

THE USE OF EXPLOSIVE PROJECTILES.

Communicated.

The Russian government has issued a circular calling upon foreign powers to adopt unconditionally a new regulation, calculated, it is supposed, to mitigate the horrors of war. Hollow projectiles have been devised suitable for small fire-arms. These balls are filled with fulminating material, and in bursting are said to produce effects much more terrible than those of ordinary bullets. Experiments, rather extensively conducted, have proved that these shells can be fired from muskets with the same facility as those of a larger size can be discharged from cannon. As yet these projectiles have been directed chiefly against wild beasts, and basing its statements, let us trust, upon this use of the new shells, the Russian document says, "An explosive bullet of this description splits into ten or more fragments, and in case of the explosion occurring in a man's body the wound is most painful and mortal. Moreover the fulminating matter seriously affects the organism of the human frame and needlessly increases the suffering." The disabling of an enemy, it argues, not the infliction of agony, is all that is desired in actual fight, and the use of these bullets is therefore unnecessary and barbarous.

Whatever may tend to the mitigation of suffering in war is certainly most desirable; but, while we are inclined to give all due credit to the humanity of sovereigns and rulers in general, and of the Czar in particular, we very much doubt that this appeal to the heart will have any weight in deciding the acceptance or rejection of the proposal. So long as evil passions exist among individuals in private life, and these passions, acting on a larger scale, tend to produce distrust, antipathy, and war between nations, a wider and more comprehensive view must be taken of the case. At present the ability to undertake and sustain a war is considered the surest guarantee of a nation's peace. In war it is a received axiom that offence is the best means of defence. If, then, it could be proved that a body of men provided with this kind of ammunition could send more certain and rapid destruction into the ranks of enemies than they would be able to do if furnished with the usual kind, feelings of humanity for the after sufferings of the fallen would not ultimately call for any prohibition of its use. We think there are certain objections, however, which stand in the way of these shells being extensively employed in warfare. Their use involves more caution and difficulty than that of the common projectile. Numerous unavoidable situations will readily occur to the mind where they would be more dangerous to friend than foe. Again, considering the nature of their structure and composition, it is not easy to see how they can be well employed with the needle gun. Taking these practical disadvantages into consideration, it will readily be perceived how the benevolent sentiments of those who wage war at the expense of their fellow men can remain undisturbed in deciding upon the rejection of these missiles; and no doubt the sagacity of the Emperor of the French led him at once to perfectly comprehend the matter in all its bearings, when with his accustomed policy he so promptly forwarded his assent to the proposal of Russia.

Over and above what at first meets the eye in this proposal, taken in connection with the general acquiescence which will be probably given to the proposition, it seems to us to have an important significance. On sea and land the art of war has arrived at a high degree of perfection. Ships, guns, and war material as a whole have been so altered and improved under the labors of the engineer, the chemist, and the machinist that war is no longer so much a matter of chance as to amount to an exciting national diversion. Death now reaps too enormous a harvest with awful certainty and speed, for nations to sacrifice in war their youth and strength and intelligence on any other ground save the preservation of life, liberty, and national existence. Aggressive wars tend now to something else than the mere gratification of pride and ambition. Princes and potentates are beginning to have these facts forced upon their attention, and, to put it in rather homely but expressive terms, are learning to calculate the "cost of the candle" before venturing on the game of war. Let inventors go on perfecting implements of destruction and devising new ones, for humanly speaking, we know of no other means which can so powerfully operate in showing the folly of armies meeting for slaughter, and forestall in some degree the time when men shall learn the art of war no more.

Artificial Granite.

A method of manufacturing artificial granite has recently been patented in England. The materials of this artificial granite are disintegrated natural granite mixed with clay, together with pounded glass, lava, and iron slags. The disintegrated granite is obtained by submitting fragments of natural granite to a strong heat, about 700 deg. or 800 deg. C. in an oven, by which after a sufficient time, it becomes dissolved into a granitic sand, the constituent parts of which, quartz, or feldspar, possess great powers of adhesion. One part of this granitic sand is then mixed with an equal quantity of pounded glass, or the constituents of glass, or lava, or iron slag, to which is added from twenty to thirty parts of refractory clay, or from thirty to fifty parts of ordinary clay. This mixture is thoroughly kneaded together with a sufficient quantity of water to make it of a pasty consistency. It is then molded to any form required, and submitted to a degree of heat sufficient to vitrify the mass for about thirty-six hours, which converts it into a durable substance resembling granite. The artificial granite thus produced may be molded into any forms required to render it suitable for various kinds of buildings, fortifications, docks, and other engineering structures, and particularly for all kinds of pavements, for which its great hardness renders it particularly suitable. When very

large blocks are required, it is preferable to make them hollow, and, after they have been baked or burnt, they may be filled with concrete, rubble, &c., to make them solid. Any kind of furnace in which the requisite heat can be generated will answer for dissolving the granite and baking or vitrifying the blocks or bricks; but Mr. Parsons finds Hoffman's annular furnaces performs this operation satisfactorily.

