

THE PREMIUM LENSES.

AT THE

GREAT PARIS EXHIBITION OF 1867,

A GOLD MEDAL FOR THE BEST TELESCOPES, AND

THE SILVER MEDAL

FOR THE

BEST PHOTOGRAPHIC LENSES,

WERE AWARDED TO

J. H. DALLMEYER.

Send for Catalogue, and observe the great variety of them, suited to all the varying necessities of Portraiture, Views, Groups, Copying, &c.

International Exhibition, 1862 — TWO PRIZE MEDALS.

Dublin International Exhibition, 1865 — PRIZE MEDAL.

Berlin International Exhibition, 1865 — PRIZE MEDAL.

Paris Exhibition, 1867 — GOLD AND SILVER MEDALS.

JURORS' REPORTS.

INTERNATIONAL EXHIBITION, 1862.—"Several quick-acting lenses with flat field and fine definition, especially adapted for card portraits, have been invented by Mr. Dallmeyer. The Medals have been awarded for the introduction of novelties as well as unsurpassed excellence of manufacture."

DUBLIN INTERNATIONAL EXHIBITION, 1865.—"We would especially direct attention to the unrivalled photographic lenses exhibited by Mr. J. H. Dallmeyer, and more particularly to a New Triple Meniscus, by which a landscape subtending at the camera as wide an angle as 70° can be photographed with extraordinary fidelity."

PARIS UNIVERSAL EXHIBITION, 1867.—PHOTOGRAPHIC LENSES.—"Since the Exhibition of 1862, great novelties and improvements have taken place in photographic lenses. In that Exhibition the chief improvement exhibited was a triple combination, for which a medal was awarded to J. H. Dallmeyer, this being the first practically useful lens with which to photograph buildings, copy maps, prints, etc., free from distortion, embracing angles of from 60° to 70° . Since that time other lenses have been introduced giving angles of upwards of 90° , and amongst these may be mentioned a wide angle single combination meniscus, composed of three cemented lenses, by Dallmeyer, and the 'Rectilinear' wide angle view lens by Dallmeyer. As regards the improvements introduced in lenses for portraiture, advances have been made in enabling the photographer to produce more artistic results. A lens has been introduced, a new form of combination, by Dallmeyer, which, whilst it possesses the advantages in respect to rapidity and definition of the old form of portrait lens, can, at the will of the operator, by the simple turn of a screw, be made to avoid extreme definition or hardness over one plane, and to distribute it over several planes. The specimens exhibited, produced by this lens, seems to demonstrate that a new power is placed in the hands of the artist."

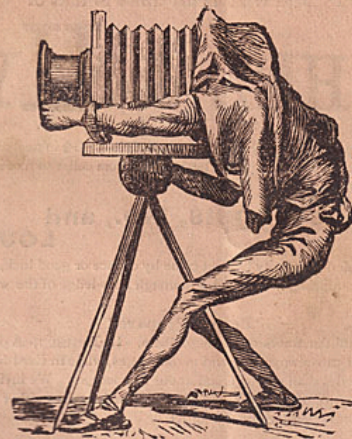
Vol. 7.

No. 3.

ANTHONY'S Photographic Bulletin



FOR MARCH, 1876.



New York:

F. & H. T. ANTHONY & Co.,

591 BROADWAY.



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ST. LOUIS, MO., and
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Better Prepared than ever before to supply all the wants of Photographers. In **Lenses, Apparatus and Chemicals**, the Best in the market can always be found in our stores, while in Card Stock and Frames we have a larger stock of fresh new styles than can be found at our competitors. We invite the Trade to avail themselves of the advantages we are able to offer, and to send their orders either to Cincinnati, St. Louis or Louisville, as may be most convenient, and don't forget

Gatchel & Hyatt.

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 WOOLLEN BACKGROUNDS.
 SCENERY BACKGROUNDS.

ST. LOUIS HEAD REST.
 SHYROCK'S ALBUMINATE.
 ROCK & FERRO VARNISH.

HEADQUARTERS FOR NOVELTIES.

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 VIA
CHAS. W.
STEVENS

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PHOTO. WAREHOUSE,
CHICAGO.

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 East will find a Welcome at the Great Central.

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CHAS. W. STEVENS.

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The Popular Philadelphia

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Carte and Picture Envelope.

IMPROVED.



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Carte and Picture Envelope.

PATENT

The Popular Philadelphia

All others an infringement.

They are well made, of excellent paper, of assorted tints, with Arch and Oval openings, and with End and Side flaps, neatly gilt and embossed, and hold one carte or one dozen.

The safest Envelope for mailing, the most beautiful to deliver Pictures in, and, when the flap is turned back (see cut), they form an Elegant Stand for the Picture.

In similar style we make the Cabinet, for plate 4 1-4 x 5 1-2, the Gem, for plate 2 1-2 x 3 1-2, the Victoria and Half Size Envelopes.

And in addition to the above we are now making Ferrotypes Envelopes of Cards and Wrappers, to accomodate those who wish a less expensive article.

These latter are of two kinds, viz., a card of size 2 1-2 x 4, with Nos. 2, 3, 4 and 5 Oval, and Nos. 9 and 10 Arch Top openings, and Bon Ton Card, 3 1-8 x 4 5-8, with Oval and Arch openings.

Both kinds are handsomely embossed and present a neat and attractive appearance, and we think will elicit the commendation of the trade generally.

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Northwestern Photographic Warehouse

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**APPARATUS, CHEMICALS,
GLASS, ALBUMENIZED PAPERS,
FRAMES, ALBUMS, VIEWS, ETC.**

Specialty.

Nitrate of Silver and Chloride of Gold made for photographic purposes. Gold and Silver Wastes refined. Returns made within two weeks. Satisfaction guaranteed.

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The most Complete and Popular Manual Extant.

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EIGHTH EDITION.

Profusely Illustrated with a large number of Wood Cuts.

Price, \$3 00.

The SILVER SUNBEAM is justly esteemed the most useful and complete of all the photographic manuals. Its 650 pages constitute an exhaustive encyclopedia of the art, and its explicitness and simplicity of style commend it alike to the student and the operator, the amateur and the professional. The Eighth edition contains many new and valuable formulae not included in the Seventh, and also a large number of woodcuts of photographic apparatus of later style and construction.

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The Paper every Photographer should try

IS

Morgan's Albumen Paper.

will give better satisfaction in warm weather, or any weather, than any other Paper. It is prepared by a process that gives it the valuable property of resisting the tendency to turn yellow soon after silvering. Its superiority is now acknowledged by a host of the leading Photographers.

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Albumenized Papers; Pure Chemicals; Dallmeyer, Voightlander, and other Tubes; Success Camera Boxes and Apparatus; Display Mats, all patterns; Cord and Tassels; New styles of Card Mounts, Card Board, &c.

EVERYTHING THE PHOTOGRAPHER NEEDS.

Morgan's Albumenized Paper,

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D. H. T. Collodion.

A. M. Collins, Son & Co.

MANUFACTURERS OF

Photographic Card Stock,

No. 18 S. Sixth St and No. 9 Decatur St.

PHILADELPHIA.

Plain White and Tinted Cards.

White and Tinted Cards, Plain and Enamelled, with Oval and Square Lines, and with Ornamented Borders.

Cards with Designs in Gilt, and India Tint and Gilt, Square and Oval Openings, for Cabinet size, to 14 x 17 Photographs.

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Thick Gilt Bevelled Edge Glacé Cards, from Card size to 12 x 15 5-8, Black and Rose Tint.

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Glacé Card Boxes. "The Easel" Glacé Card Box.

White and Tinted Paper Mats, Oval, Square and Arch Top Openings.

Ferrotypes Mats, Bon Ten Cards.

Fitzgibbon's Patent Adhesive Ferrotypes Mounts.

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Cartes de Visite, Victoria and Cabinet Mounts, Plain and Enamelled, White and Tinted, Plain or with Lines, Square and Round Corners.

Card, Victoria, Cabinet and Stereoscope Mounts with Gilded Edges, also with name and address printed by Lithography or Letter Press.

Slee Bro's Patent Prepared Cards. Price List furnished on application.

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SIZE, $4\frac{1}{2}$ x $7\frac{1}{2}$, SQUARE CORNERS.

White and Buff, Plain.

White and Buff, Gilt Borders; Buff with Red Borders.

Thin White and Rose Tint with Gilt Bevelled Edges.

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Black and Rose Tint, "J."

Cards 7 x 10, with Gilt Borders; opening, $4\frac{1}{2}$ x $7\frac{1}{2}$.

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Orders Promptly Filled

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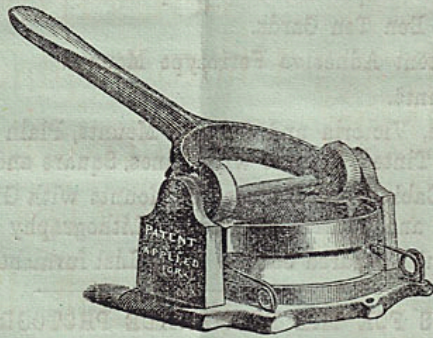
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Barker's Cameo Press.

PATENTED APRIL 25, 1873.

Card Size, with Oval and Arch Top Dies, \$2 75.

Cabinet Size, with Oval, Arch Top and Round Corner Dies, \$7 50.



Those possessing one of the above, Card Size, and desiring the Arch Top Die to use in the same, can have one sent by remitting seventy-five cents.

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No Copying Press is needed with any of the above.

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These brands of Albumenized Papers are made with the utmost possible care from selected materials and the purest albumen, and in consequence are uniform and of unsurpassed excellence. Though the latest introduction of home manufacture they have advanced to the front and are now accepted by the profession with unqualified satisfaction. The price may slightly exceed the imported article, but the quality will more than compensate for the difference in cost. The H. Extra Brilliant is especially recommended for the finest quality of work, having an exceedingly glossy surface.

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Photographic and Ferrotype

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First-class Stock

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Saving Time, Freight, Insurance,
Drayage, etc.

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SUCCESSOR TO GREEN & PARSONS.

The LARGEST and BEST assortment of

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North of New York.

Having the largest Photographic Establishment in Albany in connection with the Stock Department, can afford to sell goods cheaper than any other dealer north of New York City.

Remember the Number, 519 Broadway (Ground Floor).

Cross's Filtering and Pouring Bottle.

Having used these bottles for three years, I think it safe to say that they supply a *real* want in the Photographic Laboratory. The changes of weather, chemicals and subjects, that are constantly occurring and must be met by the practical photographer, tax his resources sufficiently, if not a little too much, at times,

for his reputation. Collodion may be right now and troublesome after a little use, as it thickens by evaporation and accumulates sediment constantly, resulting in excessive intensity and imperfect films, if not specks and pinholes. The efficacy of a change in the collodion, by thinning it, or mixing with another, either older or newer, thicker or thinner, I think all careful observers well understand. The bath of late is allowed more rest, and the collodion is "doctored" instead. Albumen requires constant clearing and removal of bubbles; varnish also needs frequent thinning and constant clearing. This bottle decants and filters incessantly, and is convenient as a flowing and receiving bottle. It requires no attention except to supply it from the stock-bottle. A filter will last for months, for collodion or varnish, and is easily replaced when necessary.

The most suitable material for filtering is a piece of canton flannel, one or more thicknesses. When not in use, the collodion vial should be filled with clean water, to prevent shrinkage of the stopper.

Its funnel orifices, *d* (2 1/8 inches in diameter), for receiving the excess from the plate, renders *waste* unnecessary. Its cap covers both the flowing and receiving orifices and is as easily operated as any cap or cork. It is simple, durable and cheap, it has a large sale, and gives universal satisfaction.

READ THE FOLLOWING:

"I have been using your patent filtering vials for some time, and take pleasure in giving my testimony to their great convenience and usefulness. I would not be without them."—A. H. Busey.

"So many practical photographers have expressed to us their approval of the article that we desire to endorse Mr. Cross's claims of its utility."—H. T. A.

For sale by Stock-dealers, and by

Price, Three dollars.

E. & H. T. ANTHONY & CO., Sole Agents.

Solar Printing.

CHAS. PAXSON & BRO.,

612 BROADWAY,

Send for Circular. NEW YORK.

CROSS' PATENT DIPPER.

This is made of the best seasoned hickory, with springs of pure Silver, for keeping the plate from sliding or jarring off when in the bath. The bath is not affected by being in contact with it. The dipper is so light that if, by accident, it should fall in the bath, no damage would ensue, as has been the case with the heavy Porcelain and Glass Dippers, so long in use. At present, two kinds are made, with and without silver clamps, from 8 1/4 to 20 inches long. Prices, 50 cents to \$1.75 each.

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Should never Forget that their Wants can be Supplied

Promptly and Cheaply by

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FINEST STOCK OF FRAMES, ALBUMS, ETC., IN THE WEST.

Texas Photographic Furnishing House,

ESTABLISHED IN 1856.

Keep a Full Supply of Fresh

Ferrotypes and Photographic Apparatus, Stock and Chemicals.

FROM THE MOST RELIABLE MANUFACTURERS AND IMPORTERS,

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IMPORTERS OF THE CELEBRATED BRANDS OF

GERMAN ALBUMEN PAPER, also GERMAN ARROWROOT (plain salted) PAPER,

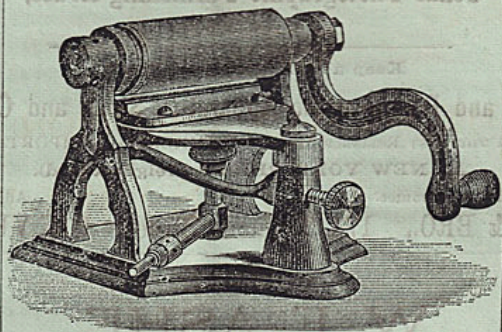
DEALERS IN

PHOTOGRAPHIC MATERIALS AND CHEMICALS,

Will mail to any address in the country, postpaid, on receipt of One Dollar, one dozen sheets of assorted Photograph Paper, each sheet being numbered for distinction.

THE ENTREKIN BURNISHER OR PLANISHER.

Manufactured under
an
Exclusive License
Granted by
W. E. Lockwood,
assignee of



J. F. Schuyler,
Whose patent bears
Date
February 24, 1863.
Reissued
June 1, 1875.

WITH THE FOLLOWING CLAIMS!

1. As an improvement in the art of planishing paper, submitting the paper to friction under pressure between a roughened feed roller and a planisher, substantially as described.
2. The combination, in a Paper Planishing Machine, of a Planisher with a draw filed roller, for controlling the paper while it is under pressure between the said roller and planisher, all substantially as set forth.

DECISION OF THE U. S. COURT SUSTAINING THE LOCKWOOD PATENT.

In the United States Circuit Court, held at Portland, Me., October 8, 1875, in the case of J. P. Bass vs. John M. Peck, the jury on questions submitted by the Court, rendered a verdict that Emile R. Weston was not the first and original inventor of the invention claimed by the said J. P. Bass, his assignor; John F. Schuyler had anticipated him by substantially the same invention, patented and assigned to W. E. Lockwood in 1863, reissued June 1, 1875.

CAUTION!

TO PHOTOGRAPHERS AND DEALERS IN PHOTOGRAPHIC MATERIALS:

Whatever doubts may have existed in the minds of Photographers as to the merits of the controversy between the undersigned, W. G. Entrekin, and the owners of the Weston Patent for Burnishers, will be set at rest by the perusal of the above claims and decision.

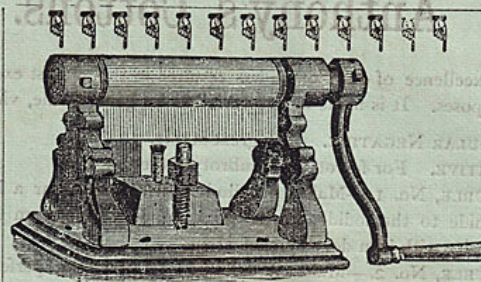
While the undersigned feels disposed to treat with liberality photographers who have been induced by threatening circulars to purchase the Weston and other machines that infringe the above claims, he will hold them responsible as infringers of the above-mentioned reissued patent of Wm. E. Lockwood in the use of said machines without first paying the small license fee which is now demanded.

On the other hand, the most prompt and determined legal measures will be taken against those infringers who deliberately, and after being thus duly cautioned, make, use, or sell burnishing machines in which is embodied the invention claimed in the said reissued patent.

W. G. ENTREKIN, Sole Licensee. }
Under Grant by W. E. Lockwood, Patentee. }

MANAYUNK, PENNA., MARCH 3, 1876.

CHAMPION.
CHAMPION.
CHAMPION.



CHAMPION.
CHAMPION.
CHAMPION.

THE WESTON CHAMPION

BURNISHER

PRICES:

6 inch, \$20; 9 inch, 30; 14 inch, \$40.

Patented July, 1864, to D. & B. Marshall; Sept. 10, 1872, March 3, 1874, Dec. 1874, April, 1875, and June, 1875, to Weston. The last is for flange, which was granted in interference against Entrekin.

Customers will be protected in the sale and use of my machines.

BANGOR, ME.

J. P. BASS.

What WILLIAM H. RULOFSON, President N. P. A., thinks of the *Weston Burnisher*, (and we will use his own words, by permission):

"For your information I will say that I do not believe you know what your machine is capable of, nor ever will till you see the one we are propelling by steam. We pile the pictures (about 2000 daily) up beside it, and in about an hour you could see to shave in every one of them. I take great pleasure in testifying to the surpassing excellence of the 'Weston Burnisher.' We find it superior to all others; its simplicity renders it easy to manipulate, and it produces the results sought with great rapidity and unerring certainty; to us it is indispensable, and so we consider it to all well-regulated photographic galleries.

I remain, very truly yours,

WM. H. RULOFSON."

Important to Photographers and Stock Dealers!

Weston's Original Patent, No. 131,320, Reissued with the following Claims, and dated Jan. 25, 1876.

"In a machine for burnishing photographic cards by friction under pressure against a non-rotating burnishing tool, I claim a broad metal plate, connected with the burnishing tool adapted and arranged to receive the flame of a lamp or gas jet, and conduct the heat thereof to said burnishing tool substantially as and for the purpose specified."

"In a machine for burnishing photographs by means of pressure and friction against a heated non-rotating burnishing tool, I claim a burnishing tool made of cast-iron."

"I also claim the process of burnishing and finishing a photographic picture by subjecting it to friction under pressure against a heated, non-rotating burnishing tool substantially as herein described."

"I also claim, as a new article of manufacture, a hot burnish-finished photograph substantially as described."

PHOTOGRAPHERS AND STOCK DEALERS

Who infringe the above claims will be called upon to pay a royalty. The above reissue has been granted by the Commissioner of patents after a full investigation into all the facts connected with Photographic Burnisher Patents. Parties selling or Photographers using machines that infringe the above claims will be prosecuted. It has been proved that Weston was the first to make burnish-finished photographs, and parties making them on any other machine than Weston's will involve themselves in litigation.

J. P. BASS.

Anthony's Cottons.

The uniform excellence of our Cotton has resulted in the almost exclusive use of it for photographic purposes. It is made in five varieties for general sale, viz:

ANTHONY'S REGULAR NEGATIVE. The great staple.

ANTHONY'S POSITIVE. For ferrotypes, ambrotypes, etc.

ANTHONY'S SOLUBLE, No. 1.—Makes a collodion which will bear a large proportion of bromide to the iodide, works quick and dries free from lines, giving perfect intensity with iron development alone.

ANTHONY'S SOLUBLE, No. 2.—Makes a collodion to flow with perfect smoothness, and free from lines. Works well for negatives with iron only, but especially recommended for ferrotypes, ambrotypes and transparent glass pictures.

ANTHONY'S SNOWY.—Very soluble, and desirable in consequence of freedom from acid and the rapidity of collodion made with it.

Anthony's Collodions.

The quality of one's collodion and its adaptation to specific uses, are important considerations to every photographer. If you do not succeed to your satisfaction with what you have, try a few bottles of Anthony's several sorts, and mark the difference. They can be had of any dealer. Let us enumerate them:

INSTANTANEOUS.—For infants and moving objects.

