PHOTOGRAPHIC NOTES.

Decline in the Price of Magnesium.—Owing to the great sensitiveness of the present dry plates, a new field has been opened for the use of magnesium ribbon in furnishing an actinic artificial light whereby pictures can be readily secured at night. This, together with improved and cheaper methods of producing it, has recently led to a marked decline in the price. The fall in England has been from 15 shillings to 2 shillings and 6 pence per ounce, or nearly seven times cheaper than formerly.

It is probable that the same product will be sold in this country at the rate of 75 cents per ounce instead of $3, as heretofore.

For obtaining a uniform actinic light in the making of enlargements and positive prints on gelatino-bromide paper, the magnesium ribbon is unexcelled. It will, in fact, be as cheap, for this purpose, as common gas. The reduction in cost is likely to bring the metal into more extensive use for photographic purposes.

Simple Remedy for Frilling.—For plates inclined to frill, Mr. A. L. Henderson, of London, recently suggested the following plan, which we find in the *British Jour. of Photo.* After exposure and prior to development he flows over the plate a solution of gelatine and water (5 grs. of gelatine to each ounce of water), and allows it to dry.

Then the plate is put in the developer, and frilling will be prevented; the additional film of gelatine does not in the least affect the action of the developer. By a simple experiment, he discovered the value of this remedy. Taking a plate which was cast aside because of its frilling tendencies, he coated half of it with the gelatine. When placed in the developer, the portion not protected at once frilled to an extraordinary degree, while the part coated with gelatine remained smooth and unaffected.

Reproducing a Brilliant Negative from one that is Overtimed.—In the *American Journal of Photography* appears a practical account by Mr. Wm. H. Rau of his plan to obtain good duplicate negatives from a poor original, as follows:

We had made upon large plates exposures of the interior of a handsomely furnished room, especially arranged for the occasion; and imagining that we had given the correct time or near it, and not for an instant suspecting an overexposure, we confidently placed the plate in the normal developer. The image did not begin to appear at once, but almost immediately on its appearance began to overcast. We at once saw that the exposure was probably four times as much as it should have been. We were anxious to save the plate, as the conditions for making another exposure were no longer possible.

It was very tame and flat, but full of detail. We added more pyro. and bromide, in order to give it the density necessary for printing, and, when sufficient strength was had, fixed it in the usual manner.

We then resorted to the following means for getting a brilliant picture by reproducing the negative.

We took a rapid plate, and exposed it for one second under the negative to the light of an ordinary gas flame, at a distance of 18 inches.

Great care was necessary in developing this positive, and we used the following proportions of developer, to secure as much contrast in the impression as possible.

We made the following solutions:

A.

Water	10 oz.
Crystallized sulphite soda	2 oz.
Carbonate potassa	4 oz.
Water to make up to 16 oz.	

B.

Water	10 oz.
Sulphite soda, cryst	2 oz.
Sulphuric acid (added slowly)	1 drm.
Pyrogallic acid	1 oz.
Water to make up to 16 oz.	

Of these solutions we took of:

A	1½ drms.
B	6 drms.
Water	6 oz.
Solution of bromide potassium (20 grs. to oz.)	1¼ drms.

The development proceeded slowly, and gradually built up a vigorous and plucky positive, full of detail and crispness.

We then used this positive to reproduce the negative, employing a rapid plate, giving the same exposure, and using the same developer.

The final negative had all the appearance of a properly timed plate.

In connection with the above, it may be of interest to know the value of Farmer's solution as a local reducer of too great intensity, either in a negative or print.

It consists of a mixture of hyposulphite of soda and ferrid cyanide of potassium, commonly called red prussiate of potash.

A solution of each is made of equal strength, say one ounce to a pint of water; when used, one-half drachm of the ferrid cyanide is added to one ounce of the hypo, the negative is plunged in the solution, and as the high lights are attacked first, they may be effectually reduced before the shadows are touched.

The solution may also be used for reducing overprinted photographs upon paper without affecting the tone in the least.