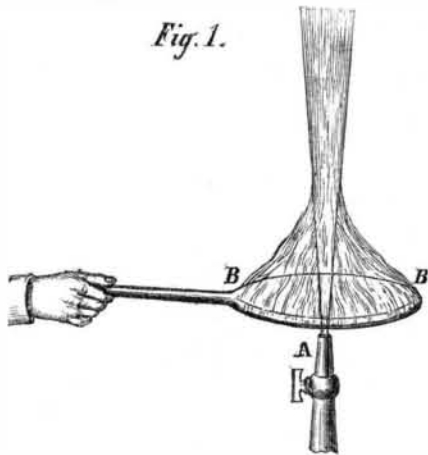
Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents

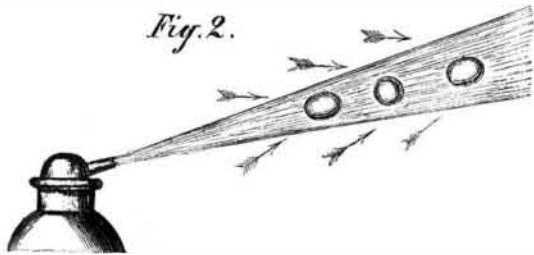
Faraday on the Ball and Jet.

MESSRS. EDITORS:—The following is an extract from an English work:

Faraday found that "if steam, at a pressure of about sixty pounds per inch, is allowed to escape from a proper jet, and a large lighted circular torch, composed of tow dipped in turpentine, held over it, the course of the external air is shown by the direction of the flames, which are forcibly pulled and blown into the jet of steam with a roaring noise, indicating



the rapidity of the blast of air moving to the steam jet." A, in the sketch, (Fig. 1.) is a steam jet, B B, the lighted torch, held around the escaping steam—the flames all rushing into the steam. Egg shells, empty flasks, India-rubber, or light copper and brass balls are suspended in the most singular manner inside an escaping jet of high pressure steam. Sin-



gular is the fact that the jet of steam might be inclined at any angle between the horizontal and perpendicular, and still hold the ball, egg shell, or other spherical figure, firmly in its vapory grasp, as shown in Fig. 2, C being a ball and socket to incline the jet.

X. X.
Syracuse, N. Y.

The Influence of Color on Vegetation.

MESSRS. EDITORS:—It is a well-known fact, that if growing plants are excluded from light, though not from air and moisture, they will become nearly or quite colorless, or of a pale yellow hue; and on the other hand, it is equally true that the foliage of nearly all healthy plants and trees, growing in the sun-light, are of one universal color, viz., green, with its various shades. Now as there are in white light but three primitive colors (red, yellow, and blue), and two of them (yellow and blue) are reflected from the surface of the leaf, forming green, it would seem that the color which is essentially a benefit to plants is that which they absorb; or red. Red and green, as well as orange and blue, yellow and violet, form white. This, I think, is a subject on which some interesting experiments might be made by any who has the necessary time and facilities. Make, say, seven small square sashes in the sides of which panes of glass may be inserted, each of one of the following colors, red, orange, yellow, green, blue, violet, and one of common glass; these with covers of the same (but no bottoms) may be placed over beds of plants, forming miniature hot-houses, and the result of the experiment watched. Perhaps young peas would be best to experiment on.

Theoretically, red would be nearest to, purple or orange next, and green farthest in effect from the natural growth.

One other substance—blood—is always of the same color. It seems that vegetable life needs red, and animal life green light, in the same manner that the former needs carbon, and the latter oxygen; in both cases, each giving of that which the other requires. The natural abode of man and other land animals, the forests, and even the sea, is of a greenish hue. As plants through the night are said to reverse the process of giving off oxygen and absorbing carbon, it may be that the red light of day prepares the surface of the leaf for the reception of carbon or the generation of oxygen, thus becoming an active agent in the production of vegetable growth. I should be pleased to have the opinion of the SCIENTIFIC AMERICAN on this, which I think is a subject deserving of more attention than it has received.