POSITIVE.—For ferrotypes.

NEGATIVE.—Good for all ordinary work.

NEW NEGATIVE.—Gives a rich, opaque film, and is good for either indoor or outdoor work.

DE'S REMBRANDT.—Softness with great detail.

NEWTON'S.—Good for either positives or negatives.

COPYING.—Gives a dense negative with clear lines.

PLAIN.—Without salts.

Let it be remembered that our collodions, like all our goods, are of full measure. We find that, on comparison, one pound of ours is in quantity two ounces more than the pound measurement of some other kinds, thus making ours the cheaper, at same nominal price, by one-seventh. In other words, a pound of our collodion, costing \$1 20, is cheaper by twelve cents than that of others at same price.

Anthony's Varnishes.

TINTED VARNISHES.—Just introduced, in cherry and orange, and at the same price as Flint.

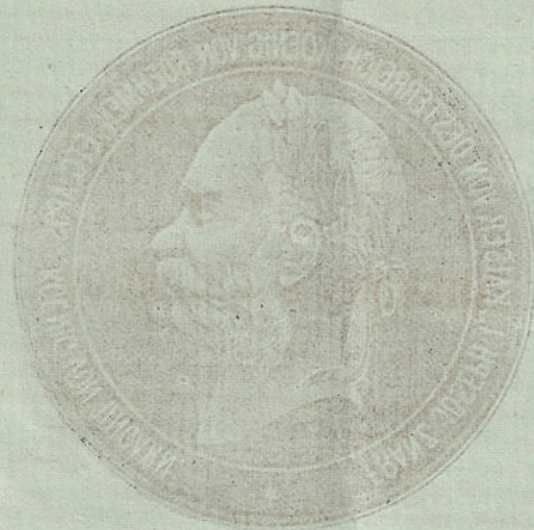
FLINT VARNISH.—The best for Negatives.

DIAMOND VARNISH.—The best for Positives.

SPECIAL VARNISH.—For those who use Bichloride Mercury.

MOUNTFORT'S VARNISH.—For those who don't use anything else.

RETOUCHING VARNISH.—No more grit—no more granular. This varnish, as clear and smooth as the glass itself, imparts an admirable retouching surface.



On Either Continent
Made to Any
HIGHEST AWARD
Being the
AT THE GREAT EXHIBITION
Adamantean Plates
Was Awarded to the
The Medal of Progress

The
Medal of Progress



Was Awarded to the

Adamantean Plates,

AT THE VIENNA EXPOSITION,

Being the

HIGHEST AWARD

Made to Any

On Either Continent.

(See the Vienna Photographische Correspondenz for Aug. 18, 1873.)

ANTHONY'S PHOTOGRAPHIC BULLETIN

FOR MARCH, 1876.

PUBLISHED BY E. & H. T. ANTHONY & CO., 591 BROADWAY, N. Y.

ADVERTISEMENTS should reach us before the 1st of the month, preceding issue, otherwise we cannot promise to publish them in the succeeding number. It is also necessary to notify us of any alteration or omission before the date above named, and to state for what period the advertisement should be continued—if for one, three, six or twelve months. Standing advertisements will be charged twenty per cent. less.

The rates for advertising are—

Page, for a single issue,	\$15
Half page, " "	8
Quarter page " "	5
Eighth page, " "	3
Special Notices, per line,	25 Cents.

TERMS FOR 1876.

THE subscription rate for 1876 is Two Dollars, though not necessarily payable in advance.

The new law requires prepayment of postage in all cases; therefore all persons who desire to receive the BULLETIN must advise us to that effect, or we cannot promise to send it. Subscribers will find a receipt for their remittances in a figure placed opposite the address, the figure 6 denoting 1876.

VOL. VII.—5

On the Silver Bath and Other Topics.

[FOR ANTHONY'S BULLETIN.]

It has long been a matter of conjecture on my part whether there is such a thing as an over-iodized bath. But in the face of so time-honored a dogma, and one supported by such eminent authority, I have never felt justified in roundly asserting, even to myself, that the negative bath *could* not be over-iodized and that the whole theory was a delusion. Nearly all authors on photography tell us to prepare the bath with a certain quantity of silver dissolved in a certain quantity of water; then to add to about seven-eighths of this solution as much iodide of potassium (or iodide of silver) as it will take up. When the solution is saturated, we are to add the remaining one-eighth. The object of this manoeuvre is to prevent the bath from being entirely saturated.

Now if this theory holds good, and if it is indeed essential that the bath should not be iodized up to saturation, it would follow that the immersion of half a dozen plates would be sufficient to spoil it, which is not the case; on the contrary, quite the reverse. For we all know that a bath may be prepared by simply making a solution of silver and water and leaving a plate in it all night. We also know that the solution greedily seizes the iodine of the collodion, and it is clear that the bath cannot be kept vasillating, so to speak, on the edge of saturation so long as one

keeps on putting plates in it. May we not, then, assume that there is no such a thing as an over-iodized bath, and that what is called over-iodizing is simply want of "l'argent" (impecuniosity, in fact), aggravated by too great an indulgence in alcoholic and ethereal stimulants?

And this reminds me of the singular idea people sometimes get, and the extraordinary causes to which they attribute photographic failures. A French photographer once told me that he attributed most of his failures to impure proto-sulphate of iron, and that he had taken the trouble to analyze several samples and had the greatest difficulty in finding one that was free from acid. It struck me as rather a profound thing at the time, but the next morning I said to him, "how do you prepare your developer?" and he gave me the usual formula. "Then what do you want your iron to be neutral for, if you mix it with a lot of acid before using?" and he said; "Oh!" and has since then ceased to bother Messrs. Poulenc & Wittman on the subject.

To return to our silver bath. Elaborate and learned articles have been written about the importance of temperature, and most ingenious methods have been described for keeping the bath packed in ice in summer and in hot water in winter, when, lo and behold! another man went to work and experimented and clearly demonstrated that a bath heated almost to boiling point and cooled little short of freezing gave exactly the same kind of negatives in both cases. Or, as the experimenter put it, "we are obliged to conclude that temperature has no perceptible effect on the working qualities of the silver bath." So warm your dark rooms, gentlemen, for your own comfort, but don't flatter yourselves you are benefitting your chemicals one particle.

How many of the readers of the BULLETIN will remember the painstaking way we used to make our collodion, and the painful anxiety lest a drop of water should get in more than was absolutely necessary for dissolving the sensitizer. Yet this morning I added half an ounce of water to a 16 ounce vial of collodion with the most enchanting result.

The idea is not mine. I wish it was. But it just shows how some of our most cherished and seemingly infallible notions are being uprooted. Why in one great and standard work on photography, we are told never to put collodion in a bottle which has to be cleaned for the purpose without first thoroughly drying the bottle in the *oven of a stove*.

To return once more to the silver bath. Few photographers are aware of the importance of keeping a little *strong* solution of nitrate of silver to add to the bath. When the day's work is done, count up and see how many plates you have dipped in the course of the day, and, according to that, add your silver solution. By using a little judgment and discretion you will soon learn to hit it off to a nicety, and it is amazing how long you can work your bath without filtering or touching it in any way. At least, that's how we do in South America; and I am thankful to say that I have found neither latitude nor longitude (any more than temperature,) to have any effect on the working qualities of the silver bath.

J. J. V. W.

MONTEVIDEO, S. A., JAN., 1876.

Buy a Vienna Curtain.

Bromide of Potassium in Albumenized Paper.

THE addition of a small proportion of a soluble bromide to the ordinary salting of albumenized paper, which is exciting considerable attention among transatlantic circles, is not new on this side of the ocean. Many years ago it was suggested to the writer by Mr. H. J. Newton, of New York, and the idea was acted upon by him. Having made some dry plate negatives which were rather hard on printing, he had some paper manufactured especially for him, and according to his instructions, containing bromide of potassium. He found that with this paper he could obtain harmonious prints from his hard negatives. We think that his experience in his respect is valuable, and might beneficially be acted upon by persons similarly situated.

—EDITOR.

Paper on Astronomical Photography.*

MR. PRESIDENT: There having been a wish expressed here that I should give to the Section an account of my experience in Astronomical Photography, I will this evening endeavor to comply with the request.

There is no difference between this class of photography and some others which are hereinafter mentioned, and were it not that my experience may be of some practical benefit in eliciting discussion, and, perhaps, experiment in that class of photography which requires sensitiveness combined with long exposures, I should not consider it of sufficient moment to merit attention. I have here an article which I will read, published by Mr. Rutherford, giving a brief description of his observatory, and detailing his experience in, and method of, correcting the instrument for astronomical photography:

Instrumental Corrections for Astronomical Photography.

BY LEWIS M. RUTHERFURD.

My present observatory is a circular brick building of twenty feet internal diameter, with a light revolving roof supported on twelve wheels which are fixed to the stone coping of the walls.

The opening, two feet wide, extends from side to side with simple shutters, which, when elevated on the weather side, serve to prevent the wind from blowing into the observatory and shaking the telescope. Opening from the west side of the Equatorial dome is a small transit apartment with computing room attached. This observatory is in the garden of the house where I reside. The transit is 189 feet N.W. from the Second Avenue, and 76.3 feet N.E. from Eleventh Street. It was erected in the summer and autumn of the year 1856. The equatorial, by Fitz, is a very substantial instrument, having circles divided on silver 18 and 20 inches in diameter.

The objective is of 11½ inches aperture,

* Read before the Photographic Section of the American Institute May 4th, 1875, and subsequently revised by Mr. D. C. Chapman.

and fourteen feet focal length, and was corrected for figure by myself after the methods and directions of Mr. Fitz. It is a fine glass, capable of showing any object which should be seen by a well corrected objective of those dimensions.

The observatory is low and therefore cannot reach any object near the horizon, but I prefer losing such observations to the tremors and expense of a high structure.

The transit room has been used on several occasions by the U. S. Coast Survey in their telegraphic operations for longitude. It is *02. 12m. 15.47s. E.* of Washington, and in latitude 40°, 43', 48''53; the latitude being the result of observations with the zenith telescope upon twenty-four pairs of stars by the observers of the Coast Survey.

During the winter of 1857-58, Messrs. Alvan Clark & Sons constructed, and in the spring attached to the equatorial, a driving clock of the highest merit. It has a remontoir escapement similar to that of Bond's spring governor.

Having seen with great interest the photographic experiments conducted at the observatory of Harvard College, I determined, as soon as the clock should be in working order, to prosecute the subject of celestial photography. After many experiments it was ascertained that the best photographic focus of the objective was about $\frac{1}{7}$ of an inch outside the visual focus. I continued making photographs of the moon and such stars as could be obtained, and although when compared with what had been done by others the results gave reason for satisfaction, yet in view of what was desirable and apparently attainable, astronomical photography with me was a failure. By reducing the aperture of the telescope to five inches for the full moon, I was enabled to produce negatives which would bear an enlargement to five inches or fifty diameters. An impression of a sixth magnitude star was never obtained, γ Virginis, then 3'' distant, was the closest pair the duplicity of which could be measured on the collodion plate. The ring of Saturn and the belts of Jupiter were plainly visible, but entirely unsatisfactory. An image of Jupiter could be obtained in from 5 to 10 seconds' ex-

posure, but the satellites failed to impress the plate in any length of time. This was due to the uncorrected condition of the objective which diffused the violet rays over a large space, so that in the case of the planet each point of the picture was influenced not only by the ray due to that point, but by the stray beams from adjoining portions of the object, and thus nearly the whole actinic force of the objective was gathered within the dimensions of the image. In the case of the satellite the lost rays were not replaced by the wanderers from any adjacent point.

During the summer of 1858 I combined my first stereograph of the moon, producing quite a satisfactory result with the low power of the stereoscope. I do not know when this was first done in England by Mr. De La Rue, but with me the idea was an original one.

My greatest success with an uncorrected objective was in the pictures of the sun taken with about one-fiftieth of a second exposure, with the aperture reduced to one inch. The negatives were four inches in diameter and exhibited the spots with reasonable sharpness the manifest difference in light between the center and the edge, and under favorable circumstances the faculae. Some of the negatives verify the observation of M. Dawes, that the faculae are elevations.

In June, 1860, the sun's disk was remarkably rich in spots, and I combined the pictures of two days to produce a stereograph, but the result was a failure and did not give the impression of a sphere, but presented the appearance of a flat uniform disk spanned by a spherical net-work which seemed entirely detached from the disk. This is attributable to a want of sufficient detail on the surface of the sun.

During the year 1859 and for a long time I worked with combinations of lenses to be inserted in the tube between the objective and the plate with the view of correcting the photographic ray. This attempt succeeded well so far as the center of the field was concerned, but it was impossible to produce a good correction over a space equal to the area of the image of the moon, without using a corrector of inconvenient size.

In 1860 I prepared a telescope with camera and instantaneous apparatus mounted equatorially to send by the U. S. Coast Survey Expedition to Labrador for the observation of the eclipse. The objective in this case was a fine one by Alvan Clark, of 4½ inches aperture. A ring was placed between the crown and flint lenses of such a width that the best visual and photographic foci were united. For this purpose it was necessary to shorten the combined focus about one-twentieth of its former value.

The pictures of the sun taken with this instrument were better than those made by my large telescope, in which no attempt had been made to correct the photographic rays.

Being unable to accompany the expedition, I made a series of pictures of the eclipse at home, upon which are seen the nuclei and penumbrae of the spots, the gradation of light of the sun's disk, and the serrated edge of the moon projected upon the sun. They show, however, none of the fogging of the moon's surface, commented upon by other observers, nor a greater intensity of light at the points of contact between the sun and the moon; both these results are, when they occur, due, in my opinion, to photographic or optical causes, and not to any true astronomical phenomena of that nature.

On examining the first negative of the eclipse I was struck by the difference of sharpness between the edge of the sun and that of the moon projected upon its disk. At first I was inclined to think that it was caused by a falling off in definition near the edge of the eye-piece used. In the next picture the edge of the sun was placed near the center of the field and the moon removed to a remote part of the plate, yet still the result was the same; the sun's edge was soft and indefinite while that of the moon was hard and sharp, showing that the light from the two objects comes to us under different conditions; in one case traversing the sun's at a sphere, in the other unaffected by this disturbing cause.

In the autumn of 1861 I began to experiment with a reflecting telescope with silvered mirror, which recommended itself both by the simplicity and ease of its construction and the entire freedom from dispersion. One

was mounted of thirteen inches aperture and eight feet focus, of the Cassegranean form. It was ground and approximately figured by Mr. Fitz, and in its frame, as strapped to my large tube and carried by the equatorial clock, weighed less than fifteen pounds. Many modes were tried of silvering, but the best results were obtained by Liebig's process, wherein the silver is deposited from an ammonia nitrate solution by sugar of milk. After three months' trial I abandoned this instrument as unfit for use in my observatory. First, the tremors of the city, quite imperceptible in the achromatic, were, by the double reflection, increased about 36 times, an insurmountable obstacle to good work. Secondly, the silver deposit is so easily attacked, both by moisture and the gases which abound in the city, as to make it necessary to re-silver the speculum at least every ten days, a labor not to be contemplated with equanimity. Dr. Draper has found the silver surface very much more durable in the dry, pure air of the country. I regard the Cassegranean form as the best adapted to lunar photography, since the dimensions of the image can be varied at will, as circumstances dictate, by simply changing the small mirror, a number of which might be kept at hand.

Having thus failed in astronomical photography with an ordinary achromatic, with a correcting lens and with a reflector, I began, in the autumn of 1863, the construction of an objective, to be corrected solely with reference to the photographic rays.

In a former communication to the journal, Jan. 1863, I drew attention to the peculiar adaptation of the spectroscopical as a means of examining the achromatic condition of an objective, and since it was principally by the aid of this instrument that I have been enabled to procure a fine photographic correction, I may be pardoned for touching again upon this application.

The image of a star at the focus of a perfectly corrected objective would be a point, the apex of all conceivable cones having the object glass, or parts of it, as the bases. This point falling upon a prism would be converted in a line red at one end and violet at the other with the intermediate colors in their

proper places. If, however, the different colored rays are not all brought to the same focus, the spectrum will no longer be a line, but in the uncorrected colors will be expanded to a brush the width of which will be the diameter of the cone where intercepted by the prism. It will thus be seen that a simple glance at a star spectrum will indicate at once what parts of the spectrum are bounded by parallel lines and consequently converged to one focal point, and what parts do not conform to this condition, and also the amount of divergence.

On applying this test I found that an objective of flint and crown in which the visual was united with the photographic focus (in other words, where the instrument could be focalized on a plate of ground glass by the eye, as in ordinary cameras, and in the heliographs constructed by Dallmeyer for the Kew Observatory and for the Russian Government), is a mere compromise to convenience in which both the visual and actinic qualities are sacrificed.

In order to bring the actinic portions of the spectrum between parallel borders, i. e., to one focus, it is necessary that a given crown lens should be combined with a flint which will produce a combined focal length about one-tenth shorter than would be required to satisfy the conditions of achromatism for the eye, and in this condition the objective is entirely worthless for vision.

Having obtained the achromatic correction, I had a most delicate task to produce the correction for figure, since the judgment of the eye was useless unless entirely protected from the influence of all but the actinic rays. A cell of glass inclosing a sufficient thickness of the cupro-sulphate of ammonia, held between the eye and the eye-piece, enabled me to work for coarse corrections upon α Lyrae and Sirius, but so darkened the expanded disk of a star in and out of focus that all the final corrections were made upon tests by photography, which gave permanent record of all the irregularities of surface to be combated. Still, however, the process was long and tedious, dependent upon but three stars as tests, and they too often obscured by bad weather. My mode of cor-

rection was almost entirely of a local nature, such as practiced by the late Mr. Fitz and Mr. Clark for many years.

This objective was completed about the first of December last; it has the same aperture, $11\frac{1}{2}$ inches, as the achromatic, with a few inches shorter focal length, and can be substituted for it in the tube with great ease.

The corrections of this objective are such that I think it capable of picturing any object as seen, provided there be sufficient light and no atmospheric obstacles.

As respects the light, I have obtained images of stars designated by Smythe as of the $8\frac{1}{2}$ magnitude, and other stars on the same plate of full a magnitude lower. In the cluster *Prosepe*, within the space of one degree square twenty-three stars are taken, many of which are of the ninth magnitude, with an exposure of three minutes. An exposure of one second gives a strong impression of *Castor*, and the smaller star is quite visible with half a second. With the achromatic objective it was necessary to expose *Castor* ten seconds to obtain a satisfactory result.

The great obstacle which prevents the results of photography from realizing the achievements of vision is atmospheric disturbance. In looking at an object the impression is formed from the revelations of the best moments, and it is often the case that the eye can clearly detect the duplicity of a star, although the whole object is dancing and oscillating over a space greater than its distance. The photograph possesses no such power of accommodation, and the image is a mean of all the conditions during exposure. It is, therefore, only on rare nights in our climate that the picture will approach the revelations of the eye.

Since the completion of the photographic objective, but one night has occurred (the 6th of March), with a fine atmosphere, and on that occasion the instrument was occupied with the moon; so that as yet I have not tested its powers upon the close double stars, $2''$ being the nearest pair it has been tried upon. This distance is quite manageable provided the stars are of nearly equal magnitude. The power to obtain images of the

9th magnitude stars with so moderate an aperture promises to develop and increase the application of photography to the mapping of the sidereal heavens, and in some measure to realize the hopes which have so long been deferred and disappointed.

It would not be difficult to arrange a camera box capable of exposing a surface sufficient to obtain a map of two degrees square, and with instruments of large aperture we may hope to reach much smaller stars than I have yet taken. There is also every probability that the chemistry of photography will be very much improved, and more sensitive methods devised.

On the 6th of March, the negatives of the moon were remarkably fine, being superior in sharpness to any I have yet seen. The exposure for that phase, three days after the first quarter, is from two to three seconds, and for the full moon about one-quarter of a second.

