

ces under government. There is so much rascality connected with official duty that it is a habit to think that every office holder is, perforce, a scoundrel.

WATER AS A DISINFECTANT.

There are two classes of disinfectants. By one class offensive odors are destroyed, by the other they are simply absorbed. Of the latter class the most powerful and universal disinfectant is charcoal. So far as we now recollect there is not a single substance which on being filtered through charcoal will not be deprived of its flavor and odor. Spirits distilled from various fruits and grains are mingled with volatile ethers which give them the flavors of the peach, apple, grape, rye, wheat, &c., from which the spirits are made. But if the liquor is filtered through charcoal, its flavor is removed, and it becomes rectified spirits—tasteless and inodorous alcohol and water. It seems to be the nature of all those delicate compounds which affect our olfactory nerves to nestle into the minute pores of charcoal, and to cling there with great tenacity.

The substance coming next to charcoal in its power of absorbing various odors is water. Water absorbs its own volume of some gases, and more than six hundred times its volume of others varying as shown in the following table:—

One cubic foot of water absorbs of	Cubic feet.
Sulphurous acid gas	43.78
Sulphide of hydrogen	2.53
Carbonic acid	1.06
Nitrous oxide	0.76
Oxygen	0.65
Hydrogen	0.46
Hydrochloric acid	480.00
Ammonia	670.00

The volumes given are those which water will absorb at a temperature of 64.4° Fah. except the last two, for which the temperature is 50°.

The offensive odors most frequently encountered are those of ammonia, and the sulphide of hydrogen, both being always produced by the decay of animal matter. The power of water to absorb these gases prevents meat decaying in a large body of water, the carcass of a horse in the harbor, for instance, from giving off any odor.

The power of water to act as a disinfectant can be made available in many circumstances; it is especially useful in chambers of the sick, as a dash of water in any vessel standing in the room will render it inoffensive.

MILITARY TRAINING IN COMMON SCHOOLS.

Messages of governors to legislatures, articles in the papers, pamphlets, circulars, and general conversation indicate clearly that military training is to be extensively introduced into our common schools. The thing that we have to say in regard to the measure is, that we hope the time for this military drill will be taken from the hours devoted to study—not from those given to play. Children are required to sit at their desks through periods altogether too protracted. One hour is quite as long as any child should be confined at study, and if the wearisome and exhausting drain upon the brains of the pupils in our schools can be broken up into shorter sections by intervals devoted to practice with arms, we have no doubt that the reform will be quite as perceptible in the more rapid advance of the children in their studies, as it will in the better development of their physical systems.

RESIGNATION OF THE SECRETARY OF WAR.

Gen. Cameron, Secretary of War, has resigned his office, and has been appointed by the President Minister to Russia, in place of Cassius M. Clay, who asks permission to return home, in order that he may have a hand in the war. Hon. Edwin M. Stanton, of Pittsburgh, has been appointed Secretary of War. Mr. Stanton is an eminent lawyer, and a man of marked ability. He is a Democrat in politics, and was Mr. Buchanan's Attorney General in the last few months of his administration, and, together with Mr. Holt and Gen. Dix, saved it from utter ruin, and the City of Washington from seizure. It is said that the President appointed Mr. Stanton out of compliment to the loyal democracy, who are so earnest in their support of his administration. If this be true, it shows that the President rises far above his party, and goes for the salvation of his country. We can honor such motives. They are patriotic.

LEARNING TO SHOOT—WESSON'S BREECH-LOADING RIFLE.

Partaking of the war spirit which has become so general among all classes of our people, we not long ago procured a rifle, and commenced to practice as we had leisure and opportunity. Being but a novice in the use of firearms, the first thing to be done was to select the kind of rifle to be used in practice, and after examining the various kinds we finally chose the Wesson breech-loading rifle, an engraving of which may be seen on page 8, Vol. V. SCIENTIFIC AMERICAN. After several months' trial we are so well pleased with our choice that we have no hesitation in recommending it to any person who enjoys the sport of target practice or the wilder sport of game hunting. The cartridges are water proof, and combine ball and cap, neatly enveloped in a copper case, so that all the operator has to do in loading is to touch a spring, and the muzzle of the barrel drops down by its own weight, and elevates the breech to admit the charge. While in the act of raising the gun to the eye, the barrel is brought to its place, and caught and rigidly held by the spring until discharged and then released for reloading. The mechanism of the lock is as simple as that of an Enfield rifle, and not more likely to get out of order. An experienced rifleman can load, take aim and fire accurately as many as 12 or 15 times per minute. The length of barrel is 24 inches, and the whole weight of gun only 6 pounds, size of bores $\frac{22}{100}$ ths, $\frac{32}{100}$ ths and $\frac{36}{100}$ ths of an inch. The cartridges are supplied on reasonable terms by the single hundred or ten thousand.

The agent in this city is J. W. Storrs, at No. 256 Broadway.

RISE IN THE PRICE OF COTTON GOODS.