Simple Apparatus for Making Lantern Slides.—At a recent meeting of the Photographic Society of Philadelphia, Mr. C. R. Pancoast, according to a description published in the *American Journal of Photography*, explained a simple way of copying transparencies from negatives. Upon a board he had hinged a frame held in an upright position at right angles, and on the frame were two parallel strips, sliding vertically, provided with grooves for receiving the glass plate. The strips could be used to approach each other by sliding up and down on the frame, and thus accommodate different widths of plates. On each face of the frame was marked a scale commencing from 0 (naught) at the center to inches on each side. In this way a negative could be quickly centered, and any portion of it could be readily brought to the center, or opposite the lens. The camera was placed on the board behind the negative frame, the space between the latter and the camera being covered by a dark cloth. The apparatus was easily made, and at the same time was simple and effective.

House Bill 4,458.

The following is the text of a bill introduced in the House of Representatives, January 26, 1886, by Hon. R. W. Townshend, of Illinois:

A bill to limit the jurisdiction of United States courts in patent cases, and to protect persons who, without notice, are *bona fide* manufacturers, purchasers, venders, and users of articles, machines, machinery, and other things for the exclusive use, manufacture, or sale of which a patent has been or may hereafter be granted.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That hereafter the United States district and circuit courts shall have no jurisdiction to hear or to try any case arising from the actual use of any patent right, or its infringement by such use, by any person in or citizen of the United States or the Territories, wherein the amount in controversy does not exceed two hundred dollars against one person or citizen.

SEC. 2. That purchasers of any patent right for actual use shall not be liable to damages, royalty, or for value of the same, or for infringing the same in any manner, who at the date of such purchase had no knowledge of the claims of any third person, or that the inventor of the same has an interest therein adverse to the seller thereof. That no person who shall in good faith purchase, use, manufacture, or sell, without previous knowledge of the existence of a patent therefor, any article, machine, machinery, or other thing for the exclusive use, sale, or manufacture of which any patent has been or hereafter may be granted to any person, persons, or corporation whatever, shall be liable, in damages or otherwise, for an infringement of such patent until after written notice of the existence thereof shall have been personally served on such person or persons or corporation, as the case may be, and such infringement shall be thereafter continued.

SEC. 3. That all laws or parts of laws inconsistent herewith are hereby repealed.

SEC. 4. That nothing herein contained shall affect any pending suit or proceeding in any of the courts of the United States or in any court of any of the several States.

Improvements in Heliogravure.

The art of heliogravure, writes Herman Reinbold in the *Inland Printer*, has been brought to great perfection lately. The processes have not only been simplified, but the results obtained have been more satisfactory, and the cost of printing cheapened. Some of these methods and improvements obtained are hereby described.

HELIOTYPEGRAVURE FOR SIMPLE LINE WORK.

This process is very valuable for the reproduction of lithographs, steel or copper plate prints, especially when the subject is to be reduced. The zinc plate, after having been well washed and polished, is coated with a solution of 100 parts of water, 10 parts of gelatine, 25 parts of honey, 8 parts of bichromate of potash, or 12 ounces of water, 2 ounces of sirup or molasses, 4 drachms of bichromate of ammonia; and dried in a strong heat.

A reversed negative is laid on the surface of one of these plates, and exposed for four or five minutes to sunlight. When it is printed, the plate is taken out and exposed to steam, which is done best by holding it over a pan containing boiling water. It will then be noticed that the parts not exposed to the light will get moist, while the other remains dry. The moist places will now take emery powder, which is put on the surface with a fine camel's hair brush, while it will not stick on the dry places. The plate is now dried once more, and this surface placed in contact with another plate of type metal or zinc, which is put under hydraulic pressure. By this procedure the emery powder will be pressed into the metal, and there produce a fine grain. From this plate impressions can be printed the same way as is done in steel plate printing.

MEZZOTINT HELIOGRAVURE.

The plates are prepared in the same manner, and a good negative (half tone) placed on it. Now expose for one minute in full sunlight, putting the plate under a right angle to the rays. The light will change only the lightest parts under the negative, and consequently only these will remain insoluble, while all the rest will take the emery powder. After having the plate dried, the impression is made on the printing plate, whereupon the film is taken off, and a new coating given to it. It is then exposed under the same negative for two minutes, dampened, and dusted with emery powder, and a second impression made on exactly the same place where the first impression was made. This will bring out the middle tints. A third exposure for three minutes on print and impression will make the darkest parts, and the plate is ready to be printed from. Care has to be taken to get all three impressions on the same place, to get the picture exact, and if this is done, the effect is surprising.