The success of this telescopic objective has encouraged me to hope that an almost equal improvement may be made for photography in the microscope, which instrument is more favorably situated for definition than the telescope, since it is independent of atmospheric conditions. Its achromatic status is easily examined by the spectroscope, using as a star the solar image reflected from a minute globule of mercury. Mr. Wales is now constructing for me a one-tenth objective, which, upon his new plan is to be provided with a tube so arranged as to admit of the removal of the rear combination, and, in place of the one ordinarily used, one is to be substituted at will which shall bring to one focus the actinic rays.—*Am. Jour. Science.*

In the place of the $11\frac{1}{2}$ inch objective above spoken of Mr. R. has constructed one of 13 inch aperture upon a different plan. It has the usual visual object glass, and to make the photographic corrections, a meniscus lens of flint glass of the proper curves to produce the necessary corrections is placed in front of the objective.

Photography, as applied to solar and lunar work, is very important, but the principle advantage derived from its application to as-

tronomy is in star work, as it greatly facilitates determining the direction and amount of their motion.

All other methods practiced require experienced observers and fair nights, one demanding large salaries, the other occurring whenever the conditions are favorable, and that being less than one-half of the time. By the application of photography a cheaper class of labor can be employed. A photographer may be obtained for a few hours on fair nights, during which time he can make negatives enough of groups to keep one person employed for months in measuring, which can be done in the daylight by operatives, at small salaries, and without loss of time to the principal.

There was a question, however, as to whether the photographs could be relied upon for measures of precision. Does the film, during the manipulation and drying after exposure, remain absolutely fixed in its position?

This subject engaged Mr. Rutherford's serious attention for some time. The photographing and measuring of stars of known distances apart convinced him that the film was perfectly reliable. Afterward, however, there being some doubt thrown upon the subject by Mr. Paschen, Mr. Rutherford instituted another series of trials—which I executed—to ascertain if possible the facts in the case, the results of which were published in the *American Journal of Science and Arts*, December, 1872.

These trials satisfied us that, with properly albumenized plates, the film can be relied upon for work requiring the greatest precision.

For this class of work the albumenizing is a matter of the greatest importance, for if the albumen is not in the proper condition, it not only does not hold the film but is a fruitful source of trouble to the bath. My experience has led me to the conclusion that if we could get an albumen solution in which the albumen would be entirely coagulated by a forty-grain silver bath, then the albumen would do no harm. But as only a portion of the albumen is coagulated, there remains a part which is soluble in the silver solution.

This is easily demonstrated by dipping three or four albumenized plates, without being coated with collodion, into a perfectly clear silver bath; then standing the latter in the sunlight for awhile. The above is true with albumen in its best fresh condition, and it is still worse when the albumen has been kept for a time, no matter under what circumstances. Everything which has the property of keeping the albumen makes it more deleterious to the silver, for there is nothing that I am acquainted with, which is used, that does not have either the tendency to coagulate or dissolve it. If we use that which has a tendency to coagulate in quantities sufficient to keep it, a portion will be coagulated, and it is that part which is most desirable to retain; for, the greater the quantity which will be coagulated in proportion to that which will not be, the better. If we use ammonia, or the like, which has a tendency to dissolve the albumen, then in time, in proportion to the amount of ammonia used, the albumen will be changed to a condition in which the silver will not coagulate it. In this condition it is worse than nothing. A small amount of ammonia may be used (say one drop to the ounce of albumen solution) to keep it for a short time, where a person is using only small quantities, but its best condition is when freshly made and alone; then one ounce of albumen to twenty of water is sufficient. My practice, in albumenizing plates, is to wash one and set it up between two nails, with one corner down, while I wash another and set it up in like manner. The first is then albumenized and set upon clean blotting-paper, on one corner, with the albumen side toward the wall. The third plate is then washed and set up to drain, and the second is albumenized. By this method the albumen is not diluted, as the surplus water drains off, leaving the surface wet enough to allow the albumen to flow readily; at the same time the edges of the plate have dried sufficiently to prevent the albumen from flowing over on the back. The albumen may be used several times if not kept too long.

Astronomical photography may be divided into two classes: One is very much like tak-

ing the pictures of children, that is, it requires to be done in the shortest possible space of time, as the object is continually moving. The other is like photographing the interior of buildings and dark objects, where the light is not sufficient to produce the desired effect without giving a very long exposure. The first class is solar and lunar photography. It may be asked, does not the image of the sun and moon stand still, with the exception of a steady motion due to the revolution of the earth on its axis? I will say that they do not, and that is where one great difficulty lies. The steady motion due to the revolution of the earth is overcome by the driving clock which keeps the telescope moving with the object; but the chief trouble in this class of work arises from the continued vibratory motion of our atmosphere, still, if those movements were only lateral, then an instantaneous exposure, such as we are enabled to give the sun (which is the one-hundredth part of a second), would give us the desired sharpness. But there are atmospheric waves of unequal density passing between the object and telescope, which have the effect of lengthening and shortening its focus, so that the image is continually moving in and out of focus, as well as in every other direction. It is this changing of focus which causes the trouble in solar work, for there is but one chance in many that the object will be in focus when the picture is taken.

In lunar photography we are even less fortunate, for the time of exposure required to make a negative of the moon varies from one-half second at full, to several seconds at the partial phases. There being no such thing as instantaneous exposure in this work, to assist in overcoming these atmospheric difficulties, our only remedy is to wait and watch; and, in case the conditions are not favorable, we are not compelled to make a blind sitting for fear of losing the customer, and then say, "Please, call and see a proof in a few days," for she is a regular customer; and if we get two or three good nights in a year in which we can make good moon pictures, we think ourselves very fortunate. But with stellar work, the conditions are not

the same in all respects, for we do not demand that degree of stillness in the atmosphere, as there is no detail to be obtained, as with the sun and moon; still we require the maximum amount of sensitiveness in the chemicals, with additional demands on their good behavior under very trying circumstances. It is now necessary that they shall be in such a condition as to admit of the sensitive film being kept from twenty to thirty minutes, and longer if possible, and when developed it shall be free from markings of all descriptions. The stars, not having the same amount of motion either in rate or direction, it is desirable to get as many as possible in each group, for, by so doing, we obtain a greater amount of information with the same labor. Even with the longest exposure which can be given, and the utmost sensitiveness of the chemicals, assisted by a supplementary exposure to light (which increases the sensitiveness about one-third), there still remain vast numbers of stars beyond the reach of photography in its present state. To show the increase of sensitiveness by a supplementary exposure to light, I have here the original plate which revealed to Mr. Rutherford that fact in March, 1866. A candle was standing so that its light fell upon one side of this plate, and you will see a very great difference in the sensitiveness, for the stars which make no trails on the unexposed portion make strong trails on that part which was exposed to the light. These trails are lines made by the stars while the telescope is standing still, the same as the streaks made by bright objects passing in front of the camera when taking views. The advantage derived by this treatment was so decided that it has been in constant use in this class of work ever since. By it we are enabled to get stars smaller by at least one and one-half magnitude.

As all of our work requires to be done in the shortest possible time, my first experiments were to get a collodion which should combine the greatest amount of sensitiveness with stability, if possible, as it would sometimes be a week or more between the working nights. The advantage of having a collodion in good working order at all times is

of great importance. In order to make reliable tests for sensitiveness it is necessary to have some means by which to compare the results with considerable nicety. To do this I constructed a photometer, as follows: Taking a piece of wood about two feet in length and one inch in height, I fixed a gas-burner to one end and about six inches in front; then I placed a row of cylinders, covered with white paper, on the top of this piece of wood, so that each succeeding cylinder ranged one inch farther from the light. And as the illumination received by each diminishes in proportion to the square of the distance the cylinders are from the light, negatives made of these will very readily show the relative sensitiveness of the chemicals employed, if the light and time of exposure are so reduced that in no case shall all of the cylinders make an impression on the film.

I have made nearly one hundred trials for sensitiveness, and have kept a record of how each was made, and of its qualities. The most important element for sensitiveness is in the cotton, and the relative proportions and purity of the alcohol and ether of which the collodion is made. That cotton which burns quickest and dissolves rather slowly, leaving a small amount of sediment, and making a rich creamy film, when fully sensitized and salted with about four and a half grains of cotton to the ounce of collodion, is the most sensitive. Cotton which makes tough, horny, and nearly transparent films work slowly, but can be improved by using an excess of alcohol. The ether is often acid; this is also very detrimental to sensitiveness, and has at times given me considerable trouble. I have never had any difficulty with Atwood's alcohol. The albumen should be used as thin as possible where sensitiveness is required, as that also has a retarding influence. With regard to the salts employed I have not found any material difference in sensitiveness, but each has peculiarities of its own in other respects. There is one point in the age of an ammonium collodion where it is equal to any other, but that period is of short duration. A combination of magnesium and cadmium gave good results, but there was not difference enough to make it of any advantage to

use. Of all the different kinds of salts there are none better than cadmium for my work; it has sensitiveness equal to any, with stability combined, and may be used as soon as made.

The amount of salting I use is six grains of iodide and two of bromide to the ounce of collodion, with sufficient tincture of iodine to give it an orange color.

The next question was, whether very sensitive chemicals would stand long exposures. In testing this question I found that it required a little more acid in the bath for long than for short exposures, which diminished the sensitiveness slightly. The chief difficulty I had to contend with in long exposures was "matt silver." I have examined every work on photography within my reach, and do not find one that gives either the cause of or cure for this trouble. I was annoyed with it more or less until one summer I had what may be called an epidemic. One set of chemicals was extremely rich in producing it.

I did not seek to get rid of, but rather encouraged it, in order if possible to find its cause. My first experiments were to produce the same effect at will; this I considered would be the key to both cause and cure, and so it was. The results of my experiments proved that by adding some organic matter, like gelatine, to an acid bath, I could produce beautiful specimens. It proved to be a deposit produced by the action of the atmosphere on the compound of acid, silver, and organic matter. It requires all four to produce it; and as I was at a loss to see how I could get along without the atmosphere or silver, I was obliged to turn my attention to the other partners in the transaction. Being obliged, as I am, to use albumenized plates which constantly add organic matter, it is impossible to keep the silver solution free from it for any length of time.

I find also that collodion made from certain kinds of cotton furnishes the bath with organic matter. It appears that the action of the acid in the manufacture of the pyroxylene, renders a portion of the collodion soluble in water, which washes out into the silver solution. In precipitating the cotton by water, out of different samples of collodion,

I found that some lost more in weight than others. I then evaporated some of the water, and found quite a quantity of organic matter had been washed from the collodion. I wish some further experiments might be made in this direction. It is a well-known fact that neutral silver will precipitate the organic matter in strong sunlight; it will also do it in the dark, but not so rapidly. The nearer neutral the silver solution is, the less organic matter it will hold in suspension. I find that a neutral solution works well for short exposures, when the plate has not been allowed to remain in it over three or four minutes, and is developed immediately after. But in long exposures the neutral silver will fog, and so will the acid solution, if there is organic matter present, but these two classes of fog are of an entirely different character. The first or alkaline fog is entirely under the film, and cannot be wiped off without disturbing it. The other or acid fog is wholly on the surface, and may be wiped off without breaking the film. This acid fog is what makes "matt silver," when it gets thick enough to produce streaks, which adhere to the film during long exposures; the larger the amount of acid in the silver, the greater the capacity for holding organic matter, and the thicker will be the surface fog with long exposures. With an acid solution there is little or no precipitate of organic matter, but if the silver is nearly or quite neutral, then the dipper and sides of the bath will be covered with a dark deposit of organic matter. So if the solution is not over-worked it will keep itself clear from the "matt silver" trouble, if the scum which floats on the top of it be frequently removed. One test I have for acidity, which is a very good one, is to touch the surface of the collodion film with my finger in several places before dipping it in the bath (using a finger which has no chemicals on it), and when the plate is developed, if the places touched do not show any darkening more than other parts, there is too much acid present. I then carefully add soda or ammonia to the bath, until there is a slight darkening of the spot touched; sometimes it is a dark ring on the edge of the spot, at other times there are

dark spots representing the markings in the cuticle, this depending upon the amount of pressure and quantity of organic matter left on the film (if it is too alkaline the spot touched will be very black all over or nearly so). This is, as far as I know, a new and very delicate manner of testing the right amount of acid in the bath.

In conclusion, I find the best way to keep clear of the above trouble is to keep the silver solution as nearly neutral as possible, and steer clear of the alkaline fog; filter often, and do not let the plate remain in the bath over three or four minutes; then draw out quickly. By so doing, the scum is prevented from adhering to the film, by the solution which is in contact with the plate rising and flowing outward at the surface, leaving nothing but clear solution on the plate, and if this is not surcharged with organic matter there will be no surface deposit. If my film has a fog on the surface which can be wiped off, I add to the bath a dilute solution of ammonia or soda, and when the proper quantity has been added it will work beautifully clear and quick, if there is nothing in it to produce fog but organic matter.

Since the foregoing article was written I have substituted chloroform for liquid ammonia, as a preservative of the albumen, and find it decidedly preferable, there being no tendency to dissolve the latter.

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An Enlarging Process Producing Fine Pictures.

BY CHARLES WALDACK.

A PHOTOGRAPHER is indisposed to make direct negatives larger than cabinet or 4-4 size. His reason may be that the use of five or six inch lenses demands a too long exposure; that the results obtained are not as true as those obtained with smaller lenses; that to give several sittings using large plates is too expensive a business; or he may not feel like making the outlay necessary to procure a large lens and suitable camera. He makes good carte and cabinet work, using for the purpose (say) a 2B or 3B lens. He de-

sires to make enlargements up to 14 by 17 size from carte or cabinet negatives, technically perfect, or nearly so, without having to do more retouching than would be necessary on large negatives made direct in the camera. What process of enlarging would be the most suitable?

I propose to go over the different processes published, and to examine their capabilities to answer these requirements of the photographer. Direct printing in the solar camera is out of the question. It can only be done about six months in the year; it requires negatives so thin that a small print cannot be made to submit for approval; besides, making two kinds of negatives—one kind thin for enlarging, and the other suitable for direct printing—is troublesome, and complicates the work of the operator. Again, small negatives for enlarging cannot be retouched. Some of these difficulties might be overcome by using a developing process, but it requires a good deal of practice to make suitable prints. On the other hand, if the photographer should wish to use a carbon process, solar camera printing, if not impossible, is exceedingly difficult, as the progress of the printing cannot be watched. A process will thus have to be used which can be worked in all kinds of weather to produce a large negative which will allow of the necessary retouching to remove technical defects, and spots, and freckles, soften too strongly marked wrinkles, etc. The object is attained by making first a transparent positive, and from this a negative.

The first process of which we will make mention is to make a transparency in the camera, by the wet collodion process, of the same size as, or a little larger than, the original negative, and from this to make a large negative in a similar way. The objection to this is the tendency to obtain in the positive a fringe or dense outline when a strong light comes in contact with a deep shadow, a defect which is increased when a large negative is made from such a positive. If we make a transparency by the carbon process, using the special transparency tissue, there is a certain loss of definition, which, although it is scarcely sensible in the positive, is easily seen in

the enlarged negative made from it, principally in the hair and beard. A transparency can be made by contact, by means of a dry collodion process; but here, again, there is a loss of definition, owing to the difficulty of securing perfect contact between two glasses. As far as definition is concerned, neither the carbon nor the dry process will give a transparency as perfect as can be made by the collodion process in the camera. If, however, such a transparency is made of the same size as the negative required, it will be seen at a glance that the first step has been made in the right direction, for not only does it possess more definition than a negative made from a small carbon or dry collodion positive, but it will be found in practice that there is very little tendency to obtain the objectionable fringe which is almost always a defect of a small collodion transparency. The defects of such a positive—such as holes, the spot in the eye too prominent, high-lights, etc.—can be retouched by means of pencils and brush. The question is, now, to obtain a negative having all the qualities of the positive. Mr. Blanchard recommends printing from it on albumen paper, and waxing. This has the disadvantage of giving a grain. A dry collodion process can be used instead, the slight loss of definition owing to imperfect contact not being objectionable, as it is not to be enlarged. I have found it more easy and practicable, however, to make the negatives by means of the special transparency tissue.

To resume the operations to be gone through are: (1) The production of an enlarged transparency in the camera; (2) the retouching of the transparency; (3) the printing of a negative on special carbon tissue; (4) the retouching of the negative; (5) the production of a print on silvered paper or on carbon single or double transfer.

To produce an enlarged transparency in the camera: Make a hole in a shutter on the north side of the house to insert the negative; throw on this the light of the zenith, by means of a mirror inclined at 45°, and permanently fastened if desired. If the large negative is intended to be reversed for single transfer printing, let the collodion side of the

small negative be inside; if for silver printing, or double transfer, let it be outside. Use a good portrait objective, the same, if possible, which has been used to make the negative, and have it reversed that the back lens is turned towards the negative. The camera can be of a simple description. Focus sharply, using a medium stop, and insert a small one to make the positive. If there should be a tendency to obtaining a fringe, use a bromized collodion and alkaline development. Give a full exposure, and, if iron is used, let your developer be weak, say ten grains to the ounce. The transparency should be intense. If too weak, it can be strengthened with a weak solution of mercury, in which a little bromide of potassium has been dissolved. Such a solution, if weak, is perfectly under control. Flow the positive while wet with diluted albumen, one white of egg to eight ounces of water. Varnish as soon as dry. To print a negative from the transparency, use a new bichromate solution, three per cent., or 15 grains to the ounce. Immerse the special transparency tissue, and let it remain from a half to two minutes, according to dampness and temperature. Lay on a glass, face down, and express the excess of solution by means of a squeegee, then hang up to dry. Before printing, paste strips of albumen paper on the positive to secure a safe edge. The tissue should not be so dry as to be hard, otherwise it is difficult to ensure perfect contact. If too dry, put it in a damp place until it becomes soft and pliable. If the transparency is of the proper density, two, three, or even four tints of the photometer will have to be given. The tissue will now have to be transferred to glass. If this is done without a substratum, the film will be very apt to become detached, or to blister during development. The best and cleanest substratum is plain collodion. It should be somewhat thinner than negative collodion, and may contain a drop of castor oil to the ounce. Flow the plate, let set, and immerse in water to wash off the alcohol and ether; then remove, and lay down flat. Dip the tissue in water and leave it about a minute; then lay it down on the wet collodionized paper in the same manner a sheet of albumen

paper is laid on the silver solution; then cover with a piece of rubber cloth, express the excess of water by means of a squeegee, and set up for ten or fifteen minutes. From the moment the tissue is put in the water, it has become insensitive, so that these operations may be done in full daylight. The development is done as usual in water at about 100°, and, owing to the substratum of collodion, proceeds without accident. All the soluble gelatine being removed, rinse and put in a tray containing a saturated solution of alum for a few minutes, then rinse again. If the negative seems too weak, intensify with a weak solution of permanganate of potash, which will turn it of a light brown color. The negative thus obtained can be retouched with a soft pencil or with sepia or brown; or, if very weak, intensify according to the Lambert method, by working in the high lights by means of a stump on mineral paper pasted on the back.—*Year-Book of Photography.*

Use Anthony's Iodides and Bromides.

The Progressive Results of the Last Season.

IN an article upon the above subject in the *Photo. News* of Jan. 14, Mr. J. Nicol, PH. D., has the following:

"But photography has its humorous as well as its serious aspect; and it is well that it should be so. We are all better of a good laugh now and then, and I for one feel grateful to those who, either by accident or design, furnish occasionally the much needed relaxation. But I have already occupied so much of your time that I shall only give one or two examples, and hope that those of our facetious friends whom I have not time to notice will excuse me, and I shall remember them on a future occasion.

"Probably the finest piece of humor that has appeared during the year was in connection with some of the much lauded nostrums by which the exposures were to be shortened one-half. It appeared in one of the journals in the form of a letter, intimating that the

writer intended in future to do his work without exposing at all, as he intended to purchase two of the secret processes, each of which reduced the time by a half, and so between them left time out of the calculation altogether.

