fowls on urea, observation showing that the urea was changed completely into uric acid during the passage through the organism.

The same author describes the *Preparation of Dichloroacetyl chloride*, which he obtains from dichloroacetic acid and aniline by digestion with phosphoric anhydride, and from ethylic dichloroacetate by first changing it into the amide and then digesting with aniline.

NEW DERIVATIVE OF INDIGOTIN.

By P. SCHUTZENBERGER.

The following results have been obtained with pure indigotin, prepared by agitating an alkaline solution of white indigo in contact with air: It was then heated in a closed vessel to 180° C., with twice its weight of the crystallized hydrate of baryta, 1½ times its weight of powdered zinc, and 10 times its weight of water, for 48 hours. At the outset there was formed an alkaline solution of white indigo, a true vat; but after two days of heating the liquid on exposure to the air ceased to yield blue indigotin. At the bottom of the autoclave was found an insoluble powder, chifty mineral, and consisting of zincate of baryta, carbonate of baryta, and zinc in powder. This residue yields to alcohol an organic substance which gives a brown color to the solvent. On evaporation to dryness this alcoholic solution leaves an amorphous resinous residue of a deep color, brittle in the cold, but becoming soft under 100°. This residue was mixed with zinc powder, and the mixture heated by portions of 10 grms. in a small porcelain crucible, set in a sand bath and heated by a Bunsen burner. The crucible was covered with filter paper, upon which rested the lid. The interior of the crucible then became lined with long and beautiful crystalline needles of a light yellow, resembling sublimed anthraquinon. They are fusible at 245°, insoluble in water, soluble in ether or alcohol, to which they communicate a bluish fluorescence. On analysis they give numbers agreeing exactly with a polymer of indol $\alpha(C_{12}H_7N)$. The new body has well defined basic properties, and forms crystalline compounds with acids. The author has given it the name indolin. It dissolves in hot dilute hydrochloric acid, and the solution forms with platinic chloride a yellow, granular, crystalline precipitate. Concentrated sulphuric acid dissolves indolin with a blue fluorescence, and the solution on exposure to the air deposits—as it becomes hydrated—yellow crystalline grains of indolin sulphate. Indolin sublimes sometimes in needles resembling anthraquinon, sometimes in leaflets like antheracen, but always leaving a carbonaceous residue.

CUPREOUS COMPOUNDS IN THE STOMACH AND BLOOD.—V. Feltz and E. Ritter.—Insoluble albuminate of copper introduced into the stomach has scarcely any effect on the system. The soluble albuminate occasions affections fully as severe as those produced by the ammoniacal sulphate in distilled water. Sulphate of copper dissolved in syrupy glycerin is much more poisonous than the same salt dissolved in aqueous glycerin. A solution of albuminate of copper containing 0.00115 grm. of copper per c. c. occasions death as soon as the dose introduced exceeds 0.0015 grm. per kilo. of the weight of the animal. A salt of copper introduced into the stomach does not become poisonous until the system has absorbed the quantity just mentioned as proving fatal in the blood. The chief channels for the elimination of copper, placed in the order of their importance, are the bowels, the liver, and the kidneys.

A REMARKABLE VEGETABLE POISON.

In consequence of the impression that acts of poisoning are associated with the increasing belief in witchcraft in Jamaica, the Government has appointed a chemist, Mr. Bowrey, to investigate the vegetable poisons of the Island. One of the plants examined by Mr. Bowrey has been the *Echites suberecta*, from which he has obtained an alkaloidal salt, one thousandth part of a grain of which is capable of poisoning a cat. The operation was a very unpleasant one in consequence of the pain caused when small particles of this substance came into contact with the skin.

PREPARATION OF CHEMICALLY PURE GRAPE SUGAR.

By C. NEUBAUER.

Finely powdered refined cane sugar is added to 500 or 600 c. c. of alcohol of 80 per cent., containing 30 or 40 c. c. of fuming hydrochloric acid, and the liquid, poured off from excess of sugar, is set aside in a closed vessel.

