rays which I need not particularize. Without dwelling upon the Newtonian theory of colors, it may be briefly stated that the primary Newtonian law was, that every colored ray indicates a certain angle of refraction, and that a certain angle of refraction always resulted in a definitely colored ray. Most decidedly we have proved beyond dispute the incorrectness of the Newtonian theory. Sir David Brewster has been able to show us that we can detect red rays, for example, at the most refrangible end of the spectrum even in the lavender rays, and also that we are able to detect blue in the red of the lower or least refrangible end. Yellow rays are also found by the use of the absorbent media in every part of the spectrum; we have thus a blue, a yellow and a red spectrum overlapping each other; those colors only coming out definitely and in intensity at those points where they arrive at their maximum of action, this point varying in refrangibility for these separate colors. Then again, by the recent researches of Professor Stokes, we have a certain confirmation of this view of Sir David Brewster. If we take the coloring matter of leaves, which produces an intense and beautiful green, and by means of a lens project a ray of light through the fluid, we shall find that ray in passing through the green medium has assumed a deep red color. If we make the prismatic spectrum pass through a certain thickness of this fluid in a glass trough, we bring out an *extraordinary* spectrum, proving the existence of red rays up to the very end of the *ordinary* spectrum, and we produce at the same time many curious variations in intensity of chromatic effect.

Again, if we take a decoction of the inner bark of the horse-chesnut, which affords a brown-yellow solution, about the color of dark sherry, we find, by throwing a spectrum through it, that we bring into view a new set of rays extending very far beyond the violet and lavender rays,—or the rays of utmost refrangibility in the Newtonian spectrum,—and that we produce some curious elongations of the rays. We have evidence of an overlapping of the colors, in the circumstance that at the lower end of the spectrum exists a crimson ray, which is clearly only the blue ray of the *under* spectrum mixing with the red of a superposed spectrum, whilst we have the red mixing with the blue producing violet at the other extremity.

In a lecture delivered by Professor Stokes at the Royal Institution, he stated that he had thus rendered the chemical rays visible, that is, the actinic rays with which photographers are working. Mr. Stokes contended, that those rays rendered visible to the eye produced peculiar chemical effects, and he maintained this mainly upon the experiments of M. E. Becquerel. The phenomenon of the extra-spectral rays of Mr. Stokes is best observed by taking a solution of the sulphate of quinine dissolved in water by the aid of a little sulphuric acid. If you pour this solution into a glass vessel, and holding it up in front of a window, look just along the edge of the fluid, it will be found that the first surface presents a film of the most beautiful silvery blue color, though the fluid by transmitted light is as colorless as the purest water. If we take a glass trough of this quinine solution and look down into it along its outer edge, we shall find that all that side facing the sun exhibits this pure silver blue light. Then we have the curious fact, that if we take a second glass trough, containing the same solution, and place it behind the first, we cannot reproduce the same effect; so that this particular class of rays, supposed to be the chemical rays rendered visible, are stopped at the very first surface of the solution of sulphate of quinine. From this singular surface action the term of Epipolized light has been applied to these rays. It has also been stated by Professor Stokes, that the flame of sulphur, when burning in oxygen gas, is extremely rich in this light, and that the flame of alcohol posseses the same property. I can speak to the fact that

neither the one or the other is capable of producing chemical effects within the limits of any ordinary time. It occurred to me this morning that it might be readily determined whether or not the solution of sulphate of quinine stopped back the chemical rays, and if it did not, this would prove that those blue rays which were not allowed to pass, could not be the rays by which chemical changes were effected. Consequently I tried a very rough experiment, which in its way is sufficiently satisfactory. I placed upon a piece of paper, which was washed over with the ammonio-nitrate of silver, a glass box, which was filled with a solution of quinine, the depth of the fluid being a little more than an inch. I found that upon that part of the prepared paper where the rays freely passed through the whole of the fluid, it was darkened as much as where it had been exposed to the full influence of the sunshine. Here we have a proof that the sulphate of quinine, which does not allow the epipolic rays to pass, does admit the chemical rays without interruption.

The chemical action of the spectrum is the immediate subject of consideration; but we could not neglect the luminous and caloric phenomena and their results, to some of which I have endeavored to direct attention. When we view the solar spectrum through a telescope, we find it is crossed by an infinite number of dark lines, and as those lines are constant for the same kind of spectrum and the same light, we are able to determine with much accuracy any particular point in the measurement of the image. The line A is situated at the lower end of the spectrum,—B, C, D, &c. indicate higher refrangibilities, and the line H is situated in the violet rays; to this dark line I more particularly wish to direct attention. Our lenses have ordinarily been corrected for chromatic aberration so as to embrace the bands from A to H, and by doing so we have produced non-chromatic luminous images; or we obtain a lens of an achromatic character, all the luminous colored rays being coincident on the same plane. The luminous image is at its maximum in the yellow rays; the light diminishes both towards the red and towards the blue end of the spectrum.

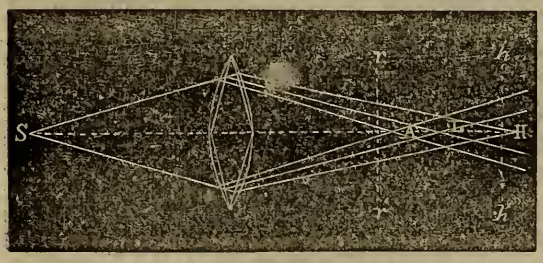
As an illustration to show the difference of the refrangibility of the two agents, Light and Heat, let us examine Sir John Herschel's mode of producing a calorific spectrum. A sunbeam falls on the edge of a prism, and the rays are refracted producing the ordinary luminous image, which is thrown upon a piece of paper previously smoked on the back and then washed over with strong ether. The result is the formation by drying, of a peculiar and most instructive image. A spot rapidly dries out, indicating the point of maximum heat, just below the red ray; then a peculiar action goes on through the prismatic image to nearly the end of the violet ray, where all heating power ceases. Whilst this is progressing, we find, at a considerable distance below the luminous image, some heat-rays which have not undergone any refraction, and these produce a yet larger head-spot far below the point of maximum temperature; and two smaller spots always uniform in their position are obtained, at a distance below the luminous spectrum equal to the entire length of that spectrum itself. Hence we have a set of calorific rays that do not undergo any refraction, and then we have another set producing an image prolonged up through the luminous spectrum, showing a great extension of the calorific radiations.

Take a piece of paper prepared with chloride of silver, and allow the same spectrum to fall upon it,—the result is, that where the yellow ray impinges we have the paper unchanged; then, the darkening commences in the green ray and extends through the whole spectrum, exhibiting its maximum effect over the space covered by the blue and violet rays, and gradually declining in intensity of action until it ceases at a point very far beyond the most refrangible of the visible rays. A certain amount of chemical action is always produced by the red rays *darkening* the chloride of silver, which is, however, always still more definite upon the bromide of silver; this being probably dependent upon the combined influences of actinism and heat.

Of the same character may be considered the chemical change effected by the red rays upon darkened chloride of silver washed with iodide of potassium in the following experiment.

If we take a piece of positive paper already darkened by exposure to sunshine and wash it over with the iodide of potas-

sium (a process which once appeared to promise much for producing positive pictures by one process in the camera), and expose it to the prismatic spectrum, we have two distinct actions taking place at the same time,—bleaching at the most refrangible end and blackening at the least refrangible. We thus prove the extension of chemical action, but chemical action varying in character, through the entire length of the luminous spectrum and far beyond it. It is an interesting experiment to take a piece of paper already darkened, wash it over with the iodide of potassium, and placing an engraving or anything we desire to copy upon it, to cover one part with a piece of red and the other with a piece of blue glass:—under the red glass we obtained a negative image; that is, all the white parts of the engraving through which the rays have passed will be represented by black lines; and under the blue glass you will get an intense and positive image—by bleaching out the brown color of the paper under the white parts of the engraving. All these results go to prove, that from the lower end of the spectrum up to far beyond the extreme end of the visible image, we have a considerable amount of chemical phenomena going on, but interrupted, and often obliterated, by the influence of *Light*, as manifested in the colored rays. Now we find that these principles do not obey—which is the particular point to which we have to direct our attention—the same order of refrangibility in passing through any particular medium. We discover, for example, taking an ordinary single lens, that the result of passing a sunbeam through such a lens is what I have endeavored to represent in fig. 1. The *actinic* focus, A, falls nearer



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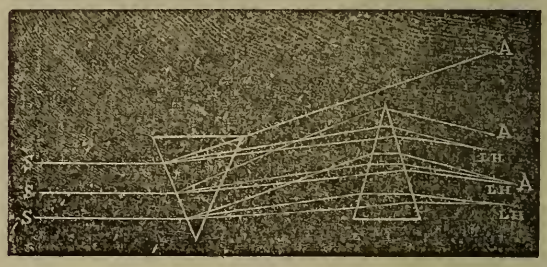
the glass than the *luminous* focus, L, which is still nearer than the focus for heat, H. The chromatic dispersion of the rays through a glass of this kind is shown by blackening its centre, and then taking a disc of paper and passing it along the line of the rays; where the rays diverge at *h*, *h'*, we shall find the paper will be fringed with violet, and nearer the lens, as at *r*, *r'*, the fringe will become red. We shall also find in such a case as this, that if we were to place a piece of prepared paper at the end of that part which is marked as actinism, A, there the chemical effect would take place in a very much shorter time than at any other part between it and the best luminous focus. Thus we get a luminous image refracted to a certain extent; we obtain the calorific point, indicating a much less refraction; and we get the chemical image refracted more considerably, its focus thus falling nearer the inner surface of the lens. If we take a prism (fig. 2), and *s*, *s*, *s* being pencils of light falling



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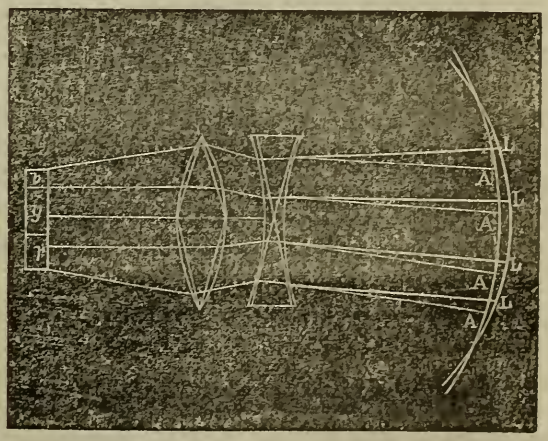
upon its edge, we find a certain amount of refraction producing color, then endeavoring to correct this, and to produce chromatic correction, we place a second prism near its further edge, we shall find that upon this prism, we have received the red and the yellow rays, L, H,—that we have indeed caught the heat-rays and the luminous rays,—and the result will be their coincidence at some point, while the more active of the chemical rays, A, will be bent off beyond the edge of the second prism, and will not undergo correction in the same way as the other radiations.

Now the refrangibility of these three distinct principles, Heat, Light, and Actinism, under the circumstances of passing through different and similar substances, is a point of very considerable interest, and of the utmost importance.

There is only one fact, however, independent of refraction, to which we need refer on the present occasion. The chemical principle, with which we have particularly to deal, does not pass with equal freedom even through perfectly transparent

and colorless media. It was noticed by Malaguti, in the first instance, that when he took solutions which were perfectly colorless and translucent, they produced very different effects upon the photographic preparations placed behind them. A few grains of salt being dissolved in the fluid effected a great difference, exalting the action in some cases, and producing in some a depressing effect. Some of those transparent and colorless fluids admitted the chemical influence to permeate them more freely; whereas others diminished the darkening effect by stopping back the chemical principle of the sunbeam. The same effect was observed by Sir J. Herschel with perfectly colorless glasses; some had a curious exalting, and others a singular depressing power; and under such circumstances as could not be expected at all by any *a-priori* reasoning. Therefore, we have here, in the construction of lenses, a point to be examined into—in most cases certainly overlooked. Indeed, in many cases is this so far overlooked, that I have been shown lately one or two photographic lenses, from one of the most celebrated opticians on the continent, in which one of the glasses was nearly opake to the chemical rays; that is, it required a great length of time for those rays to pass through the glass; and this happened to arise from the circumstance that the oxide of lead had, in the process of manufacture, been allowed to give the slightest possible tinge of yellow to the glasses that were employed*. It has also been observed, first by Daguerre, and more recently by others, that if we take a lens of the finest quality, and drop upon one surface of that lens a little of the purest oil of almonds, and then wipe it off as well as we can with a silk handkerchief, so that we should say, there was no visible trace of the oil upon the surface, yet, thin as that film of organic matter would be upon the lens, the picture taken with it would require a minute or more of time. If, by placing the lens in a solution of potash, we remove the extremely attenuated film of this organic matter from the surface, it is found that the picture, with the same lens and under the same circumstances, is taken in one-half the time; hence the *necessity* of observing with care the peculiar conditions as regards the cleanliness of the lenses and the importance of entirely getting rid of the Canada balsam with which many of our lenses are cemented. These examples show that the organic matter present interferes with the passage of those rays with which we particularly desire to work.

Now, I need not go particularly into the conditions necessary to ensure the recombination of the particular rays produced by refraction. When we look through an ordinary single lens, or a bad telescope, we find all objects are fringed with color—we have chromatic dispersion—and this arises from the circumstance that every one of the colored rays has a distinct and separate focal distance. Hence the object of a combination of lenses is to bring the colored rays to one point, where they are reunited into white light. If we bring the face of one prism up against the face of another, we recombine those prismatic rays which would be produced by refraction in one direction, and obtain a spot of white light by such recombination. I have endeavored to show in the accompanying figure, something like the result that takes place. We



3.

start with a colored image whose parallel rays fall upon a lens of flint glass, that lens representing virtually two prisms placed with two of their faces together. Supposing we use a double convex lens, representing the conditions of two prisms placed

* It has been suggested by Dr. Percy that this may be due to the presence of a very small quantity of silver in the lead from which the glass is prepared. In this country the lead, from Snailbeach in Shropshire, is principally employed in the flint glass manufacture. The quantity of silver in this lead is too small to render it profitable to separate it, and hence it may produce some slight and detrimental effect in the optical glass in which it is used.

edge to edge, we should virtually produce achromaticity. The result of the single lens of flint glass, AA, fig. 1, would be, as I have endeavored to indicate;—the luminous focus for flint glass, falling at the point (B). But by bringing against this another lens, see fig. 3, which has a different refracting angle, or which varies in dispersive power, (as, for example, a lens of crown glass), the imaginary prisms being placed in opposite directions, as shown in the figure, the result will be, that since the rays are again bent in the opposite direction to that which they were traversing, the whole of the colored rays fall upon the same plane and produce white light.

In this way the lenses have been corrected for color, but this correction for color does not include the necessary correction for ensuring the coincidence of the chemical and the luminous rays. Supposing the correction has been made for all the chromatic rays from the dark line A to the line H in the violet, there still remains an outlying set of radiations, nearly equal in length to the space between A and H, and over this space the actinic force is more particularly active. Now, in ordinary achromatic lenses, the focus of these rays of high refrangibility must fall nearer the inner surface of the lens than the true luminous focus. This was first noticed in achromatic lenses by M. Claudet. The fact for ordinary meniscus lenses, was in the first instance pointed out by Mr. Towson,* who in a paper published in the Philosophical Magazine, showed, that if, having obtained the best visual image, with a non-achromatic lens in the camera, we then put the prepared plate or paper about a quarter of an inch nearer the glass, when the focal distance is about 12 inches, an infinitely better photograph is obtained than that produced by the best visual image. M. Claudet's observations on this point were also published in the Philosophical Magazine for 1844, and may be referred to with advantage as containing some very important observations on this matter. He showed that even with achromatic lenses the visual focus and the chemical focus were not coincident. He states that with some lenses he found the focus was nearer the glass and sometimes it was further from the glass than the visual focus. It is rather difficult to understand why this should be, unless the glasses had in one case been "over-corrected," and in the other that they had been "under-corrected." Suppose we have the lens corrected accurately for chromatic dispersion, so as to bring the line H and the line A coincident the one with the other, the result would be that the chemical rays would fall still nearer the inner surface of the lens. And it will be found by a very careful adjustment of the camera, particularly where single achromatic lenses are employed, if we try two experiments, obtaining one picture at the plane giving the finest visual image, and then another at a very short distance nearer the lens, that a finer definition in the detailed part of the picture will be produced in a shorter time in the last experiment, all the other conditions being the same, than in the first. Let it be clearly understood that we have and require, the achromatic combination of glasses for producing white light: the coincidence of the rays from the colored bodies, as shown along the slightly curved line, in fig. 3. But the chemical radiations from the same object would fall upon the line, which cuts the curve of luminous intensity, so that the best chemical effect would be produced along that line. Though in ordinary cases this is but a very minute distance nearer the inner surface of good achromatic lenses, it is quite certain that a difference does exist and to this it is most important that attention should be given. With regard to the principle, therefore, that should regulate the construction of the lenses for photographic purposes, we should to a certain extent; set aside the idea of achromaticity. We should not only correct our lenses for color, but we should correct them for the peculiar principles with which, combined in action we have to deal. The chemical radiations do not affect the eye as the colored radiations do; we can detect them only by the phenomena of chemical change. They come to the eye associated with color from the colored objects external to us or to our camera. Whatever they may be, I have already shown on several occasions that *Light* acts as a positively retarding agent in all the changes which take place

* Mr. Towson is better known to the world as the enunciator of the principle of Great Circle Sailing in Navigation, so important in sailing to Australia, and other remote parts of the world.

on our photographic preparations; therefore, by throwing the colored rays even out of focus, we may really produce a perfect photographic picture in less time than when the light rays interfere. It appears to me clear that we ought to consider the chemical spectrum as distinct and separate in all respects from the luminous spectrum as made up of bands of different refrangibility. In this manner M. Melloni distinguishes the calorific spectrum as possessing a set of rays which he calls *thermochroic* rays, or rays colored for heat; those heat rays which are indicated in Sir John Herschel's experiment, being analogous to those from colored rays, produced from the spectral image of a round hole, through which the luminous pencil is admitted. The chemical spectrum, on whatever material obtained, exhibits an analogous order of refrangibility,—the same degrees of variation of intensity and a similar arrangement of form. It becomes of course important, and it is the only means by which photographers can work effectively, that they should obtain lenses which will give at the same time, the most perfect visual image that can be produced (so far achromaticity is an object to be desired, and one we always must attain), and be correct for the actinic focus. Indeed, in doing this, we must of necessity produce a lens which is nearly achromatic, or, more correctly, *over*-achromatic. Now, instead, therefore, of correcting for the line H in the violet ray or any particular line in the ordinary spectrum, it becomes, from all that we know, essential to correct for those lines recently discovered by Mr. Stokes beyond the extreme lavender ray of the Newtonian spectrum; or else we leave a considerable portion of the chemical rays out of the sphere of action. Therefore, it appears to me, under consideration of the conditions I have endeavored to explain, that it would be convenient that we should adopt for the chemical principle of the sunbeam, ACTINISM, that which Melloni has done for HEAT We should establish a nomenclature by which we should get rid of terms that do not correctly express things that we have to deal with. It was Melloni's proposition, that the body which allows radiant heat to pass through it freely should be distinguished as *diathermic*.

I am quite satisfied that until we disassociate from our minds the idea that we are dealing with the luminous principle of the sunshine in the production of our pictures, we shall not arrive at that perfection in Photography which it is desirable we should obtain. We certainly shall not succeed in representing Nature as Nature presents herself to our eye, until we carefully examine all the phenomena which are involved. We desire to produce images equal to those beautiful ones which are impressed by the physical radiations upon the human retina, and to do this we must arrive at the same conditions in our dark chamber, as those which obtain in the visual camera obscura of the eye, which is not strictly achromatic.

In conclusion, I offer these remarks with great humility, but with a conviction, from the experiments which I have made upon the subject, added to a considerable amount of thought, that they may be of some service to photography considered as a science or as an art.

The thanks of the meeting were unanimously voted to Mr. Hunt for his paper and illustrations.

Mr. Ross.—The subject is so particularly Mr. Hunt's own, and he has dealt so largely with it, that there is but little to say or remark upon his observations. I can bear testimony that my practice is precisely in accordance with Mr. Hunt's views, in several points. I would remark, with reference to the effect of yellow glass, that several times I gave additional diameter to my photographic lenses for portraiture, but failed in producing a proportional increase of intensity in the photogenic effect. This I afterwards found was mainly due to the stoppage of the chemical rays by the media I then employed. The crown or rather plate-glass was from the Thames Plate Glass Works. This had more or less a greenish tinge, which was found to be detrimental as compared with colorless glass. The flint glass lenses were made from a glass manufactured at Messrs. Chance's establishment, under the name of 'light flint.' In the process of manufacturing flint-glass for optical purposes, the material is kept in fusion a much longer time than for ordinary glass. This is necessary to afford time to perform certain manipulatory processes for obliterat-

ing the striæ, but in consequence of this long continuance in the furnace, all extraneous matters tending to give color to glass produce a greater effect, and there results a yellow-green tinge, which, together with the oxide of lead entering into the composition, causes considerable obstruction to the passage of the actinic rays. Upon mentioning this to M. Bontemps, he directed his attention to the subject, and now produces glass which is very much less colored; and in consequence I have the same intensity with a combination of lenses 3 inches diameter, that I had with 3 2-10th inches previously. With regard to the Canada balsam, I do not understand that the minute film of the oil of almonds upon the surface of the glass leads to a condemnation of the Canada balsam between the surfaces. Canada balsam we know is applied to destroy the reflection at the internal or contact surfaces, and the reflection is so great at these, that a lens would be obviously slower if they were not cemented together. Then it would become a question whether the obstruction of the chemical rays by the film of Canada balsam, is greater in amount than those reflected along with the white light from the contact surfaces of the lens. With reference to the chemical portion of the spectrum, I may state, that in the preliminary investigation for the construction of photographic lenses, I saw that the more refrangible rays should be placed with the visual, but I could arrive at no practically accurate conclusion. I ultimately obtained a diactinic lens by testing and correcting it after it was made. There yet remains much that is not understood, and which I believe to be very obscure.

Mr. Hugh Owen.—In 1850 I procured a lens from Paris which has enabled me to confirm the correctness of Mr. Hunt's observation upon the colored glass sometimes used in making lenses. I endeavored to use it on several very bright days, when operating amid Lynmouth's most beautiful scenery, and was much surprised to find my paper was of a quality less sensitive than I at first imagined. I brought my lens home with considerable disappointment; but after an examination of it (I had taken it down without trial,) I found that when placed on a white surface it had a strong tint of greenish yellow. I carefully tested it with a lens ground by Ross, using a sheet of paper, divided *after* preparation, to ensure the same condition, and it took thrice the time required by Mr. Ross's lens to get a similar image.

Mr. Shadbolt.—I wish to say a word or two with regard to Canada balsam, as I have recently been making some experiments for the purpose of procuring microscopic pictures by artificial light. Using the camphene lamp as the source of illumination, of course the impression is produced very much more slowly than by sunlight, and consequently the differences of time occupied in taking pictures under varying circumstances are much more perceptible than would be the case were a strong light made use of. In taking images of an object mounted in Canada balsam, and a similar object mounted in another fluid, viz. Glycerine, I found that the former required *four minutes* of exposure, and the latter but one minute, to effect an equal result, although the thickness of the film was far greater than that of Canada balsam. I am alluding particularly to such objects as parasites of birds. With regard to the remarks of Mr. Hunt on the actinic focus being sometimes before and sometimes behind the visual focus of the achromatic combination, it seems to me, there is one point that has not been sufficiently examined into. We know very well that the *dispersive power* of different kinds of glass is very different in degree, with respect to each peculiar color of the spectrum; that is to say, that some stretch out the yellow, and some the blue, and some the red rays more than others. Now, is it not probable that two achromatic lenses made of glasses of different densities may have the position of the actinic foci differing, just as is the case with the colored foci respectively, so that in point of fact the one would want a considerable amount more of over-correction for color than the other? That probably may be in consequence of the varying amount of what opticians call the *outstanding* rays of green and of claret in almost all achromatic combinations. The difficulty that has been experienced in getting pictures with some microscopic lenses, may probably be in consequence of a glass of very great density of yellow color being used in one of the combinations, as I know that one of our opticians formerly made

use of it. I do not know whether Mr. Ross does?

Mr. Ross.—No.

Mr. Shadbolt.—I know some microscopic objectives will not produce an image in anything like the time that others do.

Mr. Malone.—With regard to the subject of the Canada balsam, I am disposed to think that those who are in the habit of dealing with it must have observed that different samples differ very much in color, some being tinged decidedly yellow, while others are much whiter, and I think that point is to be taken into consideration. It may be replied, that opticians in applying Canada balsam to lenses, take pains to have it of the finest kind. True, but now I would throw out, merely as a hint, the consideration that wax (which is bleached by the action of light, until from being of a very decided yellow color, it has been rendered almost colorless) is known to become again more or less colored when put away, and lying in the dark for a long time. The question then arises, whether any such change takes place in the Canada balsam used in lenses; that is, where the lenses are merely occasionally used, and then put away. May they not become tinged? I may ask also—supposing them to be fitted up originally with the whitest Canada balsam that can be obtained—does the bleaching action of the light, when the lens is constantly or frequently used, preserve the Canada balsam in a state of purity, allowing the chemical rays to pass freely throughout? If this be the case Canada balsam may still be used with advantage. I think it would be desirable to make exact experiments with different samples of Canada balsam, and ascertain whether there may not be one preferable to the rest, and whether that one changes by being put away in the dark; or whether the different circumstances under which it may be placed, as regards light, may at all affect the question.

Mr. Shadbolt.—Is not the different color observed in the Canada balsam due to the loss of a portion of its hydrogen, and the development of free carbon? if so, all Canada balsam would eventually become colored.

Mr. Naylor.—I am connected with a varnish manufactory, and have been from my earliest infancy, and I find all solutions and all gums, after they become dry, gradually go from white to yellow throughout,—there is no exception.

Mr. Malone.—I venture to remark, that there is one phase of the subject which has not been treated of this evening. During the reading of Mr Hunt's paper, certain ideas suggested themselves to me, arising from my recollections of experiments made by M. Edmond Becquerel in the first place, and of those experiments being repeated and varied in form by M. Niepce de St. Victor. Having had the satisfaction of personal communication with both those gentlemen, I may be perhaps allowed to testify that they have obtained naturally colored images upon silver plates coated with chloride of silver; the best effects being produced upon the chloride previously heated to a point short of its fusion. Now I think the fact of obtaining such images proves beyond a doubt, that the time will come when we shall be able to produce pictures representing nature as we see it, and that whenever that much-to-be-desired result takes place, we shall find an achromatic lens required to give perfect delineations. I think M. Becquerel's experiments lead us to this, for we find in his case that the chloride of silver is by preference first acted upon by those rays of the spectrum which are most luminous and least actinic; the red, orange and yellow rays are the first to imprint themselves, whilst the less luminous blue and violet rays act with greater difficulty: just the reverse of what happens in the Talbotype and daguerreotype processes. And I certainly think it follows, that a differently constructed lens will be required in the production of colored images to the one used for ordinary photographic purposes.

Moreover, I think, with reference to this subject, that we must direct our attention more closely than we have hitherto done, to the very varied deportment exhibited by different chemical substances when under the influence of the spectrum. From M. Becquerel's experiments it is clear that certain chemical surfaces exist upon which the luminous rays act by preference. We also know, from experiments made by Sir John Herschel and Mr. Hunt, that certain preparations of silver used in the *non-chromatic* ordinary photographic processes are also affected more or less by rays which

exist far below the point of maximum actinic intensity—I mean the maximum as exhibited in Daguerre's original process. Ought we not to bear in mind these apparent anomalies? And shall we not be led to the conclusion that we must obtain a lens suited to the particular surface with which we may be dealing? I would even go still farther and ask,—are we not warranted in believing that the perfection of photography will consist in modifying our processes in such a manner that an achromatic lens can be employed? Our photographs would certainly then be produced by the identical rays by which natural objects are rendered visible; the gradations of light and shade and color would be correctly represented—and *photography* would redeem its name. My chief object in addressing you is to suggest, that those experimentalists who may be engaged with the more luminous rays, may find that they require a lens constructed on principles different to those so ably developed by Mr. Hunt in this evening's communication.

I am sorry that I have so imperfectly expressed what I wished to say, not having previously prepared myself.

Sir William Newton.—You do not mean to say that an actual color could be produced?

Mr. Malone.—Yes, Sir,—an actual color produced; and the colors existing in that half of the spectrum which gives the yellow ray are the first colors to be produced, so that, had M. Becquerel's experiments taken place prior to M. Daguerre's, we should have probably called that the photogenic space of the spectrum. The colors produced were evanescent if exposed to the action of the white light of daylight; but they could be preserved for some time in the dark, and could be shown occasionally in a diffused light.

Mr. Hunt.—In connection with the remarks of Mr. Malone, there appears one point which I think may require a little explanation. M. Becquerel and M. Niepce de St. Victor have most decidedly produced all the colors of the prismatic spectrum, ray for ray, as they are colored in nature; —they have copied geological maps, and highly colored pictures, producing color for color as upon the paintings. They have not succeeded in rendering these colors perfectly permanent, but M. Niepce is advancing considerably towards it by using ammonia as a fixing agent. Now, with regard to the influence which Mr Malone has indicated, showing the necessity for achromatic combinations, there is this point to be observed. Taking the example of M. Niepce's experiment, which is precisely analogous in character to Sir John Herschel's experiment with a vegetable juice, described in one of his memoirs on this subject, you have to start with a surface of a brown color which is bleached, or eaten out in color. Niepce's plan is this: —he prepares a silver plate, that is, an ordinary daguerreotype plate of silvered copper, in the following manner. The plate is connected with one pole of a voltaic battery and plunged into a bath containing muriate of soda and muriate of copper, a piece of silver forming the other terminal pole. The plate being immersed in this bath, the result is that the chlorine of the muriate of soda attacks the silver, forming a chloride of silver; at the same time some subsalt of copper combines with this chloride of silver, forming a compound which is of a chocolate-brown color. The plate thus prepared is placed in the camera-obscura, and in the course of about an hour the resulting picture is produced. This picture is the result of different degrees of degradation as it were, produced upon the plate by the combined influences of the chemical and of the luminous rays. The yellow ray of the prismatic spectrum possesses a greater degree of interfering action upon the chemical agency than any of the other rays; consequently there is less chemical change under that portion on which yellow light falls than under the other, and there a yellow color is the result. Where we go on towards the other end producing a deeper and deeper degradation, by chemical or physical change, we get the blues, the greens and the violets. There are some peculiar principles involved in this change that we do not as yet understand. The whole of the phenomena are yet obscure, and require a most searching investigation. It appears the colors produced, howsoever obtained, must be the result of that balancing power between the luminous and the chemical agencies which is constantly taking place, and therefore we can perfectly well understand that when the balance is in a certain con-

dition, we may get the surface so far chemically changed that it is in the physical state to send back yellow rays to the eye. Then the chemical principle being a little more active, and the luminous principle not so effective, red rays are the result; but when the chemical agent becomes still more active, the luminous principle being weaker in action, we get a blue radiation.

Mr. Malone.—I wish to make an additional remark. It is this—that M. Becquerel finds that the bath of sulphate of quinine, used in Mr. Stokes's experiments, cuts off certain rays, and the cutting off those rays enables him to obtain his chromatic images with greater purity, and enables him also to reproduce the effect of white light upon his plate, in cases where the original object to be copied is white. In copying plaster casts for instance, if the light reflected from the object be allowed to pass through the camera upon the plate —nothing but the lens intervening—the image has a dingy hue,—the result of the sum of action of the rays which compose ordinary white light. But if now a second experiment be made, and a bath of sulphate of quinine interposed, by which, as Mr. Stokes shows, the extreme rays of the spectrum are absorbed, then the resulting image is white, correctly representing the original object. So that it would appear that the extreme so-called chemical rays are really injurious when it is our object to produce perfect chromatic images. I would suggest that the question should be discussed as to whether we should not, in a lens constructed for colored images, and even in certain other cases, disregard the more extreme rays, which Mr. Hunt properly suggests should be taken into account in making a lens for ordinary working purposes.

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2. The Count de Montizon, "*On the Collodion Process.*"

As it is not always in the power of the amateur to purchase collodion ready-made, it will be of use, before describing the method of manipulation, to give some account of the various ways of preparing the collodion itself.

This is the more advisable, as success depends so very much upon the operator's knowledge of the nature of the material he is employing. I will not, however, do more than give the proportions of those media which I have found to produce the most perfect results.

To make Collodion.—Put into a clean basin 10 drachms of sulphuric acid of ordinary strength, 1½ oz. of nitrate of potass, and 40 grains of clean carded cotton.

With glass rods stir the cotton well for about six minutes, till it is thoroughly saturated, then pour on it plenty of common water, changing the water seven or eight times, and finally washing twice with distilled or rain water. The more thoroughly it is washed, the more completely will it afterwards dissolve in the ether. Wring it dry in a clean cloth, press it between folds of blotting-paper, and having pulled out the fibre with the hands, dry it near the fire.

This is very important, and also it is very necessary to make the gun-cotton in small quantities, not more than 40 grains, or else it will not well imbibe the liquid.

Instead of cotton, paper may be used. The Sweedish filtering paper is well suited for the purpose. All this part of the process should be done under the chimney to allow the gaseous fumes to escape.

To dissolve the Cotton.—When the cotton is quite dry, to each oz. of good sulphuric ether add 8 grs. of prepared cotton or paper, using a large bottle, so that the clear liquid may be poured off when wanted. If the cotton is well prepared, it dissolves completely. Much depends upon the quality of the ether, which ought to be good, but not too strong. In making a solution a short time since, with ether obtained from one of the best operative chemists, the cotton, when added, remained unaltered. Thinking that the cotton must have been badly prepared, I tried it in other ether, and found that it was perfectly good. Before condemning the ether, however, I tried the effect of a slight addition of alcohol. Immediately the cotton was dissolved, and with the collodion thus formed, very good negatives were produced. I found that with this ether it was necessary to add one-fourth of its bulk of alcohol.

If the collodion should be wanted for immediate use, it is unnecessary to wait until it has settled, but it must in this case be filtered through clean linen.

The collodion thus made is so strong in texture, that it can easily be transferred to paper from the glass on which it is first poured.

To iodize Collodion. — I have tried many methods of iodizing collodion. Those which have given the most successful results are the following :—

1st. In 1 oz. of collodion put a little iodide of silver and about 3 or 4 grains of iodide of potassium, and then shake it well up. The collodion becomes very turbid, but on being left for some hours it gradually clears up, beginning at the bottom. When it is quite clear, pour off the liquid into another bottle.

2nd. To 1 oz. of collodion add 2 grains of iodide of ammonium. This will give very beautiful gradation in the half-tones, but not so vigorous a picture as the first.

3rd. In 8 drachms of pure alcohol dissolve perfectly 8 grains of iodide of ammonium or iodide of potassium, and ½ grain of iodide of silver ; then add 24 drachms of collodion. The iodide of silver ought to be freshly made, or the resulting negative will be of inferior quality. The iodide of ammonia too ought to be freshly made. This collodion is one of the most sensitive, but the half-tones produced by it are inferior.

4th. In 8 drachms of alcohol dissolve 8 grs. of iodide of potassium, 4 of iodide of ammonium, and ½ grain of iodide of silver; then add 24 drachms of collodion. This forms a very sensitive medium.

5th. In 2½ oz. of collodion, 5 drachms of alchol and 5 minims of liquid ammonia, dissolve 14 grains of iodide of ammonium. This forms a very good collodion, very sensitive and colorless.

6th. In 2 drachms of alcohol dissolve 6 grains of iodide of potassium, and add 6 drachms of collodion.

We now come to the

Method of Operating.—I employ nothing but water to clean the glass plate with, using plenty of it and rubbing the glass with the hand till the water flows freely over the surface. It must be well dried and rubbed clean with a linen cloth which has been well washed without the use of soap. When the collodion comes away from the glass, it is almost always in consequence of the existence of grease or dirt or of a little moisture upon the surface.

Pour the collodion upon the glass in the usual way, and almost immediately immerse it in the bath of the nitrate of silver, 30 grs. to the ounce of water, lifting it in and out of the solution to allow the ether to escape. When it assumes a bluish opal hue, it is ready for use. By adding a little alcohol to the solution, one part of alcohol to ten parts of water, and one part of nitrate of silver, the collodion is more speedily rendered sensitive, and the image produced is more vigorous.

It seems of some importance to immerse the glass in the nitrate bath, and to place it in the slide in the same direction as that in which the collodion was poured off the glass plate.

After the appearance of the opal hue, if the bath be an old one, the plate may be left in it for some time without injury ; but if the bath be new, it must not be left longer than is necessary to excite, or the nitrate would attack the iodide of silver.

To obviate this, it is well in making a new bath to add 1 grain of iodide of silver to each ounce of the nitrate solution.

It is unnecessary to filter the bath, as it is often altered in its nature by passing through paper containing injurious chemical constituents. A little blotting-paper drawn over the surface will remove any particles of dust that may be floating upon it.

If the bath contain alcohol, it should, when not in use, be kept in a stoppered bottle.

Slides.—It is very important to have the slide in which the glass plate is next fixed perfectly clean, and that no material likely to produce decomposition of the nitrate of silver enter into its construction. In using, lately, a large camera in which the glass plate rested upon glass supports, cemented on to the wooden frame, the pictures were always stained, and from above.

On placing a strip of blotting-paper between these supports and the negative plate, the stains ceased ; and when afterwards a wooden slide was used, furnished by Mr. Ross, and painted with lac varnish, no such stains were visible.

The time of exposure in the Camera

varies, but until you know the quality of your collodion, it is best to begin with a short exposure, as you may fancy a collodion good for nothing which gives a bad picture after 30 seconds exposure, whereas if you had tried it with two seconds, it might have produced a splendid proof.

As a proof of the sensitiveness that may be obtained, I produce a picture of a pelican taken the other day during heavy rain and violent wind, yet it will be seen that the feathers are unruffled and the image quite distinct.

Here is a second example of the possibility of arresting a momentary movement. It is a picture of the pelicans about to receive their food. It is not good, but still their gestures are distinguishable.

Though the collodion is most sensitive immediately on being taken from the bath, it will bear much longer keeping than is generally supposed. For example, the picture of the dromedary here exhibited was taken three-quarters of an hour after the plate was excited.

As to working with a plate of collodion that has been washed and dried, I have not obtained good results from experiments in this direction.

The great advantage of collodion—its sensitiveness—is no longer present, and it becomes inferior to the albuminized plate.

To develop the Picture.—Pyrogallic acid appears a better agent than protosulphate of iron.

I find it better also not to place the negative upon a stand, but to hold it in my hand, taking a sufficient quantity of solution to cover the plate at once. I pour it by turns on to the surface and back into the glass measure, until the picture is completely developed.

The solution of pyrogallic acid is the one usually employed. Mix 3 grains of pyrogallic and half a drachm of acetic acid to the ounce of water. For use it is diluted with an equal measure of water. I have quite abandoned the addition of nitrate of silver to the developing solution, thinking that the negative is thereby rendered less clear, and more violent in its contrasts of light and shade. If added at all, it is only when the negative is feeble and when it appears to have ceased developing. When, however, the plate has been kept for some time after being excited, it is well, before commencing to develop, to plunge it again into the nitrate bath for an instant.

Though it seems of small importance, yet the glass which contains the pyrogallic solution should be washed after each negative, and with distilled water. The solution of pyrogallic should be made when wanted, or at most two days before, or it loses a part of its developing power.

Protosulphate of iron has this advantage, that as it does not spoil but improves with use, the plate may be plunged into it, thus avoiding the difficulty which there is in pouring the developing solution on to a large plate.

