PHOTOGRAPHIC NOTES.

To Transfer Ordinary Albumen Prints to Wood, Metal, Glass, or Porcelain, it is, according to *Photographie*, sufficient to thoroughly clean the surface to which the image is to be transferred, if it is a polished or a glossy one, and to smooth it if it is a rough one. It is then coated with a thin layer of copal varnish, and the toned and fixed albumen print is placed upon it while still wet. All the air bubbles and the excessive varnish should be pressed out by means of a squeegee or an India-rubber roller, and then the whole allowed to dry for about four hours. After this time the back of the print is moistened by means of a sponge, when it may be lifted off its support, while the albumen film, together with the picture, remains on it. The image is then coated once more with copal varnish in order to protect it and to render it more brilliant. A reversed transfer is obtained in this way. If, however, gelatine negatives which can be stripped from their glass support, or transparent films, are used, a reversed print may be made on albumen paper, and this one transferred in the manner described above.

Orthochromatic Collodio-Bromide Emulsion.—At the suggestion of Professor Eder, Dr. A. Jonas has worked out a method for making orthochromatic collodio-bromide emulsion similar to that introduced some years ago by Dr. E. Albert. The results of this important work have been published by Dr. Jonas *in extenso* in No. 370 of the *Photo. Correspondenz*. The following two solutions are prepared:

Solution No. I.

Bromide of ammonium	64 grammes.
Distilled water	80 c. c.
Alcohol (absolute)	800 "
Thick 4 per cent collodion	1,500 "
Acetic acid	65 grammes.

Solution No. II.

Nitrate of silver (crystal)	80 grammes.
Distilled water	50 c. c.

The silver nitrate is dissolved by heat, and an aqueous concentrated solution of ammonia (specific gravity 0·91) is carefully added in small portions, until the brown precipitate first formed is again just dissolved. About 75 c. c. of ammonia will be required for this purpose. Finally, 800 c. c. of warm alcohol (113° F.) are added. Both solutions may be prepared by daylight. In the dark room, which should be illuminated by orange light, solution No. II. is poured into solution No. I. in a thin stream, shaking violently all the time. The temperature of solution No. II. should be kept at from 104° to 122° F., because otherwise ammonio-nitrate of silver will crystallize out. A drop of the emulsion thus prepared is then brought into contact with litmus paper, and if it be alkaline, acetic acid should be added drop by drop until the emulsion gives a slightly acid reaction. It is then shaken for a quarter of an hour, allowed to stand for an hour, and then poured into five or six times the quantity of water. The precipitated emulsion is collected on a clean linen cloth, and the latter hung in running water for one or two hours. Finally, the superfluous water is gently pressed out, the emulsion washed several times with distilled water, pressed out once more, and spread out on thick blotting paper to dry. For use, dissolve:

Dry collodio-bromide	6 grammes.
Alcohol	40 c. c.
Ether	60 "

To render the emulsion color-sensitive, a certain quantity of picrate of ammonia and glycerine and the solution of the dye is added to it. In the case of cyanin, the following mixture should be prepared:

Collodio-bromide emulsion	100 c. c.
Solution of cyanin, 1 : 150	10 "
Glycerine	1 "

The action of excess of silver nitrate in the dyed emulsion is very remarkable also in the collodion process. If 51 milligrammes of silver nitrate are added to each 100 c.c. of the emulsion, the sensitiveness of it will be increased at least two times. To obtain a highly color-sensitive emulsion dyed with eoside of silver, proceed as follows: A raw emulsion is at first prepared by dissolving 6 c.c. of collodio-bromide in 40 c.c. of absolute alcohol and 66 c.c. of ether by frequent agitation. Then the following three solutions are prepared:

Solution No. I.

Crystallized eosin	4 grammes.
Distilled water	50 c. c.
Alcohol (96 per cent)	450 "

Solution No. II.

Silver nitrate	3·4 grammes.
Distilled water	50 c. c.
Alcohol (96 per cent)	150 "
Ammonia, concentrated solution, until the first formed precipitate is again dissolved.	

Solution No. III.