Crystals of grape sugar are soon deposited; these are collected on a filter, washed with alcohol until free from acid, and dried by exposure on porous paper. The dry substance is recrystallized from boiling absolute alcohol. By adding a further quantity of powdered cane sugar to the acid mother liquors, a second crop of grape sugar crystals is obtained.

ALCOHOL FROM SUGAR CONTAINED IN BEET LEAVES.—M. Pierre takes 347 lbs. beet leaves, cuts them into fragments, and pounds them in a mortar until from 34 to 35 quarts of juice are extracted. This is left to ferment with a couple of pounds of beer yeast at a temperature of about 48° Fah. After five or six days the juice is filtered through cloth, being previously heated for a few minutes to 176° Fah., in order to coagulate a part of the albuminoid matter. This liquid is finally submitted to several successive and methodical rectifications, which furnish 1677.5 cubic inches of alcohol at 68° centesimal plus 823.5 cubic inches of water at 80°.

EXTRACTION OF ARSENIC FROM MAGENTA RESIDUES.—M. Cl. Winckler's process consists in supersaturating with soda the mother-liquors from the purification of magenta contained in the crude product as arseniate of rosanilin, and on the reduction of the arseniate of soda by charcoal in presence of carbonate of lime.—*Chemisches Centralblatt*.

CLEANING THE DAGUERRETYPE.

By W. L. SHOEMAKER.

It certainly is a matter of vain regret that one feels on removing a daguerreotype from its case, that a specimen that represents such a wonderful era in the graphic art should be subjected to ruthless handling by many professionals of the present.

We have had pictures of every kind brought to us for copying, and I find the daguerreotype the worst abused of all.

Although never having followed the art of daguerrotypy, having become apprenticed at the time of its decline (1859) in this city, still I appreciate and admire the wonderful results that often pass through my hands, and to see a picture without being sealed, no preserver, dusty, finger-marked, is enough to make one swear.

A photographer in the West, for whom we have done a great deal of copying, sent us a package, consisting of a large number of daguerreotypes and ambrotypes. Each were taken from their cases, their mats, glass and preservers removed, each wrapped in a little piece of tissue paper, the whole enclosed in a paper box; when received the ambrotypes were broken to *flinders*, and I had to practise the mosaic art to repair damages; the daguerreotypes scratched to destruction. I am not a practical swearer, or I should have tried my hand at it on that occasion.

About three years ago, two frames of daguerreotypes, each containing about (100) one hundred one-sixth size pictures were sent to us to clean and replace.

These pictures were placed in a velvet matt without sealing; the action of the gases of the atmosphere had obliterated most of the pictures, and they were unrecognizable.

To clean them and replace in the matt would have been easier than any other method, but I desired to make them a permanent thing if I could, and tried the following experiment: first removing, brushing off all loose particles, then immersing in a dish of *hot water*; this removed all gum from sticking paper on back, and softened the coating on surface quickly, so that on laying in a dish of *weak cyanide*, they cleaned nicely; after washing *well*, I poured over the surface *raw albumen*, gave a slight rise under a small flow of water, then set up to dry spontaneously. After *thorough* drying each was placed in a dish of alcohol for a few minutes; this caused the albumen to be made insoluble, or, in other words, cooked it.

If the albumen is moist in the least degree when placed in the alcohol, the surface will dry opaque, and trouble will be given to remove it, but if the surface albumen is thoroughly dry it will remain transparent, and dry spontaneously.

This method I found left a good coating on the surface, and could be rubbed quite hard without marking.

I hesitated making this public at that time, as I desired to wait and see if they returned to their original condition, but on examining them a few weeks since, I find them all good yet, no change having taken place. I felt doubtful myself at the time, for all who have cleaned daguerreotypes, although they may have sealed them properly when putting them up, will know that a picture once cleaned is more liable to change than ever, if not very carefully washed.

My object in occupying your valuable space is not to intrude advice, but rather to relate my experience in the above case, as I aided in the preservation of a number of pictures not valuable in themselves, but for their association, as they represent a body of men, very few of whom are among the living, and were greatly appreciated by their owners.—*Philadelphia Photographer*.