ATMOGRAPHY.

Under this name a new process has been brought out in France, by which it is made possible to get the printing plate right in the camera, thus saving the trouble of making a negative, and though a little more expensive, saves time and gives better results than copying.

The action of the light on chrome salts is very slow, compared with its action on silver salts; its action on the former being due to the decomposition of the alkaline salts into a simple chrome salt and chromic acid. It has recently been discovered that bichromate of lithium decomposes about as quick as nitrate of silver. A zinc or copper plate coated with the following mixture, and exposed like a negative for the same time as is given by the wet plate process, will give very satisfactory results: 4 ounces water, 1¾ ounces albumen, 2 drachms bichromate of lithium.

The solution must be kept in a well corked bottle, and will not be valuable longer than two weeks.

After the plate has been exposed it should be immediately placed in cold water, and afterward in a fifteen per cent solution of sulphuric acid in water; again washed, and then placed in a vessel containing a bicarbonate of soda solution. The unnecessary moisture should next be taken off with a wool roller, and the plate covered with lithographic or etching ink, and dusted with asphaltum and heated. The back should then be covered with asphaltum, and etched slowly with sesquichloride of iron in alcohol until sufficiently deep. The plates made in this manner can be printed on a steam type-printing press.

The Last of the Old Handloom Weavers.

In the manufacturing districts of the West Riding of Yorkshire the handloom will soon be as rare as is now the spinning wheel or the "tummer." Not often in these days is heard through the open cottage door the click-clack of the shuttle and the rattle of the "yelds," or the soft thud of the beam closing up the weft. Seldom will the traveler (says the *Pall Mall Gazette*), in the dark afternoons and long evenings of winter, be puzzled by the quick and regular glancing of candle gleam through the blindless casements, as the to and fro motion of the weaver's beam alternately hides and reveals the light within, reminding the beholder of the revolving ray of a lighthouse in its sudden appearing and disappearing, except that the alternation is much more rapid. In the former times, when with the dark days of winter "waking and water porridge" began—a local phrase which expresses more than can be concisely explained—on many a hillside there might be seen these lights of the loom flashing and fading in quick exchange, like the dancing of Jack o'lanterns in the valley below; here for a few moments a steady gleam, while the weaver refilled his shuttle or "took up" a broken thread, and then again the quick exchange of gloom and gleam. Nowadays we do not, without some surprise, meet man or woman, lad or lass, with the donkey, "going a-bunting"—which to the uninitiated maybe explained simply as carrying to the weaver's home the warp and weft to be woven, and again carrying back the completed piece of cloth. Very, very rarely is a man or woman seen with the leathern strap across the forehead and the huge burden—bigger far and heavier than any illustrator has ever ventured to place on the poor Pilgrim's back—weighting the step and bending the back.

Arizona Alum.

According to the Clifton (Arizona) *Clarion*, Graham county in that section has a valuable alum deposit. As exposed, the entire face of the bluff for at least 500 feet is a solid bed, chief part of pure alum, though in other parts highly impregnated with copper. As it appears on the face of the bluff, it is a mixture of quartz, iron, and copper, but as the hill is penetrated the quality improves in purity The vein proper, or that which carries the larger percentage of alum, cuts through the mountain and is plainly visible from a distance. The trend of the vein deposit is northwest and southeast, although no trace of the mineral is found on the east side of the creek. In many places the deposit closely resembles the carbonate beds which occur in Nevada, especially in the Eureka district. The mass is solid where not exposed, and will require blasting. Pockets are found frequently almost of pure alum, nearly up to the standard of the marketable commodity.

The Tunnels of the Ancients.

