

CARBOLIC ACID.

This peculiar substance seems to have almost as many names as the wandering Jew, and, in defectively compiled chemical works, each name is set down as meaning a different substance. It received the above name from its discoverer, Runge, in 1834, and it is now also called phenic acid, phenol, phenic alcohol and the hydrate of phenyle. It may be obtained synthetically as well as analytically. The distinguished chemist Bertholet has made it by passing alcohol and acetic vapors through a porcelain tube heated to redness. It is, however, commonly obtained from the oil of coal tar. When this oil is submitted to fractional distillation, the part which passes over between 160 and 190 degrees of temperature is treated with hot saturated caustic and some powdered potash, and a mass of crystals is obtained which is separated by decantation. When these are dissolved in water the solution separates into two layers; the one light and oily, the other heavy and watery. The latter is separated and treated with hydrochloric acid, which sets free carbolic acid. To make it perfectly pure, however, it is digested with fused chloride of calcium and redistilled twice; when, upon cooling slowly, it forms in a solid colorless mass (C₁₂H₆O H O). It has an odor resembling creosote, and is sometimes sold for it; but the latter is a distinct substance. Carbolic acid burns with a reddish flame, and boils at 180°. It is slightly soluble in water but very soluble in alcohol, ether, acetic acid, glycerin and some volatile oils. It acts very energetically upon the skin; a weak aqueous solution coagulates albumen, and acts as a strong antiseptic. Putrid meat, fish, and fermenting animal substances instantly lose their disgusting odor when treated with a solution of carbolic acid. It is employed, mixed with plaster of Paris, in disinfecting powders, as it arrests fermentation and destroys infection. Weak solutions of it instantly destroy the lowest forms of animal and vegetable life; and ink, solutions of glue, and the juices of vegetables are prevented from becoming moldy by an addition of a very small quantity of it. A strong solution of it kills the eggs of ants, caterpillars and the larvae of flies. When applied lightly to the human skin, the latter smart for about an hour, the epidermis becomes wrinkled, and remains red and somewhat inflamed for about twenty days. When a very minute quantity of it is taken into the stomach it seems to act upon the nerves, producing insensibility almost instantaneously.

A New Want for this Country.

The breaking up of the system of slave labor in the Cotton States consequent upon the rebellion, opens a new field of experiment for our inventors and mechanics. The cotton, rice and sugar fields are to be cultivated by free labor, and as a necessary consequence, by labor-saving tools and machinery. Instead of the scratchy hoe and mule plow for breaking up the cotton lands, there must and will be steam plows introduced and used. The cotton lands are particularly adapted for the use of the steam plow; being mostly quite level, and the soil strong and compact. These lands having been worked for years chiefly on the surface only, steam plows that will go sixteen or eighteen inches deep, will bring to the surface the elements of fertility so long neglected and unused, and plantations that are now comparatively valueless under the very superficial cultivation of slave labor, can be made mines of wealth to the country. What is now wanted is the steam plow that is best calculated for this service. The population for rearing and picking the cotton are all on the lands ready for the service, and under efficient steam plowing and intelligent free labor culture, the crops may easily be doubled. Who has got the best steam plow?—*Railway Times.*

Welsh Steam Coal.

The great demand for Welsh coal which is at present experienced at the port of Cardiff, where some hundreds of vessels are at the present time waiting their "stem," has called some attention to its cause, and it has been found from the daily clearances at the Bill of Entry-office that an immense quantity is being cleared for Nassau and contiguous ports. The advantages of a smokeless coal have been quickly discovered by the Confederates and their friends,

who, in order to run the blockade, have found it necessary to employ the fastest steamers instead of sailing vessels. It is well known that Cardiff has supplied a considerable quantity of the coal consumed on board several of the notorious Confederate privateers, and there can be no doubt that a coal devoid of smoke being a great desideratum, the Welsh coal has been found the most suitable. From 30,000 to 40,000 tons of steam coal are now being shipped from the port of Cardiff monthly.

MANUFACTURE OF ENFIELD RIFLES.

An interesting paper on this subject was lately read before the Institution of Mechanical Engineers, at Birmingham, England, by Mr. T Greenwood. With respect to the making of the gun stocks, he stated that they underwent twenty-three different operations, from the rough blocks until they were finished. Nineteen of these operations were executed by machinery and four by hand. At Enfield there are two complete sets of machines in operation; these turn out 2,000 gun stocks per week, upon an average. The London Armory Company has also a set of such machines; but Birmingham is still behind the age, in not having a set running. This gun-stock machinery is of American origin. During the Crimean war Mr. J. Anderson, Colonel Burn and Lieut. Warlow, were sent out as a commission to the United States, to investigate the system of manufacturing muskets in the United States Armories, and they made an arrangement to obtain three sets of machines. The machines were made according to this agreement, but after being set up at Enfield they did not operate satisfactorily. Since then some of them were supplemented by others from America, and Mr. Greenwood has also made some machines by which stocks of different lengths are made. The cost of a set of machines complete was £8,000 (about \$40,000.) The rifles for the British Government are manufactured at Enfield, and all the operations are conducted in the same manner as at the United States Armory, Springfield, Mass. All the parts of the rifles are interchangeable (duplicates of one another), and they are completed and ready to be put together without the trouble of filing and shaving to secure accurate fitting of the parts, as by the old hand system. The time now required in putting all the parts of a rifle together is only six minutes: this includes the ramrod, bayonet, and the oiling of the stock. All the parts of a guns furniture are taken up from lots of each sort and put into the stock; the only tool used by the fitter up being a hand brace with a screw-driver in it.

