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CARBOLIC ACID THE MOST USEFUL DISINFECTANT.

Carbolic acid has lately come to be a great favorite as a disinfectant. Where its virtues are best known it is more relied on than anything else as a preventive of cholera. There are those who think that if it were liberally used wherever there is unhealthy organic decomposition, miasmatic diseases would soon become unknown. Our very efficient Board of Health, we observe, have added it to their list of disinfectants, and are using it on a large scale. At the next cholera season we predict that it will be better known and be more valued than any other disinfectant.

The reasons why carbolic acid is such an admirable disinfectant are easily to be understood. Miasmatic matter, and almost everything contained in the air which is offensive to the senses, are the products of the fermentation or putrefaction of organic matter. Now, it has been found that carbolic acid is the sovereign and never-failing anti-putrescent and antiseptic. The power of carbolic acid is wonderful for its promptness and its persistence. Putrefaction can neither go on nor be commenced in its presence; it preserves everything *in statu quo*. It is certain that several organic poisons act like a ferment, or are matter in the state of decomposition. Mr. Crookes has shown that the virus of the rinderpest is of this character, and it has long been surmised that the virus of serpents and of contagious diseases belong to the same category. In all these cases, wherever carbolic acid can be applied, it may prove to be a specific.

Chloride of lime acts very promptly as a deodorizer of the air, and to this fact it owes its high reputation. It destroys noxious matter by bringing about a chemical change in it. It enters into chemical union with some part of it, and no longer exists in a state to do more useful work; it is exhausted in doing its work; it is wholly used up. Moreover, chlorine acts by reason of its affinity for hydrogen; and as hydrogen is an element of innocuous matter, it wastes much of its energy where it is not needed. It deodorizes promptly, but where is the evidence that the virus has a foul odor? How do we know that anything beyond the odor is destroyed?

Carbolic acid, on the other hand, goes to the root of the matter. It acts as a preventive. It destroys our enemy in the egg. No noxious effluvia can come from the matter with which it is in contact. It mixes kindly with everything. A very remarkable fact about it is, that in doing its work, there is no chemical change. It remains always free carbolic acid, and the matter with which it is surrounded continues the same as at the first instant of contact. Thus the carbolic acid is never consumed, and may continue forever its office of restraining the demon.

Two simple experiments illustrate the peculiarities of chlorine and carbolic acid. Bring a piece of putrid meat into an atmosphere of chlorine and it comes out sweet. But wait. Observe that it is only the fetid atmosphere about the meat which was affected; let this be blown away, and a new one takes its place. Let the meat be now dipped in a weak solution of carbolic acid and exposed to a current of air. The foul odor is soon blown away, and the meat may continue sweet forever.

Carbolic acid is cheap, and is applicable under circumstances where anything else would be impracticable or objectionable. Thus it may be dissolved in the water used in sprinkling the streets, and relieve us from that peculiar city effluvium which is so noticeable and sickening to those who have just come out of the pure air of the country. It may be used in the washing of the clothing, bedding, etc., of infected persons. It is perfectly safe to be used in the family.

THE DUTY OF RECORDING EXPERIMENTS.

Most experiments in science and art are made with a view of substantiating some particular theory, or of elucidating some supposed fact, and if they fail to do this they are often looked upon as unsuccessful and valueless, and no record is made of what the investigator would consider his failure.

The idea is a wrong one. Every experiment is a success. If it did not result as was desired, it is no less a success than if it answered the most sanguine expectations of the projector. To prove that a thing cannot be done, or that a theory is false, may be as valuable as to achieve success, or establish a proposition. If not of direct advantage to him who made the test, it might be invaluable to others. Therefore, it is a duty the scientific man and practical mechanic owes to his kind, to keep a careful record of every manipulation, and trial with new combinations.

A few days ago an eminent mechanic, in speaking of some investigations he had made in regard to the expansive force of steam, said that he called on a firm who had followed the path of investigation for sixteen years, and ascertained that because the experiments had not determined the facts they sought to establish, they had preserved no record of them, or, if they made such records they had destroyed them. In this case an injustice had been done to other inquirers into the same subject.

The data, the processes, and the results of experiments, from their incipiency to their completion, ought to be carefully noted, and whatever may serve to throw light on the causes of failure, or serve as a means of furthering additional investigations, should be recorded and preserved.