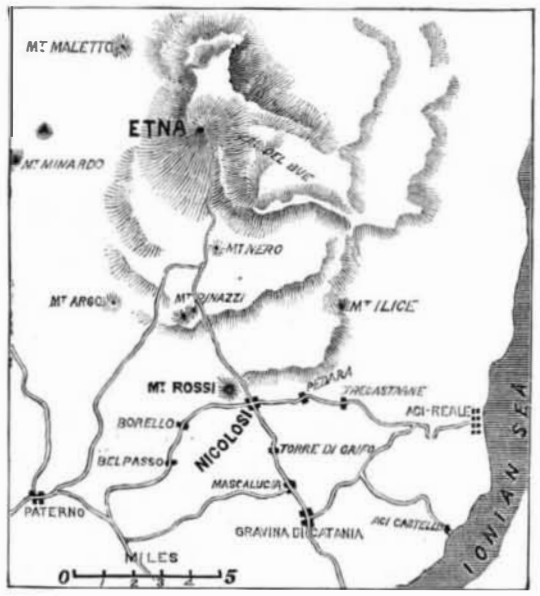
Leaving Naples by carriage, the road immediately leads through a tunnel three-quarters of a mile long, and cut right through a mountain eight hundred feet high. This tunnel is driven through a volcanic tufa. This tunnel of Posilippo, as it now exists, was cut through only twenty-seven years before Christ. Augustus Cæsar's great minister of public works, Marcus Agrippa, made the present tunnel, or he may have enlarged it from a smaller one that answered the commercial communications and necessities of the days before the Empire. This tunnel is to-day the great highway to the heart of Naples, as it has been for more than 1,900 years. The great Appian way ran to Capua, within thirty miles of Puteoli; thence this magnificent Roman high road, under the name of the Consular Way, was continued to Puteoli, and the then Consular Way pushed on through Neopolis, Herculaneum, Pompeii, Stabia, Nucera, Salernum, Paestum, down to Rheulm. This tunnel of Posilippo was formerly called the grotto or tunnel of Puteoli. The ancients began their perforations at each end, and also from above, in two places equidistant from the termini of the tunnel. The guide-books, both Murray and Baedeker, tell that the shafts from above were made by Alfonso I., in the fifteenth century, which is altogether wrong. No less than four tunnels of Roman construction existed in the vicinity of Naples, and they, all of them, even the latest, rediscovered and open in 1842, have shafts from above.

The Romans were great road, tunnel, and bridge builders, and we have never yet given their engineers half the credit which we should for their great science and skill. Nowhere, not even in the city of Rome or on the Roman Campagna, are there so many evidences of their engineering skill as are to be found in the vicinity of Naples. At the recent meeting of the British Association of Science, held at Aberdeen, Scotland, Mr. B. Baker, an eminent British civil engineer, read a paper recalling certain engineering feats of the ancients. Mr. Baker says: "I have no doubt that as able and enterprising engineers existed prior to the age of steam and steel as exist now, and their work was as beneficial to mankind, though different in direction. In the important matter of water supply to towns, indeed, I doubt whether, having reference to facility of execution, even greater works were not done 2,000 years ago than now. Herodotus speaks of a tunnel eight feet square and nearly a mile long, driven through a mountain in order to supply the city of Samos with water; and his statement, though long doubted, was verified in 1882, through the abbot of a neighboring cloister accidentally unearthing some stone slabs. The German Archæological Society sent out Ernest Fabricius to make a complete survey of the work, and the record reads like that of a modern engineering undertaking. Thus, from a covered reservoir in the hills proceeded an arched conduit about 1,000 yards long, partly driven as a tunnel and partly executed on the 'cut and cover' system, adopted on the London underground railway. The tunnel proper, more than 1,100 yards in length, was hewn by hammer and chisel through the solid limestone rock. It was driven from the two ends like the great Alpine tunnels, without intermediate shafts, and the engineers of 2,400 years ago might well be congratulated for getting only some dozen feet out of level, and little more out of line. From the lower end of the tunnel branches were constructed to supply the city mains and fountains, and the explorers found ventilating shafts and side entrances, earthenware socket-pipes with cement joints, and other interesting details connected with the water supply of towns."

This tunnel of Posilippo is also a fine specimen of ancient engineering. Millions of human beings have each year, for nearly twenty centuries, passed through it. Roman chariots and other ancient vehicles have left their autographs scraped and scratched into the lining stone, and modern wagons and carriages still rub their hubs against it, leaving their traces for generations to come. Strabo wrote about this tunnel. Seneca described his passage through it. Petronius satirized it, and Petrarch, Boccaccio, Cappaccio, and more modern writers have told us their thoughts about it; and it seems good for a thousand years to come. Virgil's tomb is just above its eastern entrance, and his farms (where he wrote part of both the "Georgics" and the "Æneid") are over it.