It is said that the protosulphate of iron produces better half-tones than pyrogallic acid. I do not find it so. The solution employed is of the following nature :—

12 drachms protosulphate,
2½ acetic acid,
25 drachms water,
11 minims sulphuric acid.

At no time while the plate is in a sensitive state must any white light be allowed to enter the dark room ; but this is especially the case during the development of the image.

The light of a candle or lamp, or fire of the grate, is very injurious, unless it is removed to a considerable distance, or falls at an acute angle upon the plate. In proof of this, I may state that I have taken in the camera a very distinct image of the flame of a candle in six seconds.

By employing a yellow curtain the operator has a greater supply of light in his dark room, and that of a kind that will not injure his negatives.

For fixing the Picture.—Use a saturated solution of hyposulphite of soda, and then wash the negative with plenty of water. Dry it, but not by the fire, and protect its surface by a varnish. The best varnish is that made from amber, according to the receipt given by Dr. Diamond. The amber is dissolved in chloroform, in the proportion of 2 drachms to 1 oz. of the spirit, and should be left in it for two or three days. The varnish made by Mr. Horne from gum damma is also excellent.

Transfering the Film.—Instead, however, of varnishing the picture on the glass plate, I prefer to transfer it to paper and this may be done so easily and so quickly that I think that one of the principal ob-

jections to the collodion process, viz. the necessity of carrying about great quantities of glass, is entirely got rid off.

After the film is fixed and washed, but before it is dry, take a piece of blotting-paper as large as the glass; wet, and lay it on the film a little short of the edge of the glass.

Lift one corner of the film, turn and double it over the paper, and proceed in the same way along that side. Then lift the paper carefully, and the film will follow, adhering to it.

Next wash one side of some thin Canson paper with gum arabic, or some other adhesive solution; lay the film down upon it, driving out all air-bubbles; turn the edge of the film that lies over the blotting-paper carefully back upon the sheet of Canson, pressing it so that it may adhere. Lift one corner of the blotting-paper carefully to see that it is separate, and then gradually lift the whole.

The thanks of the Meeting were voted to the Count de Montizon for his paper.

The Count de Montizon, in reply to a question whether the negative remained in the bath during the space of three-quarters of an hour, replied, that it did not.

Mr. Hunt.—There is one point on which I would offer a remark, arising from the suggestion of the Count himself, relative to the influence produced upon Collodion by the flame of a candle, yielding, as it does, a very large quantity of yellow light, and the light derived from a fire. During two or three months of last autumn I was engaged in a series of investigations upon the action of the spectrum. Amongst others, I had been supplied by M. Bontemps, of Messrs. Chance's establishment at Birmingham, with a very great variety of colored glasses. I found amongst these some yellow glasses that did not obstruct those rays which act energetically upon collodion. That when a piece of this yellow glass was interposed between the prism, and the spectrum falling upon the collodion plate, there was a long space blackened, corresponding with the blue and violet light of the spectrum, and over a space beyond them. There were other yellow glasses, opaque to those rays, which protected the collodion plate. This is important to pay attention to, since in many of the cameras for working out of doors, yellow glass is employed for the purpose of admitting a certain quantity of light, under the impression that yellow light does not act on the sensitive surface. The glasses which admitted the chemical rays, which darkened the collodion preparation, were colored yellow by carbon; but with silver-yellow glasses, there was that opacity to the chemical rays which it is necessary under the conditions to preserve. The series of experiments which I was then making for the British Association will be published in the next volume of their Transactions, showing the results obtained, with drawings in illustration of the chemical changes. I mention this for this reason, that in practice it will be found to obtain a yellow glass stained with oxide of silver, as a medium of admitting light to cameras for working out of doors.

Mr. Wilkinson.—I wish to make one observation as to working out of doors and yellow glass. Before our Photographic Journal commenced, I sent a contribution to the 'Notes and Queries.' I found that the deep yellow light produced by transmitting the rays through sheet India-rubber answered every purpose, and entirely obstructed the actinic or chemical rays, and I have no doubt that gutta-percha and veneers of some woods would answer equally well. Having occasion to knock a hole through the roof of my house, merely to poke out the nose of the camera, I wanted to prevent the wind and rain entering, and I happened to have a yard of sheet India-rubber, from which I cut a square foot and substituted it for the tile that had been removed. I then fitted a trap-door of wood, inside, which I intended to obstruct the light. I found, however, upon letting this trap-door down the following morning, that I not only obtained sufficient light to illuminate the whole of the dark closet, where no light was admitted otherwise, but that when using the most sensitive collodion, with the sun shining upon the India-rubber, no effect whatever was produced in blackening the excited collodion. Therefore, as a substitute for yellow glass, I think it is a discovery of some importance, if verified by further trials.

Mr. Vignoles.—What was the thickness of the India-rubber?

Mr. Wilkinson.—About one-twenty-second part of an inch. It was common

sheet India-rubber, not vulcanized. I can bring some of it to show you.

Mr. Fenton.—As this discussion seems to be one of considerable interest, I will read a paragraph from the Introduction of the Journal of the Society, in which it is stated.—"It is not purposed that the Journal should be restricted to the publication of the proceedings of the Society, but that it shall be open to the correspondence of photographers." We see from this, that though the discussion be closed for the present, we need not now close the consideration of the subject; it will be quite open, and the Council will be glad to receive from Members of the Society any suggestions that may occur to them with respect to the subject of this evening's consideration. Before closing the Meeting, I may announce that the subject of discussion for the next evening will be the "Camera and its possible improvements."

Sir William Newton.—In concluding the business of the evening, I beg to advert to a subject which Dr. Percy alluded to in his paper at the last Meeting, respecting a negative by Vicomte Vigier. This (*pointing to a photograph*) is taken by means of waxed paper. It was excited a month before it was placed in the camera. Vicomte Vigier kindly lent me several of his negatives, and I have taken that positive from one of them; and I consider it to be one of the best specimens of that class which I have ever seen. Those on each side are studies, with collodion, in 8 seconds with a single lens, that I made for the purpose of assisting in producing pictures, and I found them to be of much more service for the general effect than the most minute in *detail* that could be obtained, for *my purpose.* If I want a *particular* part, such as drapery, or anything very minute, then, of course, my object is to get it as perfectly in focus as possible. With regard to those photographs below, the paper was not particularly good, and the consequence is, that the negatives are exceedingly porous; therefore you see that the sky is very dark. I touched on the negatives with Indian ink, to form lights. I wish I could do the like again, with certainty, because I think it has produced a very picturesque character, although they must not be viewed as *specimens* of photography.

Mr. Vignoles.—Our Treasurer has been good enough to bring here a very interesting specimen of a miniature page of the 'Illustrated News.'

Mr. Roslin.—I have taken the 'Illustrated London News' at four different distances, for the purpose of testing whether there was any difference between the chemical and visual foci of the glass. I have not found, in any one instance, any alteration from the visual focus, and in every instance I have found the definition very perfect; and the one now upon the table is the eight-hundredth part of the original size: the length of the lines composing the lens is the seven-hundred-and-fiftieth part of an inch, and about half the thickness of the human hair. The thing, by being looked at, will speak for itself as to definition.

Sir Thomas Wilson.—You can read it quite perfectly.

Sir William Newton.—Should any gentleman have improvements to suggest in the Camera, he is requested to prepare a paper for the next Meeting, when that subject will be more particularly discussed.

The Meeting then adjourned to Thursday the 7th of April.

From the London Art-Journal.

ON THE RED PIGMENTS CALLED "LAKES."

BY MRS. MERRIFIELD

THERE are several conditions which influence the durability of pigments, namely, first, the nature and properties of the pigments themselves and their purity from extraneous matter; secondly, their mixture with other colors; and thirdly, the vehicle with which they are employed. We shall offer in the present article a few remarks on the red pigments called "Lakes," chiefly with reference to these conditions.

Lakes have usually the reputation of being wanting in durability, yet the traveler in Italy is frequently astonished at the brilliancy of the lake colors on paintings whose age is reckoned by centuries. "Where," says Tassi, speaking in his "Life of the Bergamasque painters," of the beautiful blue and lake colors on Italian pictures of the cinque-cento—"Where will you find such colors now?" Having, on a former occasion* alluded more particularly to this subject, it will be unnecessary now to enumerate instances of the beauty of the lake colors in old paintings. It will be sufficient to point their existence, and to observe that, with these examples before us, we should be wrong in imputing to *every* kind of lake the character of want of durability; the difficulty lies in recognising that which was at once so beautiful and so durable.

It has been already observed† that the old masters possessed several kinds of lake. The earliest were those prepared from the wood of the Cæsalpinia Sappan (the Bresil-Wood or Verzino of the old painters), from lac, and from the clippings of scarlet cloth, called Lacca di Cimatura by the Italians. The red cloth used for this purpose was sometimes dyed with kermes (the *grana* of the Italians). With regard to the Lacca di Cimatura, it is astonishing that such a round-about, unscientific method of preparing lakes as that of discharging the color from wool previously dyed red, and then precipitating it upon a white earth, should have prevailed for so long a period, and in so many countries; and it is difficult to imagine what advantage this method could have possessed over the more simple one of preparing a lake directly from the dye-rug itself, especially as we know this was done in the case of lac. We find, however, that this former method, which can be traced from the fourteenth century, was practised in this country within the last hundred years, a receipt for it being contained in the "Hand-maid of the Arts" (the second edition of which was published in 1765.)

Cochineal was introduced into Europe about 1523, but though generally known in Italy it was considered as a new pigment, the qualities of which were not thoroughly known in 1547, and it was admired for the brilliant color of the lakes prepared from it. It preserves the latter character to the present day, but it is considered to be less durable than lac and madder.

The history of madder as a pigment is not so clear. We find it mentioned in early medieval MSS. of the north of Europe; then we lose sight of it until 1612, when Neri gives a receipt of his own invention for preparing a lake from it. Even after this time receipts for madder lake, and notices of its use in painting, are scarce. Yet during the whole of this period madder was in great repute as a dye-drug, and was extensively cultivated in Flanders and Holland. The madders of Holland, called *Rosa di Fiandra*, were in great request for dyeing, and were famous throughout Europe, especially at Venice. It is the opinion of Merimee‡ that madder lake was much used by the old masters, and that the most durable lakes were prepared from this root, but he quotes no authority for his supposition, ex-

* See *Art-Journal* for 1850, p. 189.

† Id. Ibid.

‡ De la Peinture a l'Huile, pp. 139, 144.

cept the opinion of M. Chaptal, derived from the resemblance of the color of madder lake to that of the lake on the paintings of Pompeii: until some documentary or chemical proof can be given that madder was the substance of which the best lakes were formerly made, we must hesitate to concur in this opinion. The most conclusive argument, as it appears to us against the use of madder lakes by the old masters, is that we have never yet seen any madder lake which equalled in depth of tint the intensely-colored lakes we have seen on old pictures. That it might possibly have been used for the *pink* colors, we admit. The dark tints of madder lake partake of the yellow, the brown, and the purple principles which are found in the root; the rose and pink tints are never of great depth. Ruby madder has nothing in common with the gem but the name. If the old masters possessed the secret of preparing lake-colored pigments of great depth, power, and purity of color from madder, the secret has been lost. Yet that this plant is capable of producing intense and bright reds is evident from the celebrated Adrianople red dye, which is colored with it.

The tests afforded by chemistry as to the nature of the different kinds of lake are not perfectly conclusive. Chemical tests can distinguish between animal, vegetable, and mineral substances, but they cannot distinguish the coloring matter of one animal substance, as for instance, lac, kermes, and cochineal,—from each other. Neither can they distinguish one vegetable red color from another. The animal lakes when burnt exhale the peculiar odor of burnt feathers, but it is not often that enough color can be collected from old paintings to be detected by this test. It would be most desirable to ascertain whether some of the best lakes on old pictures,—those of Pinturicchio at Siena and Rome for example,—which are too old to have been cochineal, are of animal or vegetable origin. If the former, they must have been either lac or kermes; if the latter they *may* have been madder. Cennini says the lac-lake was the best. This was used we believe by Lionardo da Vinci, who mentions "Lacca senza gomma,"—that is, as we read it, "Lake freed from gum (resin)." After the introduction of cochineal, lac and kermes lakes were less esteemed, for they did not possess the brilliancy of the cochineal, although they are believed to have exceeded it in durability, and the former fell gradually so entirely into disuetude, that we are not aware of any receipts for them in modern works.

The old lakes were generally of a cool tint; at a later period they were made more scarlet by the addition of an acid; lemon-juice was frequently added to them with this intent. Acids are still added for the same purpose, but it is considered that what is gained in brilliancy is lost in durability. Sometimes, also, vermillion is mixed with the lake, to make it more scarlet; this, of course, renders the color less transparent. The presence of vermillion may be detected by holding a little of the suspected color on the blade of a knife, in the fire or candle; the vermillion will entirely evaporate, while the lake will become first brown, then black.

But whatever doubt may exist as to the identity of the coloring matter of the lakes, writers and artists generally agree that they are all liable to certain defects; and that in order to ensure, as far as the nature of the pigments will permit, their permanency, certain conditions must be observed. It is perhaps owing to the precautions the old masters took in the preparation of these pigments, and to their mode of using them, that the superior permanency of the color is to be attributed.

In addition to their general character of fugacity, lakes, when used in oil-painting, are charged, with the following imperfections:—In the first place, when kept some time after being mixed with oil, they become fat; secondly, they are frequently full of salts; and thirdly, they are bad dryers. The remedy for the first, is to keep them in powder, and to mix them with oil or varnish only as they are wanted. With regard to the second defect—their being full of salts—this is a serious evil, for the salts not only retard the drying of the color, but injure the picture: lake should always be tested to ascertain whether it is free from salts; this may be easily done by any one: for the method of effecting it the reader is referred to a former page of this Journal.* Of the third

* See *Art-Journal* for 1850, p. 189.

defect, we must speak at greater length: lakes, it is well known, are chemical combinations of coloring-matter with a base, which is always white in color, and which forms, with the coloring matter, an insoluble compound; the most usual bases are alumina, and the oxide of tin; but phosphate of lime was formerly used occasionally, and for lakes of inferior quality, chalks, and other white earths were substituted for alumina; the latter, of course, do not form insoluble compounds with the color, which is therefore liable to be changed by several re-agents.

The alumina-lakes are esteemed the most permanent; but they are bad driers in oil, because the alumina which forms their base has such great affinity for water, that after being ignited, it has been known to absorb, in a dry atmosphere, 15½ per cent in water: and in a humid atmosphere, 33 per cent.* It is a well ascertained fact, that the presence of water renders oil less drying; and the principle of most of the receipts for preparing drying-oil, is to add to the oil some substance insoluble in oil—such as calcined sulphate of zinc, litharge, and calcined salt,—which has such affinity for water that, when thrown into the oil, it will seize upon the water, which it abstracts from the oil, when the latter becomes more drying—that is to say, more easily converted into a resin. When, therefore, it is considered that lakes are seldom so thoroughly dry as to be entirely free from water, it will readily be understood, that, on this account, they are slow dryers when mixed with oil. The following experiments show that it is not merely sufficient to obtain them in a dry state from the colormen, but that, after being thoroughly dry, they imbibe moisture from the atmosphere.

Ten grains of each of the following colors were dried on a piece of foreign paper, over a candle or before a fire, until they felt hot, but not so as to change the color. They were then weighed again, when they showed the following results:—

Colors.	Loss by drying.	Gained by exposure to air.
Indian lake, No. 1 (darkest)	1 gr.	just turned the scale.
Cochineal lake	2 grs.	nil.
Rose madder (crystalized) French	3-4 gr.	nil.
Brown madder	3-4 gr.	nil.
Purple madder	very little	½ gr.
Madder carmine	1½ gr.	½ gr.
Scarlet lake	1 gr.	nil.
Purple lake	1¼ gr.	1¼ gr.
Brown pink	1 gr.	3-4 gr.
Vandyck brown	½ gr.	nil.
Burnt umber	nil.	
Raw and burnt siena	nil.	
Roman ochre	nil.	
Yellow ochre	nil.	
Indian red	nil.	

The colors which lost weight by drying are precisely those which are the worst driers. All those colors which had lost weight by drying were then placed in open papers in an uninhabited, but dry room, with an open chimney. The door and window were shut, to prevent the powders being dispersed by currents of air. They were left here for several days, when they were again weighed. The results were as in the third column.

That the driving off of the water accelerates the drying of the lakes, was proved in the following manner. The ten grains of the several colors which had imbibed moisture, or, in other words, which had increased in weight by exposure to the atmosphere, were divided into two portions, and one portion of each color was again dried. A little of *all* the colors was then

† "Alumina is a hydrate containing, when dried at the temperature of the atmosphere, almost half its weight of water. Even after ignition, alumina has such an affinity for water, that it cannot be placed on the scale of a balance without acquiring weight."—*Henry's Chemistry.*

ground up with the common drying oil of the shops, and placed upon a framed glass, at the back of which was fixed a sheet of paper, on which was written the names of each color, the dried colors being distinguished from the others. In every case the dried colors were found most siccative; they were all *tacky*, while the others were quite wet. From these experiments we learn an easy and simple method, and one which is in the power of every artist, of expediting the drying of lakes. It is merely to dry the quantity of lake intended for the day's work, either in the sun, before a fire, or in a spoon over the flame of a candle, first taking the precaution to fold the color in a piece of thin paper to preserve it from dust and light, and care being taken not to change the color of the pigment by burning it. A very short time suffices to dry the color. These experiments also point out that lakes should be kept in a dry place, and excluded as much as possible from the air. It might be advisible also, from their known tendency to fade, to keep them from the light.

These experiments also prove the soundness of the practice of the old masters in accelerating, by exposure to the sun, or to the warmth of a stove, or even by the addition of certain ingredients to the vehicle, the drying of their oil-paintings. The rapid drying of the colors was hastened as much as possible, because it was believed that the wet colors were acted upon injuriously by the air, and that when once dry they are less liable to change. In the case of lakes, especially, this precaution is important, because, as we have seen, they imbibe moisture from the air; and the water which they hold in suspension retards the drying of the oil. It will also be readily understood why, when he directs the palettes of oil-colors to be placed in water, Volpato* excepts lake, giallo santo (yellow lake), and verdigris, which are, he says, spoiled by the water, and must therefore be removed before the palette is put into water. Pacheco and Palomino, the Spanish writers and painters, make a similar remark; they say "lake must not see water."

The directions of the old masters to grind the lake very stiff—as stiff as butter, so that one may cut it—should be strictly followed; and the drying should be accelerated by artificial means either by the heat of a stove, by mixing it with a drying varnish, or by adding to it some dryer. A dryer for lake, frequently mentioned by old writers, is powdered glass; but if that operated at all as a dryer, it must have been by means of the lead which it contained. Powdered glass contains some free alkali,† which must be always injurious on pictures, not to mention its tendency to cause the red color of the lake to incline to purple. While mentioning the old methods of using lake, it may be remarked that it was frequently rubbed on with the fingers; and it is rare indeed that any marks of the brush can be discerned on the lake glazings of old pictures.

Brown pink and Vandyck brown were among the colors mentioned in the experiments. The former is a lake made of the berries of the buckthorn. This, though a fine color, cannot be classed among the most durable. It differs from the yellow lake made from the same plant only in its color, which is turned brown by an alkali, an additional reason to doubt its permanency.

The slow drying of the Vandyck brown is not to be accounted for on the same grounds, since it is not a lake, although, being an earth, it *may* contain some portion of alumina, together with the vegetable matter. Its slow drying is ascribed by Mr. Field to its bituminous nature. The experiment shows that moisture may be driven off from it by drying.

In addition to the imperfections above mentioned, lakes have the reputation of being to a certain extent incompatible with, or at least less durable, when mixed with white lead. Whether all lakes, vegetable as well as animal, are liable to suffer from this cause has yet to be determined. It is generally considered that all pigments are most durable when used alone; that is to say when unmixed with other colors, and when they are used with a vehicle which dries sufficiently fast to prevent the colors from being acted on by each other and by the air.

The Venetians were particularly careful

* "Modo da Tener nel Depenger," Ancient Practice of Painting, p. 741.

† Which may be proved by moistening it, and placing it upon turmeric paper, which is stained brown by the alkali.

to attend to this rule. Their finer colors were generally used pure, and with a vehicle which dried rapidly. Lake was employed by them chiefly as a glazing color upon a solid under-painting of other colors, the high lights being frequently, especially in rose-colored draperies, pure white. But the use of these beautiful pigments was not limited to red draperies; they were also extensively employed as general glazing colors for shadows. Thus Boschin relates that Paolo Veronese was accustomed to shade almost all his draperies with lake, not only those that were red, but also the yellows, greens, and even the blues (as may be seen) and by this means he succeeded in producing an indescribable harmony. The same author also mentions that Giacomo Bassano (Il Vecchio) glazed the extreme darks in his pictures with lake and asphaltum.

The most prudent plan would doubtless be to use lake alone, though it must be admitted that in the formation of certain compound tints, it is necessary to mix it with other pigments. That the mixture of white with lake was not *always* destructive to the color is proved by the durability of some of the pink draperies of the Roman and Florentine schools, which are stated by an eminent artist to be painted solidly, and this we think is confirmed by writers on Art. As some of the old masters are known to have mixed their blues with size instead of oil, which would have injured the color by turning it green, it becomes a question whether these beautiful pale pink draperies, such as are frequently seen on the pictures of Lorenzo di Credi, are not painted with size colors instead of oil. In this case, instead of adding white lead to the color, they might have used a lake of a light tint, made so by the addition of a greater quantity of alumina, or of some other white earth. Instances, however, are not wanting in which writers on Art sanction and recommend the mixture of other pigments with lake in oil. A few of these will now be mentioned. Lomazzo's "Treatise on Painting" contains a chapter on the mixtures of color, which, with a few variations, was copied in the Paduan MS.* From this it appears that "rose-color" was made of cinnabar and white lead; scarlet of cinnabar, lake, and white lead; blood-color with cinnabar and lake; the carnations of flesh with cinnabar, lake, and white; the flesh-color with cinnabar, ochre, lake and white; that the color of cinnabar was imitated with lake and minium; that for the shades of flesh, lake was mixed with minium and umber. The "mixtures" in which lake was used transparently were with blue (azzurro) for purple, violet, and morello; the latter was sometimes lowered with umber and black. Dark purple was made with indigo and lake. The Brussels MS.† mentions a beautiful color for shadows composed of lake, bone-black, stil de grain (brown pink), and a little minium, and also a purple color made of lake and white.

Indian lake, when burnt, makes a beautiful and most powerful shadow color. The tint varies from brown to black, according as it is burnt little or much. De Mayerne‡ speaks of it as a black, which he says is as fine as ivory black, but of greater body. In further illustration of the "mixtures of lake," we shall quote Pacheco's § directions for painting red draperies: "If you have to paint a rose-colored drapery with lake and white, the color will be more durable if it be dead-colored with vermillion, on which is to be worked the lake and white, and this, whether it is to be afterwards glazed or not. If you wish to paint a crimson drapery, mix the lake and vermillion together to an agreeable tint, adding to it white for the lights, little or much as required. If the pure lake be not sufficiently dark for the shades, add a little black. Upon this under-painting, lake may be glazed once or twice with a little fat linseed or nut-oil. It is always necessary to mix some dryer with lake, either glass or 'itargillo'—which is linseed oil boiled in a little pulverized litharge which is to be mixed with the oil after it has been boiled and removed from the fire. You will know when it is sufficiently boiled by throwing into it a piece of bread; which, if the oil be sufficiently boiled, will be roasted. This is a common dryer, which is not injurious to lake. The fat, or drying oil, made with red lead, is also good; and so is white copperas (sul-

* Ancient Practice of Painting, p. 650, &c.

† Ancient Practice, p. 822.

‡ Eastlake's Materials, p. 451, n.

§ Tratado de la Pintura.

phate of zinc) ground in oil, or mixed with it in powder. Others paint red draperies, which are to be afterwards glazed with almagre de Levante (a red earth), or with albin (a darker red earth) and white, shading them with lake and a little black. They may be glazed twice or oftener, first moistening the picture to make the colors adhere." It should be remarked, that the high lights were frequently retouched upon the glazing of lake.

Morello-colored draperies are common in pictures of the Spanish school, especially on those of Murillo. We conclude with Pacheco's directions for painting these draperies:—

"Morello-color is delicate, and not very durable; it is made with good azure and Florentine lake, and the gradations are made by the addition of white; nevertheless, if you would have a pure morello-color, which shall prove durable when imitating silks, satins, or taffetas, it must be glazed either over an under-painting of blue and white, or over the said dead-coloring of morello-color; and I consider that those are the best morello-colors which are made of good smalt. Paint your drapery which way you will, if you would have it retain its fine color, you must glaze it—and if you glaze it twice, it will be all the better for it."

COMMUNICATIONS.

For the Phot. Art-Journal.

H. Snelling, Esq.—Sir: Having been a reader of your valuable Journal from its commencement, allow me to express my gratitude for the pleasure it has afforded me; and not only pleasure, but much benefit. As variety is proverbially the spice of life, I hope your subscribers will improve upon the suggestions in the March No. and send in their communications It is gratifying to find original articles, from the artists of our own country; it evinces a friendly spirit, and I doubt not gladdens the heart of the editor in his ardous efforts to prepare a Journal, which shall not only suit the taste of his readers, but tend to elevate and promote the art, and place it in its true position; not as it is by many considered, a mere catch penny trade, a sordid, money-making business, but an art worthy the admiration and patronage of all. I have been two years and a half a practitioner, and have invariably found, that persons of cultivated minds and refined taste, are the first to prize and appreciate the labors of the artist. In communities where literature and science receive their proper attention, the daguerreotypist is most likely to receive a liberal patronage. On the contrary take the illiterate, the ignorant and selfish minds of earth, and what will be their response. "Humph! what are such things worth, I would not pay out my money for such trash." A better school for the study of human character was never opened, than is presented to the observing operator; human nature in all its various phases is as truly delineated on the mind of the artist, as the shadowy forms of his or her subjects are on the burnished plate, and no doubt will in many cases remain indelible. The lights and shadows of daguerrean life, how fitful and changing; like the sun in an April morn, rising perhaps, in usual splendor, soon to be obscured by gloomy and threatening clouds, which after watering the earth with a few tears, vanish as quickly, and are succeeded by a renewed brightness. Will not some skillful and practiced hand draw, not a fancied but a truthful sketch. Its lights to me are, when after traveling, (as of late) seven miles over the rough and muddy roads of Michigan, to take the likeness of a darling and only, deceased child, I receive the

tearful thanks and gratitude of the heart-stricken mother, that I consented to come in the cold, and hear her exclaim, "I could not part with my child without even this." That mother, with many others truly prizes a daguerreotype. Again, it is gratifying, after a successful effort, and the work accomplished, the individual with a satisfied air receives the picture, and cheerfully opens his purse and pays as though he was receiving the worth of his money, and leaves you with a happy "good day, sir." Or, when the devoted bridegroom wishes to obtain the miniature of his idol, who is all anxiety to help on the operation that all may be right, exclaims with delight, "well, wife, how pretty you look." These sunny spots are often interspersed with darkening shadows, which are so deeply felt as to need no delineation. Still the lover of the art will pursue on, and I trust persevere, till the full blaze of meridian light shall dawn on his pathway, and an admiring world be eager to bind on the brow of the successful, the wreath of enduring fame.

MARCELIA W. BARNES.

Leoni, Jackson Co. Mich., April 20th.

From the Jour. of the Phot. Soc.

To the Editor of the Journal of the Photographic Society:

DEAR SIR.—In the first No. of the Journal, Mr. Hunt is stated to have said that he did not consider any process had been discovered sufficiently rapid to give a representation of waves. In a note subjoined, however, an account is given of some views which were exhibited at the meeting of the society by a Scotch gentleman, in which waves are said to be admirably represented. Baron Gros is also stated to have obtained such pictures—I presume by the daguerreotype.

I have often felt surprise that photographers have not turned their attention more to the representation of moving objects. Very soon after the discovery of the collodion practice on glass, I attempted such views, and by some modification of the methods usually adopted, I found that pictures of a turbulent sea could be easily obtained, even without direct sunlight.—Many scores of such have been taken by me, and if I mistake not, the Scotch gentleman before-mentioned exhibited one of mine to some photographers last year in Edinburgh.

The variations from the usual practice which I adopt to procure greater sensitiveness are, in the first place, the use of a stronger solution of nitrate of silver than is commonly recommended, say of 50 grains per oz. and up to 100, according to circumstances. These solutions, especially the stronger ones, must be previously saturated with iodide of silver: unless this precaution be taken, the coating of iodide of silver formed on the plate is speedily redissolved in the bath of nitrate of silver.

In order further to increase the sensitiveness, warmth is used with good effect. The bath of nitrate of silver may be kept at about 100° Fahr., and when the plate is put into a frame for exposure, a warm polished daguerreotype plate may be put behind it: this aids the sensitiveness both by heat and reflection; for I have found that a glass plate coated on both sides had a repetition of the picture on the back of the glass, thus showing that the actinic rays had passed through the first coating and through the glass. To develop, I use a solution of protosulphate of iron of 40 grains to 1 ounce of water; this if slightly warmed has its power much increased.

By such methods I have obtained pictures of the moon, in less than five seconds; and I have ascertained by the measurement of moving objects, that the time occupied in taking some views must have been less than one-tenth of a second.

To show that these effects have not been obtained by a lens of extraordinary power, I may state that I use the portrait combination, having an object-glass $2\frac{3}{4}$ inches diameter—a diaphragm between the two glasses having an aperture of $1\frac{1}{2}$ inch diameter and a focal distance of 5 inches, measuring from the back lens.

The usual practice of uncovering the plate by a slide is ill-adapted for rapid action, and is vicious in principle, inasmuch as the fore-ground, which needs most light, is by this means made to receive the least. To avoid this, I make use of a door, which covers the coated plate, and is hinged at the bottom; this is thrown open by unloosing the detent of a spring; it is drawn up again by a cord. A still better method is the placing of a stop before the back

lens, close to it, and between the lens and the plate. This is allowed to fall by its own weight, and is drawn up again by a string; by this means more time can be allowed for nearer objects, whilst the sky and more distant parts of the picture do not receive too much light.

The motion of this screen may be entirely stopped for a short time in any part of its ascent or descent, without causing, as might be apprehended, any line or marked division on the coated plate.

I am, Sir,

Yours respectfully,

WILLIAM JACKSON.

Lancaster, March 17, '53.

POETRY.

MR. EDITOR. — Sir: The enclosed, though headed "for the Phot. Art-Journal," I submit entirely to your decision; your discrimination will direct you how to dispose of them. I make no pretensions to being a literary character, and therefore shall not feel chagrined at all if you commit them to the flames.

LIGHT.

Hail! glorious Light, firstborn of earth,
Transcendent in primeval birth,
From whence thy beings' source; to scan
Has puzzled much the mind of man,
To solve thy nature's been in vain,
Nor yet can finite minds explain,
Or tell, from whence that wondrous power,
That quickens life and paints the flower;
That decks in rich and gorgeous hues,
Earths varied drapery profuse;
That gilds the sacred arch of heaven,
In splendid grace with colors seven.
Thy mystic power with Art combined,
Reveals new beauties to the mind.
In sportive mood thou loves't to trace,
The lineaments of thought and grace;
And shadowy forms, by magic art,
Cherished mementoes of the heart.
The chemist, rich in studied lore,
Has tried thy substance to explore;
Philosophers have sought the cause,
And thought to trace thy hidden laws.
Vain is the toil, to God alone,
The secret of thy birth is known.
When all was dark chaotic night,
He spake the word in power and might,
Let there be light, and there was light!
Then order from disorder sprung,
Old Chaos back her curtains flung,
The shining orbs came rolling by,
The stars shone glittering in the sky,
Their daily courses then begun,
In circling orbits round the sun,
The central fount, round which was hurled
A universe of rolling worlds;
Guided by that unerring hand,
That wrap'd the sea in swaddling bands—
That bid the towering mountains rise,
In solemn grandeur kiss the skies,
As tokens of Almighty power
That seems as pleased to form the flower,
As bid the mighty rivers flow,
Or circling suns their orbits know.
Author of all; Thee we adore,
For all earth's rich and varied store;
But special praise is due each morn
For thee, oh Light! earth's eldest born.

M. W. B.

THE DAGUERREOTYPE.

BY MRS. L. G. ABELL.

A mother's life! a mother's life! what pictured words are those!
What frequent scenes of tenderness and beauty they disclose!
The patient toil, the watchful love, the anxious, sleepless eye,
All, all in colors beautiful, and all too bright to die.

A mother's life—her holiest thoughts, she watches them with care,
Lest a stain may fall upon the heart so innocent and fair;
The words she speaks in *softest* tones, she fears that they may wake
The cradled slumberer by her side, or bad impression make.

She feels her home is brighter for the flesh, pure spirit given,
And she gazes on her cherub as a sinless one from heaven;
All hearts have grown more tender, and kinder words there fall—
In the presence of an *angel*, who would dare to sin at all?

Then she hears a voice low speaking to her heart at midnight hour.
It breathes a blessing on her toil, a blessing on her flower,
And its whisper is the sound of Faith's melodious tone,
And that mother's heart is strong with a courage not its own.

Thus her ceaseless care and watching, that would wear a stronger frame,
But give her newer energy, as if from Heaven it came;
And she presses on, and presses on, in toils *no other* know,
Imparting all the good and true that her own heart *can bestow.*

She early sows the seeds of truth, and waters them with prayer,
Believing that her God will own her labor and her care;
Confiding trust and cheering hope, to her weak spirit given,
Encourage her to faithfulness—to "train" the soul for Heaven.

A mother's death! a mother's death! how desolate that home
That only knows its blessings by the losses that have come!
They only learn to know the worth, the value of her love,
When its guardian influence is withdrawn to a better world above.

Oh, how sorrowful, how lonely all places she has blest!
A dark and cold grave shadow lies on her couch of rest;
From out each fond memento her skillfulness has wrought
There gleams a written record of praise she never sought.

Her "life was hid;" no eye could see that world of thought within,
That urged her own to duties, to the prize her soul would win:
If earnest wish, if earnest prayer for other's good on high
Has e'er availed, those names are blest borne oft beyond the sky.

A mother's death! ah, though the clay may slumber in the grave,
How oft her living *influence* her children still may save!
So like an *angel presence*, with a low, soft word of love,
Breathing a warning to the heart, a blessing from above.

It seems to guard the bed by night, the path thro' all the day,
And sadly whispers of the wrong if e'er the footsteps stray;
It urges still those blessings which God alone can give,
Fitting them for a peaceful *death*, fitting them here to *live.*

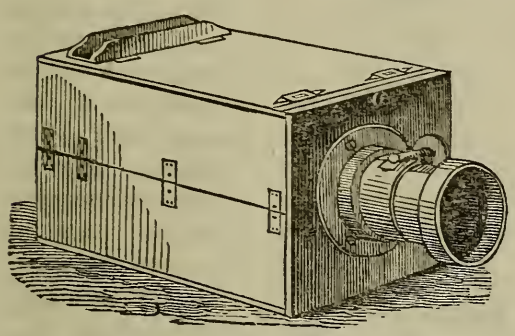
Her earnest eye is on them, it ever will be near,
They cannot see the waving wing, but murmured words they hear:
Yes, faithful, *Christian mother*, though you here lie down to die,
Your blessed influence shall live when ages have passed by.

Fixing Crayon Drawings.—A Mr. Wilkes, of Long-acre, has sent us some specimens to test his discovery of a new method of fixing Crayon Drawings. We are not acquainted with the process, but his method seems to be perfectly effectual, for the colors will not stir, nor have they lost, by the application, any of their clearness and brilliancy. A great objection to the use of colored crayons is hereby removed. Since the above were submitted to us, Dr. Wilbraham Falconer, of Bath, has forwarded some drawings fixed by a method he has discovered: these certainly enable us to express a more decidedly favorable opinion of the possibility of setting crayon drawing than Mr. Wilkes's specimens, inasmuch, as they are larger and altogether more important in character. One of Dr. Falconer's had a varnish upon it that gave it the appearance of an oil-painting, the others did not seem to have had any preparation passed over them, and yet the colors did not move in the least degree. The inventor says his process is applicable to various kinds of drawing, and to the different stages of certain modes of drawing. *Art-Journal.*

FROM "A DICTIONARY OF THE PHOTOGRAPHIC ART;"

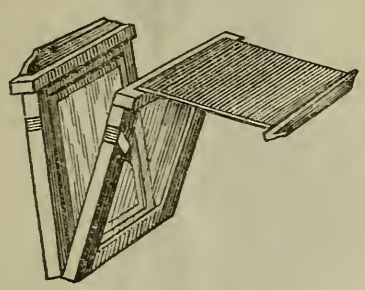
BY H. H. SNELLING.

Camera Box. — The dark chamber to which the tube is attached, and which contains the spectrum, and receives the prepared plate or paper during its exposition to the light. (*See Fig.* 16, *art. Camera.*) There are several forms of camera box constructed. Fig. 17



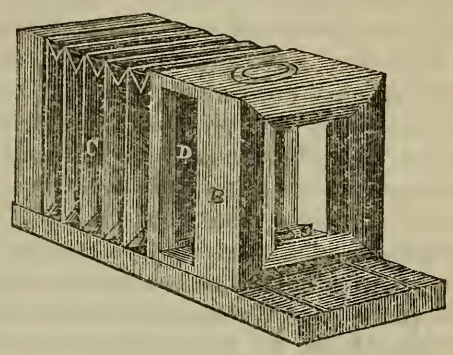
17.

represents a very good arrangement for traveling purposes, as the tube may be taken off and the box folded into a



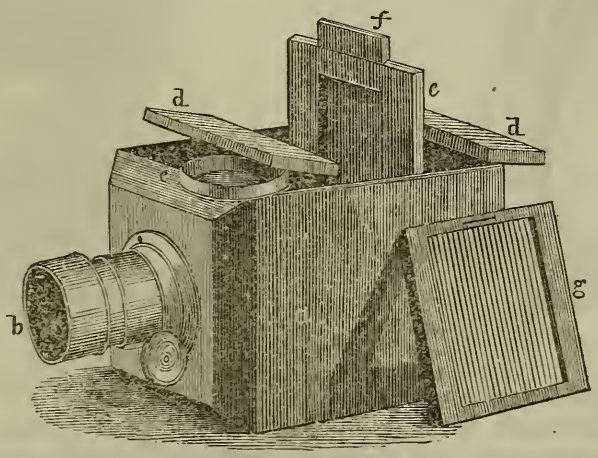
18.

small compass. Fig. 18, shows the style of the plate shield for this box. The bellows box, Fig. 19, is another



19.

convenient form, and is applicable to copying purposes. They were formerly constructed with a slide, made to contain the shields, passing through the box from side to side; but we believe this has been partially abandoned, on account of the difficulty of throwing the plate into its position without agitating the box. We must, however, recommend Mr. Allen's Copying Camera box, as certainly, to our minds, superior to any now in use. It is fully figured by the fine engraving on the opposite page. This box possesses the following qualities not possessed by any other. By means of the crack, *a*, the inner box, *e*, can be placed in a position to obtain the proper focus upon the spectrum, *d*, without taking the eye from off the image—while the thumb screw enables



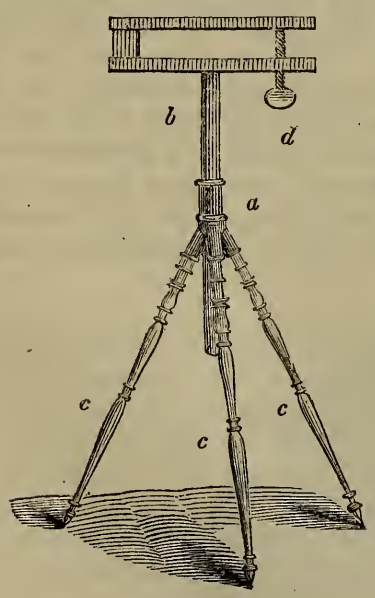
20.

the operator to fix it there, instantly, without the fear of accidentally changing the focus in the slightest degree. The positions of the plate, shield, and spec-

trum, while in the box, are fully shown in the engraving, and it will be perceived that there is no neccessity of removing the ground glass from the box, except for the purpose of cleaning, from one months' end to another, an improvement which must be considered a very excellent one. Fig. 20, shows the ordinary copying box in detail. *A*, is the body of the box, having the lenses (*b*,) placed in one end of it, through which the radiations from external objects pass, and form a diminished picture on the spectrum (*c*). The cap *e*, covers the lens at *b*, until the plate is ready to receive the image of the object to be copied ; *e* is the shield, and *f* the dark slide covering the plate to protect it from the light.

