

PHOTOGRAPHIC NOTES.

Photographing by the Aid of Magnesium Light.—Mr. Goodwin, before the Glasgow and West of Scotland Amateur Photographic Association, recently explained a simple way of burning magnesium powder for taking photographs at night, which we find reported in the *Brit. Jour. of Photo.* A long camera stand is turned upside down, and the legs tied firmly together, a horizontal arm of wood about eight inches long is lashed as near the top as possible, and at the end of this is supported a small tin funnel, beneath which is a ring of cotton wick wet with alcohol. When in use, the stand is further raised by being placed on a bench or chair, and, everything being ready for the exposure, the wick is lighted, and the magnesium powder, mixed with two parts of fine sand, is poured into the funnel; a magnificent sheet of flame results, and the negatives obtained were very soft, the light having been thoroughly diffused. A thimbleful of magnesium powder with twice the amount of sand is sufficient for an exposure.

Photographing Colored Pictures.—Many experiments have been recently made in this branch of photography, more especially in Germany, which it is probable will shortly result in the formulation of a valuable process for accurately copying colored pictures, such as paintings, chromos, etc., in the true relation of the respective tints.

One class of experimenters believe that it is necessary to mix some dye like eosine or azaline with the emulsion, in order to secure the best results; others show that an ordinary commercial dry plate may be utilized by immersing in a bath of azaline. The film thus becoming impregnated with dye is as sensitive as if the latter was contained in the original emulsion. In either case it is suggested that a pale yellow screen of glass be affixed at the rear of the lens in the camera, when daylight is employed, in order to counteract the effect of the blue rays. Dr. H. W. Vogel, one of the early experimenters, says recently in the *Photographische Correspondenz*, translated in the *British Jour. of Photography*, that he tried photographing on plates sensitized with azaline by lamplight, as follows:

I had two gas burners (Argand) at hand, which I placed right and left at a distance of about eight inches from one of my colored tables.

The direct light from the flame was screened from the lens by sheets of tin.

The lenses were of the stereoscopic class, with four inches back focus, without stops.

The first experiment showed at once that azaline plates with this illumination had a sensitiveness far beyond what I had expected.

Two minutes' exposure proved to be much too long.

I reduced the exposure to one and a half minutes, and finally to fifteen seconds; even with this short exposure the plates appeared to be overexposed, and the negatives were so vigorous that they took a long time to print.

An exact comparison with daylight showed that through a dark yellow glass screen at one o'clock in the afternoon of Dec. 7, in clear weather, six seconds was necessary to give a well exposed picture of the color table; so that in fact it is possible to obtain by lamplight, *without a yellow screen*, an image with true color relation, with an exposure only two and a half times as great as that with daylight and a yellow screen.

The photograph by lamplight had almost exactly the same relation to the colors as that by daylight. For photographing colored bodies by artificial light a new way is thus, by means of azaline plates, opened.

Further, the interesting fact is established by these experiments, that an azaline plate is more sensitive by lamplight than an ordinary dry plate with the same emulsion.

Quicksilver Production and Trade, 1885.

Mr. J. B. Randol, of San Francisco, gives the following information:

California is the only State in America where cinnabar is mined in paying quantities, and where the production of quicksilver from that ore is worthy of notice.

The year 1885, like the three years preceding, has been unsatisfactory in production and price.

In 1881, when 60,851 flasks of 76½ pounds each were produced, the price ranged from \$27.90 to \$30.75 a flask; in 1884, 31,913 flasks produced sold for from \$26 to \$35; and last year the product, 32,073 flasks, realized \$28.50 to \$32. With this large decrease in production—nearly one-half since 1881—there has been no corresponding rise in price, which, united, have caused the quicksilver industry to be almost entirely unprofitable; for, with deeper mining, the expenses have largely increased, and the ores have also become scarcer and poorer.

In this condition of affairs, all the mines would be compelled to cease operations were it not for the *ad valorem* duty of 10 per cent placed on the quicksilver produced by cheap labor at the rich mines of Almaden, Spain, and Idria, Austria, owned and worked by the governments of those countries.