ERUPTION OF MOUNT ETNA.

On May 17 an eruption of Mount Etna began, which, according to the latest dispatches from Catania, Sicily, is daily increasing in proportions, and now threatens destruction to a number of the villages scattered over the lower slopes of the mountain. Vast volumes of flame and torrents of lava are issuing from 11 of the smaller openings to the south of the main crater, and in the neighborhood of Monti Rossi. Earthquake shocks are constantly occurring. A stream of lava, in some places 200 meters broad, flowed toward the town of Nicolosi, advancing at the rate of 40 meters an hour. At last reports, it was within one kilometer of the town,



and has in all probability repeated the violence of former years. The adjacent country has been desolated over large areas, and the people forced from their homes. All the streams and water courses in the district have dried up, and a water famine prevails.

Mount Etna, or, as the Sicilians commonly call it, Mongibello, is one of the most celebrated volcanoes in the world. It is situated on the eastern seaboard of the island of Sicily. Its name signifies the burning mountain, and was known to the earliest classical writers, by whom it was invested with many legendary terrors. To them it was the prison of the fabled giant Enceladus. The flames were his breath, the thundering noises his groans, and, when he turned on his side, earthquakes were the vibrations produced by his ponderous frame. The ancients had very exaggerated notions of the size of the mountain, and computed its height at three and even four miles. As recently determined by the Italian Government, its true height is 10,868 feet. It must, however, be remembered that the cone of a volcano is far from constant in its dimensions, a diminution of more than 300 feet having been produced by a single eruption. The impressiveness of its elevation is due largely to the fact that it rises directly from the sea, while few of the interior peaks attain such a height above their respective plateaus. From the summit, the radius of vision gives an included area of 39,900 square miles. The circumference of the mountain is approximately 91 miles, and its area 480 square miles. The accompanying illustration represents Mt. Etna as seen from Catania, Monti Rossi and Nicolosi being on its southern slope. The map shows their respective locations.

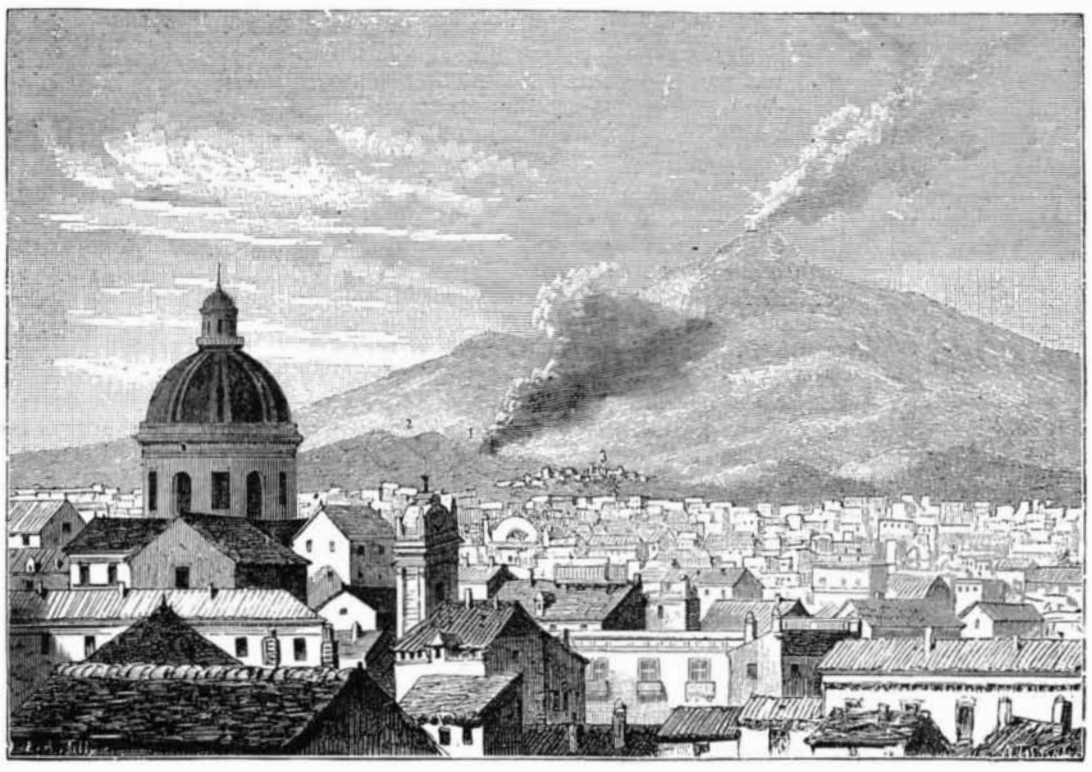
There are two cities, Catania and Aci Reale, and 63 villages on the mountain. In spite of its tragic history, Mount Etna is far more thickly populated that any other part of Sicily or Italy, no less than 300,000 persons living within its area. Its general aspect is that of a pretty regular cone with very gentle slopes. On the eastern side, the uniformity is broken by an oval valley, four or five miles in diameter, called the Val del Bue. It is bounded on three sides by nearly vertical precipices, from three to four thousand feet high, and is entirely sterile.