UNALTERABLE SILVER BATH.

HERE is the formula of a silver bath that the inventor gives as unalterable:

Nitrate of Silver.....	2.50 grammes (38 grs.)
Nitrate of Soda.....	1.25 " (19 grs.)
Ammonia.....	(2 drops)
Wood Alcohol.....	7½ c.c. (2 fl. drs.)
Water.....	30 " (8 " ")

The paper is floated in the bath for three or four minutes. As soon as the operation is finished the bath is poured into a bottle, and kept well corked.—*Bulletin Belge*.

EMULSION MANIPULATIONS.

By H. J. NEWTON.

ALTHOUGH so much has been said and written on the mode of developing and the general manipulation in the production of an emulsion negative, there still appears to be a call for light, and from some quarters this cry is fierce and sharp. The fact appears to be overlooked by some that by making a conspicuous display of their failures, they put themselves in strong and unfavorable contrast with those who succeed, and to a great extent justify adverse criticism as to their intellectual capacity.

To avoid the necessity of answering some correspondent almost every day, I will give in minute detail my mode of manipulation in producing an emulsion negative.

First, prepare the plate either with albumen or talc. If with albumen, prepare it as follows: White of one egg dissolved in eight ounces of water; after the solution is complete, add eight ounces of water, to which has been added sixteen drops of carbolic acid. Ammonia in the albumen should be avoided. If talc is used, clean the plates with undiluted sulphuric acid; wash well, and wipe dry with a clean cloth which has been washed in water containing washing soda instead of soap, and when dry apply the talc. If the plate is to be exposed and developed while wet, place it in clean water as soon as the film has set, and let it remain until the greasy lines are washed off (after this is accomplished it will not injure it if it remain in water for a week); expose, and before developing flood the surface with water, in order that the developer may go smoothly over the surface. A quantity of the soda solution, sufficient to cover the plate, is poured into a wide-mouthed vial, and just before using, a few grains of pyrogallie acid are put into it, which dissolves in a few seconds by agitating the soda; then flow over the plate. The flowing of the plate with the developer can be done moderately, as nothing is gained by dashing it on, as many do the iron developer in developing a bath negative. If the plate has been over exposed, the appearance of the negative on the application of the developer will be the same as that of a bath plate.

I would advise any one commencing the use of emulsion to expose one or more plates in this way: Prepare a plate, and give it three exposures by drawing the slide so as to expose one-third of the plate, and after ten seconds draw it so as to expose two-thirds of the plate, and give this ten seconds, and then draw the said slide so as to expose the whole plate, and give this ten seconds. In this way the first part of the plate gets thirty seconds, the middle part twenty seconds, and the last ten seconds. By developing a plate so exposed you can approximate very near the proper time for the light you are working in.

The great variation in the actinic force of light in different localities is a fact, to a great extent overlooked by photographers. The light from the rear windows of my residence

in the yards between the residences on Forty-second and Forty-third streets is at least twice as strong in actinic force as that in the Central Park, three-quarters of a mile away. Before going to the Park to expose plates, I always expose a small plate from my window at the rear of my house, and if fifteen seconds makes a good negative, I invariably give from thirty to forty seconds in the Park. The most striking illustration, however, of the difference in different localities of the actinic force of light I observed in making negatives at Niagara Falls. Plates which required thirty seconds' exposure in New York were fully exposed at the Falls in from three to six seconds.

From these facts it will be observed that, when one attempts to state definitely how much exposure should be given for a specific quantity of emulsion, the chances are that he would only mislead; for this it becomes necessary to expose a plate as above directed, and thus determine the action of light in which the emulsion is exposed.

If the plates are to be used dry, the process of development is the same. The plate should be thoroughly washed before applying the developer. I usually, however, flow the plate after washing with a pyrogallie acid solution, from three to six grains strong, until the faint outlines of the image appear. This pyro solution can be used repeatedly for several hours.