Camera Lucida.—An optical instrument, which, by means of a style, lenses and chamber, gives the outlines of external objects on paper, or canvas, so that an artist can sketch the subject.

Camera Stand.—The instrument which gives support to the camera-obscura during the exposition to the prepared plate or paper. There are many forms given to the camera stand, the most common being the tripod. Fig. 21 re-



21.

presents one of this kind in common use. They are generally made of maple or black walnut, having a cast iron socket (*a*,) through which the sliding rod, *b*, passes, into which the legs, *c*,*c*,*c*, with iron screw ferules are inserted. The platform, *e*, is made of two pieces, hinged together at the end nearest the object, and into the lower half of which is inserted a thumb screw (*d*,) for the purpose of depressing the camera. Fig. 22, represents a very good style for traveling purposes, as it can be so folded within itself as to occupy but little space. Fig. 23 shows a very excellent form of camera stand, designed and constructed by Mr. Davie, of Utica, N. Y. The platform is attached to the elevating screw by a socket hinge,

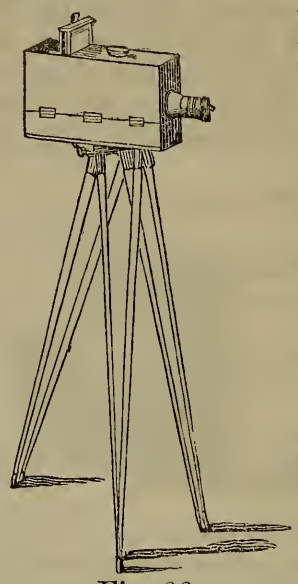
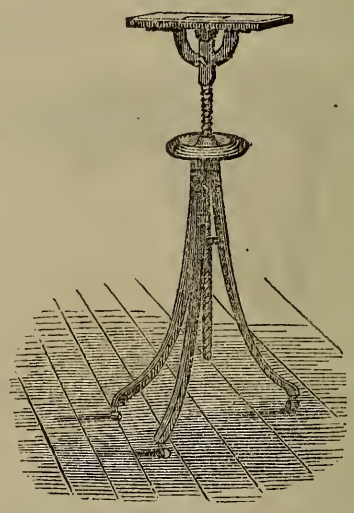


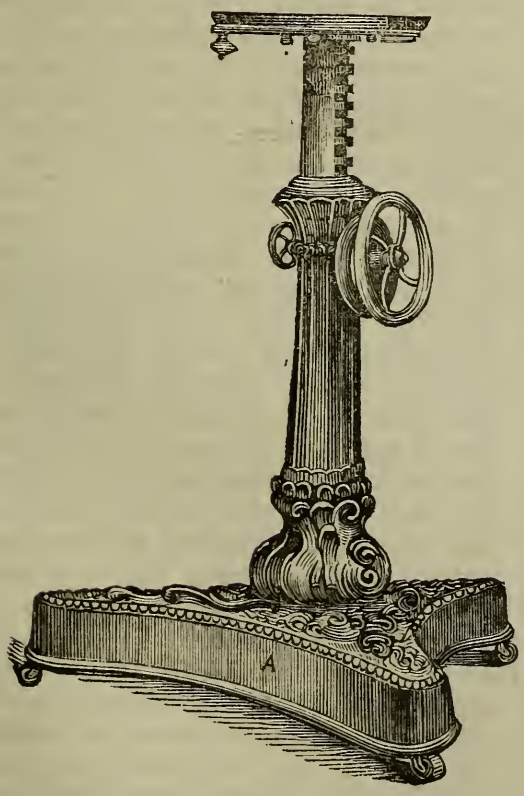
Fig. 22.



23

and is kept firm and steady in its place by means of a semicircular band of iron passing through a groove in the upper portion or head of the screw, which is flattened for the purpose. This band also serves to fix the position of the camera at any inclination desired. The elevating screw is set in motion by a wheel. It is certainly one of the most serviceable and graceful stands manufactured. Allen's improved camera stand is faithfully represented by the

beautiful engraving on the opposite page. It is undoubtedly the most chaste and beautiful piece of workmanship attempted in this article, while it is, at the same time, unsurpassed in every detail of usefulness. The elevating principle is precisely the same as that in Fig. 23. The base and column are both elaborately and exquisitely ornamented. Since this engraving was made, Mr. Allen has further improved it by using a cast iron framework for the platform, with an endless screw and cam attached by which to incline the tube, which, particularly for the larger size, diminishes the labor at least one-half. The Messrs. Lewis, of New York, have also designed a very good stand, (Fig. 24), which, although not so chaste and beautiful as that of Mr. Allen, is solid, firm and convenient. The elevating apparatus—a rack wheel and rod—also, does not suit us so well. It has a massive appearance that pleases many.



24

Canton Flannel.—A cotton cloth with very long nap, used by daguerreotypists for giving the first cleaning to the silvered plate. That manufactured by the "Amoskeag Mills" is considered the best.

Capsule.—A shallow dish or saucer.

Caseine.—The curd or coagulable portion of milk. Cheese made from skimmed milk and well pressed, is nearly pure caseine. When caseine is thrown down from skimmed milk, by adding an acid, it combines with a little of it, and forms a kind of salt. The acid may be removed by means of carbonate of lead, when pure caseine is left behind. This substance makes a very good film for glass or paper upon which to spread the sensitive coating.—*See Lacturine.*

Catalysotype.—The name given by Dr. Wood to his process with the protonitrate of iron. The Amphitype of Mr. Talbot is a modification of this process. *See Amphitype.*

Caustic.—Any substance, which, applied to living animals, acts like fire in corroding the parts and dissolving the texture.

Chemical Focus.—The exact focal distance from the lenses of the camera at which the suns' rays act to form an image upon the daguerrean plate, or photographic paper, and which should always agree with the visual forms upon the same plane. In purchasing a camera the operator should always ascertain that this is the case, and when the difficulty does occur have it remedied. The lenses are now so perfectly constructed, that the fault usually lies in the spectrum, or plate shields. A few shavings taken from one or the other speedily corrects it.

Chemical Rays.—The rays of light supposed to produce chemical decomposition, but neither heat, expansion, vision or color.

Chlorate of Potash.—Chlorate of potash, or potassa, has long been known as the oxymuriate or hyper-oxymuriate of potassa. It crystalizes in four or six sided scales, soluble in six times its weight of water at 60° and in two and a half its weight of boiling water. It fuses at 400° or 500° F., and at a red heat, is decomposed and parts with its oxygen. Specific gravity 2. It is formed by passing a current of chlorine gas through a solution of potassa until the alkalie is neutralized, boiling the

solution a few minutes, and then evaporating until a pellicle is formed upon its surface. On cooling the chlorate crystalizes, and leaves the muriate of potassa in solution. By redissolving in distilled water, and again evaporating the chlorate of potassa will be obtained very pure, in scales of a pearly lustre; deflagrating when thrown upon burning coals, and yielding per-oxide of chlorine with sulphuric acid. This salt is remarkable for its calorific property, and may be used with advantage in changing the color and tone of photographs. Mr. Cooper recommends a solution of this salt, and a silver wash of 60 gr. to the oz. of water, as capable of forming a good paper, but it cannot be used where any great degree of sensitiveness is required. The color of the photographs assumes delicate blue or lilac tints when this salt is used; or a golden yellow according to the other solutions employed.

Chloride of Bromine—Is made by passing dry chlorine through bromine, and collecting the disengaged vapor in a receiver surrounded by ice. It is a very good accelerator, but there are others much better. It can only be used in a state of vapor, or combined with anhydrous alcohol or ether.

Chloride of Calcium—Is formed by heating lime strongly in chlorine gas, when oxygen is given off. It may also be prepared by heating dry muriate of lime to ignition; or by saturating muriatic acid with chalk or marble, then filtering and evaporating to dryness. Chloride of calcium is very deliquescent; has a bitter taste, dissolves in one-fourth its weight of water at 70° F., is soluble in alcohol, and imparts a red color to flame. A very good dry sensitive may be made with chloride of calcium by the addition of bromine until it assumes an orange yellow color.

Chloride of Gold.—This salt may be obtained by digesting thin fragments of the pure metal in a mixture of 1 part nitric and 2 parts muriatic acid, and evaporating the solution to dryness by a gentle heat, to drive off the free acid. This is pure chloride of gold. In this case, as in most others, where muriatic acid is employed, part of the oxygen of the one unites with the hydrogen of the other, and sets at liberty free chlorine. The chloride of gold most generally in use by daguerreotypists for gilding their plates is made as follows. Take one dollars worth of pure gold, (coin is not sufficiently pure,) put it into a porcelain cup, or flask, and pour on about an ounce of nitro-muriatic acid. Place a feeble alcoholic flame under it—just enough to make it simmer—stir it occasionally with a glass rod, and when the gold is all dissolved, add about 100 grs. common salt; if there is not sufficient acid to saturate the salt, add more, stirring it as before until it is perfectly dry. It is then ready to bottle. Experiments have shown that chloride of gold yields readily to the influence of the sun's rays, but there are so many photographic compounds superior to it as a sensitive for paper, that it is, comparatively, unimportant. *(See Aurotype.*

Chloride of Iodine.—When dry chlorine gas passes over dry iodine at common temperatures, heat is evolved, and a solid chloride is the result. It is of an orange yellow color when the iodine is fully saturated, and reddish orange when the iodine is in excess. It deliqueses in the air, is volatile, and very soluble in water, forming a colorless fluid, which exhibits acid properties. Chloride of iodine enters largely into the daguerreotype process. It was first applied by Mr. Claudet, of London, and most unquestionably produces as fine, if not finer, pictures as any sensitive used; but unfortunately it works too slow to suit the present state of the art. In combination with bromine it works quicker, and is thus employed by a large portion of our operators.—*(See Bromide of Iodine.*

Chloride of Sodium.—This is the common salt of commerce. It is found in great quantity in sea water and saline springs. It can be obtained very pure by saturating hydrochloric acid with carbonate of soda, and evaporating to dryness. The salt obtained in this way is far preferable to the commercial article as it does not deliquese so readily. Chloride of sodium produces an

excellent preparation for negative proofs.

Chlorine.—A simple combustible, possessing a very disagreeable odor, acid taste, and a greenish yellow color. Chlorine is prepared by mixing, in a glass retort, muriatic acid and peroxide of manganese, in the proportion of 74 parts of acid to 44 of manganese. By the application of heat, half the muriatic acid is decomposed, and the peroxide of manganese gives off 1 equiv., or 8 parts of oxygen. The hydrogen of the muriatic acid unites with the extricated oxygen; forming an equivalent of water. The chlorine, being liberated, may be collected over hot water. The remainder of the muriatic acid unites with the protoxide of manganese and forms a salt, which remains in the retort. At the temperature of 68° water absorbs 1½ times its volume of the gas, and the solution is called liquid or aqueous chlorine. This liquid chlorine has no acid properties, but is by exposure to light converted into muriatic acid, owing to part of the water being decomposed. Combined with heat chlorine attacks all the metals, cauterises and disorganizes animal membranes when damp, which is the cause of its fatal action on the lungs when respired. Chlorine is used in the daguerrean art combined with gold, iodine and bromine; in the first case to whiten or bleach the picture, and in the latter as an accelerator. Liquid chlorine gives rise to a paper possessing in an eminent degree the merits of that prepared with muriatic acid, and has the advantage of retaining its sensibility much longer.

LIFE OF HENRY FUSELI.

BY A. CUNNINGHAM.

Fuseli—so he chose to spell his name, though his fathers wrote it Fuessli—was born, by all accounts save his own, in the year 1741, at Zurich; but as he seldom wished to think like other men, so he refused to be born according to tradition or register books, and taking up a little German memoir of himself, changed the date of his birth from 1741 to 1745, without adding either day or month. He was the second of eighteen children: his name pertains to Switzerland—all by which that name is distinguished to England.

The father John Gaspard Fuessli, obtained some fame as a portrait and landscape painter: his taste for poetry procured him the friendship of Kleist, Klopstock, and Wieland; and from his history of the Artists of Switzerland, his more eminent son drew some of the materials for an enlarged edition of Pilkington's Dictionary of Painters. He was of the same family as that Mathias Fuessli, a painter, of Zurich, who studied in Venice, and died in 1665, of whom Henry gives this brief character: "His extensive talent was checked by the freaks of an ungovernable fancy—his subjects in general were battles, towns pillaged, conflagrations, and storms." There is a kindred likeness here. The maiden name of Henry's mother was Elizabeth Waser; he loved to speak of her, and attributed much of his knowledge to her instructions; she died when he was eighteen years old. His father, a scholor and an artist, had probably experienced some of the sorrows common to both characters, and, desirous that his son should at least have bread, proposed to educate him for the church. The wayward temper of the boy, and an already enthusiastic love of painting opposed strong obstacles to this

sensible plan, and the father, with much of his own willfulness of spirit, resolved to enforce obedience. For a while he was successful. Henry made progress in learning; having overleaped the first difficulties, he became an ardent devourer of the classics; but it was only or chiefly to find, in the poetry of Greece and Rome, vivid images of heroic life and daring flights of imagination.

The time which the school demanded was thus spent, by one who could do in minutes what would have cost his fellows hours; for the rest of the day he had other occupation. As soon as he was released from his class, he withdrew to a secret place to enjoy unmolested the works of Michael Angelo, of whose prints his father had a fine collection. He loved, when he grew old, to talk of those days of his youth, of the enthusiasm with which he surveyed the works of his favorite masters, and the secret pleasure which he took in acquiring forbidden knowledge. With candles which he stole from the kitchen, and pencils, which his pocket-money was hoarded to procure, he pursued his studies till late at night, and made many copies from Michael Angelo and Raphael, by which he became familiar, thus early, with the style and ruling character of the two greatest masters of the art. A wild German work, called "The Hour-Glass," caught his fancy, and he illustrated it with outlines, representing fantastic imps and elves engaged in strange dances, ludicrous gambols, and mischievous tricks. Etchings of those early attempts were afterwards published, and are now exceedingly rare; they are said not to be without merit, and to show, as the poet says, that "the boy is father of the man." His schoolfellows perceived his talents—some of them purchased his works—and he presently found himself with more money in his pocket than he knew well what to do with. The taste of our youth was decidedly in favor of whatever was staring and extravagant. He bought a piece of flame-colored silk, had it made into a coat, and in this splendid attire marched up the streets of Zurich; but the laughter and mockery of his companions put him into such a passion that he soon threw off the garment and vowed never to be fine again.

With this twofold taste for literature and art upon him, Fuseli, was placed—I know not at what age—in the Humanity College of Zurich, of which two distinguished men, Bodmer and Breittenger, were professors. Here he became the bosom companion of that amiable enthusiast, Lavater, studied English, and conceived such a love for the works of Shakspeare, that he translated Macbeth into German. The writings of Wieland and Klopstock influenced his youthful fancy, and from Shakspeare he extended his affection to the chief masters in English literature. His love of poetry was natural, not affected—he practised at an early age the art which he admired through life, and some of his first attempts at composition were pieces in his native language, which made his name known in Zurich.

Like some other youthful poets, he was also a reformer. In conjunction with Lavater he composed a pamphlet against a ruler in one of the bailiwicks, who had abused his powers, and perhaps personally insulted the two friends. Pamphlets and accusations were probably uncommon thing in Zurich; in some other countries they would have dropped from the author's hands harmless or unheeded, but the united labors of Fuseli and Lavater drove the unjust magistrate into exile, and procured remuneration to those who had suffered. Of this wonder-working production I can give no farther account. It made Fuseli, in all likelihood, few friends; we are certain that it brought him enemies, who were powerful enough to make their anger be felt, and finally succeeded in inducing the young genius to quit Zurich.

With a reputation for scholarship, poetry, and painting, and patriotism, and the degree of Master of Arts attached to his name, Fuseli bid farewell to his father's house, and travelled in company with Lavater, first to Vienna, and thence to Berlin, where he placed himself under the care of Sulzer, author of the "Lexicon of the Fine Arts." His talents and learning obtained him the friendship of several distinguished men, and his acquaintance with English poetry induced Professor Sulzer to select him as one well qualified for opening a communication between the literature of Germany and that of England. Sir Robert Smith, British ambassador at the Prussian court, was consulted; and pleased with his lively genius, and his translations

and drawings from Macbeth and Lear, received Fuseli with much kindness, and advised him immediately to visit Britain. Lavater, who till now had continued his companion, presented him at parting with a card, on which he had inscribed in German, Do but the tenth part of what you can do. "Hang that up in your bed-head," said the physiognomist, "obey it—and fame and fortune will be the result."

If we trust the register of Zurich, Fuseli was in his twenty-second year, when he appeared in England in 1763; but if we prefer his own statement as to the time of his birth, he was but eighteen—a tender age for obtaining the notice of ambassadors, and too young, surely, and inexperienced for opening a communication between two great nations in a matter of literature; yet his behavior on arriving in this great Babylon may seem to countenance his own story. "When I stood in London," said he, "and considered that I did not know one soul in all this vast metropolis, I became suddenly impressed with a sense of forlornness, and burst into a flood of tears. An incident restored me. I had written a long letter to my father, giving him an account of my voyage and expressing my filial affection—now not weakened by distance—and with this letter in my hand, I inquired of a rude fellow whom I met, the way to the Post Office. My foreign accent provoked him to laughter, and as I stood cursing him in good Shaksperian English, a gentleman kindly directed me to the object of my enquiry." The embarbassment and tears thus described, may strike many as suiting better the milkiness of eighteen than the firmer manhood of twenty-two.

After he reached London, we hear no more of the channel of communication which Professor Sulzer employed him to open between the literature of Britain and that of Germany. In what manner this was to be accomplished, I can find no account: he had common letters of credit to Coutts, the banker, and friendly introductions to Johnson, Millar, and Cadell, the booksellers, who received him with kindness; but he was made acquainted with no man of influence or genius, and had to seek his way into such society as he might. His friends, the booksellers, had obtained for him the situation of tutor to the son of some nobleman, whom he accompanied to Paris. This employment suited ill with the fiery impatience, and untameable enthusiasm of Fuseli. He never told the name of his pupil, nor alluded to the success of his labors, nor was he willing, it is said, to have the matter mentioned. His governorship is supposed to have been short; and he returned to London to dedicate his pen to the daily toils of literature—to translations, essays, and critiques. Of such pieces he wrote nearly a hundred, but acknowledged none save a translation of Winkleman's work on painting and sculpture; and it required some nerve, to make that acknowledgment, for the book, as has been mentioned in the life of Barry, advocates the doctrine that British genius is unequal to the task of making noble works of art—a notion which, however absurd, seems to have sometimes possessed Fuseli himself. The book, which Barry so bitterly answered, excited no general attention here. It is a part of the English temper to listen to such fantastic assailants with exasperating indifference.

Fuseli afterward tried his skill on more inflammable materials—he precipitated himself into the angry controversy then raging between Voltaire and Rousseau. The enthusiasm of his hatred or his love enabled him to compose his Essay with uncommon rapidity, and he printed it forthwith, with the hope that it would fly abroad to exalt Rousseau, and confound Voltaire. "It had," said one of his friends, "a short life and a bright ending." The whole impression caught fire, and either angry philosopher lived and died in ignorance whether the future professor of painting in England was his friend or his enemy. Fuseli was afterwards much ashamed of this production, and scarcely counted the man his friend who alluded to it. Armstrong, the poet, his constant associate, had once the boldness to tax him in company with having written it—Fuseli kindled up "like fire to heather set" and poured out his fury in English and German. This calmed him—he then argued that his friend had no right to couple his name with such a work—but he did not deny it.

Though thus busied with tutorships and translations, he had not forgotten his early attachment to art. He found his way to

the studio of Sir Joshua Reynolds, and submitted several of his drawings to the President's examination, who looked at them for some time, and then said, "How long have you studied in Italy?" "I never studied in Italy—I studied at Zurich—I am a native of Switzerland—do you think I should study in Italy?—and, above all, is it worth while?" "Young man," said Reynolds, "were I the author of these drawing, and were offered ten thousand a year *not* to practice as an artist, I would reject the proposal with contempt." This very favorable opinion from one who considered all he said, and was so remarkable for accuracy of judgment, decided the destiny of Fuseli; he forsook for ever the hard and thankless *trade* of literature—refused a living in the church from some patron who had been struck with his talents—and addressed himself to painting with heart and hand.

The first effort of his pencil was "Joseph interpreting the Dreams of Pharaoh's chief Baker and Butler." I have been unable to learn how this work was executed or received; there was probably no contention for it among the patrons of art, since Johnson, the bookseller, became the purchaser. It hung in his house till it became cracked and faded, when Fuseli took it home to lay what he called the villainous clutch of restoration upon it. The attempt was probably never made, and the picture was lost or destroyed. He had now lived eight years in England, and was in the thirtieth year of his age; his enthusiasm was unbounded, his learning great, his imagination of a high order, and much was expected from his zeal and talents, on whatever field he might ultimately fix them.

At this period his literary compositions, especially those in the "Analytical Review," were wonderfully free from the peculiarities which mark the writings of foreigners. They have much the air of being written with the scrupulous fastidiousness of one conscious of the sins most likely to beset him, and anxiously avoiding the enthusiasm as well as the idioms of the German style. Perhaps those for whom he wrote such desultory communications, had shown him with a wet pen how to sober down the poetic aspirations of his vein, and finding resistance unprofitable, he submitted the full-blown flowers of his fancy to the editorial scythe with composure. But when eminence in art brought him into notice, he resumed the original license of his pen, and hazarded freer thoughts and took bolder liberties with language. His German nature prevailed a little against his English education—and it cannot be denied that it infused a dash of poetic fervor into his lectures and critical compositions.

The sketches and drawings of Fuseli were of a higher order than the works of his pen, and as art speaks a universal language, they were free from those deformities which are so visible in his writings. They exhibit a deep poetic feeling, acquaintance with the poets and historians of old, and a perfect sense of the heroic action and sentiment which the noblest line of art requires. Armstrong, the poet, his friend and counselor, was not insensible of their excellence, when he joined in persuading him to woo the muse of painting alone. He no sooner formed this resolution than he determined to visit Rome. Armstrong accompanied him, and both used to relate that while descanting on the glories of the Eternal City and the splendor of ancient sculpture and modern poetry, their reveries were interrupted by the sudden grounding of the vessel. This happened near Genoa, they took to their boats, landed in safety, and hastened to the capital of art.

Fuseli had from his boyhood admired Michael Angelo in engravings, and he adored him now in his full and undiminished majesty. It was a story which he loved to repeat, how he lay on his back day after day, and week succeeding week, with upturned and wondering eyes, musing on the splendid ceiling of the Sistine Chapel; on the unattainable grandeur of the Florentine. He sometimes, indeed, added, that such a posture of repose was necessary for a body fatigued like his with the pleasant gratifications of a luxurious city. He imagined, at all events, that he drank in as he lay the spirit of the sublime Michael, and that by studying in the Sistine, he had the full advantage of the mantle of inspiration suspended visibly above him. The flighty imagination of Fuseli required a soberer master; the wings of his fancy were a little too strong sometimes for his

judgment, and brought upon him the reproach of extravagance—an error so rare in British art that it almost becomes a virtue. He was no idle votary, for he strove to imitate; he was no ignorant admirer, for he thus praises his great master.

"Sublimity of conception, grandeur of form, and breadth of manner are the elements of Michael Angelo's style. By these principles he selected or rejected the objects of imitation. As painter, as sculptor, as architect, he attempted, and, above any other man, succeeded to unite magnificence of plan with endless variety of subordinate parts with the utmost simplicity and breadth. His line is uniformly grand; character and beauty were admitted only so far as they could be made subservient to grandeur; the child, the female, meanness, deformity, were by him indiscriminately stamped with grandeur. A beggar rose from his hand the patriarch of poverty; the humph of his dwarf is impressed with dignity; his women are moulds of generation; his infants teem with the man; his men are a race of giants. This is the 'Terribil via' hinted at by Agostino Caracci, though perhaps as little understood by the Bolognese as by the blindest of his Tuscan adorers, with Vasari at their head. He is the inventor of epic painting in that sublime circle of the Sistine Chapel which exhibits the origin, progress, and final dispensation of Theocracy. He has personified motion in the groups of the Cartoon of Pisa; imbodied sentiment in the monuments of St. Lorenzo; unraveled the features of meditation in the prophets and sybils of the Chapel of Sixtus; and in the Last Judgment, with every attitude that varies the human body, traced the master-trait of every passion that sways the human heart. Though as sculptor he expresses the character of flesh more perfectly than all who came before or after him, yet he never submitted to copy an individual, Julio the Second only excepted, and in him he represented the reigning passion rather than the man. In painting, he contented himself with negative color, and as the painter of mankind, rejected all meretricious ornament. The fabric of St. Peter, scattered into infinity of jarring parts by Bramanti and his successors, he concentrated, suspended the cupola, and to the most complex gave the air of the most simple of edifices."

This character carries the image of the author's mind; the style, however, is clearer, and the expression less complicated or obscure than was common with Fuseli. No unimaginative dauber ever hid his ignorance of anatomy under a redundancy of drapery, more effectually than this remarkable man could veil ordinary thoughts under colossal words. The reader will thank me for transcribing also the following portrait of Leonardi da Vinci.

"Such was the dawn of modern art when Leonardo da Vinci broke forth with a splendor which distanced former excellence; made up of all the elements which constitute the essence of genius; favored by education and circumstances; all ear, all eye, all grasp; painter, poet, sculptor, anatomist, architect, engineer, chemist, mechanist, musician, man of science, and sometimes empiric, he laid hold of every beauty in the enchanted circle—but without exclusive attachment to one, dismissed in her turn, each. Fitter to scatter hints than teach by example, he wasted life insatiate in experiment. To a capacity which at once penetrated the principle and real aim of art, he joined an inequality of fancy that at one moment lent him wings for the pursuit of beauty, and the next flung him on the ground to crawl after deformity: we owe him chiaro-scuro with all its magic; we owe him carricature with all its incongruities. His notions of the most elaborate finish and his want of perseverance were at least equal. Want of perseverance alone could make him abandon his Cartoon, destined for the great-council chamber at Florence, of which the celebrated contest of horsemen was but one group; for to him who could organise that composition, Michael Angelo himself ought rather to have been an object of emulation than of fear."

Fuseli seldom thought with sober feelings upon either art or literature, and he delighted to invest the objects of his love with the brightness of heaven—those of his hate with the hues of utter darkness. He poured out his admiration in words which he wished to thunder and lighten; his irony stung like an adder, and his sarcasm cut like a two-edged sword. As he claims at-

tention in writing as well as in painting, I shall quote a third passage, where his skill in the former art aided him in expressing his feelings concerning the latter.

"The inspiration of Michael Angelo was followed by the milder genius of Raphael—the father of dramatic painting—the painter of humanity: less elevated, less vigorous, but more insinuating; more pressing on our hearts; the warm master of our sympathies. What effect of human connexion—what feature of the mind, from the gentlest emotion to the most fervid burst of passion, has been left unobserved; has not received a characteristic stamp from that examiner of men? Michael Angelo came to nature—nature came to Raphael—he transmitted her features like a lucid glass—unstained, unmodified. We stand with awe before Michael Angelo, and tremble at the height to which he elevates us. We embrace Raphael, and follow him wherever he leads us. Perfect human beauty he has not represented. No face of Raphael's is perfectly beautiful—no figure of his, in the abstract, possesses the proportions which could raise it to a standard of imitation: form to him was only a vehicle of character or pathos; and to those he adapted it, in a mode and with a truth that leave all attempts at emendation hopeless. His invention connects the utmost stretch of possibility with the most plausible degree of probability, in a way that equally surprises our fancy, persuades our judgment, and affects our heart. His composition always hastens to the most necessary point as its centre, and from that disseminates—to that leads back as rays all secondary ones. Group, form, and contrast are subordinate to the event, and commonplace is ever excluded. The line of Raphael has been excelled in correctness, elegance, and energy; his color far surpassed in tone, in truth, and harmony; his masses, in roundness, and his chiaro-scuro in effect; but, considered as instruments of pathos, they have never been equalled; and in composition, invention, expression, and the power of telling a story, he has never been approached."

Such are the characters which Fuseli drew with his pen of those three illustrious artists. The calm dignity, the solemn grace, and tranquil divinity of Raphael affected him less than the vigorous, energetic, and startling productions of Michael Angelo. The works of the latter were indeed more akin to the fancy of Fuseli, which loved like a meteor to shine upon impassable places, and light the darkness of that region which forms the border-land between sense and absurdity. The mental radiance which Raphael shed so largely upon his compositions was inferior, in the opinion of this new student in the grand style, to the muscular glory of his great rival. Fuseli had little sympathy with gentleness and repose: he thought there was no dignity without action—no sublimity without exaggeration. He fulfilled the injunctions of Reynolds—he ate and drank, and slept and waked upon Michael Angelo. By a wiser course of study he might have schooled down his imagination; but he shunned the calmer company of Correggio and Raphael to quaff wine from the cup of the Polyphemus of modern art. He lived in a species of intoxication—affected the dress and mimicked the manners of Michael—assumed the historic shoe, and would have preferred the sandal.

In drawing and in sketching he tried to imitate his master's dashing energy and extravagance of breadth, which induced Piranesi to exclaim, "Fuseli—this is not designing but building a man!" When time had mellowed his taste, and in his turn he had become an instructor, he continued to prefer that broad rough freedom of hand, and held in derision all that was cautiously neat or timidly graceful. He would seize the chalks of the students, stamp with his tiny foot till they stared or smiled—cry "See!" and delineate a man in half the time and with a bolder stroke than a tailor uses in chalking out a garment.

Of his studies in the numerous galleries of Italy he has left a minute account. He refused to follow the common method of laboriously copying the chief pictures of the great masters, with the hope of carrying away their spirit as well as the image of their works. He sought to animate his own compositions by contemplating rather than transcribing theirs. To his sketches he added observations with his pen; they are rapturous about all that is lofty, nor are they deficient either in the shrewdness which penetrates, or the wisdom which weighs. He loved to dream along the

road—to follow the phantasies of an unbridled imagination—to pen sarcastic remarks—sketch colossal groups, and would call out ever and anon, when some strange thought struck him, "Michael Angelo!" His company was eagerly courted by all who wished to be thought wise or witty; and with the English gentry, who then, as now, swarmed in Rome, he formed friendships which were useful in after-life.

How Fuseli supported himself abroad during eight years of study, he has not told us; his family were respectable, not opulent; his attempts with the pen had enabled him to live, without making his purse overflow, and as his paintings were few, it has been supposed that the income arising from his own exertions was but little. It is now ascertained that such was his winning way in conversation, and such even then the acknowledged powers of his pencil, that from English travellers alone he had at one time commissions to the amount of £1500. Some of his letters from Rome have a laconic brevity which amuses those which they fail to inform; others breathe of a sadness of heart and depression of spirit, such as the sons of genius are commonly heirs to. In 1774, he sent to the British Exhibition a drawing of the Death of Cardinal Beaufort, and three years after, a Scene from Macbeth; both marked by much boldness and originality. His mind loved to range with Shakspeare and Milton—the Satan of the latter, majestic even in ruin, was a favorite study, and he imagined no one save himself could body him forth in all his terror and glory; the Tempest and the Midsummer Night's Dream contained images no less congenial, and he had already filled his portfolio with designs worthy of the wand of Prospero or the spells of Puck. His imagination, though he seemed not aware of it, was essentially Gothic; his mind dwelt with the poetry and the superstitions of Christendom; he talked about, but seldom drew, the gods and goddesses of Olympus.

In the year 1778 Fuseli left Italy. He paid a visit to his native Zurich, and lived six months with his father, whom he loved tenderly. His elder brother, Rodolph, had settled in Vienna, and become librarian to the emperor, and his brother Caspar died in the prime of life, after having distinguished himself by several skilful compositions on entomology. Early in 1779 he left Zurich, to which he never returned, and came back to London with his mind strengthened in knowledge, and his hand improved in its cunning. With the reputation of an eight years' residence in Rome upon him, he commenced his professional career, and the beginning was auspicious.

Thus stood art at that time in England. Reynolds excelled all men in portraiture and wrought unrivalled and alone. Wilson and Gainsborough sufficed for the moderate measure of public demand in landscape. Barry and West shared between them the wide empire of religious and historic composition, and there was nothing left for Fuseli save the poetical. Nature had endowed him eminently for this field, and the nation showed symptoms of an awakening regard for it. No preceding painter had possessed himself of the high places of British verse. The enthusiasm for Milton, and especially for Shakspeare, was warmer and also more intelligent than at any former time; and Fuseli was considered by himself and by many friends as destined to turn this state of feeling to an excellent account.

The first work which proved that an original mind had appeared in England, was the "Nightmare," exhibited in 1782. "The extraordinary and peculiar genius which it displayed," says one of his biographers, "was universally felt, and perhaps no single picture ever made a greater impression in this country. A very fine mezzotinto engraving of it was scraped by Raphael Smith, and so popular did the print become, that, although Mr. Fuseli received only twenty guineas for the picture, the publisher made five hundred by his speculation." This was a subject suitable to the unbridled fancy of the painter, and perhaps to no other imagination has the Fiend which murders our sleep ever appeared in a more poetical shape.

GOSSIP.

To appreciate the importance and effects of the photographic art, as an object of study and practice, not only to the practical manipulator, but to the human species generally, it is necessary to become intimate with its philosophy and history, its beautiful variations, its wonderful results, and its probable destiny.

Its history has been written often, and nothing of importance remains to be told; its philosophy is printed upon every page of our former volumes. So far as experiments have gone Professor Hunt and others have done the subject full justice; we are, therefore, only left the last three heads of our subject to discuss. There are others who could accomplish this more ably than ourselves, but we shall do the best we can, and give others the opportunity of completing the subject.

It might be instructive and interesting to retrace, in minute detail, the natural course and progress of the arts and sciences with the increase of civilization, and how dependent the latter has been upon the development of the former; but the subject is a vast one, and would lead to the discussion of matters which would extend our remarks far beyond the bounds of an editorial article. But, as Professor Hunt remarks:—"It is instructive to trace the progress of a discovery, from the first indication of the truth, to the period of its full development, and its application to purposes of ornament or utility. The progress of discovery is ordinarily a slow process, and it often happens that a great fact is allowed to lie dormant for years, or for ages, which, when eventually revived, is found to render a fine interpretation of some of Nature's harmonious phenomena, and to minister to the wants or the pleasures of existence. Photography is peculiarly illustrative of this position."

The strong intellect of man, operating with the faculty of language, has gradually worked a most wonderful change in the relations between man and all other created things. Still does this change go on: from the narrow limit of a few master minds the progress of science and art gently, but surely, diffuses knowledge among the masses of the people. The strong barriers which confined the stores of wisdom have been broken down, by that mighty engine of truth, the press, and a flood of intellectual light is over-spreading the whole world; old established opinions and theories are melting away, before the investigations of the learned, like snow under a summer's sun, and giving place to others more truthful, more natural, and more intrinsically valuable in the affairs of men.

Research follows research, discoveries upon discoveries are made, and the heart of man is made to rejoice—and thank an all-wise Being—over the many blessings and comforts given to him by these scientific investigations; his mind is elevated to an almost supernatural degree, and those things which once appeared to him marvellous are no longer so, but the mere effects of natural causes.

This progress of knowledge has led from the barbarism of former ages to the present civilized state; it has gone on by gradual but certain remarkable steps, and as it has proceeded it has quickened further progress.

In examining the forms and qualities of

objects around, the mind was led to notice the motions and changes going on in these bodies. These observations led to the discovery of the spherical form of the earth, that it moved upon its own axis, and around the sun; that every body in nature had its own peculiar form, its own peculiar composition; that certain invariable laws regulated these forms and these compositions; it led to the discovery of chemical affinity, and mutual attraction, and other immutable laws of nature.

In pursuing these investigations the photographic art was brought to light; and, as we remarked in our last number, the beauty of its conception, and the importance to which it must ultimately arrive in the world of art, produced an enthusiastic impression in its favor, and made it at once the cynosure of all observers, giving rise to a class of artists who must one day become as famous as the great masters of painting.

That it is capable of a great variety of beautiful developments is already proved. By it the most exquisite *fac similies* of leaves, laces, engravings and other natural and art productions are executed. Landscapes, views of buildings, and portraits are taken true to the life; by the processes upon glass beautiful ornamental lamp shades and screens are constructed; the wonders of astronomy, and of the insect world are illustrated.

The various processes on paper have reduced it to practical purposes in the illustration of books and magazines. It has even so far progressed that pictures may be taken upon stone and from thence transferred to paper. In view of all these facts we may well ask where will the wonders of photography end? Every day brings forth new applications of old inventions, and new discoveries in the order of manipulation.

From the mere half indistinct development of the daguerreotype plate we have arrived at the full drawn, bold and clear impressions of the catalysotype and crystalotype, some of which will compare favorably with the best engravings.

To its wonderful results we are indebted to photography for much in the world of art that otherwise would be inexplicable to us, but we must forbear from entering upon this part of our subject at present. The time allotted to us before the issue of this number is not sufficient to permit of doing it full justice; it is so vast that we desire to penetrate deeper into the sources of natural development, to elaborate and predict the perfections to which it will attain. We shall therefore resume this subject in our next.

— The following excellent suggestion we clip from the *New York Tribune.* We know it is not original with the writer; the same proposition having been before the N. Y. State Daguerrean Association since its organization, and by reference to the proceedings of its last meeting it will be seen that the foundation for such an institution as recommended has been laid.

A DAGUERREAN MUSEUM.

To the Editor of the Tribune:

Sir:—Having been the co-laborer and associate of the late A. L. Walcott, as pioneers in the daguerreotypic art from its first introduction in 1839 till 1844, and still continuing to have the true feeling for the past and the future in it, I think you would greatly aid the truth of history in her many discoveries connected with the original, by a request to have those now living contribute early *authenticated specimens* and documents to a common Museum, centrally located. Much is undoubtedly due to Professors Draper and Morse, also to Dr. Chilton; but far more is due to many others. A collection as sugggested would give every one a chance to have his due, and aid greatly to a future true history.

Trusting you will spare a small space

and two minutes of your overtaxed time to call attention as suggested, very respectfully yours, A CONSTANT READER.

— We have received a communication enclosing an article from the New York Journal of Commerce in which Mr. Hill's discovery for silvering glass plates, is attributed to another, and said to have been made a number of years ago. If the writer for the Journal of Commerce can show us that there exists any analogy between the two processes, we will allow him the right to speak of Mr. Hill's in the manner he has, but as we are convinced that he must be entirely ignorant of Mr. Hill's alleged invention, we consider that he has meddled with a subject with which he had no business. We are much obliged to our correspondent for calling our attention to this paragraph, for although we and Mr. Hill have some difference of opinion on the subject of Heliochromie, we cannot knowingly or willfully do him injustice. There are too many writers in this country who seize upon every American invention and seek to bestow it upon some foreign aspirant, and we consider such assertions as that of the Journal of Commerce an assumption of knowledge unfounded in fact or honesty. If the announcement of the Prattsville Advocate is a mere ruse to gain for the sage of Westkill additional notoriety it will manifest itself, and it will then be time to "*show him up*"—but if he has really made the discovery all due credit should be awarded him, and we shall be the last to endeavor to deprive him of the slightest honor he may attain by a new invention.