It is not known that any of the ten quicksilver

mines worked in California earned a dividend last year; but it is quite certain that none was paid, and the prospects for the future in that direction are quite unfavorable. To make this industry fairly remunerative, it is necessary for the government to foster it by a duty of not less than ten cents a pound, and even that would leave the strength for survival one of great uncertainty and difficulty.

The total production for 1885 was 32,073 flasks. The New Almaden mine is credited with 21,400, or 1,400 flasks more than it made in 1884; all the other mines, ten in number, had an aggregate of 10,673 flasks, which was 1,240 flasks less than they together produced in 1884.

The Gaudalupe mine made only 35 flasks, then entirely ceased operations, and is supposed to be permanently closed. The Sulphur Bank mine made a last dying effort to continue a producer; but it is believed its superficial deposits will soon be exhausted, and then one more will be added to the list of closed mines, in which category may also soon be included the Redington, Great Eastern, Aetna, New Idria.

The exports by sea from San Francisco were 15,730 flasks, an increase of 829 over the previous year. Ten thousand flasks were sent out of the State by railroad to Arizona, Utah, Idaho, Montana, and Mexico, and it is estimated that about 10,000 flasks were consumed in California and Nevada, leaving the San Francisco market bare of stock at the end of the year.

The low price of silver has shut out quicksilver as an article of export to China, and it has also seriously cut down the profits on shipments to Mexico.

Perhaps the exhaustion of the American quicksilver mines, quite sure to come before the year 1900, may yet have an important bearing on the over-supply of silver now agitating the financial and political world; for with the sources of quicksilver controlled, as they then would be, solely by the governments of Spain and Austria, it would be in their power to limit the production, and to greatly increase the price, even to a point above where it would be a loss for the silver mines to mine any but the richest ores. Thus the output of silver could be diminished from all mines except the few having smelting ores.

A Peculiar Illumination.

A brilliant phenomenon has been noticed at Beaver Falls and other places in Western Pennsylvania, where natural gas blow-off pipes send out their large volumes of flame into the frosty night air, which has aroused particular interest both from its beauty and the absence of any fully satisfactory explanation.

At those works which receive their supply of natural gas directly from a well, and are running only during the daytime, the gas is permitted to escape into the atmosphere at night, and to avoid the roaring sound is usually ignited as it issues from the top of the blow-off. These gigantic torches light up the country for miles around, the effect being particularly noticeable in cloudy weather, when the glare is reflected. It has been observed that in certain conditions of the atmosphere a vertical, feathery, and very brilliant arrow of fire extends above the flame almost to the zenith. Its greatest brilliance is perhaps at its highest point, where it is described as being quite as bright as a rod of iron at a white heat. The natural pulsations of the gas, as it rushes from the blow-off, affect the outpouring flame, and give the luminous arrow a leaping, flashing motion which adds greatly to its beauty. The observers agree in stating—and the fact is significant—that the conditions necessary for the appearance of the phenomenon depend upon the presence of a frosty atmosphere and an appreciable haziness, or else it is visible either during or immediately preceding a light, fleecy fall of snow, the temperature being somewhat below the freezing point.

Bearing these facts in mind, it is not difficult to explain the arrow. The minute crystalline faces of the suspended snow or ice particles catch the light from the burning torch, and reflect the rays in precisely the same manner as the ocean, or other expanse of water, on a moonlight night, gives us a long, silvery path of reflected moonbeams. This explanation finds further confirmation in the fact that the arrow extends only to the upper limits of the haze, and when the lower atmosphere is clear, begins at some distance above the flame.

Accident to the Pont Neuf.

On the morning of December 17, about six o'clock, a serious accident was found to have occurred at the Pont Neuf, the oldest and best known of the Paris bridges. On that part of the structure crossing the narrower of the streams into which the Seine is divided by the island of the Cité, the third pier had sunk, and the pressure of the arches toward the subsidence had torn up the pavement of the footpaths and the causeway. An alarm was given by persons who were crossing the bridge, and traffic was at once stopped by the police. A large crowd soon collected, and could see

the outer stones of the bridge break off in large masses and fall into the river. Barriers were erected at both ends of the bridge, and the gas pipes crossing it were cut off and rendered secure.

