

the tin plate keeps them in that position, so as to insure perfect rifling; the entire bullet does not exceed the weight of the ordinary round ball.

The experiments that have been tried at a range varying from two hundred to a thousand yards, were perfectly successful, the ball's eye was struck several times at four hundred yards. A correspondent of the Tribune reports that there is now in the hands of more than fifteen thousand of the French army, a gun, which is loaded with a balle-a-tige, with which a well practised soldier will hit a man thirteen hundred yards off. It is of peculiar construction, to wit: There is a stout pin three-sixteenths of an inch in diameter, which is screwed into the breech, upon it the ball strikes when put into the barrel, this pin is surrounded by powder. A heavy iron ramrod conceals at the end is used, which strikes down the ball, and causes the pin to enter it, spreading it out on all sides firmly against the walls of the barrel; the same principle is produced in both balls, the balle-a-tige by slugging, the Minie by explosion, the balls both possess precisely the same exterior form and weight.

By this principle any old uncertain musket is immediately converted into a close shooting rifle, of most extraordinary range; before which no field artillery known to science could sustain itself, and must therefore be restricted to siege operations and the defence of fortified places; and heavy cavalry can no longer be used with effect. To show the difference in power and execution between the musket with round ball, and the improved musket with balle-a-tige, four French regiments were required to fire three hundred thousand balls, one half out of muskets with round balls, and the other half out of muskets with balle-a-tige, and Minie balls.

At one hundred and fifty yards the improved balls were twice as good as the round balls; at two hundred yards twice as good; at three hundred yards seven times better; at four hundred yards eleven times better; at five hundred yards the improved ball hit nearly as often as at one hundred and fifty yards. But no round ball hit at six hundred yards, when the improved ball hit nearly a third as well as at one hundred and fifty yards distance; at seven hundred yards it hit nearly the same as at six hundred yards distance.

At eight hundred yards it hit nearly one fifth as well as at one hundred and fifty yards distance. It will be observed, therefore, from these experiments, that if one hundred and fifty men of these four regiments were armed with the improved gun and balle-a-tige or Minie ball, that at the distance of from three hundred to six hundred yards, they would, in one minute, do more execution, than five hundred and twenty-five men at a similar distance, with round balls; consequently, fifteen hundred men can be made equal to five thousand two hundred and fifty men. Or five thousand American soldiers can now be drilled and armed to do as much execution as would have been done by fifteen thousand of the veterans of the revolution.

Captain Minie lately hit a mark seven times out of ten, at the immense distance of eighteen hundred yards, with sufficient force to pass through a cuirass and kill. He has likewise driven three balls in succession into a mark the size of a man's hat, at a distance of three-quarters of a mile, off-hand, and says he can do this all day, and teach any other man of ordinary capacity to do the same.

With the common musket now in use, it is necessary to teach the soldier, that to hit a man at a certain number of yards off, in the middle of his body, the musket must be aimed at the chest; if at a further distance, at the shoulder, if still further, at the head, and if further still, at the top of his plume, making allowances in all these cases for the gravitating tendency of the ball after it has left the musket.

But with the rifle it is different; the point of aim must be nearer the point to be hit, because the range is greater, and the course straighter. But with the balle-a-tige, or Minie ball, the angle of sight must be chosen precisely.

Mr. Perry has invented a breech-loading fire-arm which consists in the combination of a vibratory charge-holder working in an arbor in a socket, and moving in a circle; a magazine or tube in the breech for fifty percussion caps, a piercing cone in connection with the exploding nipple, which introduces fire to the centre of the cartridge, producing instant explosion; also a tube forming an adjustable gas-joint with the barrel, and so arranged as to be self-cleaning in the joint, which prevents any obstruction by rapid firing; all combined so as to introduce each charge separately, and without breaking the cartridge, a single cap being at the same time placed upon the nipple. The charge-chamber is a little larger than the bore of the barrel, so as to prevent windage, and gives the same advantage as the Minie ball does to muzzle-loaders. It can also be charged with powder and patch, and no cartridge used if desired, as the breech-chamber is loaded like a common shot gun. It is said to possess one-third greater penetrating power, with one-sixth less powder than any muzzle-loading one.