— The Academy of Design opened for its twenty-ninth annual exhibition on the second of May. We have had but a rapid glance at the pictures on exhibition, and although we do not see so many striking paintings as at the last, it contains a greater number of very fine productions, and on the whole is the best we have seen for several years. During the exhibition of the World's Fair, New York will be visited by almost every daguerrean artist in the United States, and we strongly recommend all to visit the Academy of Design before returning home. Four or five hours could not be more profitably employed.

—WORKS ON PHOTOGRAPHY.—We clip the following notice from the *Scientific Daguerrean.* We have not seen the work in question, but we take it for granted that our contemporary speaks advisedly in the matter—

THE HISTORY AND PRACTICE OF DAGUERREOTYPING.—This is the title of a work on photography, by A. Bisbee, Dayton, Ohio. Price $1.50, and in our opinion is worth more than any thing else of the kind ever published in our country, (we of course except the Scientific Daguerrean and Photographic Art-Journal.) We refer to pamphlets or books, and not to periodicals. Mr. B. deserves much credit for his instructive and well arranged work, and we have no doubt it will be sought after and appreciated by the reading portion of daguerreans, but how great that portion is we are unable to say; we fear, however, that the number is comparatively small. Daguerreans will pay their money freely for anything but books, the very thing they most need. The lawyer, the doctor, the priest, and in fact professors of all the arts and sciences provide themselves with a vast amount of books, and by reading, store their minds with knowledge respecting their pursuit, but unfortunately the daguerrean overlooks this great source of knowledge; he relies wholly upon his own skill, refuses to lend a helping hand in sustaining the few books and journals already published, consequently editing a Daguerrean Journal, or writing upon that subject is an irksome task, one that promises neither pay nor praise; but should every daguerrean in the states subscribe, pay for, and read every journal or book that is published upon daguerreotyp-

ing, the whole would cost but a few dollars, and we are confident that very soon better journals would be published, and the taste and productions of daguerreans be decidedly improved.

Mr. Bisbee will please accept our most hearty thanks for the copy of his work received by mail through his politeness.

— Mr. Robert Hunt has issued a third edition of his admirable work on "*Photography*" greatly enlarged and improved. We cannot recommend it too highly to our readers.

— *The Journal of the Photographic Society*, of London, has at last made its appearance, and fully sustains the opinion we had formed of what it would be, and we welcome it as a valuable auxilliary to our labors.

— The *fourth* edition of our *History and Practice of the Art of Photography* has been issued, and is being rapidly absorbed by the studious in the art. The sale of this work has been unprecedented, and far beyond our most sanguine expectations. Besides the valuable instructions contained in former editions, a complete manual of the collodion process has been added to this; making it the cheapest and most complete work on the art yet issued.

— We fully concur in the following remarks of a brother editor.

"Since our last issue we have had the pleasure of forming the acquaintance of J. C. Gray a Daguerrean at Jamestown, forty one miles from Dunkirk. Through Mr. G's solicitation we made him a professional visit, and did him all the good we could, and felt anxious to do more, for a finer gentleman and better taste, we have not found in the business. Mr. Gray is yet young in his profession, but has produced many fine specimens of art, and we are confident that ere long he will stand at the head of Photography."

— Most of our best artists are making every preparation for the exhibition of their skill at the World's Fair. With such names before us as Hesler, Long, Fitz Gibbons, Cook, Dobyns, Von Schneideau, North, Farris, Hawkins, Meade, Webster, M'Donell, Barnard, Whitney, Davie, Root, Brady, Lawrence, Piard, Gurney, Harrison, Stansbury, Whipple, Hale, Simons, and many others of whom we have not heard as exhibitors, there might be such a display of exquisite daguerreotypes as the world never saw. We should be pleased to obtain a complete list of all who intend exhibiting for publication and would feel obliged by having the names forwarded to us in time for our next issue.

— We take pleasure in announcing that our London publishers have effected an arrangement with Mr. A. Cundell, of that city, to assist us in the conduct of the Journal, and that his first article will probably appear in our next. Mr. Cundell has been long and favorably known in Europe, —and is so, undoubtedly, in this country, —as one of the most practical as well as scientific photographers living, and he cannot fail to enhance the value of our periodical far beyond the price at which it is afforded.

— It is our greatest desire also to enlist the interest of our daguerreans in this country in the development of the intellectual talent of the artist, and to procure valuable practical communications from all parts. Now as we are obliged to pay a certain sum for translations—which amounts to considerable in the course of the year—we do not see why it should not be expended among our own artists, and it certainly would please us better to fill our journal with original papers than with these translations, and we feel confident it would also be more acceptable to our readers. Taking this view of the case, we are willing to pay for every communication sent to

us, and which we may accept, the same amount per page that we pay for translations. The articles should be as practical as possible, but we have no objections to good sound theory, when properly borne out by experimental facts. We will furnish all who desire to meet our views in this matter with our terms on application.

— We present our readers this month, according to promise, with a few pages of The *Dictionary of the Photographic Art*, by which they can judge of its general style and practical utility.

— Messrs. Dobyns & Harrington of New Orleans, in connection with Mr. V. L. Richardson, have opened a gallery in New York city, at the corner of Broadway and Duane street. The well known reputation of these gentlemen will ensure them a liberal share of patronage.

— Mr. E. S. Bachelder, of Havana, Cuba, has shown us some very successful proofs of the collodion process. Taking into consideration the nature of the light with which he has to work, and the time he has been experimenting, they evince a high degree of skill and taste.

PREMIUM FOR THE BEST DAGUERREOTYPE.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the BEST FOUR DAGUERREOTYPES that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All letters of enquiry upon the subject will receive prompt attention, and it is earnestly hoped the competition will be as spirited as possible.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense.

E. ANTHONY.

THE

PHOTOGRAPHIC ART-JOURNAL.

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PRACTICAL TREATISE ON PHOTOGRAPHY UPON PAPER AND GLASS AND METALLIC PLATES.*

TRANSLATED BY MRS. A. L. SNELLING, FROM THE FRENCH OF M. AUBREE, CHEMIST,

Associate member of the Linaen Society, Chemical and Physical, of Paris.

WASH the plate in a large quantity of water in order that no part, of precipitate may remain upon its surface. All these operations should be made in open day.

In this state, the plate is ready, and we can then calculate the certainty of a result by the lively intensity of its color, which ought to be golden, if the operations are successful. It can be preserved for months without alteration.

At the moment of operating in the dark camera, the plate is rendered sensible as usual by the aceto-nitrate of silver, which may then without inconvenience be poured on, drop by drop, the albumen being coagulated in advance, the acetic acid has no longer any action.

I shall shortly have occasion to return to this subject, and to speak more at length in presenting in the terms of the programme of the Society, some specimens of large pictures upon glass, and upon paper. I have the honor of being appointed by the Solicitor of the Society, the permission to take part in a series of lectures, which they have commenced. In consequence I pray you to assist me, by inserting some words of my communication to-day; especially of the last photographic process by *the iodide of silver*.

Society of Encouragement.

NOTE UPON PHOTOGRAPHY UPON GLASS, AND UPON SOME NEW FACTS; BY MR. NIEPCE DE ST VICTOR.

I have given in a pamphlet of the 23rd of May, a process for accelerating photography upon glass by a film of albumen.

This process consists in mingling with the albumen two or three grammes according to its consistency, of honey, for each white of egg, it is necessary to put to it 30 or 40 centi grammes of crystalized iodide of potassium, before beating the eggs. It is essential that the albumen be completely in the condition of froth, to render it very pure.

To extend equally the film of albumen upon the plate of glass, we must use a stick of glas s or a pipe; others extend it by means of the hand. This operation demands very great skill, while the application of mechanical means, renders the thing easy. It is this, that we hope to demonstrate.

The film of albumen being dry, we pass the plate into the aceto nitrate of silver, which ought to be composed of

Nitrate of silver,.....6 grs.
Acetic acid,.....12 "
Distilled water,.....60 "

We ought to leave the plate immersed in this composition only two seconds, then wash it again with distilled water.

After this operation, dry the plates in the dark to operate upon dry, and as the plates are very easily changed by light, it will be necessary as much as possible to

* Continued from page 259, Vol. 5 No. 5.

preserve simple albumen from contact with it.

It is useful during the exposition in the dark camera, to place a white plate behind the plate of glass; and to make the image appear, it is necessary also to heat a little gallic acid, to a considerable degree, but not carry it too far; for it often happens that the most beautiful proofs are those which have remained for some time, under the influence of gallic acid. We fix the negative proofs with bromine of potassium, or with the hyposulphite of soda, and to prevent the plate from the consequences that might happen, when the film of albumen is too thick, or when it is made of old eggs, or the covering of a light coat of gelatine or table varnish, which gives it still more solidity.

Of all the accelerating substances I have used, I have not found a better, than the honey of Narbonne; because it gives the greatest acceleration without having the inconveniences of other substances, such as the fluorides for example, in which, I have known for a long time a proper acceleration; but their use I have renounced for the albumen. However, we can employ them without inconvenience, by mingling them with honey, besides the fluoride of ammonia, and if you use the albumen of old eggs, you will have by the reunion of these means, a greater acceleration; but as I said before, the old eggs are subject to scale off.

It is necessary to avoid this inconvenience, by leaving the plate to dry before exposing it to the sun, to draw out the positive proof and for greater surety to cover it with a coat of a varnish.

The mingling of the honey and albumen, gives a negative proof, of very great softness in the tints; we shall have by this means some half tints, and some very deep tones, which are obtained by the dessication of this mixture, producing a film perfectly homogeneous, very dry and never cracked, even when exposed to heat, and giving an image of a clear object by diffuse light in the space of three seconds, for a country seat, and of twenty eight for a portrait, in operating with a double object glass for a quarter sized plate, when with the grand normal plate, it required forty or fifty seconds, and twenty-five or thirty with a German instrument.

Such are the results obtained by Mr. M. Vigier and Mestral who have made the proofs which I have had the honor of giving to the society. We can then operate more promptly in employing the natural means of acceleration as experience has demonstrated.

1. The thicker the film of albumen, the better the acceleration.

2. The older the eggs the better is the acceleration.

3. The more the compound of aceto-nitrate of silver is used the greater is the acceleration.

In short there exists a very great difference in the divers natures of albumen, which vary according to the nourishment of the fowl. I will say also that the albumen of eggs of the duck shake less than those of the chicken.

As to the albumen of the blood it is very accelerating, but cannot be employed alone, because it does not congeal enough with the aceto-nitrate of silver to adhere to the glass.

In washing the plate too depends a part of the accceleration; for if it is not washed enough, it forms a rusty colored film when we pour on the gallic acid. If we wash too much, we remove part of the acceleration.

If we mix a solution of a nitrate of silver with a solution of marine salt, or with the hypochlorite of ammonia, it produces the chloride of silver; this precipitate rests in the liquor in which it is formed and becomes colored by an exposition to the light, but if afterwards exposed to the heat the chloride becomes white.

We know that alcohol coagulates the albumine. If you put some iodide in the same alcohol in forming a tincture of iodide it will not coagulate.

If you put bromine into albumen the bromine is immediately enveloped in the albumen with which it coagulates, and it has no more of exhalation of the vapors of bromine.

Modifications of the Photographic Process.

BY MESSRS. TALBOT AND MALONE.

You have spoken, in the bulletin of the Society of the years 1839 and 1841, of the divers processes invented by M. Talbot for producing photographic images

upon paper. In later days he has made, in concert with M. Malone, trials to obtain these same images upon plates of porcelain, of glass, and upon oiled paper. These processes, for which he has taken a patent, on the 19th December, 1849, are described in the English journal, *Repertory of Patent Inventions.*

1. *Use plates of buscuit or porcelain.*—These plates must be fabricated from the best material; they ought to be perfectly united, semi-transparent, and porous, and to be able to impregnate and retain a sufficient quantity of the solutions employed. To avoid their rupture, we cover them with a cement upon a square piece of glass. We then re-cover it with a thin film of albumen, extended very uniformly, and then dried by the fire. According as the plate is more or less porous, it requires more or less of this preparatory film. It is rendered sensible to the light in the same manner as a sheet of paper, by plunging it into a solution of nitrate of silver, containing .618 grammes of nitrate to 31 of water. After having dried the plate, immerse it in a solution of iodide of potassium, containing the same proportions of salt and water. When it is sufficiently dry, rub it with a piece of cotton, and preserve it in this state to serve in time of need. It is then of a yellow color, owing to the presence of iodide of silver.

To render the plate sensible to the light, wash it with a solution of gallo-nitrate of silver; then place it in the dark chamber. The image appears, after the plate has a second wash with the same solution, aided by a mild heat. The negative image thus obtained, is fixed, by washing the plate with water, then with bromine of potassium, or better, with hyposulphite of soda; finally submit it to continual washes with water.

2. *Plates of glass, and conversion of positive into negative images.*—To convert the negative into positive images, place a plate of glass, very dry and very smooth, on a film of albumen clarified and filtered. Then leave the surplus to run off the plate, and expose it to a mild heat, so that the albumen may form a uniform film. The plate thus prepared is placed horizontally upon its albuminated face, at 3 or 4 inches, (96 to 100 millimetres,) in a vase containing iodide of potassium. Leave it in this state until it has taken a yellow tint, which will be in a few moments. Then plunge it into a solution of nitrate of silver, containing .971 grammes of nitrate to 31 grammes of water. Then draw it out, and after having left it to dry, place it in the dark camera. To finish it completely, draw it out and put it into a vase containing a saturated solution of gallic acid. This acid being exhausted, we pour upon the plate a solution of silver of about 1·942 gr. for 31 gr. of water, which changes remarkably in the image in converting the clear to sombre tints, and *vice versa*, which are termed the negative and positive—for it will be very apparent that the plate of glass will be either positive or negative, according as it is placed on a surface either white or black. We fix this image in the ordinary manner, by washing with water, then with hyposulphite of soda, and finally with water.

Paper, varnished or oiled.—This paper is transparent and impenetrable to water, and can replace glass under some circumstances; like that, it receives a film of albumen, or a mixture of albumen and gelatine, which has been dried, and which has been rendered sensible to the light by exposure to the vapors of the iodide, by following the process described above.

To fix perfectly the images described above, we plunge the paper into a boiling solution of caustic potash. The image, which at first has a greenish tint little agreeable to the eye, takes the color of sepia by exposing it to the vapor of sulphuretted hydrogen.

The advantages of employing paper over that of glass, consists in the facility of producing a great number of images, of preserving them indefinitely, and of transporting them to great distances without difficulty. This paper is also convenient when we wish to produce the panoramic images, because it curbs itself and is redressed so easily.

4. *Plates of polished steel.*—Mix one part of saturated solution of iodide of potassium with twenty parts of albumen—which must be extended uniformly upon the plate of steel. The layer having been dried before the fire, we draw away the plate, and while it is hot we wash it with an alcoholic solution of the nitrate of silver; it becomes then very sensible, and

easily receives the image which we fix, by washing the plate with the hyposulphite of soda, and finally with water. These images adhere to the steel with great tenacity.

Society of Encouragement.

NOTE UPON PHOTOGRAPHY UPON PAPER: BY M. C. LABORDE, PROFESSOR DE PHYSIQUE AT PITTELIN, AT NEVERS.

Many operators suppress the first bath of the nitrate of silver, and simply passing the sheet of paper to the iodide of potassium before the application of the aceto-nitrate of silver. This process, being more simple, gives good results; but the blacks of the negative proofs have always appeared less vigorous than when produced by the double operation of *Mr. Talbot.* The presence of a salt of silver in the first film determined, without doubt, to act most perfectly. To unite the advantages of the two processes, I have sought to introduce the salt of silver in the bath of iodide of potassium, and prepare, by a single immersion, a film which becomes very sensible under the aceto-nitrate of silver, and which gives to the negative proof pure white and vigorous black tones. The details of this preparation are white cyanide of potassium, 1 gramme; distilled water, 30 grammes.

In this solution, we pour by degrees as much as can dissolve of the iodide of silver recently precipitated, and after having filtered it, add to the bath, iodide of potassium, 4 grains; after having filtered it, add to it the iodide of potassium composed of water 60 grammes, iodide of potassium, 60 grammes.

The paper is extended upon the surface of the bath; when it is well developed draw it off, and after having dried it, apply it to blotting paper that can be used immediately. To prepare the iodine of silver, pour by degrees a solution of nitrate of silver into a solution of iodine of potassium; when it begins to amalgamate wash it with care, and dissolve it in the white cyanide of potassium.

It is certain that the image is formed upon the sensible film in the first instant of its exposition in the dark camera, when it can be produced by a continuator. The important point is to find a substance which can draw it out, and make it favor the action of the gallic acid; the acetate of lime and the acetate of lead associated with the gallic acid, possesses remarkable qualities, and causes it to appear, each in their own way, the effect of radiations which the gallic acid alone has power to manifest. Two grammes of lime added to 100 grammes of the ordinary gallic acid makes the image appear quickly, and gives intense black. A too strong proportion of the acetate of lime makes the white parts black, but we can suspend this effect by adding to the solution acetic acid. The ascetate of lime possesses qualities which may interest chemists; it augments considerably the dissolving power of the water for gallic acid. Certain preparations upon water require to show the image which is formed by a strong solution of gallic acid; the water can dissolve ten or twenty times more, if you wish, by augmenting progressively the dose of acetate of lime.

The nitrate of lead cannot be associated with gallic acid when it is dissolved in the distilled water; the portion employed ought to be much weaker than that of the acetate of lime. The image appears in all its details; the blacks are deeper but less vigorous, and gives great softness to the whole. The gallic acid gives an insoluble body with the acetate of lead, producing by this last formation a change of base in the acid.

When the aceto-nitrate of silver contains a too feeble proportion of nitrate of silver, the whites of the proof quickly blacken under the action of the gallic acid, or this proportion continually varies by following the volatility of the acetic acid—and then occurs one source of errors complying so much with what appears often unattainable. The nitrate of zinc can in a great measure replace the acetic acid; it augments the sensibility of the film, and the whites of the proofs sustain themselves a very long time under the action of the gallic acid. It will allow even of a second bath of iodide of potassium, or of ammonia, which can be made with the aceto-nitrate of silver. I indicate the following proportions without being convinced that they are the best—Nitrate of zinc, 2 grammes; nitrate of silver, 4

grammes; crystalizable acetic acid, 2 grammes, or more; water, 6 grammes.

We can double the proportion of nitrate of zinc, but it will diminish one-half the quantity of acetic acid.

From Household Words.

PHOTOGRAPHY.

We have been ringing artists' bells. We have been haunting the dark chambers of photographers. We have found those gentlemen—our modern high priests of Apollo, the old sun god—very courteous, and not at all desirous to forbid to the world's curiosity a knowledge of their inmost mysteries.

We rang a bell in Regent Street—which was not all a bell, for it responded to our pull not with a clatter; but with one magical stroke—and instantly, as though we had been sounding an enchanted horn, the bolts were drawn by unseen hands, and the doors turned upon its hinges. Being well read in old romance, we knew how to go on with the adventure. There were stairs before us which we mounted; swords we had none to draw. In a few seconds we reached another open door, that led into a chamber, of which the walls and tables were in great part overlaid with metal curiously wrought. A thousand images of human creatures of each sex and of every age—such as no painter ever has produced—glanced at us from all sides, as if they would have spoken to us out of the hard silver. Here a face was invisible: there it burst suddenly into view, and seemed to peep at us. Beautiful women smiled out of metal as polished and as hard as a knight's armor on the eve of battle. Young chevaliers regarded us with faces tied and fastened down so that, as it seemed, they could by no struggle get their features loose out of the very twist and smirk they chanced to wear when they were captured and fixed. Here a grave man was reading on for ever, with his eyes upon the same line of his book; and there a soldier frowned with brow insanely fierce over a rampart of moustachois.

The innumerable people whose eyes seemed to speak at us, but all whose tongues were silent; all whose limbs were fixed (although their faces seemed in a mysterious way to come and go as the lights shifted on the silver wall)—what people were these? Had they all trodden the steps by which we had ourselves ascended? Had they all breathed and moved, perhaps, about that very room. "They have," answered the genius of the room, "they have all been executed here. If you mount farther up you also may be taken."

The figures in the room were not all figures of enchantment. There were present four unmetamorphosed people; three of them were ladies, of whom of course it would be rude flatly to say that there was nothing of enchantment in there figures; but the fourth was a belted soldier with a red coat, a large cocked hat, and a heavy sword Imprudently we had come out without even so much weapon as an umbrella.

The taker of men himself came down to us, affable enough; but smiling faces have been long connected with mysterious designs. The soldier was a man of peace, a lamb in wolf's clothing; an army doctor, by whose side, if army regulations suffered it, there should have hung a scalpel, not a sword. And the expert photographer—the magic of whose art is fostered by no worse feeling than vanity, or by a hundred purer sentiments—was followed very willingly upstairs. It was all wholesome latter-day magic that we went up to see practised under a London skylight.

Light from the sky is, in fact, the chief

part of the stock-in-trade of a photographer. Other light than the sun's can be employed; but, while the sun continues to pour down to us a daily flow of light of the best quality, as cheap as health (we will not say as cheap as dirt, for dirt is a dear article), sunlight will be consumed by the photographers in preference to any other. A diffused, mellow light from the sky, which moderates the darkness of all shadows, is much better suited to the purpose of photography than a direct sunbeam; which creates hard contrasts of light and shade. For in the picture formed by light, whether on metal, glass, or paper, such hard contrasts will be made still harder. Lumpy shadows haunt the chambers of all bad photographers.

He who would not be vexed by them and would produce a portrait in which the features shall be represented with the necessary softness, finds it generally advantageous not only to let the shades be cast upon the face in a room full of diffused rays—that is to say, under a skylight—but also by the waving of large black velvet screens over the head to moderate and stint the quantity of light that falls on features not thrown into shadow. For this reason few very good photographic pictures can be taken from objects illuminated only by a side light, as in a room with ordinary windows. The diffused light of cloudy weather, if the air be free from fog, hinders the process of photography only by lengthening the time occupied in taking impressions. Light, when it is jaundiced by a fog, is quite as liable as jaundiced men to give erroneous views of mankind.

Photography, out of England has made its most rapid advances, and produced its best results in the United States and in France; but, although both the French and the Americans have the advantages of a much purer and more certain supply of sunlight, it is satisfactory to know that the English photographers have thrown as much light of their own on the new science as any of their neighbors.

Led by the military gentleman whose cocked hat elevated him in our civilians' eyes to something like the dignity of general, we mounted to the door; through which we poured our forces into the room under the skylight, where we found several defences thrown up in the shape of folding screens, and faced an unusually heavy fire from a round tower of a stove. To maintain a high and dry temperature is customary in the room used by the daguerrotypist for his operations; partly in order to protect more thoroughly the delicate surface of the plates carried about in it, partly to ensure to the sitter so much warmth as shall make perfect repose of all the features, in the most natural way, quite easy. For while the work of the photographer is done with astonishing rapidity, he is one of the few men who especially desire of those with whom they have to deal that they should *not* look sharp.

A group was to be made of Doctor Sword, and one lady, his wife. Another lady, probably his mother-in-law, declared candidly that when her turn came she must be held in some way, for she was too nervous to sit still. A younger lady, a friend to Mrs. Doctor S., looked interested. The group of two was to be the first executed. Now the lady's dress was not at all ill chosen for a photographic sitting or a masquerade. It included extensive scalp-fixings of a savage style introduced lately into this country, consisting of a ragged tuft of streamers, knotted with Birmingham pearls nearly as large as coat buttons; a great deal of gauze, wonderfully snipped about and overlaid with divers patterns; with a border of large thick white lilies round the cape. The lady was placed on a chair before the camera, though at some distance from it. The gentleman leaned over the back of the chair; symbolically to express the inclination that he had towards his wife: he was her leaning tower, he was her oak and she the nymph who sat secure under his shade. Under the point of the gentleman's sword the Pilgrim's Progress by John Bunyan was placed to prop it up; and one or two trifling distortions were made at the extremity of the proposed picture to neutralise the contrary distortions that would be produced on that portion of the image in the camera. We then peeped under a black pall into the machine itself, where we beheld the gentleman and lady on a piece of ground glass, standing on their heads. Leaving Doctor and Mrs. Sword to stand at ease and talk to one another, we Mes-

sieurs Pen, departed from the camera for a few minutes and accompanied the artist to his den behind the scenes.

The den of the photographer, in which he goes through those mysterious operations which are not submitted to the observation of the sitter, is a small room lighted by a window, and communicating into a dark closet, veiled with heavy curtains. Our sense of the supernatural, always associated with dark closets, was excited strongly in this chamber, by the sound of a loud rumbling in the bowels of the house, and the visible departure of a portion of the wall to lower regions. We thought instinctively of bandits who wind victims up and down in moveable rooms to turn them up in treacherous screw bedsteads. But, of course, there was no danger to be apprehended. What we saw was, of course, only a contrivance to save labor in conveying pictures up or down for coloring or framing. Our consciences having been satisfied on this point, the expert magician took a plate of the prescribed size, made ready to his hand. Such plates consist of a thin layer of silver fixed upon copper, and are provided to the artist highly polished; but a final and superlative polish is given to each plate, with a "buff" or pad like a double handled razor strop, tinged with a mineral powder. Simple as it appears, the final polishing of the plate is an operation that can only succeed well under a practised pair of hands, that regulate their pressure by a refined sense of touch. The plate thus polished was brushed over finally and very lightly, as with the touch of a cat's paw, with a warm pad of black velvet freshly taken from an oven.

To witness the next process we went into the dark closet itself, the very head quarters of spectredom. There, having carefully excluded daylight, the operator lifted up the lid of a small bin, rapidly fixed the plate, silver side downwards, in a place made underneath for its reception, shut down the lid, and began to measure seconds by talking between whiles, thus:—"One, that box—two—contains—three—chloride of iodine—four—strewn—five—six—at the bottom. Now!" (Presto, out came the ptate in a twinkling, and was held against a sheet of white paper, upon which it reflected a ghastly straw color by the light of a small jet of gas.) "Ah, tint not deep enough!" The plate was popped into its vapor bath again with magic quickness. "Seven—the action of the iodine" (continued the operator, counting seconds, and teaching us our lesson in the same breath) "rising in vapor upon the surface, eleven—of the plate—twelve—causes it to take in succession—thirteen—fourteen—fifteenth—all the colors of the spectrum—sixteen—sevenleen; and deposits upon it a film." As he went on solemnly counting, we asked how long he exposed the plate to the visitation of that potent vapor. "A very short time," he replied; "but it varies—thirty—thirty-one—according to the light in the next room—thirty-five—thirty-six—thirty-seven. Adjusting the plate to the weather, thirty-eight—is the result of an acquired instinct—thirty-nine—forty. Now it is ready." The plate was out, and its change to a deeper straw color was shown. The lid of an adjoining bin was lifted, and the iodized plate was hung in the same way over another vapor; that of the chloride of bromine, that the wraiths of the two vapors might mingle, mingle, mingle as black spirits with gray. In this position it remained but a very short time, while we stood watching by in the dark cupboard. The plate having had its temper worked upon by these mysterious agencies was rendered so extremely sensitive, that it was requisite to confine it at once, in a dark hole or solitary cell, made ready for it in a wooden frame; a wooden slide was let down over it, and it was ready to the camera.

Before quitting this part of the subject, we must add to the preceding description two or three external facts. We have been discussing hitherto the kernal without touching the nutshell in which these, like all other reasonable matters in this country, may be (and usually are) said to lie. The nutshell is in fact as important to a discussion in this country as the small end of the wedge or the British Lion:—In the action of light upon surfaces prepared in a certain manner lies the whole idea of photography. The camera-obscura is an old friend; how to fix chemically the illuminated images formed in the camera by light, was a problem at which Sir Humphrey Davy, half a century ago, was one of the first men who worked. Sir Humphrey

succeeded no farther than in the imprinting of a faint image, but as he could not discover how to fix it, the whole subject was laid aside. Between the years 1814 and 1828, two Frenchmen, M. Daguerre and M. Niepce, were at work upon the problem. In 1827, M. Niepce produced before the Royal Society what he then called heliographs, sun-pictures, formed and fixed upon glass, copper plated with silver, and well-polished tin. But, as he kept the secret of his processes, no scientific use was made of his discovery. M. Daguerre, working at the same problem, succeeded about the same time in fixing sun-pictures on paper impregnated with nitrate of silver. M. Daguerre and M. Niepce having combined their knowledge to increase the value of their art, the French government—in the year 1839—acting nobly, as it has often acted in the interests of science, bought for the free use of the world the details of the new discovery. For the full disclosure of their secrets there was granted to M. Daguerre a life pension of two hundred and forty pounds (he died not many months ago), and a pension of one hundred and sixty pounds to the son of M. Niepce, with the reversion of one half to their widows.

Six months before the disclosure of the processes in France, Mr. Fox Talbot in England had discovered a process leading to a like result—the fixing of sun-pictures upon paper. As the English parliament buys little for science, nothing unfortunately hindered the patenting of Mr. Talbot's method. That patent in certain respects very much obstructed the advance of photography in this country, and great credit is due to Mr. Talbot for having recently and voluntarily abandoned his exclusive rights, and given his process to the public for all purposes and uses, except that of the portrait-taker. By so doing he acted in the spirit of a liberal art born in our own days, and peculiarly marked with the character of our own time. It does one good to think how photographers, even while exercising the new art for money, have pursued it with a generous ardor for its own sake, and emulate each other in the magnanimity with which they throw their own discoveries into the common heap, and scorn to check the progress of their art for any selfish motive. After the completion of the French discovery two daguerreotype establishments were formed in London armed with patent rights, and their proprietors, Messrs. Claudet and Beard, do in fact still hold those rights, of which they have long cheerfully permitted the infringement. Mr. Beard tried to enforce them only once, we believe; and M. Claudet, with distinguished liberality, never.

At first the sitting was a long one, for the original daguerreotype plate was prepared only with iodine. We see it stated in the jury reports of the Great Exhibition, that to procure daguerreotype portraits, it was then "required that a person should sit without moving for twenty-five minutes in a glaring sunshine." That is a glaring impossibility, and in fact the statement is wrong. It is to M. Claudet that the public is indebted for the greater ease we now enjoy in photographic sittings, and it is the same gentleman who informs us that five minutes—not five-and-twenty—was the time required for the formation of a good picture on the plates prepared in the old way.

The discovery of the accelerating process, by the use of the two chlorides of iodine and bromine, was at once given to all photographers by M. Claudet; it having been made public by him, in England, through the Royal Society, and in France, through the Academie des Sciences. By the use of this double application, plates are made so sensitive that portraits may be taken in a period varying, according to the measure of the light, between a second and a minute. We have said something about varying the degree of sensitiveness in the plate according to the weather. In the account just given of our visit to a photographic studio, it will be seen that a very skillful artist (Mr. Mayall) lessens at times the sensitiveness of the plate, but in this respect the practice is not uniform. In illustration of the extreme sensitiveness that can be communicated to the prepared plate, reference has often been made to an experiment performed at a meeting of the Royal Society, the account of which we quote from Dr. Lardner. "A printed paper was fastened upon the face of a wheel, which was put in revolution with

such rapidity that the characters on the paper ceased to be visible. The camera, with the prepared photographic surface, being placed opposite the wheel and properly adjusted, the room was darkened. The room and wheel were then illuminated, for *an instant*, by a strong spark taken from the conductor of a powerful electric machine. This instantaneous appearance of the wheel before the camera was sufficient to produce a perfect picture." In reading of this experiment we are not to direct our attention to the sensitiveness of the plate so much as to the power of the light. Such a spark as was taken for the purpose produced an instantaneous light, greatly surpassing in intensity the ordinary sunlight used by the photographers. M. Claudet, in reply to our questions about the adjustment of the sensitiveness of his plates, replied simply, "I always try to make my plates as sensitive as possible." A walk through his gallery satisfied us that if, by so doing, he increases the demand on his dexterity in sunny weather, the demand is met. His results fully justify his practice.

We may say the same for Mr. Mayall, the photographer whose operations led us into the preceding digression. From the dark cupboard, cleared by a strong up draught of escaping fumes, we brought the prepared plate in its frame, carefully excluded from the light by a protecting slide. The frame was made to fit into the camera, but before placing it, the final adjustment of the sitters had to be made. The Doctor and his lady having resumed their positions, we again observed, upon the ground glass of the camera, the artistic effect of the group in an inverted miniature, colored of course. This observation was made with the head thrust under a black velvet pall. Upon the ground glass we saw drawn four squares, one within another, and we remembered well what pictures we had seen of trines and squares and houses of the planets drawn by Albertus Magnus and Agrippa. These were, however, squares, the adept told us, corresponding respectively in size to the plates, differing in price, on which it is in the choice of the sitter to have a likeness taken. A frame corresponding to each size has the plate so fixed in it that, when placed in the camera, it occupies precisely the position of the square marked on the glass. Our picture was to be of the third size—the third square was to be the house of Mars and Venus—and the object of the operator was to arrange the sitters and the camera in such a way as to procure a telling group within the boundaries of that third square upon the glass. This having been done, and a fixed point supplied, on which the eyes should feast, the velvet pall was thrown over the back of the camera to exclude the light, and a black stopper (the obturator) was clapped over the glass in front, making the chamber of the box quite dark. The frame was then inserted in its place, the slide removed, and the prepared silver reposing in the darkness was laid open to receive the meditated shock upon its sensibility. The sitters were requested then to close their eyes for a minute, that the eyelids might be rested, then to look fixedly in the direction indicated by a little picture pinned against a screen. Then "Now, quite still; try to look pleasant—a little pleasanter!" The cap was off, and the two figures, fixed as statues, shone upon the magic mirror in the camera, rigidly pleasant. In half a minute —counted accurately by the operator— suddenly, the stopper was again clapped over the glass in front; the slide was let down over the tablet, upon which light, having done its work, must shine no more until the plate was light-proof. Mars and Venus in conjunction having entered the third house, we retired into the necromancer's den to observe what would follow.

The necromancer there addressed us in manner following: "The chemical action of light has decomposed the delicate compound formed upon this tablet between the silver and the chlorides of iodine and bromine. The decomposition has been greatest, of course, where the light has been most intense, and its action has been manifested everywhere by the piercing of the sensitive surface with minute holes. Where the light has been the strongest, the number of these microscopic holes, contained upon a space equal to the area of a pin's head, is greater than in those parts on which the chemical action of the light has not been so intense. The portrait is thus minutely and delicately dotted out, dots signifying light. That is the sun

picture which I now hold in my hand." After this brief parliamentary address the adept went on with his labor.

Still hiding his dark deeds from the face of day, he took the plate to a small bath of quicksilver, from which a subtle vapor slowly ascended, the quicksilver being placed over the faint blue flame of a spirit-lamp. Suspended over this bath it received upon its polished surface the fine vapor; which, penetrating into the minute holes formed by light upon the plate, and there condensing into microscopic drops, tinged out with its own substance the surface on which light had fallen—more abundant where its action had been greatest, and less marked where the decomposition had been less. When this process was complete, the picture was complete; all the lights being expressed and graduated by a white metal, and the shadows by the darker ground. There were the allied images of gentleman and lady revealed suddenly before us with a startling accuracy, only unnaturally sensitive and altogether wanting in stability of character.

Nothing remained then but to fix the picture; to destroy the sensitiveness of the surface. This was done by pouring over it some dilute pyrogallic acid, and finally submitting it to the action of a salt of gold; of which a solution was washed over the plate, and warmed upon it for one or two minutes. The portrait was in this way perfectly spell-bound. It might be carried about loose in the pocket and indiscriminately handled, without suffering more hurt to its charms than can be worked by those ugly disenchanters, grease and dirt and scratches. For protection, however, against these, and for the better setting off of the picture, it will be delivered to its owner as a well known imp was once sold, in a bottle under glass; and as the Moors were arch magicians, with traditions of Bagdad about them, it will very fitly be enclosed in a morocco case.

Truly, a fine picture it is. The lady's dress suggests upon the plate as much delicate workmanship as would have given labor for a month to the most skillful of painters. The lilies that we did not like upon the cape, how exquisite they look here in the picture! But as this group was destined to be colored, we were courteously invited to the coloring room, a tiny closet in which two damsels were busily at work, one upon a lady's dress, the other upon the forehead of a gentleman, putting in the yellow rather lavishly, but with a good effect. "The faces," she informed us, "must be colored strongly, or they will be put out by the bright blue sky." We pointed to a small box labelled "Sky," remarking that the fair painters were magicians, to carry the sky in a wafer-box. To which one of them promptly answered "Yes; and Ogres, too, for that pill-box contains gentlemen's and ladies' 'Flesh.'"

These terrific creatures—who had quite the ways of damsels able to eat rice pudding in an honest manner—then made us acquainted with a few dry facts. The colors used by them were all dry minerals, and were laid on with the fine point of a dry brush; pointed between the lips, and left to become dry before using. A little rubbing caused these tints to adhere to the minute pores upon the plate. Each color was of course rubbed on with its own brush, and so expertly, that a large plate very elaborately painted, with a great deal of unquestionable taste, had been, as we were told, the work only of an hour. On a subsequent occasion, we saw in the same room our picture of the Doctor under the painter's hands, and undergoing flattery. We admired the subdued tone which the artist had, as we thought, taken the wise liberty of giving to the glare of the red coat. "Yes," she replied, "but I must make it redder presently; when we don't paint coats bright enough, people complain. They tell us that we make them look as if they wore old clothes."

And we may observe here that another illustration of our vanities was furnished to us on a different occasion. Daguerreotype plates commonly present faces as they would be seen in a looking-glass, that is to say, reversed: the left side of the face, in nature, appearing upon the right side of the miniature. That is the ordinary aspect in which every one sees his own face, for it is only possible for him to behold it reflected in a mirror. This reversing, of course, alters in the slightest degree the similitude. The sitter himself is generally satisfied. But M. Claudet has taken up

the parable of the poet; and has undertaken to be the kind soul who, by virtue of a scientific notion, "Wad

the giftie gie us
To see ourselves as *others* see us."

Few of us would thank him for it morally, and it is a curious fact that few of us are content to have even our faces shown to us as others see them. The non-inverted daguerreotypes differ too much from the dear images of self that we are used to learn by heart out of our looking-glasses. They invariably please the friend to whom they are to be given, but they frequently displease the sitter. For this reason, though M. Claudet has of course made public the secret of his "giftie," we are not aware that any other photographer has thought it profitable for his use.

Somebody asks, "how are those non-inverted images produced?" The question causes us again to drop the kernel of our story, and apply ourselves to a discussion of the nutshell. A daguerreotype formed in the usual way and inverted, if held before a looking-glass, becomes again inverted, and shows therefore a non-inverted picture of the person whom it represents. If the picture in the camera fell, by a previous reflection, inverted on the plate, it would in the same way be restored by a second inversion to its first position. This object could not be attained by any arrangement of glass mirror in the camera, because a piece of looking-glass reflects both from its outer surface and from the quicksilver behind, and this, though unimportant for all ordinary purposes, would make it perfectly unfit for photographic use. A piece of polished metal would have but a single surface; but the exquisite polish necessary would make the preparation of it difficult and costly, and its liability to damage great. The first reflection is made, therefore, by turning the side of the camera to the sitter and causing his image to fall upon one face of a large prism placed before the glasses otherwise in use: an image is then deflected into the camera, which falls in the required manner on the plate.