"The next, although deficient in humor, is not less amusing. Mr. W. E. Batho, in giving his experiences in connection with the albumenizing of plates, tells us of a "circumstance" that he should "scarcely have suspected," and one that, I think, nobody else will expect, even after he has called our attention to it. It is this: that when we coat a plate with albumen, notwithstanding that, with a view to keep it in its proper place, we are careful to keep the back clean, it obstinately refuses to be controlled, and insists on turning round the corner, and, bidding defiance to the law which Newton thought he had discovered, walks up the back half the journey the first time, still higher the second, and, when left alone continues slowly to crawl up till it reaches almost to the top!

"Lastly, Mr. D. Winstanley—I suppose by way of a little relaxation from his more serious work—perpetrates the wildest and, at the same time, the most successful joke of the year. He knows something of the troubles which the photographer has to bear from the accumulation of ether and alcohol in his bath, and also that they are generally cured either by boiling or precipitation; but he tells us that another, and presumably a better, method suggests *itself*. He is cautious, you will notice, and in a sense repudiates the idea of the suggestion coming from himself. Well, the fatherless bairn thus launched into the world is a "stunner." The alcohol is to be removed by the addition to the bath of such substances as it will dissolve—for example, vegeto-alkalies, resins, essential oils, etc., etc. The ether is to be treated in the same way with oily and fatty matter, phosphorus, certain saline compounds, and some organic principles, while a dose of gun cotton will greedily take up the two when they are mixed together. In case this should not be quite clear to the minds of all present, it may be well to supply a somewhat liberal translation, which may be read as follows: When

you find your bath in a state in which I hope you never find yourselves—too far gone from the effects of alcohol—and especially when, as is generally the case, it is accompanied by a quantity of ether as well, treat it to a dose of cheap salt butter, the ends of a number of lucifer matches, a squeeze of the rind of a lemon, a pinch of rosin, and a few tufts of gun cotton. Shake well for a few minutes and filter, and—well, I cannot say what is to be done next, but feel inclined to apply to the process *Punch's* celebrated lines in connection with the *papier moure*:

"I'd rather not try it on my cat
If I could try it on another."

The Artopticon is the best Instrument made for exhibiting pictures with the oil light.

Formula for Preparing Plain Salted Paper, and also for Dry Plates Without Collodion.

IN the *Bulletin Belge de la Photographique* is a formula for preparing plain salted paper. A warm solution of the following is made up:

Chloride of sodium,	35 grammes.
Nelson's gelatine,	35 "
Orange juice,	35 "
Water,	1½ litres.

Paper immersed in this solution, and afterwards dried, is sensitized on a silver bath in the ordinary way; it is very sensitive.

A method is also given of preparing dry plates without the use of collodion. A mixture is made of—

Albumen,	125 grammes.
Honey,	110 "
Iodide of potassium,	4 "
Bromide of potassium,	1 gramme.
Dry chloride of sodium,	3 decigrammes.

The mixture is beaten to a snow, and then allowed to stand for twenty to twenty-four hours. A plate coated with the composition, dried on a stove, and then allowed to cool, is sensitized in the ordinary fashion.—*London Photo. News.*

Spectrum Photography.

BY CAPTAIN J. WATERHOUSE, R. E.

(Assistant Surveyor-General of India.)

HAVING recently had occasion to take up spectrum photography, I experienced several little difficulties in the arrangement and adjustment of the instruments, about which I could obtain no information in the text-books, and it has therefore struck me that a short account of some of the most simple and economical arrangements for spectroscopic photography might not be without interest to some of the readers of the *News*, particularly as increased attention appears to have been lately given to the subject, and there is no doubt that many discoveries of great importance to photography in all its branches may yet be made by means of the spectroscope.

It will be unnecessary to enter into a description of the construction and principles of the spectroscope, beyond stating that there are two forms of it: the ordinary—usually known as the chemical or physical spectroscope—and the direct vision, both of which consist of three principal and essential parts: 1. The *prisms*, of which one or several may be used, either singly or cemented together. 2. The *slit* by which a beam of light is admitted to the prisms, and which consists of two parallel knife edges, one of which is fixed, while the other is movable by a very fine screw, by which the slit can be readily opened or closed to any desired extent. The piece carrying the slit is usually fixed at one end of a tube, at the other end of which is a lens for the purpose of collecting the rays passing through the slit, and rendering them parallel before they fall in the face of the prism. This indispensable part of the spectroscope is called the *collimator*. 3. The *observing telescope*, consisting of a small telescope by which the image of the spectrum is viewed after it leaves the prism, and is enlarged by means of eye-pieces of various powers suitable to the instrument. In the smaller forms of direct-vision spectroscopes, used for microscopic and other purposes, the observing telescope is dispensed with, and the

image viewed directly by the eye from behind the prisms.

With the direct-vision spectroscope, as the name implies, the image of the spectrum is observed by pointing the instrument directly towards the luminous object. In its larger forms it consists of a central tube containing a compound prism comprising three, five, or sometimes seven prisms, made of two kinds of glass of different refractive powers so arranged that the deviation by refraction of the ray in its passage through the prisms is neutralized, whilst the dispersion is kept, and a fair spectrum is obtained, which leaves the prisms in the same line as the compound ray entered them. The tube with the slit and collimating lens is screwed on to the central tube in front of the prisms, and the telescope in like manner at the back. In the smaller direct-vision spectroscope made without an observing telescope, some of which are small enough to be carried in the waistcoat pocket, the tube carrying the prisms and collimating lens slides into the one carrying the slit. In spectrum photography much may be done by the aid of both the larger and smaller forms of direct-vision spectroscopes, the only difference being that with the larger ones increased dispersion and better definition will be obtainable, and consequently the spectrum will be of greater length, and more lines rendered distinctly visible.

The direct-vision spectroscope may be used with a camera, either with or without a lens. If used with a lens, it is convenient to have an adapter, made so that it can be attached to the front of the lens, in place of the ordinary ring or sunshade, carrying the cap, and the spectroscope screwed on in the centre of it, the observing telescope having been removed so that the prisms may be quite close to the front of the lens.

In photographing the spectra of metals, or other incandescent substances, with such an apparatus, nothing more will be necessary than to point the lens and spectroscope directly towards the lamp in which the metals, etc., are being burnt, and to focus in the ordinary way, till the distinctive lines of the spectrum are seen as sharply as possible on the ground glass. In photographing the so-

lar spectrum, however, arrangements must be made for counteracting the effect of the earth's motion, so as to keep the rays of the sun passing through the slit constantly in the direction of the axis of the collimator tube. This may be done by mounting the camera equatorially in the same manner as an astronomical telescope, or else, which is more convenient, the rays of the sun must be thrown on to the slit of the spectroscope by means of a heliostat, or mirror moved by clockwork, and adjusted so as to throw the reflected solar rays on to the slit constantly in the same direction. For ordinary purposes, however, the solar rays may conveniently be thrown on to the slit by means of a flashing heliotrope, or even a common looking-glass with a little extra mounting to enable it to be turned on a vertical axis. In working with long focus lenses and a fine slit the mirror alone will scarcely give sufficient light, and should be supplemented by an achromatic condensing lens of about 20" focus or longer, for which an ordinary view lens will answer admirably; this should be mounted so that it may be raised or lowered as required.

Supposing the arrangement with the mirror to be adopted, the first care is to see that the centre of the mirror is on the same level, and in prolongation of the axis of the lens; the spectroscope is then attached to the lens by the adapter, and a beam of light thrown on to the slit. The image of the spectrum should then be seen in the centre of the focussing screen, and may be brought into its proper position on the sensitive plate by moving the front of the camera, and to some extent by a motion of the sliding frame carrying the slit plate. The condensing lens may now be put into its place at the distance of its focal length from the slit of the spectroscope, so that its centre may be in the line passing through the centre of the mirror, the slit collimator and axis of the camera lens, and with its central vertical plane at right angles to this line. On passing a beam through the lens so that the image of the sun is thrown on to the slit of the spectroscope, the intensity of the spectrum will be found to be greatly increased, and the Fraunhofer lines should be distinctly visible, their defini-

tion being greatly improved by lessening the width of the slit. These lines should cross the spectrum at right angles to its length, and if they are not so the slit piece should be turned in its tube till the lines are seen in their proper position. Should dark horizontal lines or streaks be observed running along the length of the spectrum, the slit is dirty, and must be carefully cleaned with a stiffish medium-sized camel (or, better, red sable) hair water-color brush. A piece of clean writing-paper moved along the edges of the slit is also a good method of removing the dust. The greatest care must, however, be taken not to notch or injure the knife edges forming the slit, or these dark lines will be irremediable without regrinding the knife edges, which is a delicate operation.—*London Photo. News.*

**The B. J. Almanac for 1876
is ready.**

On Fading.

BY J. BARKER.

It seems to be taken for granted that all silver prints must of necessity fade, it being merely a question of time—some going sooner than others, according to the degree of success in removing the hypo. in the final washing. The general *dictum* is to wash the prints to within one inch of their lives, and all sorts of ingenious apparatus have been devised to accomplish the thorough washing deemed so necessary; and yet, in spite of all this, some prints from the same batch will fade rapidly whilst others remain untarnished. This certainly would not be the case if it depended upon the washing only, for, as a rule, prints are carefully and conscientiously washed.

It seems to me that the chief reason why some prints fade and others do not is because some are properly fixed whilst others are not, and that it is the very unstable double salt left in an imperfectly-fixed print, and not a slight trace of hypo. alone, that causes fading; although if the two be combined—that is, if the prints be imperfectly fixed and a trace of hypo. left in the paper—fading sets

in with great rapidity from the well-known action of a weak solution of hyposulphite of soda on the double salt of silver left in the imperfectly-fixed print.

In support of this view the following simple experiment can be tried: Take three pieces of albumenized paper (a highly-salted, thin sample is best) which I will call "A," "B," and "C" respectively. Sensitize A on Monday, B on Wednesday, and C on Saturday, printing upon all three pieces (from the same negative, if possible) on Saturday. Treat all three pieces exactly alike as regards washing, toning, and fixing, when it will be found, upon occasionally lifting the prints from the hypo. bath and looking through them, that the piece sensitized and printed on the same day will be fixed first, B coming next, and A, in some cases—in warm weather, for instance—taking a considerable time longer than C before the whole of the double salt is removed. Now, supposing these three prints removed from the hypo. bath at the time C was properly fixed, it is almost certain that B and A would fade despite any amount of washing they might receive (the double salt left in the pores of the paper being almost insoluble in water, whilst it is almost certain to be subject to spontaneous decomposition), whilst C, in all probability, would remain as permanent as any carbon print ever yet "demonstrated," requiring nothing but the hypo. to be removed, which is readily done by repeated changes of clean water.

In conclusion I would strongly urge the adoption of the following rules:

1. Take care that all the free nitrate is removed from the print before immersing it in the hypo. bath.
2. Fix in a non-actinic light.
3. Avoid decomposed albumen.
4. Use fresh hypo., faintly alkaline.
5. See that the prints are properly fixed by looking through each one separately.
6. Do not soak the prints, but wash well in plenty of changes of clean water.—*British Journal of Photography.*

ANTHONY'S Collodio-bromide Emulsion, with complete directions for successful use, is now ready.

Photographic Canvassing.

A NEW use has recently been found for photographic portraits, as aids to election canvassing. A provincial contemporary says: "Daguerre, Niepce, Talbot, and all the other inventors or improvers of photography, certainly never foresaw to what base uses their favorite art would come at last. It was reserved for M. Rouher and his myrmidons to make of it a political agent and an instrument of sedition. But one of M. Rouher's followers has gone even further in the same direction than the grand agent himself. M. Darblay, the Bonapartist candidate for the Senate in the department of Seine-et-Oise, has reduced photography to the degraded level of an electioneering agent. To avoid all troublesome questions and compromising explanations and pledges, M. Darblay, instead of journeying round the department of which Versailles is the capital, has written a short letter to the municipal councillors of the different communes, in which he says: 'Permit me to substitute for my personal visit my *carte photographique*, to which I join my profession of faith.' This is a capital hint even for those candidates in England who have a dread of public meetings, either because eloquence or the will fails them to explain their views on ticklish questions. In future they will merely have to get their photographs liberally distributed through the constituency, or freely circulated through the streets by a legion of sandwich men. The system is found to draw well in the case of circus, music hall, and other public performers; why, then, should it not procure support for a timid or diffident election candidate? No doubt it very much resembles the proceeding of the gentleman who, having an eligibly situated house to sell, carried half a brick about with him as a sample to show to intending purchasers; nevertheless, M. Darblay deserves credit for his ingenious introduction of the electoral 'counterfeit presentment.'—*London Photo. News.*

ANYONE having copies of the BULLETIN to spare for Feb. March or April, 1875, will greatly oblige by returning them to us.

PARAGRAPHIC PENCILINGS.

BY G. H. LOOMIS.

Photographic Ghosts.

A CORRESPONDENT who speaks kindly and somewhat flatteringly of our "Pencilings," wants to know what we think of those productions known as "spirit pictures?"

Of course we are expected to state our belief or disbelief in their *genuineness*, which would amount to nothing but an individual opinion valued only at current rates. We have travelled somewhat extensively in both hemispheres, have attended numerous shows, including Madame Tousard's celebrated apparition museum in London—not to speak of several seances in "my own, my native land;" and yet I never remember of having seen a real, tangible, bona fide spirit nor the *shadow* of one, knowing it to be such. Well, the fact of *my* inattention, or blindness, if you please, only goes to show that I have not seen what hundreds of equally if not more intelligent observers *have seen*, or else *they* have been *deceived*, which is barely possible. Now I would no more undertake to *write* down or *argue* down the disciples of modern spiritualism than I would undertake to prove the family relation of Adam to the man in the moon. I have tried it in several instances after a good night's rest, and have been obliged to retire unusually early the next evening to recuperate exhausted energies. I never could prove a *thing*, for nothing of the kind was ever given me as a problem. When they say "now you see it," I stupidly, perhaps, but truthfully am obliged to say, "no; I don't." The *spirit* seems willing, but the physical senses don't come to time, and I am discouraged with the assurance that I am not in *harmony* with the laws which render the unseen and intangible as plain as the nose on your face. I go to the mirror and am astonished that anything *so plain* as that is still invisible to the naked eye.

Now it is possible that these introductory notes may savor slightly of sarcasm, but in very truth we have no wish or words of injustice for the believers or practitioners in these supernatural manifestations. Indeed,

we have many valued friends who are in sympathy with this subdivision of society, and would not for the world be found deficient in that degree of "charity which suffereth long and is kind;" but if our senses are not all at fault, we have seen a sufficiency of imposition and downright lying perpetrated by those mediumistic magicians of the dark-room to justify us, at least, in doubting their Christian character, to say nothing of their artistic claims. I do not propose to deny that many *wonderful things* have been *developed* in the photographer's dark closet, nor will I attempt to "root up" the thousand and one phenomenal and speculative notions which are current within and without the spiritualistic circles. I have seen heavily draped mourners in waiting, where they take ghostly shadows for ten dollars a dozen, and wondered at two things—first, at the credulity of human nature under such peculiar circumstances, and, secondly, at the infamous rascality displayed by the mediumistic manipulator, who takes advantage of these circumstances to put money in his purse, *knowing* that his apparitions are *impositions*.

It is barely possible that the writer is answerable for the first of these phenomenal pictures; and that he did not go into it as a *speciality* was, perhaps, a financial mistake. Some fifteen years since, and this dates back pretty well in spiritualism, I made an ambrotype copy from an old Daguerreotype, which was duly delivered and paid for. It was of a lady who for some years had been dead, but, as I afterwards learned, had only "passed on." Within a few days the original and copy were brought to my rooms to ascertain the cause of a peculiar figure appearing in the copy not in the *original*. It was in the form of a delicate *hand* with index finger extended horizontally above the head, and upon the wrist was a nice, white linen cuff; at least, it looked like linen. What could it mean? Whose hand was it? Of course it was not the "hidden hand," nor was it the artist's hand, for on it were no silver stains, and, moreover, it was too *petite* and graceful. If not the artist, who else had a hand in the matter? We were waited upon by a committee from a Brattle Street circle,

and put through a severe examination with a good stock and variety of *cross* questions, which we answered good naturedly, of course. We were finally asked to copy the original again, and we did so, repeating it several times, but with no looked-for effects. The hand would *not reappear*, and the committee were unhappy. They wanted duplicate copies, and when we kindly suggested that they could be supplied by "copying the copy" first made, they took courage and five duplicates. The pictures were introduced into several circles, provided material for numerous discussions and became the theme for newspaper comment, and, it is unnecessary to say, that many curious in such matters came to our studio for the unravelment of the ambiguous. We had one of those chemical combinations, which has never been patented, known as a *crawling developer*. It would produce some of the most fantastic shapes imaginable. We have seen, when least expected or wanted, a fine display of the aurore borealis, with two or three indifferently executed rainbows, an iceberg and a medium sized sand storm in the background, while all that we were aiming at was a moderately good likeness of a baby brought into the operating room for that purpose. If the baby's picture was satisfactory, we threw in the scenery without extra charge, rather than attempt a resitting. While endeavoring to capture the features of a customer who was not possessed of devils, as we knew of, there has appeared under the mysterious power of sulphate of iron, etc., fragmentary representations of Milo's Venus, a marine scene with a coral reef, and a bursting shell, the latter, perhaps, in painful proximity to the face of the sitter, which, of course, renders the picture unsatisfactory, if the person taken is unappreciative or has no taste for the miraculous. We have known inquisitive sitters, after seeing *the proof* with these accessories, turn it around and examine the background, with the inquiry, why this effect, and wherefore the cause? just as if the artist would be likely to divulge the secret, or as if the sitter could comprehend it when divulged.

We have instanced these illustrations, not as arguments against supernatural manifest-

ations, but as proofs that the photographer's chemical closet is prolific in the production of phenomenal phantasmagoria, or something after that style or description, with variations. That under skillful manipulation the "shadowy forms" of men and things can be produced, we have abundant evidence; that they have been produced *to order* without mediumistic agency or influence is equally apparent, and that most if not all of the *apparition* specimens we have examined are directly traceable to causes well understood by every practical photographer. But we are asked if we believe that *any* of the claimed spirit productions are entitled to credence as such? Of course, we don't know; and what we don't positively know, we are not certain of. If spirit forms are around us—and *they say they are*—and if our Dallmeyer or Voigtlander can comprehend what is invisible and incomprehensible to our human optics, then and so far must we admit the possibility, whatever we may think of the probability. As previously intimated, we have had abundant proofs that our negative and other plates have developed wonderful images besides those we have sought to transfix; but whether they were in the dim distance beyond our mortal ken, only to be caught by super-extra lens power, or whether they were the natural products of a disordered silver bath, deranged developing solution, and other chemical crudities and absurdities, deponent saith not. We observe that Dr. Vogel is authority for saying that an eruption of *varirole* (small-pox) can be detected by photography twenty-four hours before its appearance or before being visible to the eye. This is a *poser*; and yet some of us who have found a multitude of *freckles* on our negative have wondered where they all came from, as upon the face of the original they did not so appear, though undoubtedly there. The questions asked are—"What are the rays of the spectrum which transmit these images? What part is played by the *heat* which is pathologically developed by small-pox? Are there not, in cases like the above noted, particular irradiations having relation to physiological forces at present unknown?"

These interrogations, as will be seen, are

quoted, and are not ours. We have no answer to make, but give them for the thought of others. We have not been asked to explain "how spirit pictures are taken," but simply to give an opinion upon the subject. If we have treated the matter humorously, as perhaps we have, then it is because our observation and experience impressed us in that way; at the same time we are willing to be serious.

Buy a Vienna Curtain.

A Threatened Revolution in Chromo-lithography.