When the Confederate States formed their league last spring, and the political horizon became clouded, most of our manufacturing companies purchased large quantities of cotton, in anticipation of the supply being curtailed. All who purchased largely then have made immense profits by the rise in the prices of cotton goods. Fine Lowell brown sheeting, 37 inches wide, which sold last May at 8½ cents per yard, wholesale, now sells at 12½ cents. Stout brown drilling, 30 inches wide, which sold at 8½ cents per yard, now sells at 16 cents, which is an advance of 47½ per cent in the former case, and 83 per cent in the latter. The average rise in the price of plain cotton goods is 65 per cents. The rise in prints has not been so great as in plain goods; the average being 47 per cent. As most of the stock of cotton which was on hand, has been worked up, a dearth of this material stares our manufacturers in the face, as the prices of it have risen from 8 and 12 cents per lb to 36 and 40 cents, and lately small quantities have been imported from England. It is estimated that there is not a stock of cotton on hand to keep our factories running two months. What then is to be done when this is all worked up? This is now a subject of serious thought to our cotton manufacturers. The Lowell News states that large orders for cotton have just been sent to England.

THE BOTTLE LAW UNCONSTITUTIONAL.

An act was passed by the New York Legislature, on March 24, 1860, giving the right to every dealer in mineral waters to stamp his bottles, and by filing a description of them in the office of the County Clerk or Secretary of State every other person was prohibited from filling, selling or purchasing such bottles without the consent of the owner. The law also authorized a search warrant to be issued upon oath of the owner to search premises for such bottles, and every such bottle found upon search subjected the party accused to a fine of fifty cents for the first, and five dollars for every subsequent offense. On the 13th inst., Judge Sutherland, of the Supreme Court, in the case of an appeal from a District Court, decided that this law was unconstitutional—null and void—opposed to the principles of justice and common law.

Our thanks are due to F. W. Seward, Esq., Assistant Secretary of State, for copies of correspondence of the State Department with our foreign Ministers; also for a pamphlet containing the correspondence relative to the Mason and Slidell affair.

THE CHEMISTRY OF COAL.

Number 1.

A GENERAL VIEW OF THE SUBJECT.

The science of chemistry naturally divides into two departments, organic and inorganic chemistry. Plants and animals have organized structures, and the study of their composition is, therefore, called organic chemistry. All organized bodies are composed principally of four elements, oxygen, hydrogen, nitrogen and carbon. All of these substances, when in combination with each other, or with other elements, exist in the solid, the liquid and the gaseous form; but when isolated, three of them, oxygen, hydrogen and nitrogen are encountered only in the gaseous state, while the fourth, carbon, is known only as a solid, or if ever evaporated it is only at the carbon points of a galvanic circuit.

We have now on the table before us a piece of the nitrate of ammonia, which is composed wholly of the three elements, oxygen, hydrogen and nitrogen. It is a white, solid substance, looking somewhat like saltpeter, though not quite as hard, with a bitter, salty taste. If gradually heated it disappears, being decomposed into invisible gases. There are many other substances, liquid and solid, composed of the three organic gases; and they may all be decomposed, when, of course, they vanish like the imaginary creatures of superstition.

Coal is an organic product, having once existed in the form of moss. All vegetables, besides the four organic elements, contain small quantities of nine or ten inorganic elements. These form the ashes when wood or other organic substance is burned. Only two of them exist in vegetables in any considerable quantity; these are the alkaline metals, sodium and potassium, in combination with oxygen, forming soda and potash. Soda is a constituent of marine plants, and potash of land plants.

All organic substances are decomposed by heat, when the gaseous portions float away in the atmosphere, and the solid parts remain behind. The inorganic substances and the carbon are solid. If wood is heated under circumstance in which it is excluded from the action of oxygen, the oxygen, hydrogen and nitrogen which enter into its composition are driven away, and only the inorganic substances which form the ashes and the carbon remain as charcoal. The moss from which mineral coal has been formed has also been decomposed, either by heat or by some other of the forces of nature, and part of its gaseous elements have been driven off, leaving the carbon and the ashes behind. The proportion of the gaseous elements expelled depends upon the amount of decomposing force which has acted upon moss. The best anthracite coal is almost pure carbon, with about one per cent of ashes, while bituminous coal contains a considerable quantity of oxygen, hydrogen and nitrogen. When bituminous coal is heated the hydrogen is expelled, and, rising up in the gaseous form, when it comes in contact with the oxygen of the air it combines with it, burning as a flame. Flame is always the burning of a gas.

PATENT-OFFICE ILLUSTRATIONS.

We have received from Messrs. E. R. Jewett & Co., of Buffalo, N. Y., a handsomely bound volume containing illustrations of all the machines patented during the year 1860. We beg these gentlemen to accept our thanks for this volume. The engravings are superb, and the printing a model of excellence. It is a credit to our government that it has entrusted the preparation of this important work to a firm that cares for its own good reputation. Let any one compare this volume for 1860, with those of 1853, 1854 and 1855, and they will be speedily convinced of the great superiority of the skill of Messrs. Jewett & Co.

In the Province of Nova Scotia, as we learn by a Halifax paper, there are 13,230 hand looms, which produced 1,700,000 yards of home-spun flax and woolen cloth last year.

The Glasgow Mill, at South Hadley Falls, Mass., is now running on full time, after having run half time for the past six months.

The meetings of the British Association for the Advancement of Science are attended assiduously by a number of ladies.