In the present state of photographic art, no miniature can be utterly free from distortion; but distortion can be modified and corrected by the skillful pose of the sitter, and by the management of the artist. The lens of the camera being convex (in order to diminish the object, and to concentrate the rays of light upon the silver plate) the most prominent parts of the figure to be transferred—those parts, indeed, nearest to the apex of the lens—will appear proportionately large. If you look through a diminishing glass at a friend who holds his fist before his face, you will find the face very much diminished in proportion to the appearance of the fist. The clever artist, therefore, so disposes his sitter, that hands, nose, lips, &c., shall be all as nearly as possible on the same plane in apposition to the lens. In a sitting figure hands placed on the knees would seem prodigious—placed on or near hips, no more prominent than the tip of the nose, they would seem of a natural size. It is for this reason that daguerreotypes taken from pictures instead of living figures, are never distorted, because they are actually on a flat surface.

Concerning the action of light in the formation of the picture on the iodized plate within the camera, one or two facts are curious. Light contains rays that are not luminous. In the dark spaces above and below the solar spectrum some of the most decided chemical effects of light are manifested. It is probable that the chemical rays of light are, to our eyes, perfectly dark Cover a picture with a piece of yellow glass, and you can see it very well. But place it before the camera, and you will get no photographic copy. Cover a picture with a piece of dark-blue glass, and it is totally invisible: but, placed before the camera, the chemical rays pass through and imprint a photographic image as distinct and clear as if there had been no blue glass whatever. The distinct properties of the yellow and blue rays are manifested as strongly in the germination of plants. Germination is prevented by the action of the yellow ray, while to the blue ray it is mainly indebted.

The rays that have passed through to form the picture, have been called the photogenic rays: they refract not quite in the same way as the luminous or colorific rays, and therefore the focus of the photogenic picture and that of the picture thrown on the ground glass will not exactly coincide. For this, allowance has to be

made in practice, and accurate instruments for ascertaining the true photogenic focus have been invented, one by M. Claudet, and another by Mr. G. Knight. They are called Focimeters. There are hidden mysteries, however, connected with this portion of the subject. Means have been already here and there discovered, by which the colors of the spectrum may be printed at once on photographic tablets, and the sun—most brilliant of artists—may paint his pictures at the same time that he is engraving them. The process is not yet disclosed. A Mr. Hill, of New York, affirms that he has taken many pictures from Nature, having all the beauty of natural coloring upon them. A new material is said to have been introduced in aid of this effect. When all mechanical details have been perfected, we may therefore expect this new step to be made public, by which Apollo will be raised above Apelles in the world of art.

The application of photography to the stereoscope produces an extremely pretty toy, that is of no use except as an elegant and valuable illustration of a train of scientific reasoning. The instrument itself was invented some years since by Professor Wheatstone, to illustrate his discovery of the principles of binocular vision. In 1849, Sir David Brewster exhibited to the British Association at Birmingham a stereoscope adapted to the inspection of daguerreotype pictures. Afterwards he happened to describe the instrument to an optician in Paris, M. Duboscq Soleil, who being an enterprising man, constructed a number of such instruments on speculation. At the beginning of 1841 some of these were exhibited at one of the soirees of Lord Rosse; they excited attention, and the photographers of London, seizing the notion, very soon began to take stereoscopic portraits. In the stereoscope two exactly similar pictures are placed side by side under a pair of prisms, which are so adjusted, that one image falls on each eye, and the images on the two eyes do not fall on precisely corresponding parts. This gives the idea of distance.

For it is to the use of two eyes that we are indebted for the facility with which we derive ideas of form, solidity, and distance. There is only one point before us, to which both eyes can be turned in the same way at the same time. Every other point before and behind that will fall upon both eyes, will fall upon the retina of each eye in a different place, and the amount of variation presents itself through the optic nerve to the brain as the idea of distance. Upon this hint the stereoscope is formed, and the effects of roundness and distance are presented to the mind by a pair of flat photographic pictures. M. Claudet has constructed an ingenious variation on the ordinary stereoscope, by placing under it two plates not perfectly identical. In one, for example, there are two men fighting: one strikes, the other wards. The companion plate contains precisely the same men; with this difference in their attitude, that the one who struck now wards, and the aggressor stands on the defensive. In looking at this group, and at the same time rapidly moving to and fro a small slide behind the glasses, which covers now one eye and now another, the two impressions run into each other and produce the appearance of an active sparring match. Again, a needle-woman, represented on one plate with her needle in her work, and in the other with her thread drawn out to its full length, appears, when the slide is shifted to and fro, to be industriously sewing.

Among ingenious contrivances we ought not to omit to rank Mr. Mayall's very neat method of producing what are called crayon portraits in daguerreotype. His plan is to place between the sitter and the camera a revolving plate, having a hole cut into the middle of it, from which there proceed broad rays as of the sun upon a signboard. The result is a picture upon which the head is engraved with unusual distinctness, and the bust is gradually shaded down into the general color of the plate, so that the effect is that of a crayon portrait.

Photographic processes on glass and paper are even more valuable as aids to knowledge than daguerreotypes.

There are many processes by which photographic impressions may be taken upon paper and glass; a book full of them lies at this moment before us: we have ourselves seen two, and shall confine ourselves to the telling of a part of our experience. We rang the artist's bell of Mr. Henneman in Regent street, who takes very good por-

traits upon paper by a process cousin to the Talbotype. By that gentleman we were introduced into a neat little chamber lighted by gas, with a few pans and chemicals upon a counter. His process was excessively simple: he would show it to us. He took a square of glass, cleaned it very perfectly, then holding it up by one corner with the left hand, he poured over the centre of the glass some collodion, which is, as most people know, gun-cotton dissolved in ether. By a few movements of the left hand, which appear easy, but are acquired with trouble, the collodion was caused to flow into an even coat over the surface of the glass, and the excess was poured off at another corner. To do this by a few left-handed movements without causing any ripple upon the collodion adhering to the glass is really very difficult. This done, the plate was left till the ether had almost evaporated, and deposited a film of gun-cotton—which is in fact a delicate paper—spread evenly over the surface of the glass. The glass covered with this delicate paper, before it was yet quite dry, was plunged carefully into a pan or bath, containing a solution of nitrate of silver, about eight grains of it to every hundred of distilled water. In about two minutes it was taken out, and ready for the camera. It was a sheet of glass covered with a fine film of cotton-paper impregnated with nitrate of silver, a colorless salt blackened by light.

It was removed in a dark frame to the camera. Then an assistant, opening a book, assumed an attitude and sat for his picture. In a few seconds it was taken in the usual way, and the glass caried again into the operator's room. There it was dipped into another bath—a bath of pyrogallic acid—and the impression soon became apparent. To bring it out with greater force it was then dipped into a second and much weaker bath of nitrate of silver. The image was then made perfect; but, as the light parts were left depicted by the blackest shades, and the black parts were left white, the courteous assistant was represented as a negro.

That negro stage was not of course the finished portrait, it was "the negative"—sterotype plate, as it were—from which, after it had been fixed with a solution of the sulphate of the peroxyde of iron, any number of impressions could be taken. For it is obvious that if a plate like this be placed on sensitive paper, and exposed to daylight, the whole process will be reversed. The black face will obstruct the passage of the light and leave a white face underneath, the white hair will allow the light to pass, making black hair below, and so on. Impressions thus taken on paper, and afterwards fixed, may either serve for portraits, as they are, or, like silver plates, they may be colored.

The paper processes, of which we say so little, are in fact practically the most important branches of the art of the photographer. For it is not only—or indeed chiefly—by the reproduction of our own features that we bring photography into the service of our race. One application of the art has produced an apparatus which enables many natural phenomena to register themselves. Mr. Brooke's little cylinder of photographic paper, revolving in measured time under a pencil of light thrown from a small mirror attached to a moving magnet or an anemometer, tells for itself the tale of every twelve hours' work, and has already superseded the hard night-work that was necessary formerly at the Greenwich, and at other great observatories. Photography already has been found available by the astronometer; the moon has sat for a full-face picture, and there is hope that in a short time photographic paper will become a common auxiliary to the telescope. History will be indebted to photography for fac-similes of documents and volumes that have perished; travelers may bring home incontestible transcripts of inscriptions upon monuments, or foreign scenery. The artist will no longer be delayed in traveling to execute his sketches on the spot. He can now wander at his ease, and bring home photographic views, from which to work, as sculptors from the model. Photography is a young art, but from its present aspect we can judge what power it will have in its maturity. The mind may readily become bewildered among expectations, but one thing will suggest many. We understand that a catalogue of the national library of Paris has been commenced, in which each work is designated by a photographic miniature of its title-page.

From the New York Daily Tribune.

PHOTOGRAPHY IN THE UNITEO STATES.

THE art of photography—more popularly known as Daguerrotyping—is brought to so great a perfection in this country, and prosecuted on a scale of such magnitude, and the different manufactures connected with it are of such importance, especially in this city, that we propose giving a few details respecting them, and also a sketch of the origin and progress of this discovery.

Several designations distinguish this new art—it was originally called photography, or writing by light; afterward, the art of photogenic drawing, or drawing produced or occasioned by light; then heliography, or writing by the sun—the latter term being that used by the experimenter who first succeeded in fixing the delineations of pictures produced by light—Mons. Daguerre, whose name has originated another and the most general title by which the art is known—Daguerrotyping—a compliment to the discover which will hand his name down to the latest posterity.

Although it was not until the year 1839 that Daguerre first succeeded in making a picture by the aid of the sunlight, upon a plate chemically prepared, still the idea that such an effect could be produced had been entertained as far back as early in the commencement of the eighteenth century; and memoirs on the influence of light in the crystalization of salts were published, by Petit, in 1722, by Chaptal in 1788, and by Dize in 1789. These and similar researches led to the experiments of Mr. Wedgewood, the porcelain manufacturer of Staffordshire, England, who in 1803, laid before the Royal Institution of London a memoir, entitled "An Account of a Method of Copying Paintings upon *Glass*, and of Making Profiles by the Agency of Light upon Nitrate of Silver; with Observations by Sir Humphrey Davy." A solution of nitrate of silver, spread on white paper or leather, was the photographic material employed; but the experiments eventually failed, owing solely to the want of those chemical agencies which were afterwards employed as the fixing materials. Bromine, iodine, and hyposulphite of soda, were not then discovered, and, without them, photography would still have remained where Wedgewood left it.

No further investigations appear to have been made until 1814, when M. Niepce, of Chalons-sur-Saone, turned his attention to the chemical agency of light, his object being "to fix the images of the camera-obscura;" and he discovered that by spreading bitumen on a glass or metal plate, and placing this in the camera, a *dormant* image was impressed on the plate in *five or six hours*.

In 1824 Daguerre commenced his researches, employing, like Wedgewood, nitrate and chloride of silver, and in 1826, he and Niepce becoming acquainted, pursued their inquiries together. In 1829, Niepce, in a letter to Daguerre, says:

"The discovery which I have made consists in producing spontaneously, by the action of the light, with gradations of tint, from black to white, the images received by the camera-obscura."

But previous to this, in 1827, Niepce had exhibited engravings, copied by means of photography, many of which are still in existence, presenting the appearance of advanced sketches, produced by means of a graver, and proving that he had already solved the problem, which had defeated all his predecessors, making his copy insensible to the subsequent and blackening rays of the sun.

In 1829, Niepce and Daguerre entered into a deed of partnership, in which document the several portions of the discovery are accorded to the respective parties to the contract, and it contains the remarkable assertion that the experiments of the latter had elicited a process which reproduced images with sixty or eighty times the force of the previous mode. It is necessary to observe the words of the contract—"for the photographic copying of

engravings"—for not only did he fail in producing likenesses of living objects, (for, as will be presently shown, the first successful attempt in that sphere was made in this State,) but he was unsuccessful in his attempts at producing copies from nature. In a landscape, for instance, a part of the picture was badly portrayed while another portion would be poor and inefficient, and there would be between gaps entirely destroying the effect of the whole. Daguerre at length conceived a method which he called Niepce's plan completed, but, though an improvement, it was still far from efficient. Through a long course of observation, however, he at length saw the reason of his repeated failures, and by great perseverance and ingenuity finally so far overcame them as to bring his discovery to a practical state. Niepce died in 1833, and his interest in the invention devolved to his son; but it was not until 1839 that Daguerre had perfected his process. He then submitted it to the French Government, with a view to obtaining a compensation to enable him to make the result of his long labors public; and from a report made to the Chamber of Deputies, by the celebrated Arago, it appeared that the Commission of Inquiry were convinced of its capability to effect what its inventor claimed. A resolution was ultimately passed granting to Daguerre a pension of 6,000 francs ($1,200), and to Niepce, Jr., 4,000 fr. ($800) annually, but the former sum was finally increased to 10,000 fr. ($2,000.)

But previous to the grant by the French Government, which also purchased the secret of Daguerre's process, in their own words, "for the glory of endowing the world of science and of art with one of the most surprising discoveries that honor their native land," Mr. Fox Talbot, of London, published "Some Account of the Art of Photogenic Drawing," and still holds a contested claim, together with Mr. Wattles, of the United States, to a priority of the invention over Daguerre; but if Talbot be indeed entitled to the credit of an inventor of this beautiful art, the productions of Daguerre evince so much more perfection, that the palm of superiority must be conceded to the latter. The English invention is known by the name of the Calotype or Talbotype process, and differs from all others by the employment of paper instead of metal plates; but though many believe that, on account of its greater cheapness, it will finally supersede Daguerre's process, we doubt whether such will be the case. The following is the contrary opinion of an eminent authority on the subject:—

"As perfectly as the manipulators of the Talbotype profess to delineate an image on paper, they do not succeed so well as to preclude the necessity of retouching various parts of the picture with the pencil. All their art and care are incompetent to produce those well-defined, truthful and exquisite lines brought out by the daguerreotype process; while the more rapid manipulation and greater economy of the latter will always cause it to be preferred."

Mr. Talbot also is the original introducer of the process substituting unglazed porcelain for paper. The latest discovery in this art is called the Crystalotype, invented by Mr. Whipple, of Boston. It is a method of taking scenes or likenesses upon glass and paper, so that with one picture thousands of copies may be made. Its rapidity and cheapness will no doubt make it a popular method of illustration for books; it, however, still needs to be greatly improved, especially in its representations of natural objects, as houses, trees, and landscapes. It makes everything appear flat, and its landscapes are without an atmosphere.

THE STEREOSCOPE.

But one of the most wonderful of all the discoveries connected with the daguerrean art, is the stereoscope, a name signifying the power to show pictures of natural objects, under the form of solids, precisely as they themselves appear standing out in isolated relief. It was invented by Professor Wheatstone, of London, one of the claimants of the discovery of the magnetic telegraph, but who, nevertheless, regards the stereoscope as his best title to fame. By some means, however, its merits, if appreciated by a few, were overlooked by the public, and it was not until recently that a stereoscope introduced by Sir David Brewster received that attention which its predecessors had failed to procure. The following translation of a description by a

French *savan* will clearly suggest its peculiar action:—

"You take two designs or pictures of an object taken turn by turn, with the right eye and the left, then adjust them side by side, perpendicularly before your eye at the bottom of a little box, the image on the right being seen by the right eye, and that on the left by the left eye; between each eye and image you interpose a prism at such an angle or inclination as will force the two images from the right and left toward the centre. If you have correctly adjusted the angle of the two prisms, as also the distance from your eyes to the images, all the corresponding points of the two images will be seen so magically blended and commingled as to form one identical image, the looking at which produces at first a very singular physical sensation in the eyes, which very soon passes away, and you behold there the one image in the most perfect isolated relief, with all its advancing and retreating parts, as perfect as if the real object, without any intervening medium, was standing there before you. To describe the magical and captivating effect of this spontaneous transformation of two images into one solid image, and of three times the size, length, breadth and depth, would be a thing impossible. The effects of the stereoscope are not confined to the representation of geometrical objects, such as pyramids, cones, &c. If in this marvellous apparatus, we look at two drawings of a bas-relief, a statue, or two portraits of a living person, or two views of a landscape, they will appear just as they were in nature. We see the eyes, the lips, the nose, in short, all the striking features of the face and all the projecting parts of the body, coming forward clearly from the back ground with all their relative proportions. The illusion is complete, and we see the person depicted standing there identically before us. It is known that pictures of natural objects are reproduced on the plates of Daguerre, the paper of Talbot, and the albuminated glass of Niepce de Saint Victor, with the same absolute exactitude that their fleeting images are pictured on the retina of the eye. When, therefore, we wish to obtain the image of a bas-relief, a statue, a landscape, or a living person, for the stereoscope, we have only to arrange before the object a binocular camera—that is, a camera furnished with object glasses of the same diameter and focal distance, and two plates of albuminated glass. This camera looks for us, and sees the object placed before it. Like a complaisant artist, it paints for us the two images with superhuman skill and perfection, and we thus obtain with ease and facility everything essential for the stereoscope. Photography, which was before only a designer of beautiful pictures in gray tint, with the incomparable pencil which the stereoscope lends to her, has now become transformed into a superhuman painter and sculptor, armed with a pencil which would have driven Raphael and Michael Angelo to despair. Photography, thus completed, and crowned by the stereoscope, is so vastly improved that the day must soon come when nearly all important photographic pictures of landscapes, monuments, portraits, &c., will be produced double, that is, by couples, in order to their stereoscopic reproduction, in all the exact truth of living nature."

Notwithstanding this highly eulogistic description of the stereoscope, an investigation will satisfy the reader that it fully merits all the praise bestowed on it excepting only with regard to portraits. Stereoscopic portraits are frightful, giving to the individual the air of the corpse petrified and painted the color of life. But for objects of still-life, nothing could be more charming. Still, though so universally admired, the stereoscope meets with an unaccountable neglect on the part of the public, though this may be to some extent in consequence of the greater expense of pictures made by the process.

COLORED DAGUERREOTYPES.

But there is yet another difficulty to be overcome, which has hitherto baffled all the researches of the most untiring philosophers of this continent and Europe, and one which, when perfected, will add tenfold value and beauty to the art of photography. We allude to the transferring of the natural colors of the subject to be taken—whether animate or lifeless. It was fondly hoped, a few months since, that the United States would have had the honor of owning the discoverer of this grand object as one of her citizens, in the person of Rev. Levi L. Hill, of Westkill,

Greene co., New-York; and in consequence of his representations a committee of the Daguerrean trade in this city is said to have waited on him with a guarantee of $100,000 to make his secret public. The offer was rejected, since which very free opinions as to the reality of the discovery having been made at all have been unceremoniously resorted to both in conversation and in that portion of the public prints more immediately interested in establishing the truth or falsity of Mr. Hill's claim. It does not come within our present purpose to give an opinion, nor, indeed, are we sufficiently well informed on the matter. On the one hand it is stated that a large sum has been offered to the discoverer by responsible men, more than sufficient, exclusive of moneys that have been subscribed for publishing his works, with the avowed purpose of assisting him pecuniarily to prosecute his labors; and on the other, it is urged that the certificates of highly intelligent and upright men—among others, that of Professor Morse—are sufficient guarantees of the existence of the discovery. We also learn that Mr. Hill has, within a few weeks, exhibited his invention to a committee of the United Sates Senate, with the view of obtaining a special patent, and that the report is favorable to his claims, though he ackuowledges his discovery has not been perfected in its practical details. In their own words:

"The committee have formed the opinion that the specimens exhibited to them have afforded sufficient proofs that the inventor has solved the problem of photographic colorature. The committee had in their hands the plates, unprotected by glass or any other covering, and saw them freely rubbed and otherwise tested, confirming in their minds the fact of the invention and the durability of the pictures."

We devoutly hope that the committee may not prove to be mistaken, for such a discovery would be another great American triumph in Daguerrean art, superior even to that of the application of the science to the delineation of the human countenance, which Daguerre failed in accomplishing, but in which Morse, Draper, Chilton and others have succeed—a fact acknowledged with pleasure by Daguerre himself.

It certainly is very desirable to establish an early claim to the discovery of photographic coloring as many scientific men in Europe are, it is well known engaged in the pursuit of the same object; indeed, a method of transferring colors by the aid of sun-light has already been discovered by a Frenchman, though he has not yet succeeded in fixing them permanently—exposure to the light causing them to vanish in a few days. Mr. James Campbell of Dayton, Ohio, has also been experimenting with the same object; and though not attended with success, his researches have led to the development of many properties in various chemicals, under certain conditions, which they were not before known to possess; and the additional knowledge thus contributed will doubtless conduce to the more rapid discovery of the great aim in view.

THE MOON DAGUERREOTYPED.

But, great as are the claims of photography on our notice, from the unswerving minuteness with which it acts, it has still more exalted demands on our attention from its utility in advancing the cause of knowledge in its most sublime and difficult paths. Those whose admiration of the art has terminated with the expresssion of joy and surprise at the wonderful fidelity of the portrait of some cherished friend, are probably unprepared to learn that the cause of astronomy has been advanced by the agency of the same simple means. Yet such is the fact, as the following translation from a foreign paper will show:

"Dr. Bond, of Harvard University, thought that although it were impossible to render the moon,—so pale and distant—more luminous, he could make the feeble light she possesses useful for photography, if he could make a gigantic camera-obscura of the magnificent telescope which he had at his disposal. The object-glass of the telescope is 15 inches in diameter, and the image of an object formed at its focus is 25 times more brilliant than the image of the same object reproduced by a lens of three inches. Mr. Bond placed a plate of iodised silver in the dark tube of the telescope, so that the sensible surface of this plate corresponded to the focus of the achromatic object-glass, and he caused the telescope, thus prepared, to follow the movement of the moon in space, by means of one of those ingenious mechanisms that

are employed for this effect in observatories. The result was a veritable triumph. Three excellent proofs, reproducing the least details of the moon, were presented at the last meeting of the *English Association* for the progress of science. The most interesting is a sort of portrait of the moon in profile, if we can say so, of the dimensions nearly of a half dollar piece. This position of the moon was chosen, because the elongated shadows that project from the inequalities of the surface, are seen most advantageously. When we look at the lunar atmosphere, half in light and half in shade, the sun shines on it in a transverse direction to that in which we are looking. For example, when we have this hemisphere face to face, the sun strikes it from right to left, and the shadows are spread out in all their extent before our eyes and how marvelous are these shadows observed with a telescope in certain circumstances! Fringes of darkness casting themselves off behind the peaks and summits of silver, rounded waves of shadow, filling up cavities in the form of hollow cups as abysses in the midst of this strange surface; triangles of jet, shooting forth like twigs from under luminous spots, brilliant as diamonds—this is what the telescope displayed. In the photographic image produced by Dr. Bond, all these details are revealed to the eye. Everything there is so completely and so faithfully reproduced, that by the aid of a magnifying glass we perceive new objects, minute details, that had escaped the sight. The revelations of the microscope in this proof are as strange and numerous as the revelations of the telescope in the moon itself. It is probable that when the most sensible photogenic surfaces have been found, and we can employ object glasses as large as the great reflector of Harvard University, some proofs representing groups of stars can be obtained. Dr. Bond has already succeeded in producing, even on a plate of iodised silver, a distinct image of the two constituents of the star Ester. It is impossible to calculate the services that photography is called to render to astronomy. Photographic charts of the stars, frequently renewed, would certainly give to astronometers the means of discovering all the bodies wandering in space and yet unknown; and we do not doubt that the number of them may be considerable, and worthy of serious attention, when we remember that the number of the planets has grown from 4 to 30 in the space of six years."

Our space forbids our enumerating many other of the appliances of this art which suggest themselves—but the one quoted will, of itself, suffice to show that the use to which it is most generally devoted is by no means the sole or the most valuable for which it offers itself. And though it is brought in this city to so great perfection, its admirers believe that its resources and uses are but very imperfectly developed —that it may be looked upon, indeed, as in its infancy!

THE DAGUERREAN GALLERIES OF NEW YORK.

The daguerrean galleries of this city are among the primary objects of interest to visitors, and the collections here presented are incomparably superior to any to be found in a European metropolis, without exception. Many of them, too, are adorned with portraits of the most eminent of our citizens, statesmen, jurists, soldiers, physicians, and men of letters, whilst in others, fac-similes of well-known scenes are to be found. Among so many first-rate artists as are established in this city, it would be invidious to mention one or two to the exclusion of the rest—it will therefore suffice to say, that at the great exhibition of 1851, three medals of the first class were awarded to as many American competitors, whose superiority in that friendly struggle was incontestable in this department. Indeed, with the exception of Claudet, whose valuable discoveries more than his artistic excellence procured him the award of a council medal, our artists were not only superior, but on the whole, unapproachable, whether from the competition of English, French or German. The reason of this may be found in the greater cheapness of daguerreotype pictures here over those of Europe, caused equally by the more universal demand in this country, and by the profession there, being held in check by vexations and costly patents, (which, we think, ought never to have been granted, the original idea having been purchased for *the world* by the French Government), which confine it within a limited circle of practitioners, and those, in

all probability, less lovers of the art than followers of it as a means of livelihood, while here the number employed, and their constant practice, cause an improvement, either in the manipulation, or in some chemical process, to be of frequent occurrence. We may say, in a word, that in Europe there are more learned works written, and here the best pictures made; there they speculate and experiment, while we work; they are unrivaled in theory, we at the highest present point of the art in practice; though we freely admit that the rapid improvement made has been much aided by the chemical experiments of European philosophers.

Few visitors to these galleries have any idea of the importance of the trades and manufactures connected with the photographic art—a few statistics will probably be found interesting.

In the cities of New York and Brooklyn, there are upward of 100 daguerrean establishments, giving direct employment to about 250 men, women and boys, though the number who derive support from the art in the United States, in all its branches, is variously estimated at from 13,000 to 17,000, including those working in the manufactories. For some years a great proportion of daguerreotype goods were imported from Europe, principally from France; those made here being considered by operators as much inferior, especially the plates. A great improvement has, however, of late taken place in our production of these articles, and it will be seen by the number of persons employed, as given above, that this is now quite an important branch of domestic industry, there being in this city alone six large establishments for the making, importation and sale of photographic goods, the amount of cash invested being about $300,000, and the annual sale of materials, $1,000,000.

It is estimated that there cannot be less than 3,000,000 daguerreotypes taken annually in the United States; Boston, Philadelphia and Baltimorec being extensively engaged in the trade, but not equally with New York.

The interests of the science are represented in the Press by two publications—*The Photographic Art Journal* (monthly) and *Humphrey's Journal* (semi-monthly), having a joint circulation of 5,000 copies. We learn that the editor of the former (Mr. Snelling) has in press, *A Dictionary of the Photographic Art*, containing every kind of information at all bearing on the subject of which he treats, and, from the knowledge and ability displayed in his editorial capacity, we are certain that the book will be invaluable to every member of the profession, as well as to those who may desire more detailed information than our limits enable us to give.

While on the Continent the price of a daguerreotype portrait prohibits its possession, except among the wealthier classes, the cost in this country ranges so as to suit the pockets of the most humble, there being an establishment in New York professing to produce likenesses as low as twenty-five cents a piece, while as much as fifty dollars, or even more, are willingly given in other instances for a single portrait. Of course, in the latter case, the highest artistic excellence is arrived at, and a considerable portion of the expense is entailed by the handsome frame in which the picture is placed.

The method adopted at the present day to procure a photographic picture, differs materially from that of Daguerre's: many improvements, both in the camera and the chemical combinations having been introduced. Daguerre originally employed a single lens; our principal operators use the achromatic lens, one of which is of a magnitude till lately unattainable by the best opticians. By a camera made by Harrison, the operator is enabled to take a portrait nearly life-size, on plates 14 by 17 inches, the lens alone being 6½ inches in diameter; the cost of the apparatus was $400. We are told this is the largest perfect lens ever made, yet the manufacturer expects shortly to produce another, 9½ inches in diameter. The opticians of Munich, though renowned for their skill, have never yet succeeded in making a lens without flaw, of the size at present in use here. The price of a camera, of the kind in ordinary use, varies with its quality; some being sold as low as $15, and ranging up to $150. The process of procuring portraits varies in some slight respects in different establishments, but we believe the following is the method adopted by our best operators: a plate, composed

of copper and silver, in the proportion of one-sixteenth of the latter and the remainder of the former, the silver being on the surface, is brought to a high state of polish by the use of rottenstone, rouge, &c. It is then galvanized, thus receiving a fine coat of pure galvanic silver, when it is repolished, and then submitted to a primary coating of the fumes of dry iodine, and also of bromine or other accelerating compound. Having been carefully shielded from the light, it is then placed in a camera of achromatic lens, through which the reflected rays of the sun upon the sitter are transferred to the plate, when crystalisation takes place. No impression, however, will be visible until the plate be submitted to the heated fumes of mercury, when the picture stands boldly forth, a daguerreotype being nothing more than an amalgamation of mercury and silver. The application of a wash of hyposulphite of soda neutralises and removes the remaining chemicals, after which comes the most important part of the process—that of securing the impression upon the plate, which was discovered by Fizeau, in 1845, till which time daguerreotype impressions were merely transitory. It may be described as enameling or gilding. The plate is covered with a solution, consisting of chloride of gold, hyposulphite of soda, and water, which, worked upon by the agency of heat, fixes the colors of the picture beyond the possibility of their fading. To establish this fact, we have the authority of the eminent Faraday, who declares that a daguerreotype properly gilded by this process can never be naturally erased, and could only be removed by the application of acids or some other agent. The time usually occupied in what is generally called "taking a likeness," is from fifteen to twenty seconds and upwards, yet we witnessed a few days since, in the laboratory of Mr. Williamson, of Brooklyn, a new method by which a perfect picture was taken, by the aid of a galvanic battery, in one second; but as the process is unprotected by patent, we are not at liberty to explain it more fully.

In addition to what we call the daguerreotype proper, just described, are numerous other processes which have been more or less successful and popular; the principal being the daguerreotype on ivory, the crayon daguerreotype, the cameo daguerreotype, the daguerreotype in oil, the talbotype or calotype, the crystalotype, &c.

The daguerreotype on ivory, introduced by Mr. Brady, we believe, consists in the substitution of the material from which it derives its name in the place of a metal plate, and the photographic image is then transferred to a painter in oil colors. This process, which owes its beauty as much to the skill of the artist as to the fidelity of the daguerreotype is very much admired. The daguerreotype in oil is precisely the same as the above, with the exception of an ordinarily prepared metal plate being used in the place of ivory.

The crayon daguerreotype is the invention of Mr. J. A. Whipple, of Boston, and is patented by him. The manner of obtaining it is very simple. Over a hoop is stretched a piece of white paper, half of which is removed, leaving the remaining half in the form of a crescent. This is hung in a frame upon pivots, and placed between the sitter and camera in such a manner that the lower portion of the image is cut off from the spectrum. During the exposition of the plate the screen is made to oscillate backward and forward. Instead of the ordinary back ground, a white one is used. This is a most beautiful style of daguerreotype.

The cameo daguerreotype is almost the reverse of the crayon, being simply the head in light and the other parts dark and indistinct, the portrait being prominent as in a cameo-cut picture. When well executed, it presents a very tasteful appearance.

The multiplicity of visitors that are anticipated at the coming Exhibition are being actively provided for by our leading daguerrean artists, whose handsome galleries abundantly prove that hitherto they have not sought the smiles of the public in vain. In addition to the temptation of elegantly furnished rooms, provided with papers and illustrated works to while away the tedium of inevitable delay, a different disposition of the skylight is attempted in one establishment, an improved camera in another, an entirely new process in a third, and so on. Among other experiments, one of our principal operators has tried the effect of a sky-light of blue-glass, under the impression that a picture would be

thereby improved: but, owing to the variety of tints in the glass itself, the plan has been found impracticable, and accordingly abandoned. Nevertheless, if in a few cases unsuccessful, it is such attempts as these that have been the means of bringing the daguerrean art in this country to a perfection of which we may justly be proud, and we trust that the enterprise and activity we have lately witnessed in this branch of industry will this year meet again with an abundant public patronage.

We anticipate that the exhibition will add fresh laurels to those which already grace our daguerrean triumphs, as we learn that a large space has been reserved for our leading artists, and we may in all confidence look forward to a display superior even to that in Hyde Park, as we have two years' longer experience to guide us.

We cannot do better than close our article with the words of a foreign writer, an enthusiastic admirer of the photographic art:—

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

THE COLLODION PROCESS.

WITH the advance of this beautiful art, there appears to be a progessively increasing desire to produce more artistic results; and numerous improvements have recently been introduced.

Collodion, as the basis of the photographic agents beyond all other preparations, offers, in its exceeding sensibility, beauty of details in the finished pictures, and ease of operating, so very many decided advantages, that a separate chapter has been devoted to its consideration.

Collodion is a peculiar preparation, formed by dissolving gun-cotton in ether. It is a very mucilaginous solution of a volatile character, and the ether evaporating leaves a film of the utmost transparency behind. It is not all kinds of gun-cotton which dissolve equally well in ether. According to my experience the most easily soluble is prepared by soaking good cotton in a saturated solution of nitrate of potash for some time; it is then, in a moist state, plunged into sulphuric acid with which but a small quantity of nitric acid has been mixed: after remaining in the acid for about a minute, it is well washed with water until no trace of an acid taste is discovered, and then dried at a temperature but very slightly elevated above that of the apartment.

Mr. Archer, to whom, in conjunction with Mr. Fry, we are mainly indebted for the introduction of this preparation as a photographic agent, gives the following as his processes for preparing gun-cotton.

"There are two receipts for making gun-cotton, from either of which a good dissolving cotton may be obtained. Seve-

ral others have been described, but I should only be confusing the subject to attempt to give the whole; and it would be foreign to the limited purpose of this work to do so. The results, however, vary so much with the strength and proportion of the acids used, as to render it extremely difficult to name any one in particular which would entirely succeed under all circumstances. In all cases it is more easy to prepare a cotton which will explode readily, and yet *not be at all soluble*, than which will entirely dissolve in rectified sulphuric ether.

Take of dry nitre in powder, 40 parts
Sulphuric acid.....60 "
Cotton..... 2 "

"The nitre, sulphuric acid, and cotton, are weighed in the above proportions, and placed near at hand within reach of the operator, to prevent delay in mixing when the operator has commenced. Then pour the proportion of sulphuric acid into the powdered nitre, stirring them well together for a few seconds with a strong rod. Immediately the two are mixed, add the cotton, having previously pulled out the fibres, and mix them together with two glass rods, in order that the whole of the cotton may come in contact with the nitric acid vapor, which is being rapidly generated from the mixture. This action must be continued for about two minutes; then quickly remove the cotton with the adhering nitre and sulphuric acid from the basin, with the glass rods, and plunge it into a large quantity of water; it is to be well washed in repeated changes of water until all the acid and nitre are washed away. The cotton is then collected together, and first pressed between the hands to drain off the water, and then still further dried by pressure in a cloth; the fibres of cotton can now be carefully separated, and hung up with pins to the edge of a shelf, or any other convenient place, to dry. There is no necessity to use artificial heat, as the small quantity requisite for a few ounces of solution can easily be dried without it.

"The next receipt is by certain proportions of nitric and sulphuric acids:

Take 1 oz. by measure of Nitric acid, sp. gr 1.450
1 oz. by measure sulphuric ditto ordinary
80 grs. by weight of cotton.

"The fibres of cotton must be well separated as in the preceding mode. The two acids are first mixed, and the requisite proportion of cotton added as quickly as possible, and well stirred with two glass rods for not more than fifteen seconds: the gun-cotton is removed from the acids, and plunged into water to undergo the same washings, &c. as in the former recipe.

"It will be seen that the cotton is not exposed to the action of the mixed acids, in this last mode, longer than is necessary to saturate the cotton; should the action be continued further, the solubility of the cotton is entirely lost.

"Water must not be spared in washing the cotton, for not a trace of acid should be left; the collodion would be injured by any remaining."

To Prepare the Collodion.—Thirty grains of gun-cotton prepared as described should be taken and placed in 18 fluid ounces of ether and then 2 ounces of alcohol should be added; making thus an imperial pint of the solution. The cotton, if properly made, will dissolve almost entirely; any small fibres which may be floating about should be allowed to deposit, and the clear solution poured off previously to the process of iodizing it.

To Iodize the Collodion.—Mr. Archer's method is as follows; and I believe no better course can be pursued.

Prepare a saturated solution of iodide of potassium in alcohol, say 1 oz., and add to it as much iodide of silver as it will take up. Or to 1 oz. of alcohol add an excess both of iodide of potassium and iodide of silver; after a day or two, and with repeated shaking at intervals to facilate the operation, a saturated solution of the two salts will be contained, and if this is filtered off into another bottle it will always be found ready for use. The first bottle can be kept as a stock bottle, to obtain a still further supply by replenishing it with alcohol, and additional quantities of the two salts. The iodide of silver can be readily obtained by precipitation. For instance take 1 oz. of solution of nitrate of silver used in the process, 30 grs. of nitrate of silver to 1 oz. of water, and add to it sufficient of a solution of iodide of potassium in water as will throw down the whole of the nitrate of silver as iodide. When this precipitated iodide of silver has settled, which it very

readily does, the liquid above must be poured off, and fresh water added, repeating this washing several times. The iodide of silver after this is dried, and then put into a bottle with a small quantity of alcohol, just sufficient to keep it moistened. The quantity of the solution of iodide of silver which can be added to 1 oz. of collodion must depend upon the quantity of alcohol in the collodion. The collodion process now resolves itself into

1st. Cleaning the Glass Plate. —By far the the most successful general manipulator in the ordinary forms of the collodion process is Mr. Horne; and that gentleman having most obligingly furnished me with the proof sheets intended for the manuel published by his firm, I have great pleasure in being enabled to give his most recent improvements. A variety of substances, such as tripoli, nitric acid, spirits of wine, &c., have been recommended for cleaning the glass: but all these Mr. Horne thinks are quite superfluous; the only articles actually necessary being a clean cloth or two, and a wash leather that has been well and thoroughly rinsed through several changes of clean water, to deprive it as much as possible of the dressing which a new one contains, and a littel liquid ammonia, not strong, but the ordinary *liquor ammoniæ* of the shops. If this is not at hand, a little caustic potash or soda will answer as well, the purport of it being to remove any greasy matter attached to the surface, as glass is frequently marked with soap; and although it might appear at first sight that clean water must thoroughly remove this article, the operator will be certain of spoiling many of his pictures if he depend upon water alone.

The plan Mr. Horne recommends is as follows:—Pour upon the plate a few drops of ammonia, rub it well over both surfaces, and thoroughly rinse through two waters, allowing the water to flow over the plate either by pouring from a vessel or holding under a tap; now, with a clean cloth wipe perfectly dry, and finally well rub with a leather. Simple as this may appear, there is much more in it than will be at first imagined, for unless the glass is free from stains it is quite impossible to be sucessful. The plate may be washed perfectly clean, but the surface not thoroughly dried. Then, again, some hands are very warm, and if the plate is allowed to rest too much upon any one part, or held too long in the fingers at any one particular spot, that will become warmer than the surrounding part, from the glass being a bad conductor of heat. The cloth and leather should therefore be sufficiently large, that the plate may be as it were insulated as much as possible from the hands, that no unnecessary heat shall be applied. At the same time the employment of a warm cloth is very useful, for the heat is then equally diffused over the plate, and, what is very essential, the surface perfectly and quickly dried.

COATING THE PLATE.

It has already been pointed out how necessary it is to handle the plate as little as possible in cleaning; we therefore suppose the operator to have the plate in a clean dry leather, from which it is taken to receive the collodio-iodide of silver. The plate must be held by the left hand perfectly horizontal, and then with the right a sufficient quantity of collodio-iodide should be poured into the centre, so as to diffuse itself equally over the surface. This should be done coolly and steadily, allowing it to flow to each corner in succession, taking care that the edges are all well covered. Then gently tilt the plate, that the superfluous fluid may return to the bottle from the opposite corner to that by which the plate is held. At this moment the plate should be brought into a vertical position, when the diagonal lines caused by the fluid running to the corner will fall one into the other and give a clear flat surface. To do this neatly and effectually, some little practice is necessary, as in most things, but the operator should by no means hurry the operation, but do it systematically and quietly, at the same time not being longer over it than is actually necessary, for collodion being an ethereal compound evaporates very rapidly. Many operators waste their collodion by imagining it is necessary te perform this operation in great haste; but such is not the case, for an even coating can seldom be obtained if the fluid is poured on and off again too rapidly; it is better to do it steadily, and submit to a small loss from

evaporation. If the collodion becomes too thick, thin it with the addition of a little fresh and good ether.