FOR some time back a report has been current in lithographic circles of a new invention which is to completely revolutionize the whole practice of chromo-lithographic printing. This report, we have it on the authority of the Hamburg *Lithographia*, is well-founded. A process has been discovered by which the inventor, whose name is not yet disclosed, asserts that a picture containing hundreds of shades of color can be printed by a single pressure either upon paper, cardboard, linen, or tapestry. That sounds very enticing! But it is not all. The writer of the article in the *Lithographia* says that the inventor showed him several specimens of the results obtained by his process, and said that he was having presses of a peculiar construction specially made, but required no stone. He also proposes to arrange an international scale of colors and tints before publishing the details of his process. This scale is to be so arranged that, instead of ordering the color of some part of a chromo-lithograph to be printed a light green, or a very light green, he will order it only from a numbered scale of almost infinitesimal gradations of every tint—as "Green Scale X., No. 923"—so that the desired tint may be much more exactly obtained than by any mere verbal description of the color. The specimens shown were—first, a picture about twenty-eight inches high of a dancing harlequin, the colors of which were somewhat harsh, but gave quite the impression of being painted with the brush and intended for decorative

purposes. There were two copies of this picture, both on linen. The second picture was a very delicately-tinted group of flowers upon tapestry, with a greenish background, all printed at once. The shadows of a single iris were especially beautiful, and it was easy to see that there could be no question of their having been printed in the usual way by plates passing one above the other. Then came a map, in which the depth of the ocean, in so far as it is known, was indicated by different shades of green, from deep green to almost white. There were also a number of other pictures on paper, some having the appearance of oleographs, but, unfortunately, the varnish on one of the latter had cracked, and was partly peeled off. The inventor still shrouds his process in the thickest veil of secrecy, but we are promised that the veil will be removed, and that at an early date the details will be published, either in the columns of the *Lithographia* or in some other form.—*British Journal of Photography*.

Subscribe for the Bulletin.

Broken Negatives.

A "BRIGHTON PHOTOGRAPHER" sends us the following hint on the repair of broken negatives, which may prove useful to many. "It often occurs (I speak by experience) that in printing from a valuable negative, we are liable to be surprised by our printer blandly informing us, 'Please, sir, the negative is broken—only flown in the frame.' To those who are thus afflicted, permit me to offer this hint. I take my 'broken negative,' and slightly anoint the broken edges with a strong solution of 'coaguline' (*i. e.*, gelatine and acetic acid); when dry, I rub gently a little lampblack in powder into any cracks and crevices, and I find that this mended negative can now be printed without any fear of coming to pieces again, provided that the glass is quite flat during the joining business. In proof of the efficiency of my hint, I have lately printed some dozens of whole-plates from a negative thus treated with perfect success; and if the join is carefully made and filled in, the retouching required is a mere trifle."—*London Photo. News*.

Hints to Dry-plate Workers.

BY J. POLLITT.

THE wet collodion process of to-day, although now in the third decade of its history, unlike many other processes or inventions, is so nearly what it was when first made known to the world by its honored founder that as it is still practiced it may to all intents and purposes be called "Archer's process." Certainly the great simplicity of its manipulation, leading, as it does, to results of the highest technical and artistic excellence when performed by men of skill and judgment, naturally strengthens the universal opinion that at this moment it is a process little short of perfection.

The position of dry-plate photography is, however, totally different; for, although much of the talent and energy of the profession has been brought to bear on its more complete development during many years past, and with resulting processes whose name is legion, by which fair and presentable pictures may and have been taken, I am afraid it must still be said that, as regards *simplicity, certainty, and rapidity*, all combined, the most promising dry process has not yet reached that standard of excellence embodied in a good and well-manipulated wet-plate negative.

That dry-plate photography, however, is a subject of paramount importance I think few will deny; at any rate, the fact is sufficiently attested by the host of persevering experimentalists already referred to.

It is not my purpose to discuss the merits or demerits of any particular process, any further than by saying that if we simply strike out the term "rapidity" we have already a few old and well-tried processes which, when combined with skill and a fair amount of brain power, will yield results quite equal, and under some circumstances even superior, to the very best results obtainable by wet-plate photography; and it is to the means of more uniform and general success in the working of these processes that I purpose more particularly to address myself. I must, however, here remark that my experience has been almost exclusively

with collodio-albumen: therefore my remarks will apply particularly to processes of that family, viz., bromo-iodized films, and, perhaps somewhat generally, to all other processes of the bromide of silver only.

I shall start with the assumption that in order to be a successful worker of dry-plate photography it is, if not absolutely necessary, at any rate very desirable that the principles and practice of wet-plate photography should be thoroughly mastered, because by the exposure and manipulation of wet plates the right sort of education essential to make a good photographer by any process is more easily and effectually acquired; and, besides this, to produce works of the highest class of excellence, and with the least toil and labor, both the wet and dry processes must be laid under contribution, and the judicious photographer will know when to take up the one and lay by the other.

The proper method of keeping dry plates, either before or after exposure, is one of those points the importance of which is, I fear, not sufficiently appreciated generally by those who use them. Too great precaution, however, cannot be taken in this matter. In sending out commercial plates it is customary to pack them up with their films opposite one another, separated by a small space with slips of paper at the ends to keep them from touching, and then wrapped up in gutta-percha tissue, india-rubber coated paper, or some other waterproof material. In this condition they will certainly keep good for a very long time—it may be indefinitely—but for those who make their own plates, or even when a parcel has been once opened, it is more convenient to keep them in a good plate-box lined with lead foil or well coated with shellac; but care should be taken to store them with a *face* opposite to a *face* and not a *back* opposite to a *face*, and the grooves should on this account be made to hold two plates, so that they can be put together back to back. It is a bad practice to allow the plates to remain in the slides for more than a few days either before or after the exposure, as the air will get to the films through the folding joint of the shutter, and frequently make an insensitive mark

across the plate, the sensitive film being readily affected by a damp or gas-impregnated atmosphere. It is also a dangerous thing to use rings of vulcanized india-rubber, as I have seen some do, by putting them round the slides to keep the shutters from slipping open when they are held wrong side up; and still worse to use them, as I have also seen others do, by putting one round each end of the plate to keep the film from rubbing when packed up.

Another point on which much misapprehension prevails is the exposure of the plate in the camera. I am particularly anxious to make this point as plain and clear as I possibly can, as I have seen so many lamentable failures, when the results might have been perfection, through error of judgment as to the camera exposure. It is usual to say of a process "it is twice, thrice, or six times" as slow as wet collodion. Now, to talk about the relative exposure of a dry plate as compared with the wet process is exceedingly misleading, because the nature of the subject and condition of the light will alter the relationship at every step; herein will be seen the importance of an educated judgment. A process may, when tried with a lens, working with a large aperture, and on a subject in which there are no heavy shadows or dark objects near to the camera—say a view at the seaside, taking in only sky and water—be almost as sensitive as the most rapid wet collodion plate; and yet, when the same two processes are tried on the interior of a church, or some other badly-lighted subject, the analogy no longer holds good. The dry plate requires an exposure, it may be, of ten, fifteen, or even twenty times as much as will be required by the wet plate on the same subject. It will thus be seen that the rule ought to be something like the following:

If a dry plate by a given process be twice as slow as a wet plate when both are exposed on the same well lighted subject, such dry plate, when exposed on another subject, which, in the case of a wet plate would require double the exposure of the former, will require to be exposed four times as long as the wet plate, and so, as the light de-

creases or the lens is stopped down, the relative exposure of the dry plate will be about in proportion to the square of the increase of exposure required by the wet plate at every change of subject the lighting of which is decreased.

I now come to the development of the dry plate; and so much is here required of the skill and judgment of an experienced operator that, compared with which, every step in the progress of a dry plate, from the cleaning of the glass, up to this stage, may be said to be altogether mechanical. I have seen many plates spoiled by under-exposure, and some by over-exposure, but I have seen very many more ruined in the development. I shall, however, only allude to two classes of subjects as types, so, to speak, of the two extremes, between which every other variety of subject may be said to be embraced; and the intelligent reader in developing his own plates, and thereby knowing beforehand the nature of the subject he has to manipulate, will, I think, have no difficulty in applying the different modifications of treatment required for every variety of subject.

Where alkaline development is used, followed by an after-intensification with nitrate of silver, it is an extremely nice matter to stop the action of the alkaline pyro. at the right moment, so as to allow the exact amount of detail to come out during the after-intensification, the rule being that for a distant view, looking over miles of landscape or sea, the pyro. should be used very weakly alkaline, and as soon as the sky line appears the plate should be well washed without waiting for further detail, as all that is necessary will come out during the subsequent strengthening up by acid pyrogallol solution and silver.

On the other hand, if the subject consist of dark objects all near to the camera, and having heavy shadows or being badly lighted, a much stronger solution of pyrogallol acid should be used; it should also be made more alkaline, and much more detail should be got out than is desirable in the former case before commencing with the subsequent intensification with silver.

With respect to many other "wrinkles"

—such as the use of hot water in development, the developing out of dark masses of foliage in the foreground or other local parts of the plate where the action of the light has been weak—as I fear I have already transgressed my allotted space I must be silent, in the hope that the few crude hints and directions I have given may suggest the importance of that care and judgment which are the essential qualifications of a good photographer, and especially to success in dry-plate photography.—*British Journal Photographic Almanac.*

Buy a Vienna Curtain.

On Turmeric.

WE are aware that the coloring matter of turmeric (*the curcuma longa* of the pharmacopœia) has been more than once recommended as a substance likely to be useful in photographic work; but we hardly think it has received proper consideration, or that it has been utilized to the extent which its varied qualities would seem to warrant.

Our attention was recently attracted to the subject in consequence of a desire to protect by a yellowish varnish the very thin foreground of a negative we wished to print. For this purpose we added a few drops of a tincture of turmeric to a little plain collodion and poured it over the whole plate. When dry, portions covering the better-exposed parts of the plate were scraped off, and the negative exposed under paper in the ordinary way. On examining the process of printing we were somewhat surprised to find that, although the yellow film was exceedingly feeble, its non-actinic qualities were so great that when the unprotected parts of the negative were fully printed the parts covered by it were altogether untouched, and that even after an exposure of two hours to full sunshine there was no trace of decomposition of the silver chloride. This circumstance naturally prompted us to make a series of experiments, the result of which leaves no doubt in our minds that a solution of the coloring matter of turmeric should find a place in every photographic laboratory.

A convenient solution may be readily prepared as follows: Four ounces of well-dried turmeric (*radix curcumæ*), which may be obtained from any chemist, is to be well bruised, or reduced to coarse powder, and moistened with alcohol. After standing for an hour or two the damp mass is packed into a percolator—a lamp chimney with a piece of muslin tied over the smaller end answering well—and some more alcohol poured over it. If the packing has been properly done the spirit last added will displace that which had been absorbed by the turmeric, and cause it to flow through the muslin at the rate of two or three drops per second. When the operation is fairly started sufficient spirit should be added to give a bulk of four ounces of percolate, which will be a very strong solution of curcumin, capable of giving a fine yellow color to collodion, varnish, or any alcoholic solution.

A drachm of this solution added, to an ounce of plain collodion and poured over a plate of glass gives a yellow film of great beauty, which, although it hardly seems to stop out any material quantity of white light, is so non-actinic that, when used in the window of the dark room, plates of the most sensitive description may be manipulated with perfect freedom from fog. The cause of this is quite evident from a slight spectroscopic examination, which shows that the violet is altogether absorbed, the green and red alone being transmitted. We know that some emulsion makers prefer a red or, rather, ruby light in their dark rooms. This can very readily be got with the turmeric, it being only necessary to add to the collodion a few grains of boracic acid, which, when the film is dry, and especially if heated, destroys its power of transmitting the green, giving a pure red light.

It is well known that the color of turmeric, in common with many other vegetable coloring matters, is gradually decomposed by light, but our experiments would seem to show that when enveloped in the collodion film, or when mixed with ordinary photographic varnish, it is much more durable than when in contact with the starch and other *matériel* of the turmeric root, and, even

should it be found unsuitable for permanent use, it will assuredly be valuable as a temporary expedient.

But an alcoholic solution of curcumin is of more use than merely to exclude the actinic ray from the dark room; it is one of the best organifiers for a washed emulsion pellicle that we have yet tried. We added it to the extent of ten drops to the ounce of emulsion just previous to pouring into the dish: and, as the curcumin is very sparingly soluble in water, it is not removed by the necessary washing, and gives to the redissolved pellicle a fine yellow color, which altogether prevents the necessity for backing of any kind.

We may add that we experienced some difficulty at first in removing the yellow appearance from the developed plates, but ultimately it yielded readily to a wash with methylated spirit. Our experiments have not been sufficiently extended to warrant any very strong statement as to the superiority of curcumin over other organifiers; but, from what we have seen, we believe that it will be found in every way a most important addition to the *matériel* of the emulsion worker.—*British Journal of Photography.*

An Easy Method of Removing Varnish from Negatives and Ferrotypes.

EDITOR OF THE BULLETIN:

Dear Sir: In your report of Proceedings of the Photographic Section of American Institute for December I noticed an incorrect account of some remarks I made about a novel method of removing varnish from negatives without injury, which I *accidentally* discovered and *incidentally* mentioned. Most of the modern photographic discoveries occupy but small space in announcement and a large space ever after in explanation and defence; and so mine, though of small importance, is at least worthy of a correct record.

Your report says—"accidentally poured a saturated solution of cyanide over a negative, etc." What I did say was, that having occasion to remove silver stains from the varnish of a negative, I flowed it with cyanuret of potassium (saturated solution, one ounce;

alcohol 95°, two ounces), and was somewhat surprised to see all the varnish dissolving and flowing off. The action was so energetic that at first I feared the negative would be injured; but in less than a minute it was free of varnish, and I washed it under the faucet, dried and revarnished it, no difference from a new one being noticeable.

Mr. Bierstadt stating that potash in alcohol would accomplish the same result, it seemed probable, and, if so, cheaper. I therefore decided to compare them by experiment in formal scientific fashion, and accordingly selected six negatives, two of them two years old, two one year old, and two just made, none of them redeveloped or strengthened with any thing but silver. Having procured a bottle of "Holman's pure white potash" from a druggist, I mixed one part with two of alcohol and flowed one of each pair successively; and in each case, while it readily removed the varnish, it also seemed to rot the film and so loosen the silver that it either partially or entirely flowed off with the varnish, of course ruining the negatives. On the other three I tried the cyanide and alcohol with perfect success, as in less than three minutes all were free of varnish, washed and drying. As a further trial I cut a larger negative in halves, and, reducing the potash with equal bulk of water, mixed it with two parts of alcohol, as before, and tried it on one half, spoiling it also; while cyanide, as before used, left the other uninjured. I also tried the method on ferrotypes, with the same result, the potash spoiling them, while the cyanide of potash left them clear and bright as when new. I do not claim that the cyanogen has any beneficial effect; I only say that the alkali in that form acted well, while pure potash did not. If not conclusive to others, my experiments achieved the result usual with all photographic experimenters, they thoroughly convinced me that "my method is the best ever discovered" for the purpose, and therefore I confidently recommend it for trial and use.

E. K. HOUGH.

NEW YORK, Feb. 11, 1876.

B. J. Almanac for 1876—50 cents.

A Few Words on Lactate of Silver.

BY HENRY COOPER.

IN the last number of *The British Journal of Photography* there appeared a short article by Colonel Stuart Wortley, in which he states, as the result of two years' experience, that the lactate is superior to the malate of silver for emulsion work. I notice this statement with great satisfaction, as I am pleased to find Colonel Wortley has at last come round to my way of thinking.

From an immense number of experiments, extending over a considerable period, I am convinced the lactate is by far the most useful organic salt of silver (as an addition to emulsions) with which I am acquainted; and I have carefully tried not a few. One word in Colonel Wortley's communication might, perhaps, lead to a misapprehension. He mentions the lactate as having been "suggested" by me. Now this might lead a reader to infer I had merely made a suggestion that the lactate might be found useful, without having myself carefully investigated the matter. Such a supposition would be very far from the truth; as, before I recommended the use of lactate of ammonia in a collodio-bromide emulsion, I had already satisfied myself that it was one of the best salts to effect the desired object. Since then I have more keenly appreciated its good qualities, and have ascertained that it is capable of rendering good service, not only in emulsion work, but in other photographic processes, more especially in the collodio-albumen process and in collodio-chloride for printing on glass or paper.

I find from my note-book that in 1871 I was working very energetically at my experiments with lactate and other organic salts of silver, and one or two jottings from that date may not be unacceptable to emulsion workers. It is recorded in this note-book that the dose of lactate must not exceed certain limits, otherwise it produced precipitation of the bromide of silver; and also that the best time to add the lactate of ammonia to the emulsion was a few minutes after the nitrate of silver.

The formula which has the mark of "greatest merit" against it, and which is the same as the one by which my finest emulsion negatives have been produced, is perhaps worthy of repetition here. It stands thus:

Bromide of cadmium, (dried) .	52 grs.
Chloride of calcium, (anhydrous) 8 "	
Alcohol, (absolute)	2 oz.
Powdery pyroxyline,	about 40 grs.
Ether,	5 oz.

Each seven drachms to be sensitized with fourteen grains of nitrate of silver dissolved in three drachms of alcohol, and then to have a final addition of five *drops* of syrupy lactate of ammonia. (This would be equivalent to a little over *three minims*, according to a note in my book.) Use in twelve hours or so. After coating, the plates are only to be rinsed in distilled water until the greasy lines are gone before immersion in the bath of preservative. These plates were exceedingly sensitive.

Last year, when my work was suddenly put a stop to by a return of my old enemy severe rheumatism, I was just engaged in some experiments in which lactate of silver was used in washed emulsions, and the results were most encouraging. As some time may elapse before I am well enough to resume my labors, I hope those who are practically studying the washed emulsion processes will give my friend, lactate of ammonia, a chance.

In collodio-chloride I have found the lactate (very sparingly used) of great benefit. It causes the film to give a richer and more velvety image, and entirely prevents that dreadful tendency of the free nitrate of silver to crystallize out in the film, which so many must have noticed when printing on glass by this process.

I must defer speaking of the undoubted value of lactate in the collodio-albumen process, until I am able to give the history of some interesting experiments in which I was engaged in my search after an albumen process which should resemble in good qualities the one worked out by Mr. R. M. Gordon. I have never got over my keen disappointment at Mr. Gordon's leaving the country without divulging his secret. I, perhaps

more than most men, had great opportunities of becoming acquainted with the immense value of the process, and have never ceased to wonder at the apathy shown by photographers on the occasion of Mr. Gordon's leaving us. Only thirty-three photographers in the whole world sent in their names in response to Mr. Gordon's liberal offer. It is to be hoped, for the sake of photographic science, that Mr. Gordon will one day place us in possession of the details of his process; and my great wish is that that day may not be far distant.

Next week I hope to write a few words on the use of carbonate of ammonia in the hypo. fixing bath, as first introduced by Mr. J. Spiller, and since strongly recommended by myself and others. I shall also have something to say on tinted films.—*British Journal of Photography.*

**The B. J. Almanac for 1876
is ready.**

Dissolving View Apparatus.

[From the *London Photo. News.*]

SIR: In answer to some correspondents, I add to my former communications on the lantern a few remarks on the dissolving view apparatus.

The double lantern or dissolving view apparatus is not only required for showing a series of pictures artistically and without an hiatus, but is absolutely necessary for the production of dioramic effects, these even sometimes requiring three lanterns. The simplest effect slide is that called the slip slide, which consists of a piece of glass set in a frame, over which one, and sometimes two, other pieces of glass are so arranged that the exhibitor with his hand can cause them to slide backwards or forwards over the first one. Parts of the picture being painted on each piece of glass in this way, phantasmagorical figures are produced, seemingly in motion. These slides can be shown by means of one lantern only. The next most simple effect slide is the lever slide; this consists of a circular glass set in a frame, on which is generally painted the principal part of the picture,

over which another circular glass is set in a brass rim, having a handle, and is so arranged as to allow the handle or lever to be worked up and down to a certain extent. Various parts of the picture, as before, are painted on both glasses, and the painted side of all the effect slides are placed towards each other, but not allowed to touch. This description of slide can also be shown with a single lantern.

