

## MISCELLANEA.

THE PRODUCTION of pig-iron in the United States in 1872 is estimated at 2,388,250 tons (of 2,000 lbs. each), and the number of new furnaces built during the same year is reported as 100.

A bill has passed one branch of the legislature of Michigan, establishing a Commission of Fisheries and appropriating ten thousand dollars for two years for purposes connected with the increase of good fish in the State.

A very valuable deposit of bismuth is said to have been discovered in the vicinity of Salt Lake City. Little reliance, however, can be placed on reports from the mining districts of Utah. A reported discovery of tin in Missouri turns out to be, in reality, a deposit of cadmium.

Catoptric Street Lamps are now placed with advantage on the terrace in Trafalgar Square London, opposite the National Gallery. The inventor, Mr. Skelton, has also here exhibited his patented improvement for opening the bottoms of street lamps, which is simple and efficient, and gives far less shadow on the pavement than the ordinary plan now in use.

The United States Naval Observatory will shortly issue the largest catalogue of stars yet published in America. The work will be the result of more than fifteen years' labour of Professor Yauall and assistants, and will be based on more than 50,000 observations of upwards of 10,000 stars, many of which are of course too far south for observation in latitudes more northerly than Washington.

Is preparing acetic acid by synthesis M. Thénard placed in a glass receptacle a mixture of carbonic acid,  $\text{CO}_2$ , and proto-carburet of hydrogen,  $\text{CH}_4$  through which the electric current from a Ruhmkorff coil was allowed to pass. Under the influence of the electricity, the absorption of the gases commenced almost immediately, became more and more marked, and finally gave rise to a colourless liquid which could be none other than acetic acid,  $\text{C}_2\text{O}_4$ .

**WATERPROOFING CLOTH, &c.**—A solution of aluminum acetate is prepared by dissolving equal weights of alum and lead acetate in warm water, mixing the solution and straining off after settling. This solution is added to an aqueous solution of isinglass, and the articles to be waterproofed steeped in the mixture for twelve hours, after which they are dried and pressed. Cloth thus prepared, though impervious to water, does not interfere with perspiration.

**SCREWS IN PLASTER.**—It sometimes becomes desirable to insert screws in plaster walls, without attaching them to any woodwork, but when we turn them in, the plaster gives way and our effort is vain. The plan suggested is to enlarge the hole to about twice the diameter of the screw, fill it with plaster of Paris, such as is used for fastening the tops of lamps, and bed the screw in the soft plaster. When the plaster has set, the screw will be held very strongly.

A practical trial recently took place in Brooklyn of Edward W. Morton's machine worked by the rise and fall of the tide, the power thus derived to be utilized for mechanical purposes. The contrivance was tried at the foot of South Tenth street, East River, before a large number of persons interested. The machine works by means of a "float," which as it rises and falls with the waves of the tide, propels the machinery to which it may be attached. At the trial it was geared to a saw, and worked with the full rapidity of a circular saw run by steam power, although, perhaps, not quite so uniformly.—*Scientific American.*

**PLATINUM COINAGE.**—At a time when gold is said to be rising in value, and when nickel has come to be in great demand for coinage, the claims of platinum, as a useful material for the same purpose, may fairly be reconsidered. In many of its qualities it is fully equal to gold and silver. It is scarce, therefore intrinsically valuable; it is quite as refractory as gold to ordinary chemical agencies and far less fusible; it stands wear very well; and its high specific gravity renders it even less liable than gold to imitation by base alloys. A part from all abstract reasons, however, is the fact that platinum was actually used in Russia for coinage purposes, and its use was abandoned in 1845, only because of the difficulties of working which then existed. Now, however, when comparatively large ingots are manipulated by modern improved methods, such an objection can no longer be urged.

The annual inquiry for a good whitewash has commenced, and the following may be found useful.—Take half a bushel of freshly burned lime, slake it with boiling water, cover it during the process, to keep in the steam. Strain the liquid through a fine sieve, and add to it 7 lbs. of salt, previously well dissolved in warm water; 3 lbs. of ground rice, boiled to a thin paste, and stirred in boiling hot;  $\frac{1}{2}$  lb. of powdered Spanish whiting, and 1 lb. of ochre, which has been previously dissolved by soaking it well and then hanging it over a slow fire, in a small kettle within a large one filled with water. Add five gallons of hot water to the mixture, stir it well, and let it stand a few days covered from dirt. It must be put on quite hot. For this purpose it can be kept in a kettle on a portable furnace. About a pint of this mixture will cover a square yard.

M. FELIX PLATEAU describes in *Les Mondes* an ingenious process, of his own invention, for drawing on paper white lines on a black ground—a method so frequently used for scientific illustrations—by means of which both author and artist will be able to judge of the effect of such an illustration before putting it into the hands of the engraver. A piece of thickish paper, as smooth as possible, a little larger than the intended illustration is heated, say by laying it, with proper precautions against being injured, on the top of a stove, and a piece of bees-wax is rubbed over it until the paper is completely covered with a thin coating. A piece of glass, the size of the paper, is blackened by being held over a candle, and when thoroughly cooled it is laid on the waxed paper and rubbed firmly with the fingers, the result being that a blackened surface is produced on the paper on which any design can be traced with a needle for the finer lines, or the back of a steel-pen for the thicker ones.

The discovery that mashes, especially of Indian corn rye, and wheat, yield more alcohol when treated with sulphurous acid than when merely treated in the ordinary way, is due to the Brothers Fleischmann, of Olmutz, Austria, and was made in 1860. The starch granules in the grain are, as is well known, enclosed in integuments, which are only partially broken by grinding, so that only part of the amyllum is thus exposed. In order to overcome this difficulty, it had been suggested to steep the flour in water. However, it was found that steeped flour soon becomes sour, especially in warm weather, so that in the process of mashing less sugar was formed than heretofore. Here the preserving quality of sulphurous acid suggested itself. It was found that it acts by dissolving the husky coverings of the granules, and that it alters the fermentation of the corn in such a manner that the mashes never flow over in fermentation. Moreover, the formation of lactic and acetic acid, which always causes a loss of alcohol, is entirely prevented by the use of sulphurous acid gas. And what is also an important item, the gyle tun need not be so constantly scoured and washed. Sulphurous acid gas is readily absorbed by water, which accordingly increases its specific gravity, so that its strength may be determined by the saccharometer. Formerly sulphurous acid was produced by heating a mixture of charcoal and oil of vitriol. The latter loses then by part of its oxygen, which combines with the carbon, while sulphurous acid escapes in a gaseous form. When used in distilleries, it was prepared in a vessel lined with lead and conducted into the contents of the wash tun; but as the process was expensive and troublesome, it was suggested that the gas be produced by burning roll sulphur and passing the smoke into water. The *Journal of Applied Science* says that an apparatus has been prepared for this purpose, which is in use on the Continent. For 5340 lbs. of wheat flour, about 5 lbs. of roll sulphur are required. Indian corn requires one-third more, but 1 lb. is sufficient for 540 lbs. of potatoes. Rye or wheat malt are steeped while the sulphurous water is cold, covered, and left for twelve hours; then steam is introduced and the mashing machine is set in motion. Indian corn requires twenty-four hours' steeping, but potatoes may be mashed at once. It is proper to retain from potato mashes a portion of the sulphurous water for the cooling vat. Indian corn will yield 20 per cent. rye, and wheat 15 per cent., and potatoes 10 per cent. more alcohol, if treated by the process above described.