SPECTRUM.
Havana, N. Y.

[We can hardly agree with our correspondent that red is the color essentially beneficial to plants. Timbs, in his

"Curiosities of Science," says that experiments on hyacinths grown under the influence of various lights, proved that the yellow ray diminishes the growth of the roots and the absorption of water, and the red ray hinders the proper development of the plant. The blue rays retard germination at first, but accelerate the growth of the plant afterward; the act of germination being attended with absorption of oxygen, but the process of development, on the contrary, being attended with the extrication of this gas.

The experiments recommended by our correspondent are inexpensive, and easily made.—EDS.

Impertum in Imperio.

MESSRS. EDITORS:—"A house divided against itself cannot stand." If this is true it seems that our industrial fabric is liable to overthrow. We see that, in spite of the basis of our government, as shadowed in the Declaration of Independence, in which it is stated that all men have an innate right to the pursuit of happiness, we are prevented from that pursuit by the interference of the members of combinations, who seem to suppose that the pursuit should be undertaken in only the paths they themselves have marked out. I believe I have a perfect right, in this country, to pursue happiness, *i. e.*, to do my own business, in my own way, without interference from any man, or set of men, if I do not infringe upon the rights of others. Believing thus, I have so acted. Conducting a business which necessitates the employment of workmen, I have employed men and kept them in work at fair wages, without caring to inquire whether they belonged to some trades union or not.

But a "change came o'er the spirit of my dream." My men, who had perfectly satisfied my demands, and always done their work well, one by one left me without any satisfactory reason. I found great difficulty in filling their places, and at length my eyes were opened by the receipt of several threatening anonymous letters, containing the information, that if I wanted workmen I must take members of the trades union at a fixed price per day, without regard to the qualifications of the workmen, or it would be "the worse for me." Paying no regard to these threats, and determined to do my business in my own way, without permitting outside and unwarrantable interference, I again attempted to employ hands to work at my business. I found my steps dogged and my efforts hindered and forestalled by members or agents of this trades union, even my personal safety being threatened in the streets.

Now, if we have a government in a government, an authority beyond the general law which shall compel men to obey its behests rather than depend upon the protection believed to be afforded to all good and peaceable citizens by the law, it is time it should be known, and a remedy applied. I hold and acknowledge no allegiance to any government but that of the state and nation in which I reside, and repudiate all attempts of bogus authorities, in the shape of trades unions, to regulate my business or the terms I make with my workmen. I want merely the common liberty of doing my business in my own way, and paying out my money as best for my interest and for the good of my workmen, both of which, I think, I can manage for myself and them, better than any association can manage for me. My business concerns myself and those who work for me—nobody else—and I shall not submit, in this land of personal freedom, to any dictation from unauthorized outsiders as to the method of managing my business.

I think it is time that something should be said by influential papers, as the SCIENTIFIC AMERICAN, in regard to this subject. This assumption of power and interference with private, personal rights by irresponsible and self-constituted arbiters of questions between employer and employed, has assumed such proportions in its interference and dictation between employing capital and employed labor, that it has become a question whether an individual has a right to the employment of skill, or even the use of his own hands without the consent of combinations whose practices are unquestionably illegal.

These unions and associations assume too much when they insist on dictating, not only the amount of wages to the employed, but the person to whom the employer may give work. The employer is not only the best judge of the qualifications of his workmen, but he is also the best judge of the amount each earns, and also of the advantages of one workman over another. As to his ability to know his own business—that is, his profit and loss—I presume, on this point, there can be no question.

CRISPINUS.
New York city.

Modern Naval Warfare.

MESSRS. EDITORS:—Mr. Holley, of Harrisburgh, Pa., might have given one more important invention to the credit of one of the Stevens family, namely, the Armstrong time and percussion fuze; the fuze being ignited by the liberation of a plunger held in position by a wire or its equivalent on the shock of concussion by explosion of discharge, when the plunger acted on a fulminate attached to the time fuze. This invention forms the basis of the Armstrong fuze and of all the time and percussion fuzes used during the late war, except a few used on the "Springard" principle. Nearly two years ago I discovered at Fort Monroe, among the papers of Mr. Couch, master carpenter, a detailed drawing in sections of this fuze and which bore the names of two witnesses and date 1831. A copy of the original is in my possession. I afterward found in the Washington Navy-yard Museum, a perfect brass fuze of the same make, and the officer informed me that it was left there many years ago by one of the Stevens family. I called the attention of the army ordnance department to the fact when I made the discovery. No records of