Next follows the rackwork slide. These have either a single or double action, and are worked by a pinion, which is attached to a small crank rotated by hand. The single rackwork is applicable to such pictures as represent mills with moving sails, or water, etc. The double rackwork is used for chromotropes and various other effects; these also can be shown with one lantern.

I will now give an instance in which two lanterns are required. The first picture represents Napoleon reviewing his troops on the Champ de Mars, Paris. This changes to the Emperor lonely and captive, standing on the shore of St. Helena. The transformation is effected by some parts of one picture being left out in the other; but the figures of Napoleon must be exactly alike in color, drawing, size, and position in each of the two pictures. The lanterns must be accurately arranged so that they may exactly overlap each other when shown on the screen. I need hardly say that before the exhibition commences the two lanterns must be brought into such a position relative to each other, and firmly fixed, that the two circles of light on the screen shall seem as if they were but one only, and a picture, when shown by either lantern, shall appear to be equally sharp in focus and of equal size. That this may be the case, it is necessary that all pictures intended to be shown at one time should be of the same diameter, and their frames of uniform dimensions, and, for the sake of portability and weight, these latter are never made to the full size the lanterns would admit; it is thus imperatively necessary that a carrier should be provided for each lantern having a circular opening properly centred, and of somewhat smaller diameter than the pictures themselves. A prolongation of one end will

form a handle, and on its upper side should be inserted a pin or stop to prevent its being by any inadvertency thrust further across the lantern than the point at which it should rest.

Most objects apparently in motion should not be allowed to cease their action in sight of the spectators, otherwise the effect is entirely spoiled. This is particularly the case with chromotropes. It being at times quite impossible for an exhibitor to do all that is necessary single-handed, it becomes his best plan to procure, if possible, a volunteer assistant; and a rehearsal, for the purpose of his initiation, should be gone through if necessary, his duties being allotted to him. His particular attention should be directed to their performance methodically, without noise or undue haste.

I intend to offer some further information on the subject of dioramic effects by means of the magic lantern shortly. I am, dear sir, yours truly,
JAMES MARTEN.

Use Anthony's Iodides and Bromides.

Accidents in Reducing Residues.

THE recent accidents in American studios connected with the evaporation of silver baths containing glycerine call to mind a lamentable occurrence that took place about ten years ago at Pesth, and which we are glad to hear has not since been repeated. In the case of the American studios it is supposed that free nitric acid must have acted upon the glycerine and formed nitroglycerine, one of the most terrible, because most treacherous, of our explosives. In the Pesth catastrophe, the cause was said to have been the presence of a large proportion of alcohol or ammonia in the residue, and the formation of fulminate of silver, or some such compound. In the case to which we allude, which our readers may have forgotten, a travelling photographer, well known in the neighborhood, called upon a chemist in Pesth with some photographic residues, from which he desired the silver to be extracted. The residues remained some time in the laboratory, and in the end were handed over to an as-

stant to be reduced. In order to remove the precipitate, which had become perfectly dry and attached to the glass vessel in which it was contained, the assistant began to scrape it with a pair of scissors, when a fearful explosion immediately took place, that was heard throughout the town and neighborhood. The body of the chemist was found mangled and literally torn in two pieces; the assistant had been thrown to the floor by the force of the explosion and killed on the spot; while a little boy, the chemist's son, who had been watching the operation, was found stunned and bleeding, but otherwise comparatively unhurt. He alone could give what meagre details were forthcoming, but that the mixture under manipulation was made up of photographer's residues there was no doubt. An inquiry into the matter was made by several Austrian scientific men, and the results of their deliberations we published in these columns at the time, which was to the effect that no explosive compound of any description can be formed in photographic residues when an acid is present in combination, and that such a result only was possible when the residues contained large quantities of ammonia. It was therefore recommended that residues should be first treated with a small quantity of acid before being reduced. Only if there is a risk of forming nitroglycerine by the chance presence of glycerine in the residues, it would scarcely be advisable to employ nitric acid for the purpose.—*London Photo. News.*

The Artopticon is the best Instrument made for exhibiting pictures with the oil light.

Something New.—Vienna Curtains.

(Just Imported.)

WE are now enabled to offer the fraternity something new, and, at the same time, very desirable. These curtains are quite elegant in appearance, and possess the advantage of being exceedingly cheap, so that no photographer need be without one. If you wish to see the effect, send for a photograph. The prices range from \$4 00 to \$8 00 each.

Carbon Printing for Small Work.

BY A. WELLESLEY TURNER.

IT is evident that until carbon printing is more generally used for carte and cabinet work than it is at present, it will never take the position that silver printing now holds with photographers; the method, therefore, that I use for doing small permanent work may be of sufficient interest to your readers to find a place in your journal. The process has nothing particularly new in it, except the use of coagulated albumenized paper in the place of double transfer paper, which, as far as I can say, has not previously been used for the same purpose as I employ it. I also find the use of Mr. Johnson's last discovery (viz., the application of thin collodion to the carbon tissue) the greatest improvement, giving greater brilliancy to the prints, besides rendering the operation of developing much easier and more certain, so that I call special attention to this point.

The effect of the thin collodion is evidently to prevent the latent image on the surface of the carbon tissue from expanding too much before the paper and soluble gelatine behind have absorbed sufficient water to become limp enough for squeegeeing; the latent image being held at the sides of the paper causes the reticulation mentioned by Mr. Johnson, which in very bad cases ends in the film parting company with the temporary support; this, however, need never happen now with ordinary caution. The reticulation of the carbon image is not caused by any particular condition of the gelatine used in making the tissue, but by the temperature of the weather, which must materially affect an article like gelatine; but as the consideration of this point is not my object in now writing, I will pass over this subject, and give you my *modus operandi* of carbon printing as applied to carte and cabinet work.

The principal articles I use are the Autotype Company's special portrait tissue, Sawyer's flexible support, and coagulated albumenized paper. The special portrait tissue I sensitize in the ordinary way in a five per cent. bichromate bath, and hang it on laths to dry. If done in the evening, as a rule,

the tissue is dry by the next morning; I then coat the tissue as evenly as possible with a thin collodion, as described by Mr. Johnson a few weeks back (I prefer to do it before printing, as I can then coat larger sheets at a time), and afterwards cut it up into smaller pieces as required; but in doing so care must be taken that the collodion is perfectly dry before putting in the printing-frame, as it would otherwise adhere to the varnish of the negative.

After exposure, I take the prints with the same number of pieces of Sawyer's flexible support and commence the development; the whole of the flexible support (say forty or fifty pieces) first separately wetted, and then put at the far end of a large zinc dish of cold water. Having the printed tissue in a convenient place, I take one piece, and after putting it in the water, draw over one of the pieces of flexible support, and when the tissue begins to straighten, and become limp, I take them both out together, and squeegee them in the ordinary manner. Each print is then hung up by a clip, the same way all the rest of the prints are done. After hanging for about ten minutes or more, the prints are placed in the dish of warm water, the tissue stripped from the support, and then turned face side down to develop of themselves; this will be done in a few minutes, but they can be left much longer—in fact, I always leave them in the warm water whilst I am squeegeeing another batch of the prints, which are ready to go into the warm water by the time the first are thoroughly developed. By this means a large quantity of small prints could be got through. They are, when properly developed, well rinsed in clean cold water, put in alum for about fifteen minutes, and again rinsed, and hung up to dry; this must be done spontaneously, as heat, of course, will cause them to peel off from the waxed support.

The flexible support can be used repeatedly, and, in fact, is in every respect a most useful article, and I prefer it much to collodionized glass. When the prints are dry, I take some good albumenized paper that has been previously coagulated by soaking for about ten minutes in common methylated

spirits; this I cut into suitable pieces, and place them with the prints into a dish of clean cold water; when they are both perfectly limp I take them out and squeegee them together slightly in the same way as when applying ordinary double transfer paper. It is now again dried, when it will easily peel off from the flexible support. From this stage the prints can be handled and treated the same as silver prints.

The reason that I use coagulated albumenized paper is that it has such a fine texture, and gives very brilliant and delicate prints. It is easily prepared, and, in my opinion, works more uniformly and with greater certainty than the ordinary double transfer paper. I should certainly advise every photographer who is thinking of going in for carbon printing for small work, to give it a trial, and I am quite certain they will find that the difficulties which many imagine carbon printing is endowed with are not so dreadful as they appear at a distance.—*London Photo. News.*

Buy a \$12 Drapery.

The Largest Photographs in the World.

THE Australian mail brings, *inter alia*, the *Sydney Evening News* of a recent date, from which we extract an article under the above heading, that speaks highly for the skill and enterprise displayed by our antipodean brethren.

Mr. B. O. Holtermann, the well known gold miner, and one of the richest men in the colony, claims to have produced the largest photographic views in the world. This is, of course, saying a great deal. Our Yankee friends, who are proverbial for big things, may possibly be inclined to dispute Australia's claims to photographic superiority; and one can even fancy he sees a smile of incredulity lighting up the face of brother Jonathan when such an announcement as the above reaches his ears. But let us see how far Mr. Holtermann's claim is justified by facts.

After having made his fortune at gold

mining Mr. Holtermann, at the instance of the late Mr. Beaufoy Merlin, whom he engaged as private photographer, started to take photographic views of the principal parts of New South Wales and Victoria, with the idea of one day making a tour of Europe, and exhibiting a grand panorama of the Australian colonies, especially New South Wales, as a field for emigration. The idea is a philanthropic as well as a patriotic one, and does credit to the heart and head of the lucky digger. To carry out the idea successfully, however, Mr. Holtermann came to the conclusion that no half measures would do. It must, he argued, be done on a grand scale, or not at all; and with the fixed determination of making his show the largest and most complete in the world he set about his work in real earnest, and spared neither time nor expense in the fulfillment of his grand idea.

Having a keen appreciation for the beautiful in nature he fixed on the magnificent harbor and scenery of Port Jackson as the centre of his labors. He purchased a site of land at the North Shore (Blue's Point, the highest point in the locality), from whence he could command an uninterrupted view of the city and harbor of Sydney. Here he built at enormous cost a residence fit for a nobleman, and one which, though its approaches and surroundings are not yet in a finished state, is an architectural ornament to the locality in which it is situated. On the summit of the building is a tower ninety feet high, from whence the views are taken; and perhaps from no other spot in the colony can such a magnificent view be obtained as from this elevation. For miles around the eye rests upon one splendid panorama of natural and artificial scenery, not to be exceeded for beauty by any place in the world. Here was an immense advantage possessed by Mr. Holtermann, and he was not slow in turning it to good account. The most perfect instruments that money could obtain were placed at the disposal of his staff of artists (for Mr. Holtermann employs a regular staff of photographers, and is himself an amateur photographer of considerable experience). Unfortunately, the sudden death of Mr. Beaufoy Merlin interfered for a time

with Mr. Holtermann's plans, but an efficient successor was found in the person of Mr. C. Bayliss, under whose direction the great views of which Mr. Holtermann is now so proud have been produced.

He has two views of Sydney and harbor each five feet by three feet two inches, and two of four feet six inches by three feet two inches. These photographs, Mr. Holtermann claims, are the largest ever produced from single negatives. They give a complete view of the city and harbor of Sydney from Garden Island to Long Nose. No. 1 negative, which is five feet by three feet two inches, takes in the space from Garden Island to Dawes' Point; the second, of the same size, embraces from Dawes' Point to Miller's Point; the two others, each four feet six inches, showing from Miller's Point to Long Nose. Apart from the size of the pictures, they are splendid specimens of the photographer's art, the outlines being sharp and clear and the various objects shown coming out prominently before the eye. The difficulty of producing pictures of such size can be best understood and appreciated by photographers, among many of whom, we understand, it is believed that it is not possible to execute photographs of such magnitude. If such a belief exists Mr. Holtermann claims to have dispelled it, and to have worked a revolution in the art of photography.

In addition to these, Mr. Holtermann has had executed a panoramic view of Sydney and the harbor, thirty-three feet in length. This embraces a distance of about six miles in length, and the whole of the perspective is shown much clearer than can be seen by the naked eye. Signboards between two and three miles off can be seen easily without the aid of a glass. Messrs. Goodlet and Smith's Victoria Saw and Joinery Mill's signboard can be read on both picture and negative without any difficulty, while the comparatively small sign "Moore's Book Mart," in George Street, near the Town Hall, could be distinctly seen with the naked eye. There is but one defect in the picture, and that is one that cannot well be avoided, namely, the obscure and slightly "smudged" look of the shipping in the harbor. The motion of

the craft upon the water renders this defect unavoidable.

These views are the principal ones; but Mr. Holtermann's studio is stocked with thousands of photographic views, all splendid works of art, of different parts of New South Wales and Victoria. It is his intention to start for England early next year with his grand panorama of Australia, his principal object being to induce emigrants to come to Australia; and, as the expense he has already incurred is something enormous, Mr. Holtermann considers that Government aid should be given to a project designed solely to advance the interest of the colony.—*British Journal of Photography.*

Invest in a Vienna Curtain.

Nonpareil Plates.

As many persons have a prejudice against the use of the Nonpareil Plates, because the original ones had a tendency to turn yellow after the picture was finished, we desire to call attention to the fact that these plates are now prepared much better than they were at first, and that now, by proper treatment, they can be secured from change. As the presence of hyposulphite of soda is the cause of the change, all that is necessary to make the whites of the plate permanent is to remove it. This can be readily done as follows:

Make a weak solution of iodide of potassium, and in it dissolve a little iodine. After the picture is fixed wash it well, and then place it in a porcelain tray containing some water. After the plate has soaked a short time, drop into the water a little of the iodine solution and agitate the water. If the color of the iodine disappears, it is evidence of the presence of hypo. Continue to add the iodine until the water retains the color. This shows that all the hypo. has been decomposed. There remains only to wash away the slight trace of iodine and the whites of the plate are assured from change.—EDITOR.

Just issued—*B. J. Almanac for 1876.*

Cross Swords and Cross Purposes.

A GOOD deal has been written and published in different journals and advertisements apparently with the desire to confuse the minds of photographers on the subject of the Dresden Albumen Paper. The following statements will clear up the matter:

There were originally, five houses albumenizing paper in Dresden. We received shipments from time to time from all of them, with their different brands. We purchased the most, however, from S. & M., whose paper we imported long before the parties who now make so much noise ever heard of it.

On the recommendation of Mr. Bogardus we had the brand changed to N. P. A. Dresden, with the cordial acquiescence of S. & M., who will obligingly stamp their paper with any brand their customers may require.

About two years since all the five albumenizers were consolidated into one company, under the charge of Mr. S. of the former firm of S. & M. This new company requiring a very large supply, the makers of the Rives and Saxe papers put a special water-mark of cross swords in all the stock they make for the new company.

The paper is all albumenized alike, either single or double, and stamped to suit customers as the orders come in for it; and our obliging friend Mr. S. will stamp it for any one of our customers with any name or initials, celestial or terrestrial, that he may choose to order.

The sum of the whole matter then is, that all paper from the great Dresden factory has the water-mark of the "cross swords" in it, and it is all alike.

If any paper is offered as Dresden which has not this water-mark it is "Bogus." It may be as good or it may be better, but it does not come from the great Dresden factory.

We keep large supplies—all the time coming—of both the single and double albumenized, white and pink, and all orders shall receive prompt attention.

E. & H. T. ANTHONY & Co.

A Ruffed Grouse on Her Nest.

THE *Illustrated London News* of London, England, gives an illustration received from the Editor of the *New York Forest and Stream* showing a ruffed grouse upon her nest. The original was photographed from life by Messrs. A. C. McIntyre & Co. of Brockville, and also proprietors of the Crossman House Studio, Alexandria Bay, N. Y., a firm well known to tourists for their views of the Thousand Islands and the St. Lawrence. We believe the honor is due to Mr. McIntyre for obtaining the first photograph of the ruffed grouse, while in a state of incubation. It is with extreme pleasure that we chronicle the reputation which our enterprising townsman is winning, not only in Canada and United States, but also in Merry Old England.—*Brockville Evening Recorder*.

It is worthy of mention that the nest of the above mentioned grouse was located only sixteen feet from a cottage that was being built. Our Mr. E. Anthony, who was at that time at Alexandria Bay, paid several visits to the bird, approaching within a few feet without disturbing her. We doubt, however, whether anybody but Mr. McIntyre would have had the enterprise to think of photographing her.

He was fortunate in getting the photograph when he did, for the next morning the young were all hatched, and the patient bird marched off with twelve little chicks.

Fancy Embossed and Lace Envelopes.

THOSE who have a taste for showy and expensive things have now an opportunity of indulging it. Having a "few more left," we can offer the Fancy Embossed and Lace Envelopes at greatly reduced prices. The Lace Envelopes particularly are very sumptuous, being richly perforated in imitation of the finer laces. They are of the ordinary *carte de visite* size, in various delicate tints, and cost for the Embossed \$12 50 per 1000, and for the Lace \$20 00 per 1000.

Try the Snowy Cotton.

CORRESPONDENCE.

SOMERS CENTRE, N. Y., Feb. 22, 1876.

EDITOR ANTHONY'S BULLETIN.

Sir: I have seen many suggestions in different photographic publications for preparing varnished surfaces for retouching, but all of them have a hitch somewhere. Permit me to offer my plan, which is simple, reliable, and requires no previous outlay to test its efficiency:

Place a small quantity of dry bicarbonate of soda on the varnished negative and rub it briskly with a rotary motion, using Canton flannel several times folded to insure softness. In a short time the glazed surface will be succeeded by a dead one, which receives the pencil as pleasantly as the finest drawing-paper.

I invariably use Mountfort's varnish, but I presume the same effect will follow on any ordinarily hard varnish.

The only caution to be observed is to keep particles of dust from the surface, which would form lines; and not to rub long enough, or hard enough, to wear through the varnish. Respectfully,

T. H. LANE.

DENMARK, IOWA, Feb. 27, 1876.

MESSRS. E. & H. T. ANTHONY & Co.

Dear Sirs: I subscribed for the BULLETIN for one year, and liked it very much. As times were dull, I thought best to let it run out; but business is still more dull to be without it, so herein find inclosed a P. O. money order for last year's subscription, and receipt for your signature.

Respectfully, yours,

J. C. SWAN.

BUFFALO, N. Y., March 8, 1876.

MESSRS. E. & H. T. ANTHONY & Co.

Gentlemen: I was somewhat disappointed in not receiving the gun cotton, like sample sent, for the working of it, so far, I have never seen equalled. Advise us about the time it will be shipped.

Yours, truly,

DAVID TUCKER & Co.

The Artopticon.

It has been generally acknowledged that our "Artopticon" is without exception the most powerful oil lantern constructed. That it *still has* the enviable reputation of "best oil lantern" in market we positively maintain. The subjoined letter, though but one of many we receive, is so directly to the point that we quote from it, only asking our readers to judge for themselves:

AURORA, ILL., Feb. 26, 1876.

MESSRS. E. & H. T. ANTHONY & Co.

You doubtless remember I wrote you a few weeks since in regard to buying the "Artopticon," etc., etc.

As Mr. — is a friend of mine and agent for Marcy's Sciopicon, I asked him to order the "Artopticon" of you with privilege of testing it before accepting, to which he consented, and the instrument was forthcoming in a week or so after. We accordingly appointed an evening for its trial side by side with his (Marcy's), and all who were present decided the Artopticon light decidedly the best.

Yours, very truly,

D. C. PRATT.

COLDWATER, MICH., Feb. 28, 1876.

E. & H. T. ANTHONY & Co.

Dear Sirs: The I A W. A. R. lens came all safe. It is a little *beauty*, and I shall awfully hate to let it go back; I made some fine interior negatives with it on Friday and Saturday. I think that I must have one of the 6½ by 4½ Rapid Rectilinears, for they are just the thing for quick out-door work.

Yours, in haste,

JAMES TRIPP.

FORT RUSSELL, Feb. 26, 1876.

E. & H. T. ANTHONY & Co.

Gentlemen: Enclosed find fifty cents for one copy of "The British Journal Photographic Almanac" for 1876. The No. 3 D lens, of Dallmeyer's make, that you sent my pupil, C. A. Bessey, was first-rate. I was glad it pleased him, as I always swear by the Dallmeyer instruments.