Picric acid	3 grammes.
Distilled water	10 c. c.
Ammonia to neutralize the solution.	
Alcohol (96 per cent) up to	300 "

Just before use, mix—

Solution No. I.	75 c. c.
Solution No. II	30 "
Solution [illegible]	30 "
Glycerine, chem. pure	20 "
Alcohol (96 per cent)	45 "

This eoside of silver solution is allowed to stand for one or two days and filtered, and 20 c. c. of it are mixed with each 100 c. c. of the raw emulsion. This dyed emulsion requires only about one-third of the exposure of wet collodion, but it keeps only one or two days. The glass plates, before being coated with the emulsion, are provided with the following substratum: 5 grammes of white gelatine are dissolved in 500 c. c. of distilled water, and to this solution are added 15 c. c. of acetic acid and 10 c. c. of alcohol. The solution is filtered at a temperature of 100° to 110° F., and while still warm, poured twice upon the plate. After being coated with emulsion, the plates are placed directly, without washing, into the dark slide, and can be at once exposed; they will, however, keep damp for thirty to forty minutes in not too hot a room. When exposed, the plates are washed by dark red light until all greasiness has disappeared, and allowed to drain in an upright position for some time. This draining must continue the longer the larger the plates are; if they are not sufficiently drained, streaks will be produced on the film during development. Development takes place by copiously pouring the developer over the plate, as in the case of the wet collodion process. The following concentrated hydroquinone developer is recommended as the best for this purpose:

Solution A.

Distilled water	500 c. c.
Sodium sulphite	200 grammes.
Potash	200 "

Solution B.

Hydroquinone	25 grammes.
Alcohol (96 per cent)	100 c. c.

Solution C.

Bromide of ammonium	25 grammes.
Distilled water	100 c. c.

The concentrated developing solution consists of:

Solution A	100 c. c.
Solution B	5 "
Solution C	7 "

In the case of hard negatives, solution B is increased to from 6 to 7 c. c. The actual developer is prepared by mixing:

Concentrated developer	150 c. c.
Water	1,000 "

The plates can be intensified with pyrogallic acid and silver by preparing the following two solutions:

Solution A.

Pyrogallic acid	7 grammes.
Citric acid	7 "
Distilled water	1,500 c. c.

When dissolved, add:

Acetic acid	25 drops.

Solution B.

Nitrate of silver	10 grammes.
Distilled water	100 c. c.

Just before use, 100 c. c. of solution A are mixed with 5 c. c. of solution B. If it is desired to intensify the plates after fixing, the same pyro. and silver intensifier may be gsed, but the hydroquinone and silver intensifier also answers very well. For reducing the negatives the hypo. and ferricyanide of potassium reducer, as used for gelatine plates, may be used.

Increasing the Sensitiveness of Asphaltum.—E. Valenta has found that the sensitiveness of asphaltum may be materially increased if it is incorporated with sulphur. He dissolves from 7 to 10 grammes of sulphur in a sufficient quantity of bisulphuret of carbon, and adds 100 grammes of Syrian asphaltum. The solution is then freed from the bisulphuret of carbon, and for about one hour heated up to 100° C.; it is then transferred to an air bath, and gradually heated up to about 180° C., until sulphureted hydrogen is escaping. At this temperature it is kept for about five hours. The asphaltum forms, after this treatment, a black and shining mass, which does not dissolve in alcohol, and only to a small degree in ether, while it dissolves perfectly in turpentine, benzole, chloroform, and bisulphide of carbon. Four parts of this preparation are then dissolved in 100 parts of benzole, and the solution is applied in the usual manner to a polished zinc plate. It form a light yellow, thin film of comparatively high sensitiveness to light, and gives, therefore, beneath a negative of good density clear and sharp impressions after the development with turpentine, even with comparatively short exposures.—*H. E. Gunther, in Photo. News.*

Lightning Conductors.

Dr. Hess, who has been collecting statistics and has examined the tips of many lightning rods, finds that fusion of the points never occurs. A fine smooth point receives the lightning in a concentrated form, while angled or ribbed, as well as blunt points, divide it into threads. Dr. Hess considers that platinum needles and tips are entirely unnecessary, for they have no advantage over copper points; but as there are lightning strokes which are capable of making wire 0·20 in. thick incandescent, unbranched copper conductors should never be of less diameter than this, though in a good lightning rod the main point is to secure perfect communication between it and the earth.