More New Ships for the Navy.

Orders were recently received at the Boston Navy Yard for the construction of several new vessels. Two of them, sloops-of-war, will be among the largest of their class ever built for the navy. They are to be named respectively the *Ammonoosuc* and *Pompanoosuc*. It will take at least six months to construct them, and three more to supply the machinery. They will be 345 feet in length, of 3,000 tons burthen, and draw about 16½ feet of water. They will be sharp, designed entirely for speed, and very light. The armament will consist of seven guns—three 200-pounders and four broadside guns of 8-inch bore. A new iron-clad, to be called the *Quinsigamond*, is also to be built. She will have two turrets, be 382½ feet in length, with a 52 feet beam, and a depth of 18½ feet, and of 3,200 tons burthen. Two additional sloops-of-war, smaller than the *Ammonoosuc* and *Pompanoosuc*, will also be built immediately.

The Metropolitan Fair.

A large fair is to be held in this city on Feb. 22, 1864, for the benefit of the Sanitary Commission. One recently closed in Chicago netted the handsome amount of \$59,000, and it is confidently believed and hoped, that this city will be able to outdo, in generosity and patriotism, the praiseworthy example set by the people of the West. The ladies of our city will have charge of the fair and will solicit contributions from all loyal citizens. All trades, callings and professions should be represented, and in view of so worthy an object the contributions should be lavish. Notice will be given in future of the address to which the articles intended for the fair should be sent.

TRIAL OF O. R. MUMFORD'S PERCUSSION FUSE.

NAVY ORDNANCE YARD, }
Washington City, Oct. 29, 1863. }
COMMANDER H. A. WISE, Chief of Bureau of Ordnance,
Navy Department :—

SIR—In compliance with Bureau Order of June 25th, I have to report the following trial of Mr. O. R. Mumford's percussion fuse. Five service 8-inch shells, with his fuse fitted to them, were received here from Mr. Mumford, June 22d, and on Oct. 28th one of them was fired, with the following results :—
Gun Practice Experimental Battery, Oct. 28, 1863.

Gun, 8 inch, No. 3, mounted on wood carriage, on platform in front of battery. Charges, Dupont cannon powder. Initial velocity 1,521 feet. Projectiles, 8-inch shell, filled with 2 lbs. powder, Mumford's percussion fuse. Primers, friction. Elevated 30° by quadrant. Aimed at middle screen pole.

Wind N. E.	Force 1.	Bar. 30 in. 6 in.	Remarks.
No. from Gun	Charge	Weight of Project. in lbs.	Result.
1	3	53.25	107 3.6
			Shell exploded 40 yards from muzzle of gun.

This shell exploding so near the gun, the continuance of the trial was deemed inexpedient, by reason of the great danger to the vessels at the wharf.

On examining the interior of the fuse, it would appear that the copper pin which confines the rear plunger was not strong enough to withstand the effect of the explosion of the charge, and the explosion of the shell in the gun would be the consequence. Also the balloting of a spherical projectile in the gun would be sufficient to explode at least one of the fulminate caps on the surface of the cylinder.

Respectfully submitted,
(Signed) WM. MITCHELL,
Inspector of Ordnance.

Heavy Trade in Canned Provisions.

Few persons have any idea of the extent to which the business of preserving fruit for the army and the trade generally, is now carried on in this country. There are many large firms in the different States engaged in this business, who employ a great many hands, and have heavy amounts of capital embarked. The consumption of fruit, vegetables, and, in many cases, meats and game (where this branch of the business is carried on) is enormous. One firm in New Jersey is thus spoken of in an exchange :—

"The buildings in which the main operations are carried on cover more than an acre of ground, and apart from the branch of canning and preserving, which often exceeds 5,000 cans per day, they often turn out six tons of assorted jellies, in glass, per week. The product of 50,000 tomato plants, 30 acres of strawberries, and 35 acres of sweet corn, have been used during the present season for canning. During the peach season about two hundred hands, chiefly women, are employed paring and halving this delicious fruit. Choice fruits being in abundance around the establishment, they are enabled to can them fresh from the field and orchard, while they retain their primitive sweetness and natural flavor."

GISBORNE'S STEERING AND ENGINE SIGNALS.—By the use of these instruments the officer in charge of a vessel may, from any position on deck, transmit his orders to the helmsman or engineer, the order appearing instantly in printed letters, and remaining in sight as long as may be required. The signal is accompanied by the ringing of a bell to attract notice. By a single motion of the helmsman or engineer, the officer on deck receives the response to his command; at the same time the movement of the helm is made known with perfect accuracy. The result is made known in all states of the weather.

In the article on the Rifled musket, an error occurs in the type which makes material difference with the sense. In the eighth line below the engraving of the stock machinery, it is asserted that the frame vibrates on a *cutter*; it should read vibrates on a center.

A nautical mile is 6,079 linear feet; the land mile is 5,280 feet.