Yours, truly,

I. W. BROWN.

Slides of Irish Scenery with Descriptive Readings.

THIS is a collection of glass slides, ninety-three in number, representing the beauties, natural wonders, castles and lakes of that far famed "Isle of the Sea," and published by our friend F. H. Maers, of Dublin, Ireland, whose name is a guarantee of the excellence of the work.

The accompanying lecture, or book of readings, is well written, giving full descriptions of the slides, with historical data and other matter appropriate to the subject. We recommend this series to lecturers and others as meeting a want long felt. Price for set, with lecture, \$60. Slides, 75 cents.

Photographs.

A CENTENNIAL series of five subjects in 11 x 14 grey mounts representing the Cradle of Liberty, Washington Assuming Command of the Continental Armies at Cambridge, Brother Jonathan Delivering his Address of Welcome to the Foreigners, ye Firemen of 1776 and an Exile from Home. This Series will probably have an excellent run, being eminently adapted to the present year. Price, 65 cents each.

Another comic subject is entitled, Be it ever so Humble, there's no Place like Home, and represents an excited Tom Cat splurging after a fugitive rat, who is making the best of his way to his hole. It is mounted on a 10 x 12 gray card. Price, 65 cents.

Another series, on 7 x 9 grey mounts, represents Topsy's First Lesson, the Hen's Nest, Blowing Bubbles (two subjects of the latter). Excellent genre pictures from life. Price, 75 cents each.

Still another series consists of fifteen subjects as follows: Boy and Girl of '76; Spirit of '76; Joy and Grief; Grandma's Specs; Washington; Little Huguenot Lovers; Cradle of Liberty and a number of pretty ideal heads. They are on 7 x 9 grey mounts from drawings by the celebrated artist, Fred T. Vance, whose works have already become so popular and generally admired. This line will constantly receive additions and no doubt become very salable. The price is 75 cents.

Bowdish Chairs.

MR. BOWDISH, never faltering in his ambition to excel, has again increased the attractiveness of his Chairs by modifying the shape of the seats and otherwise improving their general appearance. The prices remain the same. Send for circular.

Anthony's Perfect Album.

[PAT. Nov. 15, 1875.]

THIS invention was suggested by the frequent mutilation of album leaves when inserting or removing a picture in the ordinary albums. Its novelty consists of a muslin lining placed under and calendered to the paper leaf. This imparts a great degree of durability, and effectually protects the leaves from the danger above spoken of. The muslin lining also gives additional strength from its service as a hinge, the cloth of one leaf being continuous with that of the next. We shall make these albums in a variety of patterns. Please send for samples.

Sheplie's Strip Sealing Paper.

[PAT. March 23, 1875.]

WE take great pleasure in introducing to the trade Sheplie's Strip Sealing Paper. It is exceedingly convenient for use, being only about half an inch in width, and put up in rolls of 300 yards. Price, 50 cts. per piece. E. & H. T. ANTHONY & Co., *Sole Agents.*

Card Holders.

A LITTLE novelty in great demand consists of a card holder in a variety of patterns. It can be had in silver, gilt and verde antique bronzings. The holder is composed of a pair of shells, fans or fern leaves on suitable stands. Though quite diminutive they are very effective, and readily sell at the retail price of 25 cents each.

Mr. J. P. BASS would like to call attention to an important reissue of Weston's Original Patent, for which, he says, application was made three months before the patent was applied for that was in suit in Portland.

OUR CENTENNIAL POCKET CAMERA

AND NEW BROMIDE EMULSION.

Our Centennial Pocket Camera and our New Bromide Emulsion are destined to give a great impulse to Amateur Photography.

We have recently made a little 2 x 2 Camera with six double dry plate shields for the great publisher, Frank Leslie, who has addressed us the following note:

NEW YORK, March 6, 1876.

MESSRS. E. & H. T. ANTHONY & Co.

Gentlemen:—The little Centennial Pocket Camera you made for me to take photographs, two inches square, has excited universal admiration, and is as neat a piece of workmanship as I have seen in many a day.

These little Cameras with your new dry plates must give a great impulse to amateur photography.

Please make me two more immediately, and I shall soon want others to arm all my artists with them.

Yours, truly,

FRANK LESLIE.

We make also the size 5 x 4 and 5 x 8.

Every travelling party, every camping party, and every kind of a party can carry a pocket camera, a stand in shape of a walking-stick, and a few little dry plates, and bring home mementoes of the good times they have been having, without carrying about a load of chemicals or a dark tent.

We now make Bromide Emulsion Dry Plates that work as quickly as the wet plate.

Every photographer and dealer should make this known to his friends.

Special Notices.

Twenty-five Cents per Line (seven words), payable in advance.

The German Photographic Society, of New York, have established at Chas. Cooper & Co., 150 Chatham St., N. Y., a mutual labor exchange office. Employers in need of help, and employés in want of situations, will please send their names, directions and full particulars to the place above, where each case will be promptly attended to without charge.

E. D. BRËTTCHER, Cor. Sec.

The undersigned begs leave to announce that he will take orders for retouching Photographs of any size in oil, pastel, crayon, water colors or India ink, in best style and at moderate prices. Please send orders to A. WUNDER, care E. H. Alley, Toledo, O.

Another Retouching Pencil.

After several years' experimenting Mr. Pier Crowell, a practical retoucher, has succeeded in making a pencil which in every respect is vastly superior to any pencil known to photographers. Price, 75 cents each.

E. & H. T. ANTHONY & Co.,

Sole Agents.

Bargains.

We have for sale the goods enumerated below. They have been but little used and are all in perfect order. Note the following low rates:

One Queen's Oxy-hydrogen Lantern (list \$120), \$90.
One " Calcium " (list 57), 40.
One pair Edgerton's Gas Cylinders (list 95), 70.

E. & H. T. ANTHONY & Co.

Rapid Dry Plates.

They keep well and stand the highest summer heat. Can be developed a month after exposure.

Prepared by P. C. DUCHOCHOIS,
826 Broadway, N. Y. City.

For Sale.—One American Optical Co. 17 x 20 Double Swing Back Portrait Camera Box. Has been used but little. Original price \$110; will sell for \$75. Address B. B.,

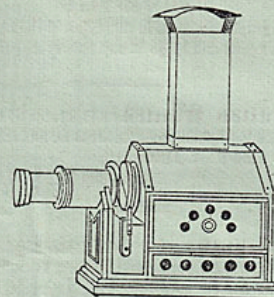
Care E. & H. T. Anthony & Co.,
Box 2200, New York City.

Wanted.—A situation by a first-class negative retoucher, who is also thoroughly acquainted with all branches of photography.

Please address H. B.,
264 Bowery, N. Y.

LANTERN OUTFIT.

Our outfits are rapidly convincing all that we are still, as we for years have been, at the head of the lantern trade in America—witness our One Hundred Dollar Outfit, which we will *guarantee* to exceed in quantity and value any other outfit offered by any parties whatsoever. The list will comprise:



THE ARTOPTICON.—BEST OIL LANTERN IN USE.

An Artoptic, (the best instrument yet constructed for oil light; is compact, light, easily managed; has no glasses or chimney to break; is readily adapted for oxy-calcium or other light, with which it can be used to perfection,

Case for above,
Finest French made Views,
Choice American " "
Statuary, " "
Fables,
Home Scenes,
Colored, Scripture, Temperance or Comic,
Colored, Very Choice,
Dioramic (fine),
Chromatrope,
Comic Slipping Slides.

The above assortment will be varied, within certain limits, to suit the wishes of customers. With such an outfit as this, who could not make money. It is just the business for dull times. Try it.

E. & H. T. ANTHONY & Co.

591 Broadway, New York City.

Lovejoy's Glass Cutter

And Putty Knife combined. Will cut as well as a diamond, and with much less trouble. Price 40 cts. Sent by mail on receipt of price.]

"Wild Deer" Stereo, mailed for 25 cts.
Print Labels, Cards, etc., yourself, \$1 to 6.
Self-(Ribbon)-Inking Stamp and Job Press.
Send 3c for Illust'd circular. D.H. Brooks, Crete, Ill.

Special Notices.

Pianos and Organs—Photographers wishing to buy a Beatty *Piano or Organ*, can get extra inducements through Photographing. Address DANIEL F. BEATTY, Manufacturer, Washington, N. J.

OTTO ERK, 841 BROADWAY, NEW YORK.
Artist to the Trade.
Photographs finished in all styles in the best manner. Crayons and large Water Colors a specialty.

Situation Wanted as Operator by one who understands retouching. Address OPERATOR, Care R. A. HOWARTH, 42 John St., N. Y. City.

A Bargain.—One 10-inch Condensing Lens with Woodward's Stamp and License for Solar Camera; only \$50.00. Address Mrs. JACKSON, Care T. W. BURGER, 206 and 208 Fulton St., New York.

For Sale—a Portable Photograph Gallery nearly new, 30 x 15 feet, with or without instruments, cheap for cash. A. S. BARBER, Wellsville, N. Y.

For Sale.—One of the best equipped galleries in the State of Nebraska. One-half interest or the whole if desired. It is a fine location in every respect, having a good reputation, and in the Capital city of the State. Apply immediately. Address Box 757, Lincoln, Neb.

For Sale.—Photograph Gallery in the beautiful village of Greene, located in the central part of a fine farming county thickly settled with well off, prosperous farmers. No better location in the State. Good and sure business guaranteed. No other gallery in the place, and no opposition within 20 miles. Will be sold at a great sacrifice, owing to proprietor's illness. A chance like this is rarely offered to get a Gallery as well located, well established and as well arranged and fitted up, at a price far below original cost. Really a splendid chance and great bargain. No use writing for particulars. Everything all right and no deception about the place. Come and see. Bring along what money you have to spare, and no doubt we can make arrangements to suit as to price, etc. Address L. R. BRONK, Greene, Chenango Co., N. Y. N. B.—No Postal cards answered.

Wanted.—A Photographer to take charge of a first-class Gallery. Must understand the business thoroughly. Give reference and state salary in gold. Address Geo. T. SIMONSON, St. John, N. B.

Photographic Tents.

Of a new and very superior style, of the best and most durable material. Also, the best of tent furniture, including—COMBINATION WORK-TABLE AND CHEMICAL-CHEST, TENT POSITION CHAIR (has but three legs, will stand on any surface and can be packed in a very small space for moving, etc.) Every tent furnished with *dark-room* without additional cost. Send for descriptive price-list to GEO. PATCH, P. O. Box 442, Stevens Point, Wis.

For Sale.—The leading gallery in Chester, Pa., is offered for sale on the first of May. Chester is a live city of 15,000 population and rapidly increasing; situated on the Delaware River, 14 miles from Philadelphia. The gallery has been established for more than seven years, and is now doing a good paying business. Has a good reputation in all respects and is sold for no fault. Having been in the business for nearly thirty years, I expect to retire from it. Any good photographer who would step into a good business, and be sure to lay up money every year, cannot find a better opportunity. Its proximity to the grand Centennial Exhibition will bring much extra work this year. Price, \$700. Any one meaning business will address WILLIAM SNELL.

For Sale.—A Photo. Gallery in Fort Plain, N. Y., on Central R. R. Pop. 5000. One other gallery in the place. Rooms just painted and papered; new Carpet; Mirror, cost \$52.00; plenty of soft water. Reception room and skylight on same floor. Splendid chance for show at the entrance. Price, \$600; one-half down. Will inventory \$800. All kinds of instruments, frames and stock. Now doing a good business. Reason for selling, am engaged in a Patent Right, and cannot attend to both. Address G. B. HALL, Fort Plain, N. Y.

For Sale.

The celebrated Riverside Gallery at Topeka, the Capital of Kansas, for sale, or would sell a half interest to the right man. Terms easy. A good stock of paying negatives; a large trade in Ink work and frames; fair prices, and enough honorable competition to require the making of good work. Reasons for selling, duties outside the gallery require my full time and attention. For particulars address J. LEE KNIGHT, Topeka, Kas.

Special Notices.

\$250—will buy a Photographic Boat. A good chance for making views. No expense for moving. For particulars address H. O. SICKLER, Mill City, Pa.

For Sale Cheap.—One Rostger extra mammoth tube, a good instrument, \$125. One Extra 4-4 Harrison, patent diaphragm (will cut a 11 x 14 plate), \$75; one 4-4 Harrison (a fair instrument), \$35. Samples of work by these instruments (used in our gallery the last 5 years,) sent on application, and will allow them to be tried. Reasons for selling, wish to refit with Voigtlander and Dallmeyer instruments. Will take desirable photographic apparatus and furniture in part pay. Also for sale cheap, two half size tubes, each, \$15. One fine nickel-plated Roller Press, for imperials and cards, at \$10. Address BACHRACH & BRO. Cor. Eutaw & Lexington Sts., Baltimore, Md.

Bay Window Gallery For Sale.

Intending to remove to our home latitude—where we much prefer to live, and having an opportunity to open a Gallery there—we offer for sale our Elegant Bay Window Gallery, splendidly located in the City of Detroit, Mich., or the lease and permanent fixtures, or any part thereof. This gallery is first-class in every particular, and doing a paying, rapidly increasing business. To a man with a few hundred dollars this is the best opportunity yet offered to get into business in one of the most beautiful cities in the U. S. No curiosity letters. For any information address J. H. SWAINE, 209 Jeff. Ave., Detroit, Mich.

Wanted—by a skilled Operator of 12 years' experience, a situation. All branches of photography a specialty. Address PHOTO-AT-HOME, Box 120, Plainfield, Cumberland Co., Penn.

Eureka will be the cry of the man who buys that fine Gallery we now offer for sale. Prices are good; also large frame trade and no competition for twenty miles; 25,000 inhabitants. Will sell cheap. Address LONG & SMITH, Dealers in Photo. Stock, Quincy, Ill.

A Gallery for Sale.—In one of the best locations on Broadway, in splendid condition, equipped with a full set of first-class instruments. A good workman might make a fortune in a short time, as the Centennial is close at hand. Please call on Anthony & Co., 591 Broadway, for information.

A good negative retoucher, printer and toner, wishes an engagement. Willing to assist in operating. Will accept a moderate salary. References furnished. Address W. C. L., No. 2 Raynor Block, N. Clinton St., Syracuse, N. Y.

For Sale.—A first-class and best located Photograph Gallery in Utica. Rare inducements to early applicants. Address G. R. MARTIN, 58 Franklin Square, Utica, N. Y.

Wanted.—A good second hand Solar Camera, direct Printer. Address BLACK'S GALLERY, Lock Box 77, Franklin, Pa.

For Sale.—A first-class Gallery in Westfield, Mass., in consequence of the foreclosure of a mortgage. Location next to the Post Office. Population, 9,000. No opposition for 10 miles. Must be sold immediately. Terms very satisfactory.

Address

LYMANN WOLCOTT, Westfield, Mass.

P. S.—Fine large light with every facility.

Van Wagner's Retouching Fluid. 25 cents. E. & H. T. Anthony & Co., Sole Agents.

British J. Almanac, 50 cents

Before purchasing, send for a catalogue of the NEW AND IMPROVED **Stereopticons, Magic Lanterns, etc.,** MANUFACTURED BY E. & H. T. ANTHONY & CO., 591 Broadway, New York.

1. Micro. Scientific Lantern,	\$150 00
2. Stereo. Panopticon,	210 00
3. University Stereopticon,	100 00
3/4. Advertiser's Stereopticon,	40 00
(The above are without accessories.)	
4. Artopticon, complete,	\$45 00
5. School Lantern,	33 00
6. Family Lantern,	20 00
7. People's Lantern,	14 00

Each style is the best Apparatus of its class in the market. Also, Oxy-hydrogen and Oxy-calcium Jets, Cylinders, Lenses, etc., etc. Lantern Slides and Views in large variety.

Send for Catalogue giving full particulars.

THE CENTENNIAL
Pocket Camera.

[PATENTED DEC. 16, 1875.]

The perfection attained in dry plate photography within the last few years has induced us to give greater attention to the production of cameras specially adapted to it, and we therefore now offer to the trade an article which will be found superior for the purpose to anything heretofore made.

The body of the camera is constructed of veneers (and being turned at the corners, is consequently in one entire piece,) which renders the camera more substantial and also much lighter than when jointed in the ordinary way. The bed is made of metal, and folds back or removes when not in use, occupying very little space. The tripod screw passes through the bed and fastens into the body of the camera, the focus being drawn in front—*i.e.*, the front part of the camera moves and the rear part remains stationary. It is fitted with Wright's patent swing back, and the bed is so arranged that the camera can be reversed at pleasure.

Double backs are made for it in two styles, which we shall designate as Nos. 1 and 2.

No. 1 is plainly finished, the plates being separated and held in position by pieces of thick cloth, and during exposure the slide is wholly withdrawn.

No. 2 is handsomely finished, having a hinged metal door with springs on each side for holding the plates securely in their places, and tongued and grooved for perfectly excluding the light. The front slides are hinged, so that during exposure they rest against the side of the Camera, thus being removed from the influence of the wind.

We have the following sizes ready for delivery, and, in giving prices, we have separated the camera and shields, so that as many of the latter can be ordered with the camera as desired, and additional ones at any time.

The tripod is round when folded, and forms a tourist's "alpenstock."

PRICES.

4 x 5 Swing Back Pocket Camera, with Wooden Case and Tripod, Ground Glass and Frame, without Shields,	\$37 50
No. 1 Double Dry Plate Shields 4 x 5, each,	6 00
No. 2 " " " " " " " " " "	7 75
5 x 8 Swing Back Stereo Pocket Camera, with Wooden Case, Tri- pod, Ground Glass and Frame, without Shields,	45 00
No. 1 Double Dry Plate Shields 5 x 8, each,	6 75
No. 2 " " " " " " " " " "	8 50

FOR SALE BY

E. & H. T. ANTHONY & Co.

Anthony's Standard Photographic Prepara- tions and Chemicals.

ALWAYS RELIABLE. THE BEST OF THEIR KINDS.

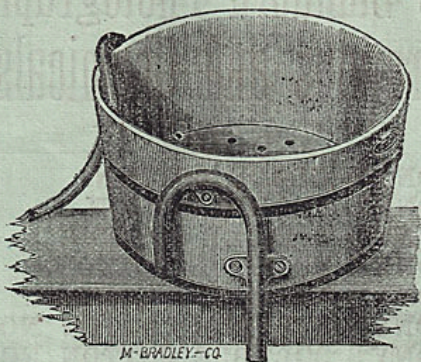
STANDARD IN QUALITY, QUANTITY AND REPUTATION.

- ANTHONY'S GLACE COTTON.
- ANTHONY'S SNOWY COTTON.
- ANTHONY'S SPECIAL COTTON.
- ANTHONY'S POSITIVE COTTON.
- ANTHONY'S NEGATIVE COTTON.
- ANTHONY'S SOLUBLE COTTON NO. 1.
- ANTHONY'S SOLUBLE COTTON NO. 2.
- ANTHONY'S SOLUBLE PAPER.
- ANTHONY'S PLAIN COLLODION.
- ANTHONY'S GLACE COLLODION.
- ANTHONY'S NEGATIVE COLLODION.
- ANTHONY'S POSITIVE COLLODION.
- ANTHONY'S NEW NEGATIVE COLLODION.
- ANTHONY'S EXTRA PORTR'T COLLODION.
- ANTHONY'S INSTANTANEOUS COLLODION.
- ANTHONY'S COPYING COLLODION.
- ANTHONY'S DRY COLLODION.
- ANTHONY'S NONPAREIL COLLODION.
- ANTHONY'S COLLODIO-CHLORIDE.
- ANTHONY'S BROMIDE EMULSION AND PRESERVATIVE.
- DE'S REMBRANDT COLLODION.
- NEWTON'S QUICK COLLODION.
- ANTHONY'S FLINT VARNISH.
- ANTHONY'S DIAMOND VARNISH.
- ANTHONY'S SPECIAL VARNISH.
- ANTHONY'S RETOUCHING VARNISH.
- ANTHONY'S TINTED VARNISH.
- ANTHONY'S CHROMO VARNISH.
- ANTHONY'S PRINT VARNISH.
- MOUNTFORT'S VARNISH.
- ANTHONY'S CONC. SULPH. ETHER.
- ANTHONY'S IODIDES AND BROMIDES.
- ANTHONY'S CHLORIDE OF GOLD.
- ANTHONY'S ENAMELLINE.
- ANTHONY'S DERMALINE.
- ANTHONY'S GUM ROYAL.