EXCITING THE PLATE.

Previous to the last operation it is necessary to have the bath ready, which is made as follows:—

Nitrate of silver . . .	30 grains.
Distilled water . . .	1 ounce.

Dissolve and filter.

The quantity of this fluid *necessary* to be made must depend upon the *form of trough to be used*, whether horizontal or vertical, and also upon the *size* of plate. The kind used by Mr. Horne is the vertical, though many still prefer the former, and attach, as before described, a piece of Indian rubber to the back of the plate as a handle whilst applying the collodion, and to keep the fingers from the solution whilst dipping in the bath. With the vertical throughs a glass dipper is provided, upon which the plate rests, preventing the necessity of any handle or the fingers going into the liquid. If, however, the glass used is a little larger than is required, this is not necessary. Having then obtained one or other of these two, and filtered the liquid, previously free from any particles of dust, &c., the plate is to be *immersed steadily and without hesitation*, for if a pause should be made at any part a line is sure to be formed, which will print in a subsequent part of the process.

The plate being immersed, must be kept there a sufficient time for the liquid to act freely upon the surface, particularly if a negative picture is to be obtained. *As a general rule it will take about two minutes, but this will vary with the temperature of the air at the time of operating, and the condition of the collodion.* In very cold weather, or indeed anything below 50° Fahrenheit, the bath should be placed in a warm situation, or a proper decomposition is not obtained under a very long time. Above 60° the plate will be certain to have obtained its maximum of sensibility by two minutes' immersion, but below this temperature it is better to give it a little extra time.

To faciliatate the action, let the temperature be what it may, the plate must be lifted out of the liquid two or three times, which also assists in getting rid of the ether from the surface, for without this is thoroughly done a uniform coating cannot be obtained; *but on no account should it be removed until the plate has been immersed about half a minute*, as marks are apt to be produced if removed sooner.

Having obtained the desired coating, the plate is then extremely sensitive, and, therefore, we presume the operator has taken every precaution to exclude ordinary day-light.

The room must be closed against any portion of day-light.

The plate thus rendered sensitive must then be lifted from the solution and held over the trough, that as much liquid as possible may drain off previous to being placed in the frame of the camera, and the more effectually this is done the better, or the action in the camera will not be equal over the whole surface; at the same time it must not be allowed to dry, but in short, to obtain its full maximum of sensibility, it should be damp without superfluous moisture.

The question, says Mr. Horne, is often asked, how soon after coating the plate with collodio-iodide should it be immersed in the nitrate bath? Now, this is a difficult question to answer. We have said the time of *immersion* is dependent upon the temperature and quaility of the collodion; so likewise must we be governed as to time *before immersion*. To make collodio-iodide or xylo-iodide, for, chemically speaking, there is no difference in the two, it is necessary that the ether should contain a certain quantity of alcohol, or the different articles are not soluble: therefore, if we take a fresh bottle, and coat the plate from this, it contains its full dose of ether, and with the thermometer ranging between 60° and 7° the evaporation of this article will be very rapid, and consequently a tough film soon formed. If, on the other hand, we are using a solution which has been in use some time, and many plates, perhaps, coated, the proportion of alcohol is much greater, and not being of so volatile a nature, it will necessarily take a longer time to acquire the requisite firmness for immersion. If, for instance, after coating a plate, we find on immersion it does not color freely, we have then reason to suppose the plate has not been im-

mersed sufficiently quick, but if on the other hand we find the film very tender, and upon drying it cracks, then we have reason to known that plates prepared from that bottle must not be immersed quite so soon. *The larger the proportion of alcohol the more sensitive will be the plates, and the quicker and more even will be the action of the bath*, a longer period must be allowed for the sensitive film to harden before immersion.

The next question also often asked is, how long must be the exposure in the camera? a question more difficult to answer than the last, without knowing something of the character of the lens and the intensity of light. Practice alone can determine, combined with close observation of those parts which should be the shadows of a picture. If, for instance, in developing we find those parts less exposed to the light than others developing immediately the solution is applied, then we have reason to suppose the exposure has been too long; but if on the contrary they develop very slowly we have proof the time allowed has not been sufficient to produce the necessary action. In a good picture we should see first the whites of a dress appear, then the forehead, after which we shall find, if the light has been pretty equally diffused, the whole of the face and then the dress.

The Development of the Image.—To effect this it must be taken again into the room, and with care removed from the slide to the levelling stand.

It will be well also to caution the operator respecting the removal of the plate. Glass, as before observed, is a bad conductor of heat; therefore, if in taking it out we allow it to rest on the fingers at any one spot too long, that portion will be warmed through to the face, and as this is not done until the developing solution is ready to go over, the action will be more energetic at those parts than at others, and consequently destroy the evenness of the picture. We should, therefore, handle the plate with care, as if it already possessed too much heat to be comfortable to the fingers, and that we must therefore get it on the stand as soon as possible.

Having then got it there, we must next cover the face with the developing solution.

This should be made as follows:—

Pyrogallic acid.....5 grains.
Distilled water.....10 oz.
Glacial acetic acid.....40 minims.

Dissolve and filter.

Now, in developing a plate, the quantity of liquid taken must be in proportion to its size. A plate measuring 5 inches by 4 will require half an ounce; less may be used, but it is at the risk of stains; therefore we would recommend that half an ounce of the above be measured out into *a perfectly clean measure*, and to this from 8 to 12 drops of a 50 grain solution of nitrate of silver added. Pour this quickly over the surface, taking care not to hold the measure too high, and not to pour all at one spot, but having taken the measure properly in the fingers, begin at one end, and carry the hand forward; immediately blow upon the face of the plate, which has the effect not only of diffusing it over the surface, but causes the solution to combine more equally with the damp surface, of the plate: it also has the effect of keeping any deposit that may form in motion, which, if allowed to settle, causes the picture to come out mottled. A piece of white paper may now be held under the plate, to observe the development of the picture, if the light of the room is adapted for viewing in this manner well; if not, a light must be held below, but in either case arrangements should be made to view the plate easily whilst under this operation, a successful result depending so much upon obtaining sufficient development without carrying it too far.

As soon as the necessary development has been obtained, the liquor must be poured off, and the surface washed with a little water, which is easily done by holding the plate over a dish and pouring water on it, taking care, both in this and a subsequent part of the process, to hold the plate horizontally, and not vertically, so as to prevent the coating being torn by the force and weight of the water.

Fixing of the Image.—This is simply the removal of iodine from the surface of the plate, and is effected by pouring over it, after the water, a solution of hyposulphite of soda, made of the strength of 4 oz. to a pint of water. At this point daylight may be admitted into the room; and, indeed, we cannot judge well of its removal without it.

We then see, by tilting the plate to and fro, the iodide gradually dissolve away, and the different parts left more or less transparent, according to the action of light upon them.

It then only remains to thoroughly wash away every trace of hyposulphite, for, should any of the salt be left, it gradually destroys the picture. The plate should, therefore, either be immersed with great care in a vessel of clean water, or, what is better, water poured gently and carefully over the surface.

After this it must be stood up to dry, or held before a fire.

We have now carried the operator carefully through every stage of the process, from the cleaning of plate to the fixing of images; but our remarks have reference to collodio-iodide alone; that is, gun-cotton dissolved in ether, charged with an iodide of silver. We cannot, however, consider our task finished without mentioning the addition of gutta percha to the collodion. This valuable discovery was made by Mr. P. W. Fry, to which gentleman belongs some of the most important steps made in the art.

The sensibility of the plates appears to be more materially increased by the addition of the gutta percha; indeed, the pictures by superposition may be obtained with absolute instantaneity, and in the camera obscura in less than a second of time.

The plan of proceeding to obtain this extreme sensibility, as recommended by Mr. Fry, is to obtain a thick and strongly charged collodio-iodide, and to two parts of this add one of a saturated ethereal solution of gutta percha, allowing it to stand a day or two to clear itself, previous to being used.

The plate is then coated in the usual manner. As the ether evaporates a peculiar white film comes over, at which time it is ready for immersion in the bath This must be conducted as previously described and, from its extreme sensibility, with, if possible, greater precaution than before.

For the development of negative pictures, Mr. Fry recommends the pyrogallic solution rather stronger than that previously given, about one grain to the ounce, with the addition of an extra portion of acetic acid, and the plate *redipped in the nitrate bath*, in preference to adding silver solution to the pyrogallic acid.

In fixing the image after the development it is necessary to keep the hyposulphite on longer than with the ordinary collodion, as the iodide is held with greater tenacity. In other respects the method of proceeding is precisely the same.

Having, by the foregoing means, obtained and fixed a negative photographic image on glass, and which is capable of producing positives upon paper by the ordinary photographic means, it is as well, previous to obtaining these, to render the tender film of collodion less liable to injury.

This can be accomplished by means of a varnish, of which there are different kinds that may be used.

By far the best kind of varnish which can be employed is one for which we are indebted to Dr. Diamond, of the Surrey Lunatic Asylum. This varnish is made by powdering some amber and putting it into chloroform. In a few days a perfect solution takes place. This varnish flows readily over the plate, and dries in a few minutes, leaving a beautifully transparent hard glaze upon the picture.

It was shown by Mr. Horne in the early days of collodion that the negative images could be converted into positives ones by mixing with the pyrogallic solution a very small quantity of nitric acid; but it has since been shown by Mr. Fry, and others, that a better result may be obtained by the use of proto-sulphate and proto-nitrate of iron.

The former salt is readily obtained, and in a very pure form. It should be used as follows:—

Proto-sulphate of iron.....	10 grains.
Distilled water.....	1 oz.
Nitric acid.....	2 drops.

To develop the image pour the above over the plate, taking care not to carry the development too far.

The proto-nitrate may be obtained by double decomposition, as recommended by Dr. Diamond: 600 grains of proto-sulphate of iron are dissolved in one ounce of water, and the same quantity of nitrate of baryta in six ounces of water; these being mixed together, protonitrate of iron and sulphate of baryta are formed by double decomposition; also, by dissolving sulphu-

ret of iron in dilute nitric acid, as recommended by Mr. Ellis, who proceeds as follows:—

To one ounce of nitric acid and seven of water, add a small quantity of sulphuret of iron broken into fragments. Stand the vessel aside, that the sulphuretted hydrogen may escape, and the acid become saturated with iron. Pour off the liquid, and filter. Then boil in a florence flask, to get rid of the sulphur, and again filter, when a dark green liquid will be obtained, which is the proto nitrate of iron. This should be kept in well-stopped bottles, and protected from the air as much as possible, to prevent its changing into a pernitrate, in which state it is quite useless as a photographic agent.

To develop the picture mix one part of the above proto-nitrate with three of water, and apply it to the plate in the ordinary way, when a most beautiful clear image can be obtained.

The negative image being developed, a mixture of pyro-gallic and hypo-sulphite of soda, which has undergone partial decomposition, is poured over the plate, and then it is gently warmed. Upon this the darkened parts are rendered brilliantly white by the formation of metallic silver. This picture being backed up with black velvet assumes the air of a fine daguerreotype, without any of the advantages arising from the reflection of light from the polished silver surface. For this beautiful result photography is indebted to Dr. Diamond, who is still pursuing the subject with much zeal. We have also seen a similar effect produced by Mr. Fry and Mr. Berger, by the use of the proto-sulphate of iron solution and pyrogallic acid The image is first developed by the iron and the solution poured off; immediately another of pyrogallic acid is poured on, and the effect is produced.

The pictures are fixed with the hyposulphite in the usual method.

A peculiar whitening process was introduced by Mr. Archer, which is as follows:

The picture being thoroughly washed in plenty of water, after fixing with hypo-sulphite of soda, is treated in the following manner.

Prepare a saturated solution of bi-chloride of mercury in muriatic acid. Add one part of this solution to six of water. Pour a small quantity of it over the picture at one corner, and allow it to run evenly over the glass. It will be found immediately to deepen the tones of the picture considerably, and the positive image will almost disappear; presently, a peculiar whitening will come over it, and in a short time a beautifully delicate white picture will be brought out.

The negative character of the drawing will be entirely destroyed, the white positive alone remaining. This picture, after being well washed and dried, can be varnished and preserved as a positive; but nevertheless, even after this bleaching, it can be changed into a deep-toned negative, many shades darker than it was originally, by immersing it, after a thorough washing, in a weak solution of hypo-sulphite of soda, or a weak solution of ammonia. The white picture will vanish, and a black negative will be the result.

It is very singular that the picture can be alternately changed from a white positive to a black negative many times in succsion, and very often with improvement.

Thus, by the above process, a most perfect white positive or a deep black negative is produced, quite distinct from each other.

In the first part of this after-process it will be observed that the effect of this bichloride of mercury solution is to deepen the shades of the picture, and this peculiarity can be made available to strengthen a faint image, by taking the precaution of using the solution weaker, in order that the first change may be completed before the whitening effect comes on.

The progress of the change can be stopped at this point by the simple application of water.

The author first pointed out the remarkable action of corrosive sublimate, in his paper, published by the Royal Society, on the daguerreotype process on paper.

M. Adolphe Martin has published some remarks on the collodion in the Comptes Rendus of the 5th July, 1852.

The collodion he employs is made of—

30 grains of cotton.
950 grains of nitrate of potash.
1500 grains of sulphuric acid.

This is well washed and dissolved in 10 volumes of ether and 1 volume of alcohol:

by this, 15 grains of gun-cotton are dissolved in the 1860 grains of ether, and 930 grains of alcohol; add then to this collodion, 15 grains of nitrate of silver transformed into iodide, and dissolved in 20 grains of alcohol by means of an alkaline iodide. M. Adolphe Martin prefers iodide of ammonium.

The plate is next plunged into a bath of 1 part distilled water, 1 1-12th nitrate of silver, and 1 1-20th nitric acid. The image is developed by proto sulphate of iron, and he effects the change from negative to positive by a bath of double cyanide of silver and potash consisting of about 2 quarts of water, in which are dissolved 375 grains of cyanide of potassium, and 60 grains of nitrate of silver. The pictures thus produced are remarkable for their intense whiteness.

We must allow Mr. Archer to give his own description of a very ingeniously constructed camera, which he has devised for working out of doors.

Description of the Camera for the Collodion.—"I will proceed to give a general description of the camera I have constructed, premising that it admits of being made a very light folding camera, if thought necessary.

"It is a wooden box, 18 inches long, 12 inches wide, and 12 inches deep, and is capable of taking a picture 10 inches square. Externally it may be thus described:—In front it has a sliding door, with a circular opening in it to admit the lens: this sliding door enables the operator to lower, or raise, the lens, and consequently the image formed by it, on the ground glass, as the view may require. The two sides of the camera have openings cut in them, into which sleeves of India rubber cloth are fixed, to admit the hands of the operator; and are furnished with India rubber bands at the lower ends, which press against the wrists, and prevent the admission of light.

"The back of the camera has a hinged door fitted at its upper part with an opening of just sufficient size for the eyes, and shaped so as to fit close to the face. A black cloth is tied round this end of the camera, to prevent any ray of light penetrating at this opening. In the top of the camera near the front is inserted a piece of yellow of glass, to admit a small quantity of yellow light, and is closed with a hinged door, to regulate the quantity of light required.

"The interior of the box is furnished with a sliding frame, to support the ground glass or the bath and the prepared plate; and it has a stop, by means of which any focus from 3 inches to 15 inches can easily be obtained.

"The bottom of the camera is furnished with a gutta percha tray, about 1 inch deep, to hold the washings, &c., when the camera is in operation.

"Also, the bottom of the camera at the back has an opening cut in, it extending nearly the whole width of the camera, and as far in as the edge of the gutta percha tray.

"This opening is intended to admit, when the camera is not in use, a light wooden case containing the glass bath, focusing frame, stock of glass, and paper required in the process.

"There are various other little contrivances which I have not specified; such as a drawer for the pictures, a shelf for bottles, &c.

"This form of camera will admit of the following manipulation. Having placed it upon a stand pointing to the object to be taken, the hinged door at the back is opened, and the bath is three parts filled with the solution of nitrate of silver; a plate of glass is then taken from the cell, and cleaned if necessary.

The collodion is poured on in the manner previously described; when the film has set a little it is immersed in the nitrate of silver bath, and the lid of the bath is closed down upon it. The next step is to obtain the focus with the ground glass: this can be done whilst the collodion is becoming iodized.

"After adjusting the sliding frame to the proper focal distance, the camera must be closed, and the rest of the process conducted by passing the hands through the sleeves and placing the eyes close to the aperture in the back of the camera, and drawing the black cloth over the front of the head.

"By the aid of the yellow light admitted from the top, the operator can carry on the rest of the process. The plate is now ready for the action of light, and is taken from the bath; or the bath itself,

with the plate in it, is placed in the sliding frame. The refracted image is at once thrown upon the sensitive plate. After the requisite exposure, the plate is taken from the bath, and the picture is developed with the solution previously described. The progress of this operation can be seen by aid of the yellow light keeping the eyes close to the aperture behind.

"When from experience, the picture is sufficiently brought out a little water is poured on the glass to wash off the developing solution, and the drawing is partially fixed by the application of common salt.

"The drawing may now be removed from the camera without fear of being injured by the light, and the remainder of the operations can be conducted outside the camera.

"If the film is sufficiently strong to bear removal from the glass, the following procedure is adopted. The plate of glass is placed horizontally upon the back lid of the camera, which is hung so as to form a temporary table, and the film is loosened from the edge of the glass with a flat strip of glass; a sheet of damp paper is then placed flat on the drawing, and rather within its upper edge; the film is turned over the edge of the paper, and a glass rod is placed just within the edge. The sheet of paper with the collodion in contact with it is now raised from the glass, and rolled upon the glass rod. When the drawing is entirely enclosed in the paper, the rod is removed, and the delicate film thus encased is put away into its proper receptacle, to be finally fixed and mounted at leisure.

"The drawing, thus rolled up can be preserved for months without injury, provided it is kept slightly damp; and if each drawing is enclosed in another sheet of paper, its preservation is still further secured.

"The advantages of a camera of this kind may be thus enumerated.

"It allows the preparation on the spot of the most sensitive surfaces; their immediate use whilst the sensibility is at its maximum; the ready development of the image, and after fixing.

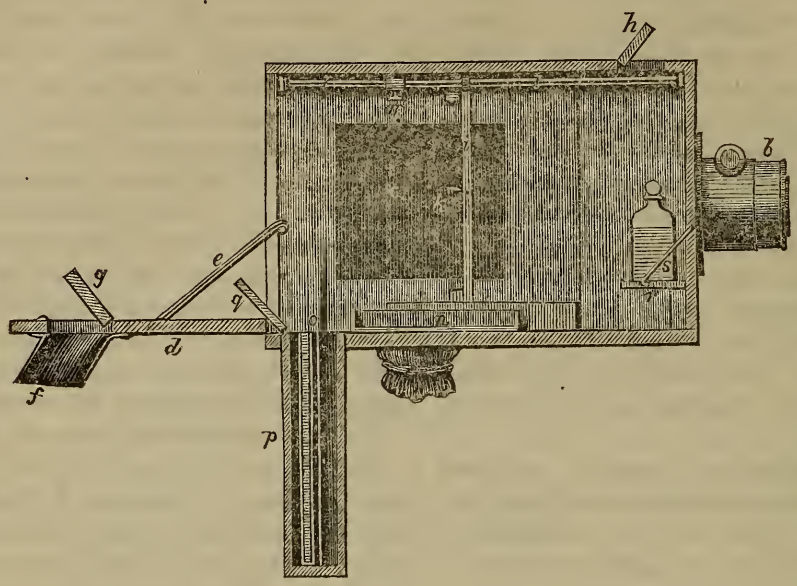
"All these operations being carried on consecutively, the operator can, after the first trial, see what results the progress of his labors is likely to produce.

"It gives him the power of shading off any portions of the view during the action of the light, by holding in front of the prepared plate and near the lens a moveable screen, or any flat piece of wood, as the case may require; thereby preventing the too rapid action and consequent solarisation of the distant portions of the scene. The spire of a church, for instance, pointing upwards into a bright sky, often requires this precaution to prevent its being entirely lost. Other instances of this effect will readily suggest themselves to those at all acquainted with the art."

"The camera can be made, with slight modifications, applicable to any other process on paper or glass, and of course obviates the necessity of any kind of portable tent."—*Archer, F. S., Manual of the Collodion Photographic Process.*

The following figures represent Mr. Archer's Camera, as constructed by Mr. Griffin:—

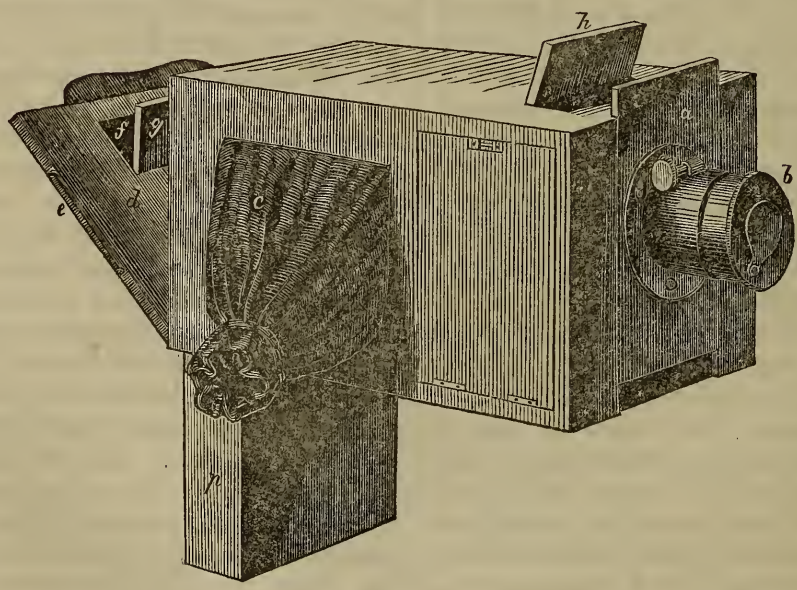
The figure 1 is a section of the camera, and 2 its external form, which, with a view to portability, is constructed so as to serve as a packing case for the entire apparatus represented by figs. 1 to 7. *a* is the sliding door that supports the lens *b*. *c c* are the side openings fitted with cloth sleeves to admit the operator's arms. *d* is a hinged door at the back of the camera, which can be supported like a table by the hook *e*. *f* is the opening for looking into the camera during an operation. This opening is closed, when necessary, by the door *g*, which can be opened by the hand passed into the camera through the sleeves *c*. The yellow glass window which admits light into the camera during an operation is under the door *h*. *i* is the sliding frame for holding the focussing glass, or the frame with the prepared glass, either of which is fastened to the sliding frame by the check *k*. The frame slides along the rod *l*, *l*, and can be fixed at the proper focus by means of the step *m*. *n* is the gutta percha washing tray. *o* is an opening in the bottom of the camera near the door, to admit the well *p*, and which is closed, when the well is removed, by the door *q*. The well is divided into cells, one of which contains the focussing glass and the other the glass trough, each in a frame adapted to the sliding frame *i*. On each side of



1.

the sliding door that supports the lens *b*, there is, within the camera, a small hinged table *r*, supported by a bracket *s*. .These two tables serve to support the bottles that contain the solutions necessary to be applied to the glass plate after its exposure to the lens.

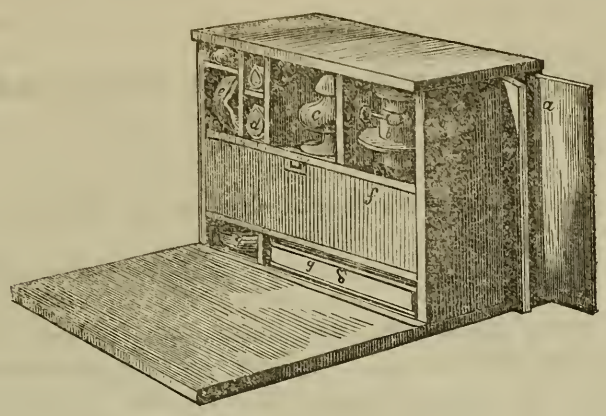
Figs. 3 and 4 represent two cases,



2.

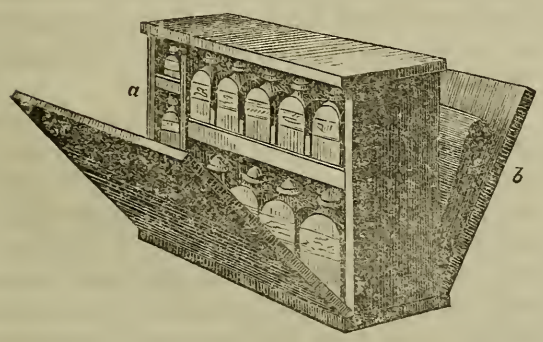
containing the various instruments and chemical preparations required for the collodion process. *a*, fig. 3, is a grooved cell for a series of glass plates. *b* is a receptacle for the lens of the camera. *c* contains a spirit lamp; *d*, a pair of glass measures; *e*, a porcelain pestle and mortar. The door *f* encloses a space containing a funnel with filter papers, and silks and leathers for cleaning the plates. *g* contains a small retort stand, a porcelain capsule, and a box with scales and weights.

The case, fig. 4, is divided into two compartments. One side, *a*, contains 12 stoppered glass bottles, with the various chemical preparations required by the ope-



3.

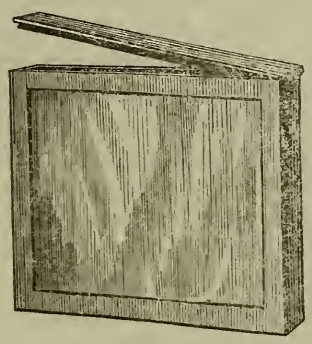
rator. The other side, which can be closed by the door *b*, contains a supply of pho-



4.

tographic paper, both for negative and positive pictures.

Fig. 5 is the glass trough for holding the nitrate of silver solution.



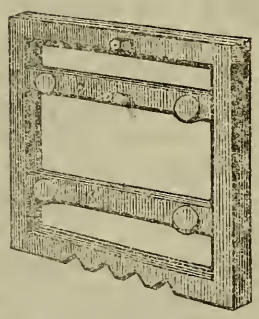
5.

Fig. 6 is a frame for fixing in the camera such plates of glass as do not require to be exposed to the lens while still in the trough.

Fig. 7 is a pressure frame for the preparation of positive from negative photographs.

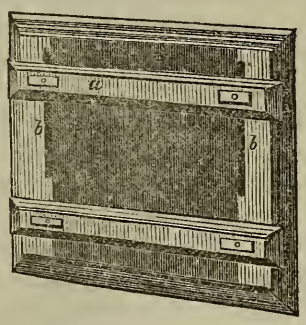
Fig. 8 is a section of this frame.

Both of these frames, figs. 6 and 7,



6.

are so contrived as to be suitable sizes. In the frame represented by fig. 6, the bars *a* and *b* are both moveable, to permit the fixing of the plate in the camera directly opposite the centre of the lens. In the frame represented by fig. 7, the bar *a*



7. 8.

alone is moveable, and is fastened by screws that move in the slitts *b*, *b*.

The whole of these boxes and frames can be conveniently packed in the camera.

The box fig. 3, is passed in by the side-door ; the well, *p*, and all the other cases and frames, by the door *d*; and the camera, thus loaded for transport, is put into a strong leather case.

A GENERAL REVIEW OF THE DAGUERREOTYPE.*

BY M. A. GAUDIN.

Translated from the French of La Lumiere by W. Grigg, A. B.

SECTION XI

ON VIEWS OF MONUMENTS, LANDSCAPE AND INSTANTANEOUS PROOFS.

We are, at length, thank Heaven, arrived at the end of the necessary, though extremely fastidious description of the buffing, iodizing, washing and fixing processess, &c., through which manipulations it is absolutely necessary to pass to obtain those images, so delicate and truthful in their linemeants, called daguerrean.

I cannot express my amazement and the pleasurable emotions I experienced on examining for the first time, the sculptured front of an edifice, obtained by Daguerre himself: the whole was to me a subject of profound admiration, as well the details brought out in the shadows projected from a balcony, as the opened windows of the attics, or the discs suspended above the sheet iron pipes by a thin thread of iron. I admired the extreme clearness of every line, and was astonished that nothing had been forgotten, as though such an omission were possible.

Since then, things more astonishing still have been seen: trees in all their foliage, meadows where not the smallest herb was unremembered, the sky in his robe of clouds, streams with their reflection and the very ripples of their current; mountains, in the distance, with their delicately traced summits; of such purity of profile, and of a diminution of tone so proportional that their actual distance on the confines of the horizon may be measured.

The primitive process of daguerre with its iodide of silver could only be employed for immoveable objects; the sky was represented by a smooth tint, uniform, of a slatish blue color, with neither perspective or depth; and the total absence of everything endowed with life gave a desert-like and solitary appearance to the pictures, which made it highly desirable that the time of exposition in the camera should undergo some abbreviation.

The realisation of this wish has been hastened by the discovery of accelerating substances and the employment of object glasses of short focus; so that the quarter of an hour of Daguerre has been definitely reduced to the tenth of a second.

When an image is formed in so short a space of time, every cloud in the sky, trees and water agitated by the breeze, are arrested on the instant, in their immediate aspect; every animated being is depicted with its peculiar gait and gestures; light and shadow are displayed with such precision, that even the very ærial prospect itself is perfect and complete, and one can hardly help imagining that he perceives the very brilliancy of the sun—in a word, nature is portrayed with minute exactness; and nothing is more capable of satisfying the mind of the artist, than these delicate images, where the living world finds itself for ever fixed, with a *tout ensemble*, that the most practised eye could never collect or even perceive in the original. Dating from this period, the artists who have said so much against the daguerreotype, have acknowledged, that it would serve them excellently well for teaching perspective, and the degradation of tones, for composition.

I have often been amused at the exclamations of surprise, that my unpretending efforts have elicited from Messouier and Eugene Girard. I have taken on my plates a troup of cows while watering for Brascassat, and also a bull at pasture, in every variety of position he could desire.

The ordinary daguerreotype has this defect, that it always gives the image in an inverted position, that is to say the right is shown on the left, and the left on the right;

* Continued from page, 270, Vol. 5, No. 5.

but there is an easy remedy for this in the employment of a mirror.

For the above reason and also for the size of the impressions, photography on paper is possessed of marked advantages; views of monuments and landscapes are taken also now a-days by this latter process, which is exempt moreover, from *reflection* (miroitage) and allows of an indefinite reproduction.

To obtain views whether of large or small dimensions sufficiently perfect to bear examination in the microscope, and with a clearness as perfect towards the sides as in the centre, it is necessary that two conditions be observed, which are, the employment of a simple achromatic object glass, provided with a small diaphragm. For example, with any apparatus of 10 to 15 *centimetres** focus, I have chanced to employ a diaphragm of only one *millimetre*† aperture. I more frequently used a diaphragm of two *millimetres* requiring a minute at the most of exposition in the camera, while to obtain instantaneous views, I employed a diaphragm of 2 *centimetres;* with this diaphragm, I worked in less than an eight of a second; its aperture however being only a hundred times larger than that of 2 *millimetres*, I ought to have worked a hundred times quicker, say in 30″-100 = 1-3 of a second: that is supposing the view taken in half a minute with a diaphragm of 2 *millimetres* aperture, the time which was positively taken with an aperture which was certainly greater than 2 *millimetres.* It has then been demonstrated, by continued results I have obtained, that the formation of the image is more rapid in proportion to the enlargement of the aperture of the surface of the diaphragms.

To obtain a view of the sky adorned with clouds, there is another indispensable condition to fulfill, which is to veil the sky during a good part of the exposition in the camera; this precaution experience dictated to me; and one may easily explain the reason of it to himself. The clouds, and all objects in a highly elevated position, are enlightened not only by the sun, but by the surface of the ground in a forward semi-circle: the clouds themselves are enlightened by the total circle of the reflecting ground beneath; and each watery vessicle even is enlightened integrally by the direct light of the sun, through a reflecting sphere composed of all the adjacent vessicles; in a word, clouds are produced about six times quicker than a white wall; and summits in the horizon three times quicker than even this white wall in the foreground. Without using this precaution, it is impossible to obtain distant mountains with that harmony of outline, of which I have spoken; further above the sky becomes confounded with them in a foggy appearance, and the view is worthless.

I have found a very simple remedy for this, in the employment of a curtain of black velvet, nailed to the upper part of the camera, its lower part being moveable, I first unveil the whole view by completely raising the curtain, and, when one-sixth of the time of the presumed exposition has passed, I lower the curtain in a slanting roof like position so as to make its lower extremity coincide with a line joining the centre of the object glass with the horizon; at this moment, and during the remainder of the time I alternately raise and lower the curtain, in a way to conceal the effect of this manœuvre, continuing moreover, to gradually lower the curtain until very near the base of the view; by this means the sky and mountains remain luminous, and the vault of heaven presents transparency and depth.

For instantaneous views, it is impossible to observe all these different phases; but it may be remarked that in raising and lowering the screen with all the celerity of which the arm is susceptible, an analogous effect is produced; the sky is the first unveiled, and the first veiled, and so, consequently for the back ground, it is only the fore ground which remains uncovered the tenth or at the most an eight of a second.

This is especially applicable to chains of mountains; I have made trial of it at my cost; being at Auvergne, before the most celebrated craters of its extinct volcanos, wishing to obtain some of the extremely pure *silionette* found there, I took a view of them, but kept them constantly unveiled too long a time, desiring to give sufficient time and never dreaming that objects greatly elevated are produced quicker even

* From 4 to 6 inches.

† About 46-1000 of an inch.

than distant mountains; it was a great mistake; every summit was solarized, the foreground alone possessed any vigor.

It is as well applicable to photography on paper as to the daguerreotype, every operator too who desires to take views with a mountain back ground and clouds should make use of a velvet screen, as I have just described; a simple fronting even no matter how elevated will require it, if it is desired that the upper portion of the view be not solarized, when the lower has reached the right tone.

SECTION XII.

OF PORTRAITS AND ON THE COLORING OF PROOFS.

The most advantageous and fruitful application of the daguerreotype has been, without contradiction, that which has served and will forever serve for the production of portraits. I was one of the first engaged in it, as well with the normal plate with the iodide of silver, by the process of Daguerre, as with 1-6 plates, with object glasses of short focus, and with the aid of accelerating substances.

The perfection of portraits requires the agreement of a number of conditions, which are:—1st. A short exposition in the camera. 2nd. A good light, that is to say, a distribution of the proper light for giving relief. 3rd. Such a distance between the object and the camera, that the anterior portions of the body do not present proportions out of character with those more distant.

The fullfilment of these three conditions presents some difficulties, which we are now to examine; at the same time, we will acknowledge that no one of them can be omitted, if we wish for natural traits.

The first condition is the most important of all, that is, the short duration of the exposition, by which alone we can obtain the expression of the features and the purity of the lines; however little this duration is augmented, the life-like character disappears, and though the impression obtained may still be faithful, it represents nought more than a mask of a disagreeable aspect, and would only too well justify the complaints of the public that the daguerreotype enlarges the features, giving them a serious air, and rendering them old and ugly.

The greatest obstacle in the way of a short exposition in the camera, is owing to the extreme sensibility of the eyes which can only preserve their normal conditions under a moderated light (such as we have in our apartments) which has ever till now been found too feeble to attain any great celerity. By taking portaits in a sharp light we attain the required celerity certainly; but a contraction of the eye is inevitable, and every feature partakes of it, and it becomes impossible to obtain a calm countenance, save in very rare exceptions where it is due to the strength of sight natural to certain persons.

It is important then, above all, to operate in a gallery sufficiently, but not too strongly lighted, and to proportion the light at each operation to the sight of the person to be taken.

This is extremely easy; the light may be modified by means of bluish curtains or screens of a blue surfac; but it will be necessary to guard against a contrary excess.

When the incident light is such that every one can under its action keep his eyes naturally open, it is very rare that a portrait can be obtained in a sufficiently short space of time. This reminds me of a circumstance where I felt the force of this truth by experience. Being in the forest of Fontainbleau with a party of artists, occupied in taking them in a group, I succeed very well in getting them placed beneath a tree in the shade of the overhanging branches, when, to the great contentment of all the ambient light seemed mild enough for the eye, the impression met with constant failures, owing to an insufficient time of exposition in the camera, although a large allowance was made for the presumed diminution of the light.

The principal reason of this failure arose from the fact that rays which have traversed foliage are essentially green and deprived of all photogenic power. This blending is not apparent to a superficial observer, but by means of certain precautions the fact is put to the proof, which can besides be reasonably explained. Therefore, whenever we would operate in the shade of foliage, we must mistrust the presumed intensity of the surrounding light, and also, in every other position, we will only be able to operate rapidly if the

surrounding light is sufficiently intense to affect sensitive sights, it will then only remain to diminish it sufficiently for these latter.

Besides the intensity of the light, there is also the disposition of it, which is not the least important. Daguerrean proofs being produced by a single optical glass, their relief can never appear so decided as we perceive with the two eyes, or as are produced by the art of drawing and painting; these images are more or less flat, this is a reason, morever, for disposing the light in such a manner as to give very light shadows; that is to say the maximum relief. For example, a head, without relief, is wanting essentially in model, and every proof taken under these conditions, is necessarily imperfect, the less the full light of the sun is upon it, which totally changes the primary conditions; and if the sun is simply veiled by a light cloud, we have by this fact alone, an excellent relief: we can augment this relief still more by throwing greater light on one side than on the other; by this means we obtain a light shading almost invisible, and only revealing its existence by the production of a satisfactory model.

Great skill and attentive observation is necessary to assure ourselves of this fact, which is an important element of success.

Lastly, the third requisite consists in placing the apparatus at a sufficient distance from the person, so as not to give the forward portions of the body exaggerated proportions. The daguerreotype, with the reason of which we are not too well acquainted, produces manifest exaggeration in this respect, where ordinary sight sees none; we should therefore confine ourselves to the rules fixed by artists for the distance to be observed between the point of view and the object, with reference to the size of this object. There is no difficulty, consequently, in carrying the point of view, represented by the object glass, farther off than the maximum distance fixed by the general regulation.

When it is said that the daguerreotype enlarges the features, it is not necessary to attribute the malformation to the greater proximity of the more forward features; this effect would certainly be unperceivable on an instantaneous proof; it is the continual motion of the features, by the twitching of the muscles, and the expansion and contraction of the bosom, which is the cause of it: an object glass has always sufficient clearness to copy a countenance correctly, that is supposing it motionless; but, I again repeat; this immobility is very difficult to obtain. The most direct method generally employed is the head rest; this is a very simple method, yet it possesses many inconveniences; it is rare for instance, that it does not change the natural position of the head; in a very large number of portraits we perceive at once the employment of the head-rest; often too, in order to meet the rest, placed too far back, unskillful operators place the sitter with the nose in the air. In this case there is a manifest malformation in the countenance; an otherwise regular head presents enormous jaws, with a contracted forehead, it is therefore necessary, in order to get the natural position of the head, to bring the rest towards the head, till the proper position is obtained, and not the head towards the rest.

The employment of compound glasses, which have completely superseded simple object glasses, only gives clearness to objects equally distant from the object glass; we are forced to place the limbs as much as possible at the same distance as the head, by this means moreover their disproportion is avoided; but this requisition is too troublesome and tedious in getting a position. I have always favored simple object glasses, which give clearness to views at variable distances, and within limits of sufficient extent; the only reproach cast upon these kind of glasses is their inability to produce any but images of the smallest dimensions, for a given distance from the model to the object glass; but if we could arrive at a method of increasing the sensibility of the plates, I think we might return to them, on account of the greater facility of their employment, their less cost, while possessing equal perfection, and especially on account of their giving more space between different grounds.

