PHOTOGRAPHIC NOTES.

Retouching Enlarged Negatives.—The following method of retouching enlarged negatives is practiced by a well-known photographic firm of Berlin. *Papier vegetal* is used for the purpose on account of its fineness and transparency. Two pieces of this paper of the size of the negative are cut out, one of them being mounted on the film side, the other one on the glass side of the negative. For mounting, the paper is at first slightly wetted, so that it will become quite tight after drying on the negative, when it is coated all round with glue, and transferred to the glass. In retouching, the larger portions of the negative which are too transparent are strengthened on the paper pasted on the glass side of the negative with powdered black chalk or plumbago, by means of a leather or paper stomp. On the paper mounted on the film side of the negative, the flesh portions are equalized with the brush and Indian ink, bold effects of light being at the same time put in where it seems necessary. It is not at all necessary to work very accurately, since the light produces a softness of effect which could only be equaled by the most laborious retouching of the ordinary kind. The enlarged negative is then printed in the usual manner in the printing frame.

Developers for Shortly Exposed Plates.—Mr. Victor Angerer, one of the most eminent photographers of Vienna, has made a series of experiments with different developers in order to determine which of them acts most energetically in the case of instantaneous exposures. For this purpose he used: (1) The iron developer with the well known accelerator; (2) the cristallos developer; (3) hydroquinone developer with ferrocyanide of potassium, according to the formula of Mr. Lainer; (4) the combined hydroquinone and eikonogen developer. The solutions were freshly prepared—except the cristallos developer—and the plates developed at the same time. The results were the following: Developer No. 1 gave the fewest details, and a slightly fogged negative; No. 2, plenty of details, but the lights too dense, no fog; No. 3, plenty of details, very dense lights, and a slightly fogged negative; No. 4, an entirely clear and soft negative with very fine details and with all the half tones. The combined hydroquinone and eikonogen developer (No. 4), which was superior to all others, was prepared according to the following formula:

Solution No. 1.

Distilled water	1,250 c. c.
Potassium sulphite	150 grammes.
Eikonogen	22½ "
Hydroquinone	7½ "

Solution No. 2.

Water	250 c. c.
Potassium carbonate	75 grammes.

For use, five parts of solution No. 1 were mixed with one part of solution No. 2.

To Produce Ground Glass.—The following process to produce ground glass has been recommended to me by a professional photographer. A cup is filled up to one-half with water, to which some emery powder is added. Stir well, allow to stand for about five minutes, and decant into another cup. Allow to stand again for five minutes, and decant the fluid into a third cup. In each of the cups remains a sediment of emery powder of various degrees of granularity. Take a well cleaned glass plate, and commence to grind it with the coarsest grain; proceed with the grain of the second cup, and finish with the finest one. A semi-transparent glass plate of exceeding fineness is obtained by this method. —*H. E. Gunther, in Photo. News.*

Platinum Toning Bath for Silver Prints.—M. Brunel Paul recommends the following for a platinum toning bath, which he says is stable and keeps for a length of time:

Chloroplatinite of soda	2 parts.
Chloride of sodium	2 "
Bitartrate of soda	1 part.

Dissolve in 1,000 parts of cold water. The bitartrate has the effect of rendering the bath slightly acid, which is necessary for effecting the toning. This bath keeps good for a long time, and gives a very fine effect. The prints first washed in water may be immersed in it directly. The first tones are purple, purple-brown, and finally of the black of Indian ink. After toning, the print is passed through a bath of hyposulphite of soda twenty per cent, and thoroughly washed. The tones are absolutely unalterable and particularly suited to landscapes.

Sketching on Lantern Slides.—M. Canfyn, of the Association Belge, recommends a method of preparing lantern slides for drawing on with pencil. This glass is first coated with a "matt" varnish of the following composition:

Ether	100 parts.
Sandarac	2 "
Mastic	2 "
Benzine	20 "

After the drawing has been made upon the surface so prepared it is covered with the following varnish:

Ether	100 parts.
Sandarac	3 "
Mastic	3 "

This varnish dries brilliantly smooth, so that the slide appears perfectly transparent, and may be used well for lantern projections.—*Br. Jour. of Photo.*

The Incandescent Lamp Suit.