In every thing which is of use to man, the grand, present result is the fruit of the work of generations. It can hardly be estimated how much further we might have advanced if the duty of recording means, object, and result had always been recognized. He who tries a new experiment adds directly to the world's wealth of useful knowledge. That the result did not answer his expectations argues nothing against this proposition. Many of our most valuable discoveries have come from these negative investigations. To prove that an object sought is opposed to the laws of nature and the qualities of matter, may be of as much benefit as to ascertain the converse.

Every experimentalist should bring to his investigations an honest desire to ascertain the truth, even if it proves him to be in the wrong. But many make te ts simply to establish and demonstrate a favorite proposition, and, if not successful, carefully destroy all record of what they consider their failure. This is not wise from any point of view. The vocation of our practical men is higher than that of merely distinguishing or benefiting themselves. They work for the world at large, and if by a fortunate discovery or useful invention they make themselves rich, the world receives a larger share of the benefits than they. The inventor of the sewing machine, or those portions which make it a necessity, has been made immensely rich, but his fortune is but dust in the balance when compared with the benefit his inventions have conferred on the world.

It is a rule without an exception, that no man can absorb to himself the full benefit of an invention. He must share it with the mass, and when he selfishly attempts to hide his repeated failures by the light of his one grand success, he does violence to his own conscience and injustice to his fellow men.

TRANSVERSE FORCE OF EXPLOSIVE GASES IN GUNS.

In another column is an article from the *Engineering*, which mentions some facts in connection with experiments with a Whitworth gun, which seem to bear upon the subject of the wedging of confined explosive gases, a subject we have several times referred to before. The experiment was that of leaving an air space of twelve inches in one instance, thirteen in another, between the powder charge and the projectile of the Whitworth 70-pounder gun. The bore of the gun was enlarged at the base of the shot. It could be wished that the record of the experiment had stated whether there was a difference in the recoil of the gun, when fired with this air space intervening between the powder and projectile, and when fired without the intervention of the space. We believe it would be found that the force expended ordinarily in producing a rebound, or recoil, would be directed mainly against the walls of the gun. The test was a severe one for the gun, and it is highly favorable to the credit of the manufacturer.

If it could be proved that the Harding experiments demonstrated the fact, that the temporary compression and confinement of the atmospheric air, or the gas, at the instant of explosion, served the purpose of a breech sufficiently well to give a recoil toward the projectile, without much impairing its initial velocity, we should regard it as an immense stride in the science of gunnery.

Every experiment, or accident, having conditions similar to the trials of the Harding tubes, seems to substantiate the theory that the recoil of a gun can be taken up by a temporary breech of condensed gases. It is certain that guns are burst frequently when the missile is separated from the charge, or when there is an obstruction between the charge and muzzle, leaving an inclosed space. In such a case it seems plain that the action of the explosive is diverted from its course toward the muzzle, and exerts its tremendous power directly upon the walls of the tube.

It is well known that with a very heavy projectile, as in our large guns, quick-burning powder cannot be used. The mass of the projectile, we may imagine, moves sluggishly. It requires an almost inconceivable force to overcome instantly the inertia of the shot, and if the gases are generated too rapidly they jam, or wedge, before they can start the ball. Suppose these gases are allowed a space for expansion in a chamber bounded by the walls of the gun and the breech, which confine them closely, but at another point they find only the resistance of a column of air, backed by a heavy shot; the breech and immediate surrounding walls receive the first impact of the explosion, while in front of the charge, confined air resists the impulse. The explosive force is partially expended on this column of air, which is instantly compressed and forced against the walls of the tube. The particles of air are thus wedged before they can exert their proper force directly upon the projectile.

In the Whitworth experiments, the effect of this instantaneous wedging of the air particles was a permanent enlargement of the bore at the point of impact; that it did not burst the gun is excellent testimony in favor of the manufacturer.

We believe this subject is of importance enough to receive the earnest attention of our mechanics. A series of experiments directed to the elucidation of the action of explosives on a confined column of air, could not be otherwise than beneficial. It is a path that may lead to discoveries which may revolutionize the whole science of gunnery, as at present understood, and possibly give us some new ideas on the subject of boiler explosions.