It was found that the part of the bridge which had been injured had subsided 65 centimeters. That part of the bridge which crossed the wide stream is secure, but the other part will have to be entirely rebuilt. The city engineers state that the work will be long and tedious, and that while it is going on it will be necessary to erect a temporary bridge connecting the Quai des Orfevres and the Quai des Grands Augustins. The common proverb, "Solide comme le Pont Neuf," has thus been falsified.—*London Times*.

How a Wise Man Built His House.

Many of our readers will find their own experience reflected in the following paragraph taken from the last number of the *Central Law Journal*, where it is used to illustrate another subject. A gentleman wished to build for himself a nice mansion, and, of course, was exceedingly anxious to have the approbation of his friends and neighbors. So he asked the advice of all. The first said, "Here is a nice site, and I should build such a style of house." The second said, "I don't like that site nor the style of house." The third came along, and was utterly amazed at the selection of the site made by the others, and of their total want of taste in architecture. He said, "Leave off all that; here is the most charming spot for a house, and here is the most exquisite plan for a house." And so it went on until the gentleman became disgusted with his advisers, and went and selected his own site and adopted his own style of architecture, and builded a house to suit himself. By a multitude of counselors there is wisdom, but the house builder's experience in seeking the advice of his neighbors found it different, and was probably wise in rejecting all their suggestions, and following the plans his own judgment dictated. The moral here conveyed does not end with locating of a house site or the erection of the building. It will be generally found best to follow one's own impressions and taste rather than to defer to others.

The Universal Telemeter.

Some interesting experiments were recently carried out on the Thames Embankment with the universal telemeter, a new surveying instrument, the invention of the Abbe Luigi Cerebotani, Professor of Astronomy and Mathematics at the University of Verona. The instrument consists mainly of two glasses capable of accurate adjustment, the one acting as the base line, the other, the side of an angle. The direction of the glasses is gauged by a graded rule, by means of which the distance between the two glasses of observation and the point to be measured is registered, rendering the finding of the required length of line a matter of easy calculation. The stand on which the telemeter is fixed is provided with a drawing board, on which the objects measured can be dotted as the measurements are obtained, thus gradually forming a plan of the country surveyed. The whole is exceedingly simple, and can be worked by any one not possessing special knowledge. The telemeter has already been tested by Herr Foerster, of the Berlin Observatory, and one is now in use by the German War Office. The instrument seems well adapted to ordinary surveying, although it might possibly be urged that its utility may be somewhat handicapped by the shortness of its base line.

The Cost of Wheat Production.

The phenomenally low prices for wheat which have prevailed during the past year have directed attention to the details of the cost of producing that grain, and in various States of the wheat section the statistical experts are making calculations to settle the question whether, at the prevailing prices, the culture of wheat can be profitably continued. One of the most interesting reports yet published on this point has been made by the Michigan Secretary of State concerning the cost of producing and marketing the wheat, oats, and corn crops of 1885 in that State.

The average yield per acre is given at 21.98 bushels of wheat, 40.55 bushels of oats, and 70.87 bushels of ears of corn. The yield thus indicated applied to the cost per acre shows an average cost per bushel of 59.1 cents for wheat, 29 cents for oats, and 21.1 cents for ear corn. The average price of wheat on January 1, for the State, is placed at about 74 cents, oats 30 cents, and corn 24 cents per bushel of ears. In regard to wheat, the report observes that the "net profit on investment in the southern counties is 38 per cent, and in the northern counties 35 per cent."

P. ORR & SONS, of Madras, write that, owing to the terrific rains in India, a good waterproof roofing is very necessary. The writers think the paper tile referred to in the *SCIENTIFIC AMERICAN* of Oct. 31 might be specially adapted to their climate and storms, and suggest that the manufacturers of the article send them samples for trial.