A suit brought upon one of Edison's fundamental incandescent lamp patents, No. 223,898, of January 27, 1880, is now upon its final hearing in the United States Circuit Court in this city before Judge Wallace. It is one of the most important patent suits that has recently come to trial, and if awarded in favor of the Edison patent, will give the Edison companies the monopoly of incandescent lamp manufacture for some six years to come, besides the benefits of an accounting for past infringements. The parties to the suit are the Edison Electric Light Company against the United States Electric Lighting Company.

The interest involved is enormous; it is estimated that from fifty thousand to seventy-five thousand lamps are manufactured daily, the royalty or profit on which would represent several millions of dollars annually. The counsel include Clarence A. Seward, Grosvenor P. Lowrey and Richard N. Dyer for the Edison Co., and Edmund Netmore, Gen. Duncan, and Frederick H. Betts for the defendants. In the opening argument Mr. Dyer laid much stress on the commercial success of the Edison lamp, claiming that up to his time the critical point for the construction of a successful lamp had been missed by all inventors.

The American Institute of Electrical Engineers.

The eighth annual meeting of the American Institute of Electrical Engineers, held on May 19, 20 and 21, in this city, in many respects may be noted as the most important of these gatherings. The rapid development of the science, the clearing up of old difficulties and the development of new problems have operated to evolve papers of high merit and indicative of much research and systematization.

For the succeeding year Professor Alexander Graham Bell was elected president, succeeding Professor William A. Anthony. Professor Anthony presided over the sessions of the meeting.

The first paper read was one by Francis B. Crocker, on "The Perfection of Stationary Electric Motors." This was largely devoted to an elucidation of the system of construction and of the data of the motor identified with the lecturer's name. The structural details were so clearly presented as to make the paper, though apparently of limited scope, a really valuable study for dynamo builders. A paper on "A Photographic Study of the Electric Arc," by Professor Edward L. Nichols, followed. This gave the results of an examination of the fluctuations in the electric arc, as observed by photography, the alternating current being employed. A species of flame reactions, similar to those obtained with the manometric capsule or by other methods in the well known physical experiments with gas flames, were discovered. The sensitized plate during exposure was driven at high speed across the field of projection. This operated to give a band-like photograph, whose irregularities disclosed the alternations and cessations of the arc due to the reversals of current. The photographs strongly suggest the revolving mirror reflections of a sensitive flame affected by a sound.

The subject of electric welding, as treated by Frederick A. C. Perrine, D.Sc., was of much interest as bringing the description of the commercial uses of the process up to date. The daily record at the Roebling wire mills shows nearly 1,000 welds of wire, in great part for telegraph and submarine cable work. The Trenton Iron Company use the process for uniting iron rope. The process results in a two inch weld, at which the rope is converted into a solid bar. The welding is done with the ends of the rope abutting within a cast iron collar, which collar is afterward broken off. Another works uses the process for welding car wheel tires, which are 4 inches wide and ¾ inch thick, as well as light wagon wheel tires. One of the Johnstown, Pa., works welds rails together—about the heaviest line of work yet executed. Band saws not only have their ends thus united, but broken teeth are replaced by electric welding, a drop of oil being applied to the replaced tooth to give it proper temper. The welding of chains and shells for heavy ordnance was also spoken of. The limitations of the process and its disadvantages as far as they exist were treated of in the conclusion of the paper.

Prof. George S. Moler's paper upon "An Alternating Current Potentiometer" was an excellent contribution to the practical measurement of alternating current voltage. A lamp was lighted by alternating and constant current in rapid succession, the change from one to the other being effected by a switch. The constant current, being of known factors, was the standard. The regulation was so effected that both currents gave equal intensity of illumination, so that the reading of the constant circuit voltmeter gave the voltage of the other circuit. It was proposed to use the apparatus for standardizing voltmeters.