Rapid Progress of Electric Railways.

The address of President Watson at the recent Pittsburg meeting of the American Street Railway Association was a discussion of the present condition and prospects of the various methods of street railway traction and contained some valuable statistics. He said:

"It is a source of no little satisfaction to us to know that, in the development of the electric railway, America leads the world. Three years ago there were only 13 electrical roads in the United States; now there are over 400, and the advices from every part of the country indicate that before the close of the present year the number will be increased to 500. The capital now invested in American electric railways exceeds $75,000,000. 'Horse sense' counts for but little in this age of rapid transit. We old dogs have been obliged to learn new tricks, and without the usual privilege of serving an apprenticeship. Our stables are being converted into power houses; the electrician has taken the place of the veterinary surgeon; our drivers are being educated as motor men, and most of us have horse cars for sale.

"Our cities and large towns are becoming as hungry for street railways as the people of the West are for steam roads, and the bulletins of the new census reports show that in 54 of the largest American cities the mileage was nearly doubled between the years of 1880 and 1889, the figures being 1,983 miles in 1880, and 3,150 miles in 1889.

"The following statistics have been compiled from returns made by street railway companies in the United States and Canada to the middle of September, and are believed to be as reliable as it is possible to make them:

Total number of miles	11,030
Number of miles operated by animal power	5,443
" " " " electricity	3,009
" " " " steam motors	1,918
" " " " cable	660
Total number of cars employed in street railway traffic	36,517
Number of cars operated by animal power	25,424
" " " " electricity	6,732
" " " " cable	3,317
" " " " steam motors	1,044
The number of horses employed	88,114
" " mules "	12,002
" " steam motors	200
Number of companies operating street railway lines	1,003
" " " by animal power	537
" " " " electricity	412
" " " " cable	54
" " engaged in building new lines, about	75

"It is interesting to note that since November, 1890, the number of horses employed on street railway lines has fallen from 116,795 to 88,114; that is, 28,681 in one year. At this rate, it will not take long to emancipate the horse from street railway business.

"According to the official figures taken from one of the street railway journals for the month of October, 1891, Philadelphia leads with 510 miles of single track; and after the Quaker City comes Chicago with 452 miles, New York with 289 miles, Brooklyn 285, Boston with 283, St. Louis 275, Baltimore 207, San Francisco 205, Cleveland 192, Cincinnati 180, Pittsburg 168, Kansas City 141, New Orleans 139, Louisville 132, Buffalo 110, Minneapolis 101, Los Angeles 99, Detroit 94, Birmingham, Ala., 92, St. Paul 90, Washington 85.

"The official figures of the census just completed show that in December, 1889, 476 cities and towns possessed rapid transit facilities; and it is now difficult to find any town of 5,000 inhabitants without one or more street railways.

"Since the introduction of cable and electric transit, the government, in its wisdom, has found a new use for the street cars. Some of our lines have been elevated to the dignity of United States mail routes. The plan, in bold outlines, is to place on all the cars convenient little boxes for the collection of mail, which is taken up and sorted at some central point and the city letters sent to the sub-stations, without any of the delays incident to the handling of the mails at a general post office. As an illustration of the workings of such a system there is on record a well authenticated instance of the travels of two letters, one of which was dropped into a letter box on a lamp post in a large city, and the other sent from the same point at the same time to the general post office on an electric car. A comparison of the envelopes subsequently made shows that the last named letter actually reached Washington, 400 miles away, at almost the same time that the letter dropped into the box was received at the general post office, only two miles away. In the city, where all the cars come to a common center, the plan seems most feasible, and companies who have not given this matter due consideration will do well to consult their local postal authorities at an early day."

Preserving Wire Ropes.

For preserving wire ropes carried under water or under the earth's surface a mixture of 35 parts of slaked lime and from 50 to 60 parts of tar is recommended. The compound is boiled and applied to the article hot. For dry-lying cables a thick mixture of graphite boiled in tallow, and one of crude linseed oil and vegetable tar, have both been tried with success.