Mr. William Palmer has invented a ball suitable for both small guns and cannon, which he describes as far more deadly and destructive in its effects than any yet in use. He says, "it cuts, wounds, and lacerates in such a manner, that it is scarcely possible that any animal or man should live after being struck by it. A ball that would fit a common gun, say five-eighths of an inch in diameter, expands on leaving the gun, to four inches, and the instant it touches anything, cuts in all directions. A cannon ball, on the same principle, would cut a space of at least two feet. The invention has been tried in small guns, and it does not appear to affect the flight of the ball in the slightest degree.

A Mr. Neron exhibited, at a recent meeting of the Institute of Civil Engineers, at Paris, an ingenious mode of placing detonating caps on the nipple of a rifle or musket.

The apparatus consisted of a tube containing twenty-two caps, placed parallel with, and close

beside the barrel, being partially inserted in the stock, and so arranged, that whilst the near end was attached by a pin to the hammer, the further extremity was free to travel in a slot. Its action was very simple, the tube being fitted with caps from a reservoir, several of which would occupy but a small space, the end cover was turned down. On drawing the hammer to half-cock, the tube was urged forward until a cap was brought over the nipple; and at full cock, the cap was pressed down upon it. After firing, if any portion of the copper remained attached to the cap, it was removed by a small picker preceding the tube, on its being again drawn forward to repeat the operation.

It was evident, that by this simple and cheap addition to any fire-arm, much time must be saved in loading, and a great waste of caps avoided; they were kept dry in the reservoir, instead of being exposed to damp, and running the risk of not exploding, as had occurred frequently in action on recent occasions in the Crimea. The system was stated to have obtained the approbation of the highest military authorities in France; and with the characteristic alacrity of that government, to be already in process of adaptation to the Minie rifle, and all kinds of fire-arms now used by the army. Within a very short period it has been laid before the English Institute of Civil Engineers, where it will probably meet with like success.

Martin's improved gun and cartridge is worthy of mention. It consists in a breech-bolt or slide, which, by drawing the lever forward, is brought back from the breech end of the barrel a sufficient distance to allow space in the breech in which to place a ball cartridge. When the cartridge is placed in this space or chamber through an opening on the right-hand side of the gun, the lever is drawn back, and the ball cartridge is forced by a pressure of some fifty pounds into its seat in the barrel; the cartridge has a conical ball cemented into it.

Porter's Patent Rifle is one of the most recent and important improvements in fire-arms. It is a self-loading rifle, which in its construction is as sure as it is commendable.

The barrel and stock are not very different from the ordinary rifle, the invention being chiefly confined to the lock.

That which composes the lock of the rifle is fastened forward, with a hinge to the barrel of the rifle, and a spring fastens the other end of the lock to the stock. This being turned, the lock swings forward like a gate, and to it are attached all the principal appliances of the invention. Under the hammer in the lock, is a spring cap box, which constantly throws a cap over the touchhole of the cylinder. When the hammer is raised, the gun being fired, the guard is again pressed forward, a simple metallic spring pushes away the exploded cap, and when the guard is again brought back, a new charge is under the cap ready for use.

There is an aperture at the side of the barrel about three inches in length, and three-quarters of an inch in width, into which nine charges of powder are placed.

When they are fired, the lock is unlatched, a new charged cylinder takes the place of the one used, and the firing is renewed. This gun has many merits over any other known. It is waterproof, all the touch-holes, nine in number, are perfectly air-tight while revolving against the lock. It will shoot forty times in a minute, is well guarded against accident, there being no caps over the touch-hole until the hammer is raised. Having brought several varieties of rifles and guns before you this evening, I will at our next meeting endeavor to show that the Minie, or expanding bullet, is capable of affording greater range and greater accuracy than any other.