I determine in this way whether the exposure has been long or short. If the image comes out quickly and has a reddish appearance, it indicates an over-exposure. I then reduce my soda solution by adding a small quantity of water, in the first place one-fourth, and determine by its action how to treat the next plate.

Some failures to get good negatives from emulsion have been caused by washing the plates in water unfit for the purpose. Organic is less objectionable than mineral substances in the water. Water from melted ice is always good for this purpose.

The greater the quantity of pyrogallie acid used, the more intense will be the negative. There is, of course, a limit to this effect of pyro. If the negative after fixing needs strengthening, use the iron and citric acid as follows:

No. 1.

Water.....	16 ounces.
Protosulph. iron.....	1 ounce.
Citric acid.....	½ "

No. 2.

Water.....	1 ounce.
Silver.....	20 grains.
Nitric acid.....	6 drops.

Pyro and citric acid can be used, but are more likely to produce stains, and in my hands are not so satisfactory as the iron.—*Photographic Times*.

PHOTO HINTS.

1. *Plate Cleaning*.—The best plate cleaning solution is the water in which potatoes have been boiled. In this water boil your glass plates, and rinse; you will find them much better cleaned than with soda or potass. Try it.

2. Never make your silver nitrate of pieces of silver which have been electro-plated. This year we made some nitrate with fragments of a set of teeth gilded by galvanoplastic, expecting the silver to dissolve and leave the gold intact. But it is not so; and the gold seemed to be dissolved with the silver, as it was not visible in the nitrate. When the nitrate was used in the negative bath we tried and found the plate covered entirely with minute pinholes. The bath solution seemed clear and limpid, but when seen in the sun with a ray falling on the bottle, we saw thousands of minute atoms of gold reflecting and floating in the solution. Filtering was no cure; precipitating as carbonate, no cure; as a chloride the particles did not pass the filter, but rested on it. We then converted the bath into metallic silver by copper plates, as indicated by Captain Abney's Manual, and at the first conversion we still found gold in the nitrate.

3. The simplest way for amateurs of reducing silver wastes is to throw the silver containing solutions (except hypo) on sawdust mixed with ash of paper, and then place a Paris clay crucible with a little borax and nitrate of potass; the wood and nitrate of potass will form carbonate of potass (pearlash). When the flux is limpid as water, and black as jet, flow on dry sand; when cool, you will find pure silver. When the sawdust used is not sufficient to black the flux, put in the crucible a wood stock, which will set all right.—*Photo News*.

PHOTOGRAPHY BY LIGHTNING.

ON June 10th a severe thunderstorm visited Ramsgate, England. The lightning being very vivid, I tried to obtain a photograph, and succeeded perfectly after sensitizing a quarter-plate in the ordinary way. I placed it at the back of a negative. Four flashes were counted, and upon developing up came the image as clear and as quick as if taken by ordinary daylight. One flash with a weak negative gave a fair transparency. I next tried with the camera; after getting everything nicely in focus through my studio window, which was done by the aid of lightning, I obtained a photograph with twenty flashes, the view being the back of Queen street, Ramsgate. This, I think, shows most clearly that the chemical power of lightning is quite equal to the electric light produced artificially, and nearly equal to daylight. As this is the first time I have ever heard of a photograph being taken by lightning, I thought it worth communicating to the *Photographic News*.

A. J. JARMAN.

CLEANING OF PLATES AND LENSES.

ALL persons who work in photography know, or should know, that to clean lenses, and preserve the polish of their surfaces, they should not be wiped with a cloth, but after having removed the dust by means of a brush, they should be covered with a thin coating of grease, then wiped with a piece of very soft chamois. An amateur asserts that for this purpose there is nothing better than chicken grease. Without contesting the merit of this fatty body, we simply use tallow, which we recommend not only for lenses, but also for plates which are to be collodionized.

The dealers in glass plates for clichés coat them with grease, and simply wipe them before delivering them to photographers, and it is known that these plates generally give very pure clichés without any other cleaning.

THE lightning struck the stables of the Gentlemen's Driving Park Association, in Bergen county, N. J., and killed four horses. One of them was Huntington's trotter, for which \$10,000 was recently offered.