SOMETHING NEW!

The Automatic
PHOTOGRAPHIC WASHER.

PATENT APPLIED FOR.



FILLS AND EMPTIES
EVERY SEVEN MINUTES.

Stands on its Own Bottom,

We take great pleasure in introducing and recommending to the fraternity this new and valuable invention, built on thoroughly scientific principles, making it simple, durable and effectual.

Some of the many advantages the Automatic Washer has over the old methods:

FIRST—We guarantee that our Automatic Machine will wash Photographic Prints more thoroughly in one hour's time, removing all traces of "Hypo," than can be done by the old sink or vat process in twenty-four hours.

SECOND—Photographs washed in the Automatic Washer retain all their brilliancy, while the old way of soaking softens the albumen, and destroys their beauty.

THIRD—The Automatic Washer, being circular in form, the pictures and water get a thorough circulation; thus from one to one thousand Prints can be washed at a time, each and every Print getting a thorough and effectual washing, thereby preventing "matting down," as in the old sink or vat.

FOURTH—The water entering at the top and passing out at the bottom, filling and emptying alternately, will convince the Photographer at once that this is the only practical way of removing all traces of Hypo from Photographic Prints.

In fact, the Automatic Washer is complete in itself. Requires no care or attention after once set in motion. Impossible to overflow. Manufactured from the best cedar. No possibility of leaking, and require no plumbing or expense in setting up, standard size, 22 inches diameter, and is just what every Photographer who is ambitious to do first-class work will have. Sold at the low price of \$7 50.

We are using Moore & Newell's automatic print washer, and recommend it as being the best washer we have ever used.

NEW YORK, Feb. 26, 1875.

C. D. FREDRICKS & Co.

Gentlemen: I have been using your automatic washer for some time, and can cheerfully recommend it to the fraternity as giving me complete satisfaction for the object we have used it.

I recommend it more especially on the ground of constant change of water, which clears the prints from all the silver and dust. Yours very truly,

NEW YORK, Feb. 27, 1875.

J. M. MORA.

E. & H. T. Anthony & Co.,

TRADE AGENTS.

THE NONPAREIL VIGNETTING ATTACHMENT.

[Pat'd by I. M. Van Wagner and E. P. Griswold May 5, 1874.]

The most complete, simple and practical method for producing vignettes ever offered to the fraternity. What has been a tedious and troublesome process is by this attachment made easy and pleasant; the labor of hours is reduced to minutes. There is no building up or pasting of papers; the openings and distance can be regulated almost instantaneously. It only needs to be seen to recommend itself to every practical photographer. They are made to fit the ordinary flat printing frames, and are offered at the following prices:

Size, 1-2, \$1 50. Size, 4-4, \$2 20. Size, 8 x 10, \$2 50. 8 x 10 Imperial, \$2 75.

Other sizes furnished to order at reasonable figures.

E. & H. T. Anthony & Co.,
SOLE AGENTS. NEW YORK.

DERMALINE.

It cures burns.
It cures chapped hands.
It cures bites of insects.
It cures old sores and
scabs.



It cures itching or any irritation of the skin.
It cures a great many things, but does NOT cure everything.

We introduced this article originally to protect the hands of Photographers from stains and corrosive chemicals. It has been useful for so many purposes that its fame has spread without being generally advertised, and wholesale druggists are ordering it of us in quantity, so that we are obliged to enlarge our manufacture, and are advised to make it more generally known.

DERMALINE, IN WHATEVER QUANTITY USED, IS PERFECTLY HARMLESS.

For chapped hands or roughness of the skin produced by exposure it is a specific of acknowledged superiority over preparations of glycerine, creams, salves, etc., etc. Its softening and healing influence continues for a long time, hence its value as a protective emollient on the face after shaving.

The peculiar constitution of this preparation is such that no greasiness accompanies its use, nor will the hands, after being thoroughly rubbed with it and dried, soil the clothing.

A gentleman writes us from Boston as follows:

Dec. 11, 1875.

MESSRS. E. & H. T. ANTHONY & Co.

Gentlemen: I wish to call your attention to the fact that Dermaline possesses properties not heretofore claimed for it by you. It is a great and speedy cure for Burns of any kind. My daughter fell on the stove, and burnt her breast very badly. Not having anything else handy, I applied Dermaline. The result was astonishing, for almost instantly the pain disappeared, and the fire or inflammation was drawn out. I have mentioned the fact to several persons, and all use it for the above purpose. When it is applied to old scabs or sores, a most speedy cure is the result.

For any itching or irritation of the skin it is an effectual cure. Yours Truly,
J. H. HALLENBECK.

Another writes from Williamsport, Pa., under date of Dec. 9, 1875:

MESSRS. E. & H. T. ANTHONY & Co.

Gentlemen: I know that one of our most prominent physicians used Dermaline on my suggestion for stubborn sore around a child's nose and at corners of mouth, and healed them in a few days, when his own preparation had failed. We call Dermaline the *Magic Healer*.
Yours Respectfully,

D. R. STILTZ.

A friend who travels most of the year on the railroads says he rubs Dermaline on his hands every morning before going on a railway journey, and no matter how much grime and dust gets on the skin, it remains on the surface and floats off the instant he puts his hands in the water, even without the use of soap.

One who finds the little chocolate colored insects that are so often encountered in strange beds when travelling very poisonous to his skin, escapes the trouble entirely by rubbing Dermaline on his neck and wrists before retiring.

We do not pretend in this circular to enumerate all the cases in which this preparation may be found useful. They will readily suggest themselves to persons who have tried it.

The price is 25 cents per bottle, and we do not know of anything from which an equal amount of comfort can be extracted for so small an outlay. Photographers who recommend and sell it to their friends will be supplied at the rate of \$2 25 per box of one dozen.

It ought to be in every house and in every traveller's trunk.

Directions on each bottle. All that is genuine bears our trade mark as above, and has moulded in the bottle "Dermaline. E. & H. T. ANTHONY & Co., New York."

E. & H. T. ANTHONY & CO., 591 Broadway, New York.

EXTRA PORTRAIT COLLODION.

We would call the attention of photographers to our Extra Portrait Collodion, which will be found invaluable. Its advantages are—

- 1st. It takes *less silver* out of the bath.
- 2d. It does away with *pinholes*.
- 3rd. It gives finer *detail* and *half tone* and at the same time extraordinary *brilliancy*.
- 4th. It gives any degree of intensity with the *iron developer alone*.
- 5th. It removes all danger of *fogging* in the development.
- 6th. It gives a structureless film and clean backgrounds.
- 7th. It is suitable for all kinds of studio work.

Testimonials from leading photographers declare it to be superior to anything in the market. See circular. Price of half-pound bottle, \$1 00. For sale by all Dealers.

E. & H. T. Anthony & Co., Sole Agents.

TESTIMONIALS.

MR. H. T. ANTHONY: NEW YORK, Dec. 9, 1874.
I have been using your New Extra Portrait Collodion, and find it superior to any I have ever used.
A. J. RUSSELL.

MESSRS. ANTHONY: PROVIDENCE, R. I., Nov. 12, 1874.
The collodion works splendidly. Send us two or three pounds. Better send the collodion by return express, soon as possible. Yours, etc.,

COLEMAN & REMINGTON.

N. Y. CITY, Nov. 23, 1874.
We have used the "Extra Portrait Collodion" manufactured by E. & H. T. Anthony & Co., and recommend it to the fraternity as being a very desirable article for all classes of work, and superior to anything in the market.
W. R. HOWELL, D. H. CROSSIN, Operator.

NEW YORK, Nov. 26, 1874.

E. & H. T. ANTHONY & Co.:
Your Extra Portrait Collodion should be called "*The Perfection Collodion*," for such it is. If you want a brilliant portrait collodion, giving exquisite transparency to shadows, use this! If you want quick-acting Landscape Collodion, working out foliage admirably, use this! If you want to make transparencies for the lantern, there is nothing in the market that can compare with it. Yours truly,

GEO. G. ROCKWOOD.

Lea's Manual of Photography.

THIRD EDITION.

The author's illustrations now number 150, nearly double the number of the first edition.

The Chapters on Failures have been much elaborated and rearranged, so as to afford a ready reference in case of almost any trouble or difficulty liable to occur to the photographer, with appropriate remedies therefor.

It contains a method of preparing silvered PAPER WHICH WILL KEEP FOR WEEKS, and with care, even for months; no washing or additional manipulation of the paper needed.

Investigation of Negative Varnishes and formulas for Water-proof Varnish, such that negatives varnished with it have been kept for months under water without injury.

Tables to aid in the construction of glass houses, etc.,

PRICE, \$3.75. 440 pages on fine toned paper, 150 wood cuts, cloth, beveled edges, a 12 g. 4.

FOR SALE BY ALL STOCK-DEALERS.

Sent by return mail, on receipt of price by

E. & H. T. ANTHONY & Co., Sole Agents.

SUBSCRIBE

THE NONPAREIL PLATE.

A substitute for Porcelain, having more than all its beauties with none of its defects.

As these plates are a pure and uniform white coating upon a ferrotype plate, they can readily be cut to any size for lockets and cases. Being flexible, they admit of perfect contact with the negative, and can be printed in the ordinary pressure frame. They have a great advantage of being very easily and quickly printed and finished, while they have a delicacy and beauty hitherto unattained by prints made upon paper. The few pictures as yet made have elicited the most general expression of approval and admiration, and a large demand for them has sprung up in anticipation of their readiness for the market. Every-body should get a supply at once.

They are put up neatly in boxes of one dozen each. Printed directions accompany each box.

PRICES.

1-6 size, per Box of One Dozen Plates,	\$ 1 00
1-4 " " " " " "	1 50
1-2 " " " " " "	3 00
5 x 7 " " " " " "	3 25
4-4 " " " " " "	6 00
7 x 10 " " " " " "	8 00
10 x 14 " " " " " "	18 00

All purchasers of the new Nonpareil Plates will be protected against any party who may claim them to be an infringement of his patent.

John Dean & Co., Worcester, Mass., Manuf'rs.

Trade E. & H. T. Anthony & Co., Agents.

Northern New York Stock Depot.

GLEN'S FALLS, N. Y.

Photographic Goods at New York Prices.

"CRYSTAL" Stereographs of Northern New York Scenery.

100 Landscape Studies for Artists.

PUBLISHER OF

The "ADIRONDACKS," Illustrated, "LAKE GEORGE," "TICONDEROGA," etc.

S. R. Stoddard, Glen's Falls, N. Y.

USE

Slee's Card Mounter.

TURNER'S Business Check Book.

This is a book containing upwards of 125 leaves, each leaf having four sets of four checks each, with an index at the back for keeping the name and number of the checks. It is designed to facilitate the business between a photographer and his patrons, by simplifying and systematizing the entries, and giving briefly necessary directions to the operator and subject. By using this book all others may be dispensed with, no cash book, ledger, nor other records of any kind being required, each check being a complete reference for every transaction between the patron, proprietor and operator. Those who have once had them have never discontinued their use.

For particulars send for circular. Price \$3 50.

E. & H. T. ANTHONY & Co., Sole Agents.

Anthony's Nonpareil Collodion.

Anthony's Nonpareil Collodion for the Nonpareil picture, like all the rest of Anthony's goods, is the best in market. It would give us great pleasure to publish the numerous testimonials indicating the uniform success attained by those who use it. Photographers need not now be discouraged as to any uncertainty in the production of the Nonpareil pictures. It is put up in two bottles, to be mixed when required for use. Price \$1 50 per package.

Anthony's Soluble Paper.

It has been ascertained beyond controversy that our soluble paper is the best article yet produced for making emulsions, and for quick, wet collodion negatives. It dissolves freely, makes a structureless film, and is admirably suited for all photographic work. See what Mr. H. J. Newton says regarding it. Price, \$1 00 per ounce.

E. & H. T. ANTHONY & Co.

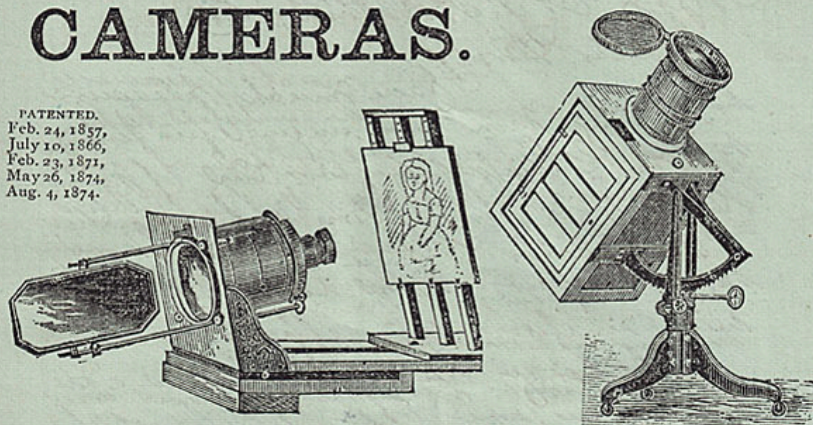
Curtains and Draperies.

The pleasing effects so often seen in photographic portraits have not unfrequently been the result of judiciously-disposed accessories, more especially of draperies or curtains. The styles introduced by Mr. Sarony have, more than all others, proved most attractive and popular; but they were exceedingly expensive. Repeated trials of different materials have led to the adoption of fabrics eminently suited to the purpose, being both substantial in quality and rich and effective in appearance.

These, in draperies, may be had for \$12 00, and in curtains for \$15 00 each. Genuine gros-grain silk curtains, \$30 to 45, according to length and richness.

IMPROVED SOLAR CAMERAS.

PATENTED.
Feb. 24, 1857,
July 10, 1866,
Feb. 23, 1871,
May 26, 1874,
Aug. 4, 1874.



REFLECTING

AND DIRECT PRINTING.

Manufactured under the immediate direction of D. A. WOODWARD, the original inventor and patentee, combining *all the important* improvements that have been made. The CONDENSING AND MAGNIFYING LENSES, free from color as can be obtained, are made in Europe expressly to order, while the OPTICAL CONSTRUCTION of the apparatus is calculated to secure the greatest amount of light to pass through the negative WITH PRECISION and RAPIDITY of action. By recent improvements the bodies of these Cameras are composed principally of METAL, combining lightness with great strength and durability. The REFLECTING CAMERA can be moved to and from the window with the greatest ease, carrying the sensitive surface along with it; while the mode of working its reflector has been so improved that STRONG WINDS CANNOT DISTURB IT, at the same time the regulation being effected with the greatest facility, thereby securing sharpness and perfection of the picture. Each Camera will be provided with the new AUTOMATIC VIGNETTING APPARATUS.

Prices of DIRECT PRINTING or REFLECTING SOLAR CAMERAS:

10 inch diameter condensing lens, will print 18 x 23 in., . . .	\$190 00,	Boxing, \$2 50
12 " " " " " " 25 x 30 " . . .	220 00,	" 4 00
15 " " " " " " 29 x 36 " . . .	275 00,	" 6 00
18 " " " " " " 40 x 50 " . . .	400 00,	" 8 00

Any of the REFLECTING CAMERAS may be made to print much larger than the above marked sizes by increasing the length of the platform supporting the easel.

Every Camera will be tested and guaranteed before delivery, and will be licensed and accompanied by the regular PATENT STAMP of the patentee. Can be ordered through any STOCK DEALER or directly from either of the undersigned.

D. A. WOODWARD, Maryland Institute, BALTIMORE.

E. & H. T. Anthony & Co.,
MANUFACTURER'S AGENTS. NEW YORK.

All persons are Cautioned against Infringing the Solar Camera Patents.

Montreal
 4 Nov 1872.
 Messrs E. H. J. Anthony & Co

Dear Sir I have much pleasure
 in giving you my unqualified testimony
 to the satisfactory working of your
 Collodions, both Dry & Wet Negative
 - the former I have used for more
 than 10 years & the latter for 5 years,
 with uniform good effects.

The large quantities I now order
 from you, are the best proof of
 my estimate of their value.

Indeed, I now confine myself
 pretty much to your preparations
 although I have long been in the
 habit of manufacturing my own

Yours truly
 W. Norman

New York

Oval Russia Leather Cases.

A very excellent novelty in the way of cases is our new Russia leather oval, which can be had in five sizes. This case, which is made of the now fashionable Russia leather, has all the requirements of a first-class manufacture, being very substantial in construction and neat and elegant in appearance. The prices are as follows:

Size, I-16,	per doz., \$10 00
" I-12,	" 12 00
" I-9,	" 15 00
" I-6,	" 18 00
" I-4,	" 22 50

All of which we have in stock.



Attention!

Photographers!

BURRELL'S CHARTS

Of Ribbons and Dress Goods are now offered to the Trade.
 They will show your customers at a glance just how the various fashionable shades will "take," thus avoiding a great many extra sittings. Size 10 1-2 x 12 1-2, on tinted board 13 x 15; only \$1 25 by express, or unmounted by mail post paid.
 Accompanying the chart is sent an excellent little card with Hints to Patrons, or without chart on receipt of 10 cents. Will save dollars to the Photographer. One or more should hang in every studio.
 All orders addressed to

D. T. BURRELL, BROCKTON, MASS.,

Will receive prompt attention, or for sale by the principal stock dealers.

Anthony's Negative Preservers.

Having secured better prices from the manufacturer, we are enabled to place these goods at such figures as will admit of their much more extended use. They will now undoubtedly be very generally employed by photographers, who have gradually learned their value and their adaptation to the particular purpose for which they are intended.

The prices per 1000 now are:

No 1,	2,	3,	4,	5,	6
3 1/2 x 4 1/2,	4 1/2 x 5 1/2,	4 1/2 x 6 1/2,	5 x 8,	6 1/2 x 8 1/2,	8 x 10,
\$3 75,	5 25,	6 25,	7 25,	8 75,	11 75.

Stoddard's Patent Camera Box.

The object of this invention is to keep the camera box constantly closed, thus keeping out the dust, while the ground glass remains always upon the box and resumes its place immediately upon the withdrawal of the shield. The construction of the shield also renders it more permanent than those ordinarily made.

The only cameras manufactured with this improvement are the Victoria and our No. 43, the additional cost on each being \$8 00.



E. & H. T. ANTHONY & CO., Sole Manufacturers.

SUCCESS CAMERA BOXES.

USED BY THE BEST PHOTOGRAPHERS IN THIS
COUNTRY. READ THEIR TESTIMONIALS.

Examine the Quality
AND
Compare Prices.

Exceeded by None!

 ILLUSTRATED PRICE-LIST SENT ON 
APPLICATION.

FOR SALE BY ALL DEALERS.

E. & H. T. ANTHONY & CO., PROPRIETORS.

LP 1162

ADAMANTEAN PLATES!

THE BEST,
MOST UNIFORM,
MOST RELIABLE

Ferrotypes Plate

IN THE MARKET,

With an egg-shell surface,

With a glossy surface,

With a tinted egg-shell surface,

With a tinted glossy surface,

IF YOU WANT A PLATE AS HARD AS ADAMANT,

USE THE

ADAMANTEAN.

Messrs. E. & H. T. ANTHONY & CO.

31 UNION SQUARE, February 7th, 1871.

Gents—The 1,000 sheets 10x14 Ferro-plates have been received, and I hereby tender you my sincere thanks for the promptness displayed in filling the order; and further, I deem it my duty to say to you that the plates are of the same excellent quality I have always had from you. Having thanked you for myself, I would do so for Ferrotypers generally, for producing at so low a price such an uniformly excellent quality of plate.

I remain yours, very truly,

E. M. ESTABROOK.