The mountain itself is divided into three distinct regions. The lowest of these, the *Coltivata*, is extremely fertile, and produces an abundance of semi-tropical fruits and grains. When decomposed, the lava makes a very rich soil. This zone covers the entire base of the mountain, and extends to an elevation of about 2,000 feet. Above this is the *Selvosa*, or woody region, which is covered with large forests. From its upper limit, at a level of 6,300 feet, to the summit is the *Deserta*, a dreary waste of ashes and lava. For a large part of the year this remains permanently covered with snow. A characteristic feature of Mount Etna is the large number of secondary cones scattered over its sides. There are at least eighty of these cones which possess some prominence. If one counts the monticules, there are between six and seven hundred.

The first eruption of the volcano within the historic period happened during the seventh century B. C. Since that time we have a record of seventy-eight different eruptions, many of which, however, have been of a comparatively harmless character. One of the most disastrous of the earlier eruptions was that of 1169. A violent earthquake destroyed Catania in a few minutes, burying 15,000 people beneath the ruins. In 1669 another terrible outburst occurred. Nicolosi was entirely destroyed. An immense stream of lava poured down the sides of the mountain. On reaching the walls of Catania, it accumulated without progression until it rose to the top of the wall, a height of 60 feet, and poured into the city in a fiery cascade. The lava flood covered at least 40 square miles of territory. In 1693 Catania was again destroyed by an earthquake, and in all Sicily between sixty and a hundred thousand people lost their lives. On the 26th of August, 1852, a very violent eruption occurred, which lasted for nine months. A party of English tourists were climbing the mountain at the time, and had a very narrow escape. The mass of lava ejected during this period is estimated to be equal to an area six miles long by two broad, with an average depth of twelve feet.

In 1864 earthquakes were frequent, and in 1865 an eruption of some violence took place. After that the mountain remained in a quiescent state until March 20, 1883, when an outburst occurred in almost the same locality as the destructive eruption of 1669. It created great consternation, but the phenomena ceased on the third day without causing damages. The present eruption occurs in almost the same part of the mountain, and were it not for the interval of time which has elapsed, could readily be considered a resumption of the hostilities then begun.

Geologically, Mount Etna is somewhat older than Vesuvius. Lyell states that its formation probably began in the newer Pliocene period.



1. Place of the Eruption. 2. Monti Rossi. 3. Village of Nicolosi.

ERUPTION OF MOUNT ETNA, MARCH 22, 1883.

Another Inventor Gone.

Mr. E. F. Loiseau, formerly of Philadelphia, and well known as an inventor of a practical method of making compressed artificial fuel, died in Brussels, Belgium, on the 30th of last April.

Mr. Loiseau was enthusiatic on the subject of compressing coal dust with adhesive substances for fuel, and he went abroad several months ago to erect machinery at some Belgian collieries for the manufacture of fuel from the coal waste. A short time before his death, he wrote home that he had been obliged to bury his machinery to prevent its destruction by the infuriated laborers, who objected to the introduction of his machinery in the mining districts.

THE latest invention in hat lining is a map of the city of London printed on silk, so that any stranger or gay young fellow may find his way home or see at a glance if cabby is taking him the nearest route to his destination.