

DESTRUCTIVE WAR IMPLEMENTS.

Dr. J. H. McLean, of St. Louis, who has expended about \$200,000 for models of implements of war which he claims are so destructive that their practical use in one campaign would force the world into a state of perpetual peace, gave a public exhibition of his inventions at Washington Navy Yard on the 27th ult. About 200 persons were present, including the Chinese Minister and suite, General Benet, Chief of Ordnance; Commander McCormick, of the Bureau of Navy Ordnance; Admiral Scott, (Colonel Macaulay, Captain Harbison, Lieutenant Very and many army and navy officers. There were 14 implements on exhibition, but only four of them were tried, and of these only one worked perfectly. The "General Sherman," a small breech-loading cannon, which was expected to fire 26 shots per minute, fired 20 shots in a minute and a half. The "Vixen," built of bronze, fired a one-inch ball once in seven seconds. The "Annihilator," which was intended to fire two charges in a second, fired one in a little less than two seconds. The "Lady McLean," which has 36 barrels with an estimated capacity of nearly 13,000 shots per minute, with a range of three miles, was worked to the speed of 72 shots per second. The other guns were not in order for trial. Among other inventions that Dr. McLean exhibited is a magnetic torpedo propelled by clock-work, and guided to iron ships to be destroyed by a loadstone. The guns were pronounced fairly successful by the officers, but the claim that they would bring on a millennium was by no means admitted.

JUTE FOR BRUSSELS CARPETING.—A patent has been taken out in France by M. L'Heureux, which rests upon the jute in the manufacture of so-called Wilton or Brussels carpeting, which hitherto has been made from wool. The application of jute for this purpose is facilitated by the preparation of a portion of jute yarn into what is called the "Camel," and by the varying proportions of the number of the yarn made use of for the web and the main warp. The jute yarn is fermented for about 10 or 12 hours in solution formed of 50 quarts of water and one lb. of alum, these proportions to be used for working about 90 lb. weight of thread. After the jute has thus been cleared of the oil it may have gathered during its progress through the various processes of the spinning mill, that is to say, after it has been disinfected, it is dyed if required in the ordinary way; the jute is then sized with the following preparation, one lb. of starch dissolved in 90 quarts of water; the same weight of jute is submitted to the weight of sizing above-named. The warp is prepared and dried in the customary manner. The weaving is carried out on looms, such as are used in weaving velvet, and therefore it does not require special observations. Carpets made in this way can be produced at a reasonable price. —*Fils et Tissus.*

NOVEL EXPERIMENT.—The Port Jarvis, N. Y., *Gazette* says: An odd-looking car has been running over the eastern part of the Erie road recently. The top of the car was covered with wind-mills and revolving cups, so that it looked like the roof of a signal service station. The object, it is said, was to test the pressure of the atmosphere on cars going at different speeds, so as to determine of what shape to make the front of the cars to best resist this pressure, which is very great. The sloping, curved end of the mansard-roofed cars was found to be the best, and the more curves at the end of the car the less was the atmospheric resistance, according to the experiments made.

CEMENTING LABELS TO METALS.—For attaching labels to tin and other bright metallic surfaces, first rub the surface with a mixture of muriatic acid and alcohol; then apply the label with a very thin coating of the paste, and it will adhere most as well as on glass. —*Amateurs' Handbook.*

MINES OF SONORA, MEXICO.

The mines of Sonora have been worked from time immemorial. The immense number of old mines that have a history clouded with early traditions prove the ancient character of the mines of Sonora. Some have been known to reach back 100 years, and others have no data to determine the first period in their history. The number of abandoned mines is considerable, some of which were unquestionably exhausted, while others were abandoned on account of the ignorance of the miners on reaching ores that were refractory or hard to work. Right here it might be well to caution American capitalists against buying holes in the ground, solely because, at one period in their history, they had yielded millions.

Most of the abandoned mines, or quite a large number of them, and of the richest, have been ruined by the class of miners of Mexico called "gambucinos," a poor class who had no capital, and were in search of "bonanzas," or rich spots, working these solely, and filling the drifts and shafts behind them with rejected ores and rubbish, so that when they finished a mine it was almost entirely ruined. In some instances, they have extracted the pillars of old mines of great value, and the walls have fallen in, thus doing an incalculable injury to the mines of the State. There is an old Spanish proverb that tersely states: "It takes another mine to work a mine."