When I hear daguerreotypists say that they must absolutely have 40 or 50 seconds sitting to produce a good portrait, I take it they mean a beautiful impression, of excellent light and extreme clearness, if the position has been good; but as to discerning therein the life and thought of an instant,

that appears to me impossible; by my own experience I have proved that 3 or 4 seconds are often too long a time to produce the expressive and varying countenances of a very numerous class of persons, women and children for instance.

SECTION XII.

ON PORTRAITS AND ON THE COLORING OF PROOFS.

Happily ladies toilettes are always rendered with extraordinary fidelity which makes the fair sex indulgent in many other points; it is important, however, never to force a position or let the body incline backwards; in this position the constant flattening of the features certainly enlarges the mouth, and their form is magnified even to the most unpracticed eye.

It is to be greatly desired that the time of exposition in the camera should be lessened, by every means possible, for taking the portraits of children. When a certain celerity is attained no art can rival the daguerreotype in this respect; and there cannot be a more real and durable source of joy to parents than the possession of the portraits of their children, in which they see an artlessness in the attitude and in the features so true to nature, that painters can admire it, but cannot give it us.

There is still another reason against forced portraits; that is, the necessity of concealing as much as possible the defect of symmetry, natural, so to speak, to every countenance. This defect which, faithfully rendered, gives to the physiognomy its impression, and produces the resemblance, becomes a deformity and bewilders the memory, when it is rendered in an inverted position, as is always the case, when a mirror is not employed; photography has here a great advantage, in this respect the proofs are always upright. The superiority of the plate portraits of Mr. Claudet is owing in a great measure to the fact, that he takes them with a correcting prism. There is a striking resemblance also in all his portraits. This quality is rarely found in inverted impressions; there is a moment of hesitation, of short duration in truth, during which the judgment performs the necessary labor to avoid this obstacle. This imperfection is easy of explanation. Daguerreotype portraits taken invertedly present the features as when reflected by a mirror, and consequently the person reproduced considers the resemblance perfect; but to all others the portrait is enigmatical, at first glance; the nose seems distorted, precisely because naturally it is never regular, it has generally a slight curvature towards the right; the inequalities of the eyes and mouth are generally represented on the wrong side; all this together detracts singularly from the resemblance.

In default of a correcting mirror, it is then very important to diminish these effects by taking a very prominent three quarter portrait.

If from the *tout ensemble*, we pass into detail, we come to the expression of the eyes which is the essential of a portrait. In order that the portrait may have a gazing expression, the eyes must be directed upon the object glass, this is the position most generally chosen; but in order that the picture may be good it requires an indispensable condition; which is that the light enter from the side, and not on the line which joins the object glass with the model, otherwise luminous points are placed in the middle of the eye which produces a very bad effect. To place these luminous points properly, it is necessary to see they are adjusted to each eye, for a portrait with one eye only enlightened is just as imperfect. These two conditions are seldom observed by some operators; we see a host of portraits where the lighting up of the eyes is perfectly shocking.

Certain blue eyes, besides, are difficult to render, by reason of the shade of their cornea or pupil; their pure blue, which at a distance might cause them to be taken for black eyes, is brought out clear on the proof. For portraits, it is necessary to decrease the time of the sitting, otherwise the eyes are lost.

As for the back grounds, the only essential to be observed is that the hair and dress are easily distinguished from them; it is for this reason that black back grounds are valueless. The best are the plain grey black grounds, or painted one, free from bold vertical lines. With compound object glasses, which are generally used, there is no reason to apprehend that the back ground will show too strong, since it never appears with any degree of distinctness, it is however necessary to be careful that

no object painted upon it rises in a grotesque manner above the shoulders or head.

The color of the dress presents fresh difficulties, black is advantageous for the skin but these are obtained with difficulty without reflection. White on the contrary, always gives a dark tinge to the flesh, but the form of the dress is destroyed whenever it presents a mass of white in projection ; the worst of all, is a plain dress having equal photogenic value with the flesh ; the portrait presents in this case an uniform tone from one end to the other. With such elements, success was once impossible to be obtained, but now a-days, with the aid of the coloring process, there no longer exists any difficulty ; a light blue or green tint to the dress establishes at once the distinction ; only we are thereby forced to color the flesh at the same time, which is not quite as easy. Strictly speaking the coloring of photogenic portraits is an operation defective in principle : its effects must always appear unnatural to a professional painter ; however, not regarding it too closely, we are forced to admit that a light shade of color well distributed gives much life to a proof. They are not so dark, and the skin presents some transparency.

To succeed well in coloring, it is necessary above all to procure color of the first quality, with a rich shade, extreme tenuity, and free from all cutting properties or asperity, that is to say, incapable of streaking the silverw hile laying it on with a brush. Vegetable colors perfectly fulfill these requisites ; the coloring elements of dry wood and madder, crystalized and finely ground, give very rich yellows and reds ; indigo will give the blue ; the *terre de Sienne*, the browns, which will serve to repress the vivacity of the yellows and reds, and will render them, by their addition in very small quantities, fit to be employed in the coloring of the flesh.

To retain the color no gummy substance can be put beneath it without in a great measure diminishing the intensity of the impressions ; it will be better, therefore to rest content with blowing upon the plate, which readily gives the silver, and the photogenic deposits that cover it, a remarkable affinity for the coloring particles which are presented for contact by the brush.

The colors in powder are put upon a palette of fine pumice stone paste board, and are mixed dry with the finger.

To obtain a fine coloring, the colors must be applied in very light coats by a steady rubbing, and not by heaping on a mass of red and ochre as is too often done ; the prominent portions only receive a few light touches of some lively color, which heightens the relief of the proof.

Messers. Mayer Brothers have for a long time excelled in the coloring of portraits ; but at present M. Gonin is at the head of this branch of the art. Their productions are very remarkable both for the vivacity of the tones and the skill with which they are distributed. It will be necessary to compare their proofs with and without coloring to discover how greatly the coloring skillfully disposed, lights up the picture and adds to the illusion.

OF PORTRAITS AND OF THE COLORING OF PROOFS.

It is not sufficient to know what are the best conditions to be observed, it is necessary to be able to observe them, which is often difficult, on account of the demand of the public for very clear pictures, that is to say without heavy shadows, as if relief could exist without shading.

A proof which presents all the relief of which it is susceptible is always in fact rather dark, that is to say essentially anti-photogenic.

A great number of operators, though wishing to avoid these shades, know not to what to attribute the desperate paleness of the proofs they obtain towards the afternoon, when the light has attained its maximum intensity. This effect arises from two causes, and it may be remedied by means much more simple than those generally employed.

The confusion of the images, at the moment of the maximum degree of intensity of the light is caused, I say, by the dissemination of the light, which penetrates superabundantly through the aparture of the object glass, and enlightens the model in every direction.

This is ordinarily remedied by placing the apparatus in a kind of camera obscura, and veiling the light by means of spacious

curtains. This method is certainly successful, but the same result may be attained in a much more simple way.

All lateral light which penetrates the object glass, hastens, it is true, the formation of the image, but it is at the expense of its clearness. It is to avoid this that object glasses are protected in front by a tube blackened on the inside. The camera in which the dagerreotype is placed merely produces the effect of a longer tube, that is all. It would therefore, be preferable to add to the brass tube already in use, a tube blackened on the inside which by drawing in and out would produce the same effect as the like operations with the camera.

For the same reason, a black screen, placed in front of the object intercepts as much light as an extent of curtains comprised in the interior of the cone formed by the screen as the base, and an illuminated point of the object glass as the apex; for example a circular screen about 40 inches diameter placed 20 inches from the person is equivalent to 1,000 square inches of black curtain placed at five times greater distance; a similar screen, mounted on a screw stand, might be placed instantaneously and with more direct effect, than by a disposition of curtains the most excellently combined.

Mr. Claudet employs hand screens with a camera in which he places his daguerreotypes; I say his daguerreotypes, because he often takes simultaneous portraits for the stereoscope with the correcting prisms. For this kind of work, the camera is indeed more handy, but for the ordinary simple apparatus, it is completely useless, and it may be replaced by a simple cylindrical and moveable tube.

SECTION XIII.

OF THE APPLICATIONS TO BE MADE WITH DAGUERREAN PROOFS.

The rapid progress that photography on paper is from day to day making, limits the applications to which daguerrean proofs are capable; the latter at the present day have no longer any advantage, save the small sizes, on account of their mathematical accuracy which can bear examination with a lens of the highest power.

It is precisely the extreme finish of these proofs which has hindered their transformation by chemical agents. The most transparent varnishes even in excessively thin coatings destroys the lights; the same thing occurs by fixing the proofs with a deposit of sulphate of silver and oxide of lead: corrosion by means of acids in engraving, and the operations for fixings without reflection, attack the mezzo-tints, if we desire to attain the vigor of the primitive proofs, and finally we end with the imperfections of the paper.

The improvements to be hoped for consist, I think, in the simultaneous employment of the yellow chloride of iodine and the red glass; in fixing without reflection by means of sulphurous vapors incapable of injuring the lights. By the wetting process a similar fixing is effected, preserving to the proofs an exquisite purity with a very sensible diminution of reflection and a rich golden tint; but the tone is greatly diminished. This is the necessary effect of a yellow, transparant chemical varnish.

In the actual condition in which the daguerreotype now is, the only immediate application to be made of its productions is to exhibit them strongly illuminated at the same time magnifying them, and rectifying their position: by adding moreover a stereoscopic effect; normal-plate views of monuments or capital cities would form subjects of still greater interest.

In my following articles I will give a general summary of photography on paper.

GENERAL HISTORICAL SUMMARY OF PHOTOGRAPHY ON PAPER.

Photography is essentially based upon the transformations which the compositions of silver undergo under the influence of light. This singular property, which has since become so fertile in its applications, was recognized for the first time on the white precipitate which is formed by the solution of nitrate of silver, whenever it is mixed with ordinary water, by reason of the chlorides which the water always contains. In the infancy of chemistry, the precipitations of nitrate of silver with bay salt or the spirits of salt (the chlorohydric acid of to-day) in white flakes like snow, and gradually darkening on exposure to light, was simply a curious phenomenon, which could not be explained: but there was no delay in discovering that all the compositions of silver

changed in hue under the action of light, which was the cause of their being called unstable.

The nitrate of silver itself, unless it was in very dry crystals, was not free from like changes, and its solution, however little it was contaminated with foreign substances blackened rapidly in full light, and often even when protected from light.

At first there was no acquaintance with any thing but the nitrate and chloride of silver, the one as the ordinary form of silver dissolved, and the other as the silver precipitate.

Since then, however, the idea of profiting by these phenomena, was conceived, in the formation of pictures; it was then deemed sufficient to impregnate sheets of paper with nitrate of silver, and the sheet being dry, it was covered with a body acting as a screen; after which the whole was exposed to the solar rays for a sufficient time; a very clear *silbouette* of the body was obtained, with an indication of its clearer portions if the body were translucid; it was well understood that the opaque portions left the white of the paper visible, and that the clear or exterior parts separated themselves into a brown of more or less depth; in a word, the black produced white, and *vice versa*. If we add that these images gradually faded in a strong light, it will at last be understood why there has been so much delay in taking advantage of it.

The discoloring on exposure to light of ordinary paper is owing in a great measure to the sizing; this discoloring is consequently excessively slow; it appears, however, to have been the method employed by Wedgewood and Sir Humphry Davy; the latter has even obtained very delicate images by placing his paper in the focus of a solar microscope.

At the same epoch Charles, the French physician, showed in his courses of lectures the formation of these images, and on account of the greater celerity which is necessary to call the attention of an audience, it is probable he woked on paper coated with chloride of silver.

More than thirty years elapsed between these feeble experiments and the glorious birth of the photographic art. In this interval, two French *savants* had made known some new simple substances which play at the present day a powerful part, namely, iodine discovered in 1812 by Courtois, and bromine discovered in 1826 by M. Balard. The iodide of silver which is perhaps the only argentiferous compound most resisting the action of light, became, by fortunate adjunctions, the soul of photography, and nothing can be done without it.

Niepce, of Châlon-Sur-Saône, who was the most persevering investigator, worked many years without any remarkable result, on account of his not having employed the compositions of silver, and the accident alone which made him substitute the silver leaf for plates of tin, appears to have set Daguerre upon the track which has led to the discovery of the daguerreotype. On silver, iodine is the only substance which exhibits a manifest change under the influence of light.

At the simple announcement of the wonderful discovery of Daguerre, an English savant, Mr. Talbot, exhibited his productions on paper; they were infinitely inferior to the daguerrean image, but his very ingenious process at length solved the problem of the obtainment of the images from the camera obscura, with the lights and shades in their true place. This process has been much improved since then, but its principle stands firm as a masterly and glorious discovery of the English savant.

The thing is very simple: the images formed upon photogenic paper in the camera obscura being inverted (at the point of view of the light in relation to the shades,) that is to say *negative*, as they are called at the present day, Mr. Talbot conceived the fortunate idea of employing these negative proofs as a screen to place upon photogenic paper.

Success answered his expectations, and at a single stroke he obtained proofs perfectly identical with the aspect of the natural objects, presenting, moreover, the advantage of indefinite reproduction from the same type.

Mr. Talbot obtained his proofs on paper, coated with the iodide of silver which he rendered sensitive by steeping it prior to its exposition in the camera, in a solution of nitrate of silver, acetic and gallic acid

being added thereto, and, lastly, he fixed the proof by washing in the bromide of potassium.

With this negative proof placed on a piece of paper made photogenic with the chloride of silver, and exposed to the sun for a suitable length of time, he obtained an indefinite number of positive proofs.

The subsequent improvements have chiefly consisted in receipts for rendering proofs, as well positive as negative, insensible to the light, and for rendering negatives more transparent and increasing their delicacy.

These last investigations lead photographers very naturally to replace the paper, by artificial membranes, more homogenous, and of less opacity; such was the origin of the discoveries of M. Niepce de Saint Victor, who, operating at first upon plates deposited in thin coats on glass plates, obtained negatives on albumenized glass.

These negatives, which possess extreme delicacy already approaching plate proofs, have given rise to numerous experiments for giving to the coating of albumen a uniform thickness and homogeneousness, and to prevent its cracking through dryness; it may be remedied by a judicious addition of glutinous vegetable or animal matter, such as honey, molasses, &c.

Lastly, at the present day every mind is turned towards the employment of collodion in place of albumen. The new production gives immediately great sensibility and a great delicacy of design; the operation of laying it on glass is exceedingly prompt; but, like all new productions, its results are extremely variable, and it will require the union and skill of every artist to make it triumph over its predecessors.

In all probability, the paper which at the outset was employed alone, will end by being employed solely as forming the chain of a coating or continuous woof, susceptible of rendering every delicacy, as well in the negative as the positive.

By the way, inventing photographers have published a multitude of receipts or processes, whether for direct proofs, or the tone of the positives. I intend in the following articles, to cull from this rich collection the most useful and improved methods.

PHOTOGRAPHY ON PAPER

The paper is composed of ligneous fibres from 2 to 3 one hundredths of a *millimetre* in diameter, cylindrical when taken from linen or hemp, and striped longitudinally when taken from cotton.

This ligneous material is colorless and perfectly transparent, but each fibre acting in the light like a prism which separates it white is the result, the same as with snow, which is a combination of the crystals of congealed water.

The paper is not as white as snow, comparatively it is rather yellowish, owing to the impurities which have entered into it; its whiteness, however, is always sufficiently perfect, in the superior qualifications, for the purposes of photography.

The interlacement of its fibres produces inequalities on its surface more or less prominent which form its grain; this inequality disappeared almost entirely by submitting the paper to an energetic pressure in its moist state; this is the hot pressing in use at the present day. If it is added that continued operations cause every trace of the form upon which the fibres have taken their body, to disappear, it may be said that choice paper is capable of rendering every delicacy of which photography is possessed; and the egregious blemishes, which proofs on paper have still very often presented, cannot be attributed to the coarseness of the fibres, nor yet to their interlacement. It is so much the better that the image is formed of infinitely minute particles of the solid composition of silver which every where encloses the ligneous fibres; the clear and dark spots, visible to the naked eye, are then produced much sooner through the equality of the distribution of the sensitive precipitate, by its removal arising from the washes, and especially by departure from the contact of the fixing liquid. For example it is this departure, in the hyposulphite or bromide of potassium, which is the cause of the want of success of Mr. Bardon de Gênes. I became assured of this by comparing with a magnifying glass the positives and negatives which he sent me; in the negative there is a statue, the head of which, on a black base, bears very distinct white traits indicating the eyes, nose and mouth, while in the positive this head is represented by a completely white oval.

M. A. Guadin.

(*To be continued.*)

SOME THOUGHTS ON THE FITTING UP OF DAGUERREAN ROOMS.

Extract from a manuscript volume soon to be published.

No artist needs be told, that *expression* constitutes the chief beauty and power of the human face. No mere configuration or tinting can produce these results. And it were equally superfluous saying, that expression is the product of thought and feeling, either habitual or occasional; in a word, of character or mood.

How much of expression abides perennially in the face, we are seldom aware, in the case of our familiar associates. If, however, peculiarly observant or impressionable, an encounter with a *stranger* shows us what a wondrous expositor of the soul within is found in the few square inches of muscular tissue constituting the human countenance.

The infant, too, whose native susceptibilities have not as yet been indurated by attrition against the hard conditions of life, is in his way a more sagacious reader of character, than the adult. All of us, I dare say, have seen both men and women, from whom the delicately organised infant has shrunk vehemently at first sight, and whom he would, at no rate, permit to handle and caress him. Others, again, we have seen, whose faces, however far from conventionally handsome, were an absolute magnet to the infantile regard; constraining the little ones to covet their companionship and fondlings.

Children have much of this intuitive penetration in their whole progress up to maturity. Their likes and dislikes of individuals are determined, not by analysis or reasoning, but by an unconscious or semi-conscious interrogation of facial expression.*

In this providential fact is found a prime security for social order, since it ensures, that men shall ultimately be known for what they are. Vainly do the rogue and profligate, the false-hearted and egotistic mimic those modes of speech, action and demeanor, which pertain naturally to the good and pure. The inward villainy or unworthiness *will* glare out through the fleshly masks, within which it would fain hide itself.

In addition, however, to what may be termed the *average* expression of the face, or that stamped upon it by the soul's *predominant* workings for a lengthened period, there are also mirrored upon it, with greater or less distinctness, the varying passions and emotions of the moment. That is, joy, grief, anger, love, hate may, especially if intense, throw into the shade or even totally obliterate, for the time, the wonted characteristics of the countenance.

So, too, the ordinary facial expression may be intensified or made extraordinarily vivid by some mental excitement which calls into vigorous action those attributes, which have done most to give the face its distinctive cast.

These remarks bear directly on the purpose of this chapter. For what does the artist chiefly aim at, while exercising his art, be his instrument a camel's hair brush or the solar ray?

Not, of course, *merely* to produce an *accurate outline* of the face before him. Neither is it *solely* to fill up and color his sketch, so that, in shape, features and tints, it shall be a perfect transcript of the living face. All those items are, indeed, indispensable to a *faultless* portrait. Nevertheless, all these are not only insufficient, but even trivial, if one thing beside be wanting. This one thing is *expression*,—that indefinable *somewhat*, which reveals to the beholder the soul within; which stamps a man with that *individuality*,

* We have heard an anecdote of the late Daniel Webster illustrative of this fact, which we have never seen in print. Mr. Webster was on a visit to a friend, and while waiting in the parlor his thought became abstracted, and perhaps were not of the most pleasant kind, for a little girl, running into the room, the moment she caught sight of him shrieked violently, and it was with the utmost difficulty her nervous excitement could be calmed. By this time the expression of Mr. Webster's face had changed, and the moment the child again looked at him, she rushed into his arms and caressed him as if he had been her father.—*Ed. Phot. Art-Jour.*

which distinguishes him from all men else.

If the artist is incompetent to seize *this*, his "occupation's gone;" his pencil and palette are useless implements, for he cannot produce what merits the name of portrait.

Both the painter and the heliographist, in the endeavor to get a truthful picture, must needs encounter one and the same difficulty. From the stillness of the place; the immoveable, and, maybe, constrained attitude of the sitter, with its resulting weariness and *ennui*, his facial expression is not infrequently dull and unnatural; and, in fact, scarce ever of the bright, genial cast, of which the face is susceptible, and which, in other conditions, it does actually exhibit. To both these artists, therefore, it is of vital moment, that some means should, if possible, be adopted to summon into their "sitters" faces, at the time of sitting, the best and noblest expression, with which it *can* be illumined.

In the endeavor to supply this desideratum, the heliographist has one advantage over his fellow artist. This consists in the celerity with which the essential part of his work is done. Thus if, by whatever method, the *desired expression* can be called into the sitter's face *for a few seconds even*, it may infallibly be caught and fixed, since, unlike all artists else, the Sun *cannot miss* of securing what is before him.

What methods then, if any, can the heliographist employ to call up, for the moment, the facial expression he would transfer to his plate?

His aim, of course, must be to act on the *mind* of his subject. And here be it noted, that through the magnetism which one human being exerts upon another, *his own mind and manner*, under certain conditions, *may be* among the most potent agencies to this end. That is, supposing him possessed, in a large measure, of genius and talent, combined with culture and accomplishments, with genial dispositions and finely toned character, he may exert on his subject a present influence beyond calculation and may count with almost absolute certainty on attaining the desired result. Of course, too, the larger the measure he possesses of these attributes, the more efficient is likely to be his influence, all other conditions being identical, to the end in question.

But, among other agencies to the same end, may be reckoned the circumstances surrounding the subject just prior to, and at the precise moment of sitting. In busy seasons, persons are often subjected to considerable delay, before the disposing of previous comers enables the artist to attend to themselves. Such delay is apt to be tedious and wearisome, and sometimes positively irritating; and either of these moods is a sorry preparation for portrait-sitting. It were, therefore, a great desideratum to preclude, on the one hand, the access of *these* moods, and, on the other, to awaken the mood *wished for*.

I believe much might be done for both these ends by a proper fitting up of the daguerrean rooms. The precise several items of such filling up I shall not attempt to prescribe. I will merely venture a few suggestions, which each artist can modify, add to, or diminish, according as his individual taste and judgment may dictate, or his resources permit.

First, then, I would have the waiting room amply supplied with books sufficiently various to suit the tastes of all comers I do not mean books of large bulk or of grave or abstract character, but such, as may attract and interest in the fragments of time under review. Such books are abundant in our day, and by a little effort, provision might be made for all ages, tempers and tastes. These will do much both for staving off *ennui* and for awaking the mind's better moods.

Then I would have lying on the tables a large variety of the finest engravings, prints, &c., I could procure; as also curiosities of different kinds, more especially those having classic, romantic and historic associations connected with them. Of this class are coins, medals, vases, urns, &c., whether original, or transcript. Without, however, restricting myself to these, I would adopt any and every attainable object, appealing to the sense of beauty or grandeur, or suited to enliven and exalt the feelings.

But, over and above these items, I would make *everything in and about the daguerrean rooms* converge to the single point of producing in the sitter a genial, elevated tone of sentiment. Our rectangular, formal apartments are the reverse of fitted to *inspire* either artist or subject. That these

apartments may best serve their end, an artist of genius and taste should prescribe the plan, the construction, and the fitting up of his own. The *curve* is recognised as the authentic line of beauty. Whether, however, the curve, as appearing in the circle, or in some other of the conic sections, should determine the shape of the rooms, I shall not venture to decide. But I am confident that *some mode of the curve* would be dictated by the highest artistic taste, as the *shaping principle* of the construction.

Having achieved the highest attainable beauty in the *general form*, I would carry the same formative principle into every item, however small, in the fitting up of the rooms.

Thus, in the windows I would discard the customary rectangle and adapt some variety of the curve. In a portion of them too, if not in all, I would set that beautiful *stained glass*, to which the medieval chapels and cathedrals owed so much of their attractiveness. I would also drape them with ample and splendid curtains,—taking special heed, however, that a fastidiously artistic taste be not sacrificed to mere richness.

The garnishing of the walls, either with paper or paint, furnishes scope for a diversity of tastes, any and all of which *may be* artistically beautiful. One such apartment, at least, I should like to see equiped with *medieval tapestry* of some handsome texture and interesting device. Such, though perhaps with considerable difficulty, I presume might be procured even now; and by the romantic associations it would naturally awaken, it would be a potent auxiliary of the artist.

At all events, let all things in this department relate strictly to the single point of making the desired impression on the beholder.

On the walls, if so prepared as to harmonise with such arrangement, I would suspend well executed and appropriate pictures in various styles; while statues and busts of marble or plaster should occupy the angles and other fitting locations,—care being had, that the objects and scenes represented thereby should conduce to the impression I would create.

Finally, in selecting the *furniture* (technically speaking) of the rooms,—such as carpets, tables, chairs, sofas &c.,—I would adhere strictly to the same dominant principle. That is, I would have every article, from greatest to minutest, modeled and finished in accordance with the highest existing conceptions of the beautiful and graceful.

Of course it will be apprehended, that a *unity* of *idea* must preside over and permeate the several particulars of the complex whole, from the skeleton outline of an apartment down to the very device and color of a carpet; since the *want* of this may defeat and cast ridicule on the noblest plan and the most perfect execution of isolated particulars.

The sum of my suggestions is this;—

I would fain have the daguerrean rooms a temple of beauty and grandeur, so that those entering may inhale a spirit which shall illuminate their faces with the expression desired by the artist alike for his own sake and that of his subject.

As already said, I have not assumed to furnish a complete description of what I regard as the *appropriate* rooms of the daguerrean artist, but to offer a few suggestions, as possible helps towards the construction and equipment of such rooms. Doubtless many different modes might be adopted for attaining this end, which might equally please an artistic taste; and it were best, that each artist should, if practicable, impress his own apartments with his own individuality.

The great fact, however, that the aspect of the artist's rooms may have an important bearing on his achievement of eminence, can scarce be too forcibly urged. The obtuse and shallow may fail to recognise it and may even sneer at the suggestion. But the man of genius, as well as every one, who has carefully studied the infinitely complex and mysterious mechanism of human nature, with its multitudinous affinities and relations, has the most intense conviction of its verity.

In fact, all things animate and inanimate, from the remotest stars to the grass we tread upon, the flowers that lavish on us their beauty and fragrance, and the brook hurrying songfully by us; and every individual among the myriads of our own race encountered by us in the longest life-journey; all, I say, exert upon us their own specific influence, and on our intellects and

hearts imprint their own peculiar mark. So beyond all measurement is this multiplex influence, that not a few high names in philosophy have pronounced Man the sole, exclusive creature of circumstances.

We need not adopt this extreme conclusion. But it may, with literal truth, be averred, that both the transient moods and the predominant characters of the majority of mankind reflect, to a very great degree, the circumstances about them.

This is a basis quite sufficient for all the suggestions of this chapter; I, therefore, respectfully submit them to my heliographic co-laborers, with the hope, that they may find in them something which may be of service both to themselves and to the noble art, which we jointly practice.

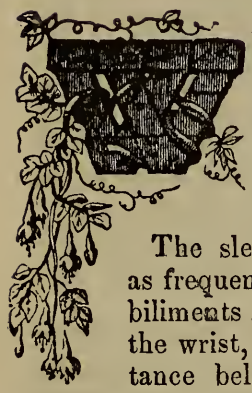
M. A. Root,
140 Chestnut-st.

Phila., May, 1853.

DRESS—AS A FINE ART.*

BY MRS. MERRIFIELD.

PART IV. THE DRESS.



We shall consider the dress, by which we mean simply the upper garment worn within doors, as consisting of three parts, the sleeve, the body, and the skirt.

The sleeve has changed its form as frequently as any part of our habiliments; sometimes it reached to the wrist, sometimes to a short distance below the shoulder. Sometimes it was tight to the arm; sometimes it fell in voluminous folds to the hands; now it was widest at the top, then widest at the bottom. To large sleeves themselves there is no objection in a pictorial view, provided that their portion of junction with the shoulder is so conspicuous that they do not add to the apparent width of the body in this part. The lines of the sleeves should be flowing, and they are much more graceful when they are widest in the lower part, especially so open as to display to advantage the beautiful form of the wrist and forearm. In this way they partake of the pyramid, while the inelegant gigot sleeve, which for so long a period enjoyed the favor of the ladies, presents the form of a cone reverted, and is obviously out of place in the human figure. When the large sleeve supported by canes or whalebones forms a continuous line with the shoulder, it gives an unnatural width to this part of the figure—an effect that is increased by the large collar which conceals the point where the sleeve meets the dress. Examples of the large open sleeve in its extreme character may be studied with most advantage in the portraits of Vandyck. The effect of these sleeves is frequently improved by their being lined with a different color, and sometimes by contrasting the rich silk of the outer sleeve with the thin gauze or lace which forms the immediate covering of the arm. The figures in the woodcuts* will show the comparative gracefulness of two kinds of large sleeves, namely, that which is widest at the top, and that which is widest below. If the outline of the central figure of our more modern group, which we copy from a French work, were filled up with black, a person ignorant of the fashion might, from the great width of the shoulders, have mistaken it for the Farnese Herculese in petticoats.

The large sleeves, tight in the upper

* Concluded from page, 261, Vol. 5, No.

* See London *Art-Journal* Vol. V, No. 52.

part and enlarging gradually to the wrist, which are worn by the modern Greeks are extremely graceful. When these are confined below the elbow, which is sometimes done for convenience, they resemble somewhat the elbow sleeves with wide ruffles which were so common in the time of Sir Joshua Reynolds. Sleeves like those now worn in Greece were, fashionable in France in the tenth century, and again about the beginning of the sixteenth century. They were also worn by Jeane D'Albret, the mother of Henry IV., and are seen in the engraving at p. 3 of this volume.

A very elegant sleeve fitting nearly close at the shoulder, and becoming very full and long, till it falls in graceful folds almost to the feet, prevailed in England during the time of Henry V., and VI. On the authority of Prof. Heideloff,* it is said to have existed also in Flanders in the thirteenth and fourteenth centuries, and in France in the fifteenth century. In the examples of continental costume, the *tout ensemble* is graceful, and especially the head dress, while in England the elegant sleeve is accompanied with very short waists, and with the hideous horned head-dresses then fashionable. We engrave a specimen of this costume, which is copied from a highly finished drawing in a manuscript of the time of Henry V., now preserved in the British Museum (Royal MSS., 15, D. 3.) The effect of these sleeves much resembles that of the mantles of the present day, and its wide flow is only adapted for full dress or out-of-door costume. The sleeves worn under these full ones were generally tight.† At a much later period, the large sleeves were made of more moderate dimensions, both in length and width, and a full sleeve of fine lawn or muslin, fastened at the wrist with a band and edged with a lace ruffle, was worn beneath. This kind of sleeve has recently been again introduced into this country, but has given place to another form, in which the under sleeve of lace or muslin being of the same size as the upper, suffers the lower part of the arm to be visible. The effect of this sleeve, which is certainly becoming to a finely-formed arm, is analogous to that of the elbow sleeve, which, with its deep ruffles of point lace, is frequent in the portraits of Sir Joshua Reynolds.

The slashed sleeve, criticised by Shakspeare in the "Taming of the Shrew," was sometimes very elegant. The form in which it appears in a figure of the fifteenth century is particularly graceful. Not so, however, the lower part of the sleeve.

In the preceding remarks we have considered the sleeve merely in a picturesque point of view without reference to its convenience or inconvenience.

The length of the waist has always been a matter of caprice. Sometimes the girdle was placed nearly under the arms; sometimes it passed to the opposite extreme, and was suffered to fall upon the hips. Sometimes it was drawn tightly round the middle, when it seemed to cut the body almost in two like an hour glass. Judging from what we see, we should say that this is a feat which many ladies of the present time are endeavoring to achieve. The first and third cases are almost equally objectionable, because they distort the figure. The hip girdle, which is common in Greece and oriental countries, prevailed also in England some centuries ago. The miniatures of old manuscrips furnish us with examples of long-waisted dresses fitting closely to the person, sometimes stiffened like the modern stays, at others yielding to the figure. The waist of this kind of dress reached to the hips, where it was joined to the full petticoat which was gathered round the top—an extremely ungraceful fashion. The hip girdle, properly used, is however by no means inelegant. It is not at all necessary that it should coincide with the waist of the dress; it should be merely looped or clasped loosely round the figure, and suffered to fall to its place, by its own weight. But to enable it to do so in a graceful manner, it is essential that the skirt of the dress should be so united with the body, as to produce no harsh lines of separation or sudden changes of curvature—as for example when the skirt is set on in full plaits or gathers and spread over a hoop. We have before noticed that this point was attended to by Reubens, by Vandyck, by Sir Joshua Reynolds, and by the modern Greeks. The most natural situation for the girdle, or point of junction of the body

* See *Art-Journal* for 1851, pp. 18, 57, and 92.

† In the above example however a longer and wider inner sleeve seems to fall and cover the hand.

with the skirt, is somewhere between the end of the breast bone and the last rib, as seen in front—a space of about three or four inches. Fashion may dictate the exact spot, but within this space it cannot be positively wrong. The effect is good when the whole space is filled with a wide sash folded round the waist, as in Sir C. Eastlake's Greek Girl or some of the graceful portraits by Sir Joshua Reynolds. How much more elegant is a sash of this description than the stiff line which characterises the upper part of the dress of Sancta Victoria.* The whale-bone or busk is absolutely necessary to keep the dress in its proper place. The resemblance in form between the body of the dress of this figure and those now or recently in fashion cannot fail to arrest the attention of the reader. Stiff though as it undoubtedly is, the whole dress is superior to the modern in the general flow of the lines uniting the body and the skirt.

Long skirts are more graceful than short ones, and a train of moderate length adds to the elegance of a dress but not to its convenience. Long dresses also add to the apparent height of a figure, and for this reason they are well adapted to short persons. For the same reason, waists of moderate length are more generally becoming than those that are very long, because the latter, by shortening the skirt of the dress, diminish the apparent height.

Besides the variation in length, the skirts of dresses have passed through every gradation of fulness. At one time it was the fashion to slope gradually from the waist without gathers or plaits; then a little fulness was admitted at the back, then a little at the front also. The next step was to carry the fulness all round the waist. In the graceful costume of the time of Vandyck, and even in the more stiff and formal dress delineated in the pictures of Rubens, the skirt was united to the body by large flat plaits, when the fulness expanded gradually and gracefully, and the rich material of the dress spread in well arranged folds to the feet. The lines were gently undulating and graceful, and that unnatural and clumsy contrivance called a "bustle"—a near relation of the hoop and fardingale—was at that time happily unknown.

This principle of uniting the skirt gradually with the body of the dress is carried out to the fullest extent by the modern Greeks. In the peasant from the neighborhood of Athens, the pelisse is made without gathers or plaits; the skirt, which hangs full round the knees, is "gored" or sloped away till it fits the body at the waist. The long under skirt is, as we find from the figure of the woman of Makrinitza, gathered several times so as to lay flat to the figure instead of being spread over the inelegant "bustle." It is only necessary to compare these graceful figures, in which due regard has been paid to the undulating lines of the figure, with a fashionable lady of the present day, whose "polka jacket," or whatever may be the name of this article of dress, is cut with violent and deep curves to enable it to spread itself over the "bustle" and prominent folds of the dress.

Not satisfied with the bustle in the upper part of the skirt, some ladies of the present day have returned to the old practice of wearing hoops to make the dresses stand out at the base. These are easily recognized in the street by the "swagging"—no other term will exactly convey the idea—from side to side of the hoops, an effect which is distinctly visible as the wearer walks along. It is difficult to imagine what there is attractive in the fardingale and hoop, that they should have prevailed in some form or other for so many years, and that they should have maintained their ground in spite of the cutting though playful raillery of the "Spectator," and the jeers and caricatures of less refined censors of the eccentricities of dress. They were not recommended either by beauty of line or convenience, but by the tyrant Fashion, and we owe some gratitude to George IV. who banished the last relics of this singular fashion from the court dress, of which until his time it continued to form a part. Who could imagine that there would be an attempt to revive the hoop petticoat in the nineteenth century? We invite our readers to contrast the lines of the drapery in the figures after Vandyck, and those in the modern Greek costume, with that of a lady in the hoop, after our satirical painter Hogarth, and two figures

* From a MS. of the fifteenth century. The figure is published in M. Champollion-Figeac's work, entitled "Louis et Charles Ducs d'Orleans, leurs influences sur les arts, la literature, et l'esprit de leur siecle."

from a design by Jules David, in "Le Moniteur de la Mode," a modern fashionable authority in dress. There can be no doubt which is the most graceful. The width of the shoulders, and the tight waists of the latter, will not escape the notice of our readers.

From Quar. Journal of Microscopical Science.

ON THE PHOTOGRAPHIC DELINEATION OF MICROSCOPIC OBJECTS BY ARTIFICIAL ILLUMINATION.

BY GEORGE SHADBOLT, ESQ.

THE application of photography to the purpose of delineating microscopic forms I for some years entertained as a favorite project; but some practical difficulties of manipulation deterred me from putting it to the test until quite recently, when a sufficient stimulus was applied in the beautiful specimens both on paper and glass exhibited in the month of October last, at the Microscopical Society of London, by Mr. Joseph Delves, of Tonbridge Wells. Of the excellent promise for a highly valuable adjunct to microscopic science, the proofs in the present number of the journal will afford your readers an opportunity of judging.

As it is not my intention to enter into particulars of the rise and progress of this art as connected with the microscope, I will only observe that the earliest microscopic photographs which I had the pleasure of seeing were some daguerreotypes executed by Mr. Richard Hodgson by the aid of the *direct rays of the sun;* and for these I believe he is entitled to claim the honor of having been the first to produce a picture of this kind.

But however beautiful the sharpness and detail of pictures upon metallic plates there are many causes to confine the practice of the daguerreotypic art within such very contracted limits as to render it of but little use to the microscopist; whereas the increasing beauty and sensibility of the collodion process renders it a much more encouraging medium for further experiment in this direction, besides offering the additional inducement of enabling one to transmit duplicates upon paper to others engaged upon similar observations at a distant part, by which comparisons of much value can be made, and without the expense and inconvenience of having to execute duplicates from the objects themselves.

As it happens that the great majority of the followers of microscopic science are mostly engaged in professional or other business pursuits during the day-time, and in most instances at a distance from home, it occurred to me that if *artificial light* could be made to act sufficiently energetically to produce microscopic pictures, it would be a very considerable advantage to a large number of persons who would otherwise not be able to avail themselves of so excellent an assistant as the photographic art; and further, that to render it practically useful, it must be done by an illumination *readily accessible* and *inexpensive*; I therefore determined to institute a series of experiments with this end in view and having availed myself of all the hints thrown out by Mr. Delves, Mr. Hogg, and others, at the Microscopical meeting in October, after very many failures and no small amount of trouble, I at length was fortunate enough to meet with such success, as in my opinion, to offer very considerable encouragement for further operations with a reasonable hope of a really useful result; and at the meeting of the Microscopical Society in November last I had the pleasure of exhibiting a picture of

a fly's proboscis, produced by the aid of a very small camphene lamp. In the hope of enlisting more laborers in this field of research, I purpose detailing the "modus operandi" which I have found most successful; trusting that, in a short time, the little seed thus sown may bring forth an abundant harvest.

I would premise that I do not advocate photography in microscopic science as a rival that will *supersede* the draughtsman, except in certain cases; and although it may in very many instances do so, it will most assuredly *make* much more work than it takes away from those who follow the occupation of a microscopic artist.

When the object to be delineated is flat and moderately thin, as compared with the necessary power in use, a very excellent picture may be produced without any aid from the limner; but where the object is not so formed—although when under microscopic examination the mind can readily acquire a correct knowledge of the form by focussing up and down—it is evident that from the very construction of a good objective a *picture* can only be obtained in *one plane at a time*, and it will then be necessary to take several pictures in different planes, and call in the artist's aid to unite the productions. The immense amount of time and labor that can be thus saved in delineating subjects of an elaborate character can only be appreciated by those who have attempted the production of objects of this class.

