

if I do not mistake, 1 and 2 on Howard Vyse's plan. Finding they had not been disturbed before, he prudently covered them up again, as he was summoned to Cairo, owing to the approach of M. Mariette's death. He has, however, now resumed his diggings, which abundantly confirm his first hasty observations. The two pyramids are of the time of the sixth dynasty—the last dynasty, that is, of the ancient Egyptian monarchy. One is the *Men Nefer* (the Good Place) of King Pepi; the other the *Cha Nefer* (Fair Arising) of his son and successor, King Rameren. Both are full of inscriptions of a funeral character, thus differing from the tombs of private individuals of the same period. These inscriptions are likely to prove of transcendent interest to the scientific student, as no other religious writings of the period is known to exist, with the exception of a few brief epitaphs like that of Mycerinus, in the British Museum. It is curious to reflect that during the many years over which M. Mariette continued his researches he never had the good fortune to find the body of a King of the pyramid-builders, and that one, if not two, such mummies should be discovered within a few weeks of his death. The only other body of the kind is that of Mycerinus alluded to above, perhaps the most precious Egyptian relic in England."

**PRE-HISTORIC MINERS.**—The *Arizona Miner* of recent date, says that the miners in the Silver Belt mine have made a remarkable discovery, showing that the mine was worked ages ago. The 10 ft. bonanza recently uncovered, continuing to widen at every stroke of the pick, left an overhanging wall on one side that appeared more like loam than the ordinary wall or vein matter of a quartz ledge, and so soft that it caved in such a way as to obstruct the work. They then went up above the cave and decided to run down on the ledge in a new place, so as to get under the cave, in order to have solid ground to work on; and in cleaning away a place to start in, they found lying on the ore, on top of the ledge, in the soft loam 3 ft. from the surface, five stone hammers, such as are found in the ancient ruins and abandoned mines of the Aztecs all over the country, showing clearly that the Silver Belt has been worked in pre-historic times. This is, the only indication that has been found that the Belt was ever disturbed before the present owners uncovered it.

## Miscellaneous.

### WARNERKE'S DISCOVERY IN PHOTOGRAPHY.

At the last meeting of the Photographic Society of Great Britain, Mr. L. Warnerke described the discovery he has recently patented. The discovery he said consisted in the fact that a gelatine plate submitted to pyrogallic acid became insoluble in those parts acted upon by light, exactly in the same way as gelatine was acted upon by chromic salts, the insolubility being in proportion to the amount of light and the thickness of the gelatine. This property he proposed to utilize in various ways. The drawback in the ordinary gelatine process was that unless the exposure was very accurately timed there was considerable danger of over-exposure, and, as intensification was very difficult, pictures by the gelatine process were often inferior to those by collodion. By the new process he was, however, able not only to intensify, but also to overcome the drawbacks arising from over-exposure. The latter he effected by using the emulsion on paper. He had found that no matter how much the paper was over-exposed the picture—provided the developer was restrained, sufficiently—was not injured, while in the case of the emulsion on glass, there was not only halation of the image, but a reversal also. The transfer of the image from paper on to the glass was a very easy matter. The paper was immersed in water and placed in contact with a glass plate. The superfluous moisture was removed by a squeegee, and the paper could then be stripped off, leaving the tissue on the glass. Hot water was then applied, which dissolved all the gelatine not acted on by light, together with the free bromide or soluble salts, and the image was left upon the glass in relief. Intensification he effected by mixing with the emulsion a coloring non-sensitic matter, which was not effected by silver. Aniline colors he had found answered the purpose, and in that way special emulsion for special purposes could be prepared. That method of preparation he thought would be especially suitable for magic lanterns slides. He claimed for his discovery that by it relief could be obtained far more easily than by the ordinary bi-chromatised gelatine, and therefore it was especially suitable for the Woodburytype process. By mixing emery powder with

the emulsion it was rendered fit for engraving purposes, and by a combination with vitrified colors the image could be burnt in and so was adapted for enamels. In the ordinary methods for producing enamels from carbonized gelatine the latter, from the difficulty of burning it without the formation of bubbles, was a great source of trouble. By using a suitable emulsion, however, so little gelatine might be employed that this drawback was overcome. The process could also be adapted for collotype printing. In the course of his remarks, Mr. Warnerke demonstrated the removal of a gelatine picture produced by this method from paper on to glass, and showed that the mere immersion and washing in hot water fixed the picture by the dissolving of the gelatine unacted upon by light, which thus carried away the free bromide of silver. In conclusion, he stated that the sensitive paper could be used in the camera in lengths wound on rollers, and exhibited a camera which he had made for the purpose.—*Industrial News*.

### VARNISH FOR GELATINE NEGATIVES.

Collodion, by itself—even the ordinary porous collodion employed in negative work—answers admirably, says the *British Journal of Photography*. As a protection against damp its effect is simply marvelous; for should the moisture penetrate it and reach the gelatine film, it possesses sufficient elasticity to withstand the strain put upon it. It exhibits little tendency to absorb silver from the damp printing paper, and in the event of actual moisture being accidentally present when in contact with the paper there is no fear of adhesion. For portraiture the film will bear working on with the pencil in retouching, though from its hardness and smooth surface it is usually desirable to use a "medium" to give a "tooth" which will take the pencil.

In preparing a special collodion for the purpose we should select a good, tough—not necessary "horny"—sample of pyroxyline, and use it of the strength of not more than four grains to the ounce, with two or three drops of castor oil. The best protective medium we have used consisted of a collodion made from celloidine, which gives a remarkably clear and structureless film and may be used stronger than ordinary pyroxyline. Five grains of celloidine and two drops of castor oil to each ounce of solvents will answer well. There is a slight advantage in employing a small excess of ether over alcohol in dissolving—say nine parts of ether to seven of alcohol—both being as free from water as possible, and the negative very thoroughly dried before application.

### IMPROVED CAR TRUCK.

The annexed engraving represents an improved car truck recently invented by Mr. F. Beaumont, jr., of San Antonio, Texas, which admits of greatly reducing the gauge of the road without diminishing the width of the car. It is easy to show that an immense saving can be made by using the narrow gauge instead of the broad gauge system of railroad building. With the narrow gauge all the heavier work of grading, embanking, tunneling, etc., costs far less, and an important proportion of land damages is avoided. Half the expense of rails is saved and shorter curves are practicable, which makes the constructive engineering both easier and cheaper. Roads of the ordinary narrow gauge of three feet cost about five-eighths as much as the broad gauge roads. And an equal degree of speed is also attainable with greater safety, as from the shortness of the axles the wheels slip less on the outer sides of curves, thereby diminishing the torsional strain on axles, which, as is well known, destroys the fiber of the iron, making the car axles useless after a time, and is frequently the cause of railway accidents.

A much larger saving in the cost of construction can be attained by the use of the improvements illustrated, without proportionately diminishing the size of the cars, as shown in the engraving, representing an end view of a car seven feet in width (usual width of narrow gauge cars) on a track of only eighteen inch gauge. The engraving so well explains the nature of the invention that but little need be said further, than that the improvement consists of the lateral wheels placed upon axles, inclined upward and inward at an angle of about forty-five degrees to the axles of the ordinary transporting wheels. These inclined axles have their bearings in the bolsters, one of which is placed at each end of the car truck. The inclined wheels run on the outside of their respective rails, their flanges projecting under the rail head, tending to keep the car in equilibrium, and permitting a much larger part of it than usual to overhang the rails in perfect security, thus enabling the gauge of the track,