Carl Hering's paper upon "A New Graphical Method of Calculating Leads for Wiring" was doubly acceptable, as it indicates a system of three-data calculation upon a single sheet—something which would seem to be of wide applicability in many calculations, as in gas photometry and other work.

Other papers were read which cannot be summarized here. On the evening of May 20, Mr. Nikola Tesla gave a most brilliant lecture and series of demonstrations entitled "Experiments with Alternating Currents of High Potential." His experiments were performed with a current of immense rapidity of alternation, 20,000 periods per second, and one which included a difference of potential which ran up as high sometimes as 250,000 volts. Geissler tubes and incandescent lamps were lighted without any direct contact. The lecture lasted nearly two and one-half hours. Some of the results suggested the possibility of lighting the room without any direct contact by simple distribution of Geissler tubes and lamps in the excited field. This the lecturer stated he would have done had time permitted him to make the necessary preparations. The currents or discharges produced at the lecture would pass through ordinary insulators, such as glass, India rubber and paper, with heat effects, sometimes producing a species of welding.

A reception by the Electric Club, visits to electric works, and an exhibition of historic books and apparatus were features of the meeting, which adjourned to meet a year hence.

New Process of Water Softening.

A new process of softening locomotive feed water has been devised by Mr. Leonard Archbutt and Mr. Deeley, and, after much experiment at the Midland Railway Company's works at Derby, is about to be extensively adopted at that place. The details of the plant and process were communicated by these two gentlemen in a paper read on May 4 before the London section of the Society of Chemical Industry, and from its favorable reception there, much success may be safely foretold for the method they have adopted.

It consists, says *The Engineer*, in treating the water to be softened with a mixture of lime, sodium carbonate, and aluminum sulphate, under somewhat peculiar conditions. The chemicals used are in no way novel, having been employed in the Maignen process for softening water and in many previously devised methods, but the application of the mixture and the subsequent treatment of the water are so well devised and effective, that a very qualified success has been converted into one of which no reasonable doubt can exist.

In the experimental tank, holding 20,000 gallons, with which Mr. Archbutt has worked, the arrangement was as follows: A smaller tank, above that holding the water, served for the solution of the chemicals, the aqueous solution formed therein being allowed to flow into a well in the larger tank, at the bottom of which is a steam trajector, which forcibly mixes the concentrated solution of purifying reagents with the water to be treated. The sludge from a previous operation is allowed to remain at the bottom of the large tank during this part of the process, and so far from any efforts being made to prevent its admixture with the fresh supply of water, is forcibly intermingled therewith by air being forced in, with the view of rousing it thoroughly after the admixture of the chemicals proper. The reason for this is simply that it is found that the coarse-grained precipitate formed in a previous operation materially aids the deposition of the finely divided suspended matter that results from the action of the chemical reagents. So completely does this occur, that subsidence is very rapid and clear. Purified effluent can be drawn off without recourse being needed to filter presses or settling plates to expedite it in any way.

That the process is effective is clearly shown by the following analyses:

	Before treatment. Grains per gal.	After treatment. Grains per gal.
Calcium carbonate	9·74	2·25
Magnesium carbonate	2·45	2·18
Sodium carbonate	--	0·85
Calcium sulphate	5·64	--
Magnesium sulphate	1·34	--
Sodium sulphate	3·41	11·33
Sodium chloride	2·81	3·38
Silica	0·34	0·48
Total	25·74	20·47
Lime	7·78	1·26
Magnesia	1·62	1·02

It was found, however, that water thus purified coated the feeding apparatus of the boilers in which it was used, the cause being the deposition of a further quantity of calcium and magnesium salts on raising the temperature of the water. This trouble, which threatened to be formidable, was completely obviated by slightly carbonating the water after its purification by leading into it the gases from a coke fire, after which treatment no difficulty of the kind presented itself. With this modification the method promises to be a complete success, and we learn that the Midland Railway Company contemplates putting down plant for the purification of the whole of the water used for locomotive purposes at the central works at Derby.