This is undoubtedly true of every mine abandoned by these miners. We use strong language on account of the destruction following in the wake of the "gambucinos." The warning of Mr. Mowry to capitalists in his valuable work on Arizona and Sonora, we herewith quote: "As it is desirable that, in the investment of foreign capital there should be no error committed at the outset, than which nothing would retard the progress of this new mining field more; all persons new to the country had better leave abandoned mines alone, unless directed to them by persons long resident in the country, whose character and veracity are undoubted, and who, after the investigation of all the facts, current accounts, and traditions, have full confidence in some abandoned mine or other. There are, undoubtedly, many abandoned mines that are well worthy of attention and outlay of capital, but strangers are not likely to know at once which of the many deserted mines it will be prudent to meddle with. Under the present state of things, the safest investment for new comers will be those mines that have bona fide owners, for, as long as a mine can be worked according to the custom of the country, it is hardly ever abandoned altogether. The owners are fully alive to the value of their possessions, and as they are already in a more or less independent position, and always in expectation of a sudden fortune, they are not anxious to sell unless induced by a fair offer. It is not advisable to enter into any arrangement with Mexican miners to furnish capital to open up a mine, but it is better to buy the whole at once."

PHOSPHOR TIN.—An alloy of tin with phosphorus has been in use in Germany for some time for making phosphorus bronze. A practical man gives it as the result of his experience that such a compound must contain at least 9% of phosphorus, else part of the tin will remain uncombined. If more than 9% of phosphorus is introduced, the excess will be oxidized and volatilized, because the tin is unable to take up and hold more than a certain quantity of phosphorus. A compound containing 9½% of phosphorus corresponds to the formula $P_2 Sn_3$, corresponding to the higher oxide $P_2 O_3$.

IODINE.—The best woods from which to make the ashes for the extraction of iodine are said, by Dr. Thiercelin, to be two varieties of the fungus digitans. He has succeeded in obtaining from the plant 3% of iodine.

DETECTING GAS LEAKS.

Mr. G. F. Ansell, of England, whose death was recently announced, recently applied the principle of his fire-damp indicator in the production of a handy little instrument for detecting gas leaks. The action of Mr. Ansell's fire-damp indicator is founded on the fact that different gases have different rates of diffusion through a porous body, the velocities of diffusion being inversely as the square roots of the respective densities of the gases. In the gas-leak indicator this property is taken advantage of as follows: A small chamber is provided, having its back formed by a disk of terra-cotta, this chamber being provided with a small stop-cock, by which its interior can be placed in communication with the outer air. If, when this stop-cock is closed, the indicator be taken into a room where a gas leakage exists, the gas, in virtue of the above-named law of diffusion, enters the chamber through the terra-cotta disk more rapidly than the inclosed air escapes, and the pressure in the chamber consequently rises. This increase of pressure is utilized to move a hand on a dial at the front of the instrument, each pressure corresponding to a certain percentage of gas in the atmosphere in which the indicator is placed. The dial is graduated from 0 to 35% of gas, and is moreover marked to show when the mixture is and is not explosive. The instrument is very sensitive and prompt in its action, and it is calculated to serve a very useful purpose.

EFFECTS OF TEA ON THE SKIN.—If you place a few drops of strong tea upon a piece of iron, a knife blade for instance, the tannate of iron is formed which is black. If you mix tea with iron filings, or pulverized iron, you can make a fair article of ink. If you mix it with fresh human blood, it forms with the iron of the blood, the tannate of iron. Take human skin and let it soak for a time in strong tea; and it will become leather. Now, when we remember that the liquids which enter the stomach are rapidly absorbed by the venous absorbents of the stomach, and enter into the system by the skin, lungs and kidneys, it is probable that a drink so common as tea, and so abundantly used, will have some effect. Can it be possible that tannin, introduced with so much liquid-producing respiration, will have no effect upon the skin? Look at the tea-drinkers of Russia, the Chinese, and the old women of America, who have so long continued the habit of drinking strong tea. Are they not dark-colored and leather-skinned?

HUDSON RIVER TUNNEL.—According to the *Railway News* the Hudson River tunnel is advancing satisfactorily toward the New York shore at the rate of five ft. a day. Two hundred men are employed digging out the dirt and putting in the iron and brick work. The tunnel is finished as they go along, and the work is much safer than under the old plan, which resulted so disastrously. A small tunnel, about six ft. in diameter, is run ahead of the larger tunnel, which follows and incloses it; warning is thus given of the nature of the soil. The work is now in the south tunnel, which is now completed 290 ft. from the shaft, and will soon be out as far as the north tunnel, which has been cleaned out, but not extended, since the accident. Both tunnels will then be carried along together. A caisson is in course of construction for beginning the work on the New York side.

LEIGHORN HATS are whitened (otherwise than with the fumes of sulphur) as follows: Immerse in a strong aqueous solution of sulphite of soda or bleaching powder (chloride of lime), and then in dilute sulphuric acid (acid 1, water 5). The bleaching powder treatment requires much subsequent washing, or the use of an antichlorine dip, hypochlorite of soda dissolved in 20 parts of water.