It is scarcely necessary to enter into a preliminary explanation of the photographic phenomena, as it is of very little use for an entire novice in the practice of this art to commence upon microscopic subjects; I shall, therefore, presume that I am addressing those who understand the general principles of photography, and shall therefore commence with

The Arrangement of the Apparatus.—Place the microscope with the body in a horizontal position, and screw on the objective to be used, and fix the object in its proper position on the object-plate of the stage by pressing down the sliding spring-piece. Turn the mirror aside or remove it altogether, and having taken out the eyepiece, insert into the body a tube of brown paper *lined with black velvet*, in order to prevent the slightest reflection from the sides, which would infallibly spoil every picture if allowed to operate. The lens should then be removed from an ordinary photographic camera, and the latter elevated so as to bring its centre in an exact line with the axis of the microscope body, which must have its eyepiece-end inserted in the place left vacant by the removal of the camera lens, and that portion of the opening not filled up by the body may be rendered impervious to light by a piece of black cloth, velvet, or other similar material.

The lighted lamp must next be brought, so that the centre of the flame is in the axis of the instrument, and its distance must depend upon the focus of the lens used to concentrate the light, for which purpose an ordinary convex lens of 2 1-2 to 3 inches diameter, with its flat side towards the lamp, is perhaps as useful as any, provided a second plano-convex lens of that focus is interposed near the object to concentrate the light still more strongly. It is not necessary, or even desirable, that an *image* should be formed of the source of light, and consequently the spherical aberration in such an arrangement as recommended is *not* detrimental, *may be* advantageous.

The ground glass screen to receive the image being in its proper place in the camera, the object may be brought to a correct focus in the usual way with the coarse and fine adjustment, and this cannot be done too accurately; in fact, for delicate objects, a means of magnifying the image is absolutely requisite, and for this purpose a positive eyepiece, placed in contact with the ground glass, is perhaps best.

Most achromatic objectives of the best construction are slightly over-corrected (as it is termed) for color, in order to compensate for a small amount of under-correction in the eye-piece, that is to say the violet and blue rays of the spectrum are therefore projected beyond the red ones.

As it is ascertained that most of the photogenic or actinic rays are located in the violet end of the spectrum, it follows that with such a lens as is used for the microscope, the *chemical focus* will be somewhat more distant from the object than the visual focus, and it therefore becomes necessary to make some allowance for this difference.

This may be done in two ways, either by placing the sensitive plate somewhat farther off than the ground glass on which the image is received, or by altering the focus by the fine adjustment; the latter being the plan I prefer, as I find it much more accurate.

The *amount* of difference between the foci probably varies in every objective, even apparently of the same make, and can only be ascertained by direct experiment, but the following may be some guide to those who wish to experiment upon the subject.

An *inch-and-a-half* objective of Smith and Beck's make required to be *withdrawn from* the object after the the correct visual focus is ascertained 1-50th of an inch, or *two turns* of *their* fine adjustment.

A *two-thirds of an inch* object glass of same make wants a withdrawal of 1-200th of an inch, or ½ turn of the fine adjustment, and

A 4-10ths of an inch, about 2 divisions, or 1-1000th of an inch farther off. With the 1-4th, and higher powers, the difference between the foci is so minute that it is *practically* unimportant. The above differences are those actually existing in my own objectives, but, as before intimated, it does not follow that they will be correct for others even of the same makers.

Having arranged the apparatus, focussed, and made the requisite adjustment for chemical focus, the ground glass may be removed, and the sensitive plate placed in its stead.

As in all other photographic processes, the time of exposure must be varied according to the power in use, the nature of the object to be taken, and the amount of illumination, to which must be added in the present instance the *medium in which* the object is mounted, but from 1 *to* 10 *minutes'* exposure is generally requisite. An explanation of the last named disturbing causes may probably be found in the beautiful discovery of Professor Stokes, of the property possessed by certain transparent media of arresting the chemical rays.

Any account of the preparation of the collodion, &c. &c., would be more fitted for a work on photography, and would render the present paper much too lengthy: moreover there is an abundance of information on photographic manipulatory details readily accessible in numerous publications, such as Mr. Robert Hunt's Manual, Mr. Bingham's, Mr. Archer's, Mr. Horne's Mr. Hennah's &c. &c. There are, however, one or two points which it is as well to allude to. If the film of a collodion picture be examined by the microscope, some specimens will present an appearance very much resembling condensed cellular tissue, such as that in the cuticle of leaves, being apparently made up of flattened irregular hexagonal cells; while others seem to consist of an entirely structureless amorphous mass; the latter sort of collodion is most suitable for microscopic purposes.

The final fixation of the picture by removal of the iodide of silver has a singular influence upon the result according to the method employed, and advantage may be taken of this in order to improve the effect according as it is desired to produce glass positives or negatives; for though all collodion pictures partake of *both* characters, one of the two *should* always be predominant.

Of course a negative is most useful, because the drawings can be multiplied upon paper almost ad infinitum, but for certain objects the amount of detail when *very delicate* is inconceivably better shown upon glass than upon paper. If then a negative picture be desired, it is best to develop with the pyrogallic acid solution and *fix* with a solution of hyposulphite of soda; but if, on the contrary, a positive picture is the desideratum, the effect will be infinitely better by fixing with a bath of the following, viz:

Cynanide of potassium	1½ drams
Water	1 pint.
Nitrate of silver	15 grains.

The cynanide to be dissolved in the water, and the crystals of nitrate of silver added, which immediately cause a curdy precipitate, but this is quickly redissolved, and the whole becomes quite translucent.

By this method of fixing, the *whites* are very much purer and brighter than when the hyposulphite is used, but the pictures do not answer so well for printing from. A still further intensity of the whites may be produced by *developing* the picture with a solution of the *proto-sulphate of iron* instead of the pyrogallic acid, and afeter-

wards fixing with the cyanide solution; there are, however, certain difficulties of manipulation to overcome. The solution is made as follows:

Proto-sulphate of iron in crystals... 1 oz.
Water..... by measure 10 oz.
Sulphuric acid..... " 1 oz.

This is best used by placing in a *glass* bath and *totally immersing* the plate, which should be withdrawn *the moment* the picture is perfectly developed, which will be in from 15 to 60 seconds, and it ought to be instantly plunged into a bath of plain water sufficiently copious to dilute the adherent moisture very considerably. The object of the bath being of glass, is in order to see the development of the picture, as every *second* it remains after it is fully produced, is to the detriment thereof, by causing a sort of fogginess to appear all over it.

When developed with the protosulphate of iron, the pictures may be exposed to direct day-light before the final fixing without injury, in fact with positive benefit according to Mr. Martin.

The causes most frequently operating to prevent the success of the process are, *first*, want of attention to the proper illumination; it is to this point more than any other that the utmost attention should be paid, and I feel confident that by well concerted measures to attain this requisite, we shall eventually be able to obtain pictures in a tithe of the time now necessary; in the second place failures more often occur from *over exposure* than from being too short a time; thirdly, want of allowance for difference of visual and chemical foci.

In conclusion, I would observe that some experiments upon the different *light producing* substances would in all probability well repay the trouble of testing their capabilities, as from certain hints thrown out by Professor Stokes, there appears to be a very considerable difference in the amount of actinic rays emitted by differing combustibles, and it seems not improbable that a well contrived *spirit lamp* may be found highly advantageous to use while taking the impression, although its light-giving properties are so defective. I hope shortly to be able to resume this subject.

OPTICS.*

PART IV.—*Continued.*

SECTION V.—PERSPECTIVE; DIVERGENCE OF RAYS OF LIGHT, AND CONVERGENCE OF THE OPTIC AXES.

THE distance and magnitude of objects as they appear to the eye, is the effect of their distinctness of outline and brightness of color; or, in other words owing to the intensity of light and shade.

All who are in the least familiar with the effects produced in a picture, by the use of colors, know that distant views must be represented by faint shades, and with indistinct out lines, and that the more these are deepened and heightened the nearer they appear to be brought to the eye, and the effect of distance is destroyed.

Light radiating from a centre becomes rapidly weaker as the distance from the centre increases. Thus, it is that the near objects of a landscape illuminated by the sun, give strong outlines and shadows and bright lights, and as the eye extends its range of vision, small objects are no longer visible, in consequence of the blending of colors and figures, until at last the outline of the distant mountain or sea fades away into the blue sky.

By the proper disposition of light and shades, and the management of colors, combined with the perspective, the painter is nable d to give those beautiful illustrations of nature so grateful to the man of taste and refinement, and as it requires a really

* Continued from page 273, Vol. 5 No. 5.

artistic eye, to arrive at a true knowledge of perspective drawing, we find that but few artists have been eminent in the art of landscape painting.

This art of fore-shortening, and of reducing the size of objects as they are more distant, is called linear perspective; that of the varying of color and the disposition of light and shade, the ærial perspective; the knowledge of the effect of light and shade in painting is called chiro-obscuro.

The effect of increased or diminished light in causing objects to appear remote or nearer must have been observed by every one. The clearer the atmosphere the more distant can objects be seen, and the brighter the light the nearer they appear. Objects also appear larger when seen through a misty atmosphere, owing to the diminished intensity of light which makes them appear more distant without diminishing the angle subtended by them; for to a man at forty rods distance who subtends the same angle as one at twenty rods, the same object must appear thrice as large. Thus in the fading light of day, or the first dawn of morning, objects seem magnified, and frequently diminutive forms assume those of the giant, filling the minds of the ignorant with superstitious dread and giving rise to stories of ghosts and monsters.

By the divergence of the rays of light we are assisted in judging of the distance and magnitude of objects. The eye having to make an effort to bend or repeat the rays of light proceeding from a body exactly in proportion as they are divergent, the same degree of effect cannot be produced by a painting as the rays of light, from every object depicted, have to proceed from a perfectly flat surface, whereas in nature they are reflected with different degrees of divergence according to the distance of of the reflecting medium

By the convergence of the optic axes is meant, that the axes of each eye is directed towards a point, or that the two axes converge when both eyes are looking towards the same point. The optic axes is the axes of the crystaline lens continued to the object at which we look. This imaginary axis back of the crystalline lens terminates at the middle of the retina, and this part is called the point of distinct vision. The inclination or convergence of the optic axes is greater for near objects than distant ones.

SECTION VI.—CAUSE OF SINGLE AND IMPERFECT VISION; POSITION OF THE IMPRESSION OF LIGHT UPON THE EYE.

The cause of single vision with two eyes is in consequence of the power of directing the axes of both eyes in one direction, or of their convergence, that, though an image is formed on each retina, the mind sees but a single object. This singleness of vision would take place if, instead of two, we had a much greater number of eyes, providing they could all direct their axes on the same point at the same moment. Images formed at the same time, of objects nearer or farther from the eye than the point where the axes meet, must appear double, because they are not formed at the point of distinct vision. A simple experiment will illustrate this. Hold the two fore fingers in a line from the eyes, so that one may be a little more distant than the other, by looking at the more distant the nearer will appear double, and by looking at the nearest the more distant will appear double.

When the crystaline lens has ceased to be homogeneous, either from disease or age, small images, such as the letters of a book, will be seen double. Double vision is sometimes apparent in persons who are dying, and the cant term "he sees double" applied to a drunken person is philosophically true as well as notoriously.

When both eyes do not seem to be directed to the object at which a person is looking he is said to be cross-eyed, a state of imperfect vision caused by a permanent lengthening of one of the lateral muscles of the ball of the eye, and a permanent shortening of its antagonist. Short-sightedness arises from a too great convexity of the crystaline lens, while long-sightedness, another imperfection of vision—is caused by want of sufficient convexity. In the former case the rays of light converged so much that they are brought to a focus, before reaching the retina; as in the latter, the rays of light are not converged sufficiently to bring them to a focus in the retina, but this focus, or the image of an object is formed at a point beyond. The first defect is corrected by the use of concave eye-glasses, and the last by those of con-

vex lens, which accomplish for the eye that labor, in bending the rays of light, which it is unable to perform itself.

The diminution of the impression of the objects upon the eye is contracted somewhat beyond the time at which any objec is actually visible, as illustrated by the fac that we are enabled to see some second after it has set below the horizon.

LIFE OF HENRY FUSELI.*

BY A. CUNNINGHAM.

His rising fame—his poetic feeling—his great knowledge—and his greater confidence—now induced Fuseli to commence an undertaking worthy of the highest genius—The Shakspeare Gallery. An accidental conversation at the table of the nephew of Alderman Boydell, started, it is said, the idea; and West, and Romney, and Hayley, and Fuseli shared in the honor. To the mind of the latter, indeed, such a scheme had been long present; it dawned on his fancy in Rome, even as he lay on his back marvelling in the sistine, and he saw in imagination a long and shadowy succession of pictures. Boydell supported the plan anxiously and effectually; on receiving £500 Reynolds entered, though with reluctance, into a scheme which consumed time and required much thought: but Fuseli had no rich commissions in the way—his heart was with the subject—in his own fancy he had already commenced the work, and the enthusiastic alderman found a more enthusiastic painter, who made no preliminary stipulations, but prepared his palette and began.

Shakspeare presented a whole world to the eye of art; and to embody the whole or any considerable portion of his visions, would command a combination of powers not to be hoped for. As might have been expected, Fuseli grappled with the wildest passages of the most imaginative plays; and he handled them with a kind of happy and vigorous extravagance, and startled common beholders.

The Tempest, the Midsummer Night's Dream, King Lear, and Hamlet, suggested the best of the eight Shakspearian pictures which he painted, and of these, that from Hamlet is certainly the noblest. It is, indeed, strangely wild and superhuman—if ever a spirit visited, it must have appeared to Fuseli. The majesty of buried Denmark is no vulgar ghost such as scares the belated rustic, but a sad and majestic shape with the port of a god: to imagine this required poetry, and in that our artist was never deficient. He had fine taste in matters of high import; he drew the boundary line between the terrible and the horrible, and he never passed it; the former he knew was allied to grandeur, the latter to deformity and disgust. An eminent metaphysician visited the gallery before the public exhibition; he saw the Hamlet's Ghost of Fuseli, and exclaimed, like Burn's rustic in Halloween, "Lord, preserve me!" He declared that it haunted him round the room.

The paintings which composed the Shakspeare Gallery were supplied by various hands; the plan was new, and novelty seldom fails to attract the multitude; but the multitude cannot be supposed to have much sympathy with works of a purely poetic order. There must be a strong infusion of the grosser realities of life to secure extensive popularity: any rustic can feel the merits of John Gilpin, but what can such a person comprehend of the Penserosa? Much as the Shakspeare

* Continued from page, 315, Vol. 5, No.

Gallery was praised, its excellence therefore was not felt by the people at large. The superiority of Fuseli in poetic conception over his compeers was however appreciated by the few on whose approbation alone he placed any value.

Those pictures were followed by others, all of a poetic order—Dante's Inferno suggested the Fransesca and Paola—Virgil supplied him with Dido, and from Sophocles he took Œdipus devoting his son, and Œdipus with his daughters. They were all marked with poetic freedom of thought and by more than poetic extravagance of action. They astonished many whom they could not please, and the name of Fuseli was spread over the island and heard of in foreign lands. He was elected an Associate of the Academy in 1788, and early in 1790 became an Academician—honors won by talent, without the slighest co-operation of intrigue..

In 1788 he had married Sophia Rawlins, a young woman whom he first, it is said, employed as a model, and on whom, finding that her vocation had neither corrupted her heart nor rendered her cold in affection, he thought it no dishonor to bestow his hand. She proved a kind and faithful wife, who soothed him in moments of irritation, loved him warmly, and worshipped his genius. Higher birth, and more delicate breeding might not have done more for him. She was handsome in youth, nor was she much faded when Opie painted her portrait. She was a woman of discretion, too, as well as of kindly feelings, and had what ladies call "trials." These must be described as they are interwoven closely with the character of her husband.

At the table of Johnson, the bookseller, Fuseli was a frequent guest, and in all conversations that passed there was lord of the ascendant. There he met his friend Armstrong, who praised him in the journals, Wolcot, whom he hated, and Mary Wolstonecraft, who at the first interview conferred upon him the honor of her love. The French Revolution was at that time giving hopes to the young and fears to the old. Fuseli was slightly smitten: but the cap of liberty itself seemed to have descended on the heart as well as the head of the lady; who conducted herself as if it were absurd to doubt that the new order of things had loosened all the old moral obligations, and that marriage was but one of the worn-out ceremonies displaced for ever by the new dispensation of Lepaux and his brethren. With such notions Mary Wolstonecraft cast bold eyes upon the Shakspeare of canvas. And he, instead of repelling, as they deserved, those ridiculous advances, forthwith, it seems, imagined himself possessed with the pure spirit of Platonic love—assumed the air of a sentimental Corydon—exhibited artificial raptures, and revived in imagination the fading fires of his youth. Yet Mrs. Fuseli appears to have had little serious cause for jealousy in this mutual attachment.

"Between the celebrated painter and herself," says the able writer who afterward married Mary Wolstonecraft, "there existed sentiments of genuine affection and friendship. She saw Mr. Fuseli frequently; he amused, delighted, and instructed her. As a painter, she could not but wish to see his works, and consequently to frequent his house; she visited him; her visits were returned. Notwithstanding the inequality of their years, Mary was not of a temper to live upon terms of so much intimacy with a man of merit and genius without loving him. The delight she enjoyed in his society she transferred by association to his person. She had now lived for upwards of thirty years in a state of celibacy and seclusion, and as her sensibilities were exquisitely acute she felt this kind of banishment from social charities more painfully than persons in general are like to feel it. The sentiments which Mr. Fuseli excited in her mind taught her the secret to which she was in a manner a stranger. Let it not, however, be imagined, that this was any other than the dictate of a refined sentiment, and the simple deduction of morality and reason. It happened in the present case that Mr. Fuseli was already married; and in visiting at his house his wife became the acquaintance of Mary. Mary did not disguise from herself how desirable it would have been that the man in whom she discovered qualities calling forth all the strength of her attachment, should have been equally free with herself. But she cheerfully submitted to the empire of circumstances."

The coquetting of a married man of fifty with a tender female philosopher of thirty-one can never be an agreeble subject of

contemplation; but it is probable that Fuseli felt no disposition to abandon his wife and his duty, however culpable he may have been in permitting the commencement of a flirtation, which the authoress of "the Rights of Woman" wished to find this termination. Mrs. Fuseli, meanwhile, regarded the philandering of these originals with no easy mind. One day, when she seemed to be in a towering passion, "Sophia, my love," said her sarcastic husband, "why don't you swear?—you don't know how much it would ease your mind."

To ease her own mind Mary Wolstonecraft, went to France in the year 1792. "One of her principal inducements to this step," says her husband and biographer, "related, I believe, to Mr. Fuseli. She had at first considered it as reasonable and judicious to cultivate what I may be permitted to call a Platonic affection for him, but she did not in the sequel find all the satisfaction in this plan which she had originally expected from it. It was in vain that she enjoyed much pleasure in his society and that she enjoyed it frequently. Her ardent imagination was continually conjuring up pictures of the happiness she would have found if fortune had favored their more intimate union. She felt herself formed for domestic affection, and all those tender charities which men of sensibility have always treated as the dearest bond of human society. General conversation and society could not satisfy her; she felt herself alone, as it were, in the great mass of her species, and she repined when she reflected that the best years of her life were spent in this comfortless solitude. These ideas made the cordial intercourse of Mr. Fuseli, which had at first been one of her greatest pleasures, a source of perpetual torment to her. She conceived it necessary to snap the chain of this association in her mind, and for this purpose determined to seek a new climate and mingle in different scenes." It would have been as well if Philosophy had kept her favorite daughter at home: but I shall lift the veil no farther—those who wish to follow out the story of this strange person may consult the pages of the gentleman who could not only admire, but marry her, and when she was no more, employ the pen which wrote Caleb Williams, in a detailed narrative of her crazy and vicious career.

Fuseli sought refuge from the active affection of Miss Wolstonecraft, in the absorbing studies of a new and gigantic undertaking—this was the Milton Gallery of Paintings commenced in 1790, completed in 1800, and containing in all forty-seven pictures from the works of the illustrious poet. To this high task the artist brought many high qualities; but when the doors of the Milton Gallery were opened to the world, it was seen that the genius of Fuseli was of a different order from that of Milton. To the severe serene majesty of the poet the intractable fancy of the painter had refused to bow; the awful grandeur of the realm of Perdition, and the sublime despair of its untameable Tenant, were too much for him—though he probably thought them too little. He could add fury to Moloch and malignancy to Beelzebub; but he fell below the character of terrible daring, enduring fortitude, and angelic splendor, which mark the arch-apostate of Milton. The most visible want is in that grave and majestic solemnity with which the poet has invested all that he has touched; and the chief excellencies to be set against this prevailing defect are, a certain aërial buoyancy, and a supernatural glow of color, which in some of these fill the imagination of the observer, and redeem in so far the reputation of Fuseli.

Of the paintings which compose this gallery, the Lazar House is most admired by men of vertû: The rising of Satan at the touch of Ithuriel's Spear is the favorite with the multitude. In the first he showed the fine taste and poetic tact, by omitting all which could excite disgust, and by giving a mental rather than a bodily image of the poet's meaning. In the latter, he shows us our first parents asleep in the lustre of innocence, and the discovered fiend starting up in his own likeness at the touch of the celestial spear. In the Lazar House he has handled a difficult subject with wonderful skill—in the other he has successfully shown the power which he possessed above all men of giving aërial motion to his supernatural creations. In the whole compass of art there is not a lovelier or more terrific scene than this—the naked and reposing loveliness of the new created

pair, and the startled and lowering looks of the audacious fiend as he rises "like a pyramid of fire," are blended into strange but perfect harmony.

"The Night-Hag" is another noble effort of imagination—it embodies these fine lines:

"Nor uglier follow the Night-hag, when called
In secret, riding through the air she comes,
Lured with the smell of infant blood, to dance
With Lapland witches, while the laboring moon
Eclipses at their charms."

In this picture Fuseli may almost be said to have equalled his author; yet it remained long on his hands. In 1808, when Mr. Knowles bought it, Fuseli looked earnestly at him, and said, "Young man, the picture you have purchased is one of my very best—yet no one has asked its price till now—it requires a poetic mind to feel and love such a work."

In a pecuniary point of view these pieces were unproductive; but the praise which the attempt and much of the execution obtained gratified the painter, nor was he unwilling to believe, that, like the poem which they embellished, they would have but an age of oblivion and many centuries of light. They were all visible, he said, to his fancy before he painted them. He pondered over the poet till he was fully possessed with the character of the scene; the figures which belonged to it appeared, as it were, in a vision; but he nevertheless complained of the spendor in which his fancy invested them, and declared that he could not paint up to his imagination. In comparing those splendid fictions with living nature, he was struck, he often said, with the lamentable deficiencies of the latter; yet conscious that by nature he must be tried and judged, he was heard to exclaim, in a fit of peevishness, "Damn Nature! she always puts me out." He had sometimes the curiosity to walk into the Milton Gallery after it was open to the public, and as it was never very crowded, he could look at his works without much fear of interruption. One day a visitor accosted him, mistaking him for the keeper. "Those paintings, sir, are from Paradise Lost, I hear, and Paradise Lost was written by Milton—I have never read the poem, but I shall read it now." "I would not advise you, sir," said the sarcastic artist, "*you* will find it an exceedingly tough job." In the original sketch of the guardian angels forsaking our first parents after the fall, they were represented rising on wings. He looked earnestly at his sketch, and exclaimed—for he generally thought aloud—"They *shall* rise without wings." He tried and succeeded.

During his labors in the Milton Gallery, he obtained the friendship of the poet Cowper. Homer, we have already said, was one of the gods whom Fuseli worshipped, while on our English poets, with the exception of Chaucer, Spenser, Shakspeare, and Milton, he looked with indifference or contempt. But when the author of the Task laid his hand on Homer, he rose suddenly in the estimation of Fuseli. To offer incense to his chief idol was a proof at once of belief and taste, and the learned artist volunteered to correct some passages where the translator, as he imagined, had erred in the sense, and to lend him light in other parts which the commentators had left obscure. That he was equal to all this there can be little doubt, since Cowper says so. "I am very sensibly obliged"—he thus writes to his bookseller—"by the remarks of Mr. Fuseli, and I beg that you will tell him so: they afford me opportunities of improvement which I shall not neglect. When he shall see the press copy he will be convinced of this, and will be convinced, likewise, that smart as he sometimes is, he spares me often when I have no mercy on myself."

In another letter the poet bestows higher praise on his critic. "My translation," he says, "fast as it proceeds, passes under the observation of a most accurate discerner of all blemishes. I know not whether I told you before or now tell you for the first time, that I am in the hands of a most extraordinary person. He is intimate with my bookseller and voluntarily offered his service. I was at first doubtful whether to accept it or not; but finding that my friends were not to be satisfied on any other terms, though myself a perfect stranger to the man and his qualifications, except as he was recommended by Johnson, I at length consented, and have since found reason to rejoice that I did. I called him an extraordinary person, and such he is; for he is not only correct in Homer and accurate in his knowledge of the Greek to a degree that entitles him to that appella-

tion, but though a foreigner, is a perfect master of our language and has exquisite taste in English poetry." Praise from a man so wise and conscientious as Cowper is entitled to every respect.

Examples of his critical sagacity and specimens of his nice perception of the meaning of Homer, might readily be quoted, for Cowper has affixed his initials to all the emendations which he adopted. There is strong poetic sensibility in many of his corrections; and the learned are agreed that sound scholarship pervades them all. "By his assistance," says Cowper, with his customary openness, "I have improved many passages,* supplied many oversights, and corrected many mistakes —such as will of course escape the most diligent and attentive labor in such a work. I ought to add, because it is the best assurance of his zeal and fidelity, that he does not toil for hire, nor will accept of any premium, but has entered upon the business merely for his amusement." In literature as well as in art, Fuseli was a thorough enthusiast—the love of mere *amusement* had no charms for him any more than the desire of gain—he was a slave to his love of fame and a slave to nothing else. His voluntary labors on Homer extended over a space of five years.

Though Fuseli was accustomed to express sovereign contempt for all that artists know by the name of commissions, he was prevailed upon by an offer of two hundred and fifty pounds to make drawings for a large edition of Shakspeare. Of this backsliding he never failed to speak with sorrow and scorn; he conceived commissions to be injurious to art, and to take away much of the inspiration which must or should be felt in the creation of works of true genius. His illustrations of Shakspeare, however, are not less clever than strange They are full of poetical feeling and more than poetical wildness. The observance of nature and the barbarism of dress were constantly in his way, and in his attempts to escape from the fetters of costume he cuts very curious capers. Orlando in the Forest is a striking example—he is demanding food for his famishing companion, his posture is ludicrously extravagant, and his dress fits so close, that were it not for the projecting selvages of his pantaloons, he would not appear to live in a land of civilization and tailors.

Nor was Fuseli much more sedate in the action of his designs when a graver work demanded his pencil—he furnished sketches for the Bible, published in sixpenny numbers, and joined Westall in illustrating a splendid edition of the New Testament. This too was a commission; and whatever resembled trade hurt the sensitive nature of Fuseli: for the excellence of the work take his own words. "*We* made pictures for the New Testament—there was only one good one among them all, and I suspect I painted it; but Westall may have the merit if he likes, for it was not much." The *cidevant* friend of Miss Wolstonecraft was no scoffer at revelation, nor would he suffer any one in his presence to call it in question; he was, in fact, too full of feeling not to reverence his Bible, and he was at all times difficult to please with modern attempts to imbody Scripture. When Northcote exhibited his Judgment of Solomon, Fuseli looked at it with a sarcastic smirk on his face. "How do you like my picture?" inquired Northcote. "Much," was the answer—"the action suits the word—Solomon holds out his fingers like a pair of open scissors at the child, and says, 'Cut it'—I like it much!" Northcote remembered this when Fuseli exhibited a picture representing Hercules drawing his arrow at Pluto. "How do you like my picture?" inquired Fuseli. "Much!" said Northcote—"it is clever, very clever, but he'll never hit him." "He shall hit him," exclaimed the other, and that speedily." Away ran Fuseli with his brush, and as he labored to give the arrow the true direction, was heard to mutter, "Hit him!—by Jupiter, but he shall hit him!"

* To give a single example—the second line in the following passage, describing Hector and his warriors, in the thirteenth Book of the Illiad, was supplied by Fuseli.

——"Spear crowded spear,
Shield, helmet, man, pressed helmet, man and shield:
The hairy crest of their resplendent casques
Kiss'd close at every nod."

GOSSIP.

In our last we promised to continue the subject of the various applications of photography to the arts and sciences, but two articles which we publish this month, have presented our concluding branch of the subject in so much better light than we possibly can do it, that we consider any further remarks from us at this time superfluous. The time, however, is near at hand when very important announcements in photographic discoveries are to be made to the daguerrean world. We have every reason to believe that during the next six months of our publication, we shall have many things to lay before our readers that will not only enhance the value of the journal to them, but set the whole fraternity in a blaze. Thus much we are permitted to say, but no more. The source from which the facts emanate leave us no room to doubt, that what is promised will be fulfilled, and we have only to beg our readers to have sufficient patience to await the *denouement* without over anxiety.

In the development of certain events that have cast their shadows before them we can predict for those skillful artists who have not only, so far, kept up with the improvements of the age, but have given dignity and respectability to the art of photography, a most triumphant finale to their successes and perseverance, while the mere dabsters and cobblers of the profession will hide their diminished head behind the clouds of abortions they have produced.

A brighter era is dawning upon the art—and it behooves every man and lady of respectability in its practice to be on the alert and meet the coming charge with a determination to make the art rise superior to its present condition. Mind we give you a warning voice and it will not be our fault if any of you are caught napping.

In the present number—the closing one of our fifth volume—we give a very interesting series of papers, none of which can fail of being intrinsically valuable to our readers, and we can assure them that our arrangements for the future are far more extensive, and will give greater weight to the influence of the journal than heretofore. We are determined that it shall stand at the head of photographic journalism, and all we ask of the artists of this country is a fair support of our exertions. Heretofore we think we have fully kept our promises in the conduct of the journal, and we look for that patronage which will enable us to continue its improvement. It is our intention further to increase its popularity by giving crystalotype illustrations in each number, and in order to make these the more interesting we wish to give copies of daguerreotypes, in the manner proposed for the Photographic album. In the selection of subjects we shall endeavor to be guided by the artistic taste displayed by the daguerreotypist, and by the pleasing nature of the subject. As daguerreotypes, to be copied by the crystalotype, must be perfectly clear and bold in outline, with proper gradations of light and shade, and soft in their tone, these illustrations will afford fair tests of the skill of the operator, and be the means of placing him in his true position, as an artist, before the public. In this respect they will be valuable

auxilliaries to their business success. A short descriptive sketch should accompany each daguerreotype.

— We see it stated in London papers that Mr. Talbot has discovered a method of engraving daguerreotype impressions on steel and printing from them. We shall publish his account, so far as he has made it public, in our next.

— We have received an excellent communication from Mr. Davie, of Utica; but being too late for this number, it will appear in our next.

— Our friend, R. M. Cole, of Peoria, Ill., is on a visit to the commercial emporium, but he did not bring us any specimens of his skill, which we regret, for his modesty and conversation convinces us that he could not have anything to fear in comparing his works with others. In our opinion he is an artist who is on the road to an elevated standard, and will arrive at it rapidly.

— The happy smile of Mr. Faris has also greeted us since our last, and a friend writes us from Cincinnati that he is constantly improving in his manipulations, but he is himself too modest to give us ocular demonstration of the fact.

— Mr. Fredericks, one of our most finished artists, has gone to Paris, and if he does not astonish the good people of that city, we are very much mistaken in their taste and judgment. They will also have an opportunity of seeing the admirably constructed apparatus of Mr. Anthony's establishment, and the perfection to which this branch of the art is brought in this country, as well as the superior cameras of C. C. Harrison. Mr. Fredericks takes with him, without doubt, the largest and most perfect object-glass ever constructed in any country, and which must prove to our Trans-Atlantic neighbors Mr. Harrison's superiority in the manufacture of this article.

— The following remarks are deserving of a place, in every paper and periodical throughout the land.

The Beautiful.—The disposition and capacity to distinguish and interest ourselves in the *true*, the *beautiful*, the *good*, and the *great*, were given us as a rule and law, continually to point out that election and conduct which is most becoming and most comfortable to our nature as moral agents; and nothing can be more certain, than that the interest we take in all the objects which surround us, is (cæteris paribus) in an exact proportion to the number and degree of those qualities, whether considered singly or combined.

As to *beauty*, prudence may and often does incline us to hesitate in our election of the greater or lesser degree of it, in proportion to the association of those degrees of beauty with other valuable or worthless qualities. These ideas of beauty, order, and goodness, have an intimate and almost immediate reference to each other in the mind; as absolute and complete satisfaction can only result from the perfect union of all these qualities in their highest degree. Therefore, it is that the pleasure which we receive in the contemplation of human nature (where beauty may be in a high degree united with those other qualities) is much greater than that which results from the contemplation of beauty in all the species of animal, vegetable, or other objects, where moral agency does not exist; and yet, such is the innate force or power of mere beauty, even in the lowest order of beings, that the particular perfections discoverable amongst quadrupeds, birds, fishes, trees, and flowers are sure to excite in us agreeable sensations, and incline us to a predilection and choice, of which those irrational beings appear utterly unconscious and insensible.

There is, then, a *beautiful* which is positive, essential, and independent of national or temporary institutions or opinions. This immutable and (if I may be allowed the expression) eternal beauty is widely different from those arbitrary, local, temporary notions of beauty which have a kind of occasional currency under the terms *ton*, *fashion*, or *mode*, and, like particular languages, are ever fluctuating and unstable, always different amongst the different na-

tions, and in the different ages of the same nation. This *false* beauty, which roots itself in affectation, has nothing to do with genuine legitimate art, and is no otherwise worth mention here, than to point it out as a quicksand, where many ingenious artists have been sunk for ever. It cannot therefore be too studiously avoided, for though a conformity with those temporary modes may gratify our employers, and the circle around them, and consequently be advantageous to what we may call our interest, yet it must lose us the admiration of men of sound judgment in all times; and all the future frivolities will have fashionable affectations and beauties of their own, quite different from those upon which our attention had been wasted.

Another source of confusion, though less general in its influence, arises from the sensuality which some people mix with their ideas of beauty. A high degree of the luscious, the languid—a simper, or leer—though associated with ordinary qualities, with them, outweigh all other perfections of body or mind. However, the judgment of those voluptuaries has but little weight with the bulk of mankind; like misers absorbed in one particular passion, they are regarded as blind and dead to every thing else. But the beautiful, which makes so essential a part in the design of a great artist, is, and must be, founded on the unalterable nature of things, and independent of all particular dispositions.

Men have differed more in their definition and maner of explaining beauty, than in their ideas of it. According to the definitions generally given, beauty consists of unity and gradual variety; or unity, variety, and harmony. This may be admitted as true, as far as it goes: but it is neither full nor satisfactory; for though it be certain that unity and variety are found in beautiful objects of all kinds,—in flowers, fruits, in the several species of animals as well as in human nature—yet it is equally certain that they are compounded differently, and though in any one of these species we may further increase the variety, or simplify the unity, yet we should not proportionably add to the beauty, but the contrary.—*Barry's Lectures.*

— We were surprised when we learned that the statue of De Witt Clinton, now on exhibition in the Park, was the work of H. K. Brown. Our first inspection of it caused us to attribute it to some uncultivated would be genius, who imagined he had accomplised a "great first work" and was desirous of astounding the people. But for H. K. Brown to turn from his hands a subject so glorious so imperfect in every respect is a matter of surprise most overwhelming to us. There is but one position from which to view it that gives the slightest pleasing result—very meagre it is true—but as it now stands a position to the south-east, so as to hide the deformities of a full front view and that of the hand and arm, in a measure relieves the mind of that unpleasant sensation otherwise inflicted by any other. We find that the press generally ccincides with our views on this subject; but we never expected to read such a piece of "*old fogyism,*" as the following conclusion to an article on this statue, in the columns of the Sunday Courier:—

"But, one of the greatest objections to the statue lies in the statue itself. Here is a large lump of brass, costing $15,000, having no intrinsic value whatever except as metal to be put to some serviceable use, which is to be erected in Greenwood Cemetery in honor of a man whose name is a household word, and whose history is a part of the history of the country. What conceivable honor can such an object be to the memory of such a man, or in what manner can it serve a purpose but to gratify an absurd desire on the part of those who contributed the money, to ape the customs of the old world.

When there was no other method of perpetuating the name and memory of a public benefactor, the erection of a statue representing the man, or an obelisk recounting his deeds, was necessary. But the invention of the art of printing put an end to statues, and all that have since been erected answer no better purpose than ornaments to parks and gardens. The idea of putting a brazen effigy of such a man as De Witt Clinton to ornament a public place, is a degradation and not an honor."

— Mr. S. B. Barnaby, of Dayton, O., has shown us a few specimens of his handiwork, which evince marked improvement, and should gain for him the confidence and patronage of his fellow townsmen and women. He is peculiarly happy in his delineations of the female form and of children, and he certainly has most excellent taste in position. The daguerreotypes shown us are among the most graceful we have ever seen.

— Mr. Romero, a young artist of decided ability, is on his way to San Francisco, with a complete apparatus for taking paper photographs.

— We see by the California papers, that our young friend S. Selleck has won for himself the decided approbation of the people of San Francisco. This was to be expected, for apart from his having received instructions in one of the best establishments of New York, his natural tastes and abilities marked him as a first class artist, and the development of his hands has fully carried out the genius of his mind. Mr. Johnson did well when he secured his aid, and acted wisely when he made him his partner.

The Quarterly Journal of Microscopical Science.—The March number of this valuable Journal comes to us illustrated by the aid of photography. This was undoubtedly the first attempt to illustrate a periodical with sun pictures, and a most successful one it is. The most minute portions of the probosis of a fly are as prominently brought out upon the paper, as if it were a building or a statue. The naturalist will now be indebted to photography for a source of mental culture, in the study of microscopical insects, from which he has heretofore been debarred. Who will say that photography has its limits !

Premium for the best Daguerreotype.—One year since I offered a reward of *five hundred dollars* for the greatest improvement that should be made in the Photographic art during the year 1851. No applications of any importance were made for it, probably in consequence of the natural modesty of inventors. Inasmuch, however, as the money has been offered, I consider that it no longer belongs to myself but to the Art. Therefore, with the advice and consent of Professor Renwick, Morse and Draper, who were appointed the judges in the matter, I have decided to invest the above amount in a MASSIVE SILVER PITCHER, of appropriate design, to be awarded as a prize for the best four daguerreotypes that shall be offered for competition previous to November 1st, 1853.

No competitor will be allowed to exhibit more than one Daguerreotype of each size.

The Daguerreotypes offered for competition must be on what is called the full, two-third, half and quarter sizes.

After the decision of the judges the pictures will again become the property of the artists who made them, and be returned as may be directed.

A description of the method of operating in the production of the picture offered, must accompany each picture, mentioning the brand of plate and the makers of the various chemicals used, as far as the operator may be able to tell.

In order that there may be no complaint as to partiality, the pictures must be sent anonymously, accompanied by a sealed package containing the name of the artist and the method of operating. The pictures and sealed envelopes will be marked with corresponding numbers in the order of their reception, and the latter will only be opened after the decision of the judges.

As this prize is offered as a test of the skill of manipulators and not the excellence of the camera, no instrument larger than the regular full size must be used. Daguerreotypes taken by the mammoth camera will be excluded.

Artists of all countries are invited to send pictures for competition.

All who intend to compete for the prize should send in their names as early as possible, as lists of the competitors will from time to time be published.

The pictures must be forwarded to my address, free of expense. E. Anthony.