Mr. Pell was then asked to draw a comparison between the British and Russian rifle, he said the English rifle now being manufactured for the troops, is very superior to the Russian, it is considerably longer, much lighter, easier to clean and to handle, and of superior workmanship. The way in which the barrel and stock are connected is novel and ingenious. The barrel is encircled and bound fast to the stock by three iron rings, or clips of great strength, which are kept in their places by as many spring catches; by pressing which, the barrel can be unshipped immediately. The ramrod, a really turned piece of steel, with cup and screw, is incomparably superior to that of the Russian rifle; the bayonet is exceedingly slight, of finely tempered steel, and the mode of securing it in its place admirable. The sight is hinged, and lies horizontally on the barrel; it is thrown up to a vertical position by a spring, and then represents a slit between two pillars, up and down which slides a small piece of metal, forming the sight; the length is four feet six and a half inches, with bayonet, six feet one inch, weight of rifle alone, eight pounds six ounces; weight of bayonet one pound ten ounces, weight of rifle and bayonet nine pounds.

The Russian rifle in length is three feet ten inches, with bayonet fixed, five feet eight inches; weight of rifle alone ten pounds, weight of bayonet one pound fourteen ounces, weight of rifle and bayonet eleven pounds fourteen ounces.

The barrel of the British rifle is eight and a half inches longer than the Russian, and has three rifled grooves, whereas the Russian has only two. The British rifle, with bayonet fixed, is five inches longer than the Russian piece with its sword bayonet.

#### Experiments in Manners.

Among many excellent bits of experience related in the autobiography of Dr. Caldwell, is the following lesson in civility:—

"In the year 1821, I made, in London, in a spirit of wager, a very decisive and satisfactory experiment as to the effect of civil and courteous manners on people of various ranks and descriptions.

There were in the place a number of young

Americans, who often complained to me of the neglect and rudeness experienced by them from citizens to whom they spoke in the streets.—They asserted, in particular, that as often as they requested directions to any point in the city towards which they were proceeding, they either received an uncivil and evasive answer, or none at all.

I told them that my experience on the same subject had been exceedingly different; that I had never failed to receive a civil reply to my questions—often communicating the information requested; and that I could not help suspecting that their failure to receive similar replies arose, in part at least, if not entirely, from the plainness, not to say the bluntness, of their manner in making their inquiries.

The correctness of this charge, however, they sturdily denied, asserting that their manner of asking for information was good enough for those to whom they addressed themselves. Unable to convince them by words of the truth of my suspicions, I proposed to them the following simple and conclusive experiment:—

"Let us take together a walk of two or three hours in some of the public streets of the city.—You shall yourselves designate to me the persons to whom I shall propose questions, and the subjects also to which the questions shall relate; and the only restriction imposed is, that no question shall be proposed to any one who shall appear greatly hurried, agitated, distressed, or in any other way deeply pre-occupied, in mind or body, and no one shall speak to the person questioned but myself.

My proposition being accepted, out we sallied, and to work we went; and I continued my experiment until my young friends surrendered at discretion, frankly acknowledging that my opinion was right, and theirs, of course, wrong; and that, in our passage through life, courtesy of address and deportment may be made both a pleasant and powerful means to attain our ends and gratify our wishes.

I put questions to more than twenty persons of every rank, from the high-bred gentleman to the servant in livery, and received, in every instance, a satisfactory reply. If the information asked for was not imparted, the individual addressed gave an assurance of his regret at being unable to communicate it.

What seemed most to surprise my friends was, that the individuals accosted by me almost uniformly imitated my own manner. If I uncovered, as I usually did in speaking to a gentleman, or even to a man of ordinary appearance and breeding, he did the same in his reply; and when I touched my hat to a liveried coachman or waiting-man, his hat was immediately under his arm.

So much may be done, and such advantages gained, by simply avoiding coarseness and vulgarity, and being well-bred and agreeable. Nor can the case be otherwise.

For the foundation of good-breeding is good nature, and good sense—two of the most useful and indispensable attributes of a well constructed mind.

Let it not be forgotten, however, that good-breeding is not to be regarded as identical with politeness—a mistake which is too frequently, if not generally committed. A person may be exceedingly polite without the much higher and more valuable accomplishment of good-breeding."

#### Cultivation of Millet.

In answer to several inquiries about millet and its cultivation, it will be in order to say that this grain is cultivated for several purposes, and has obtained many very flattering commendations from persons who have grown it extensively.—In Italy and some of the German states, it is used to make bread, furnishing a very nutritious brown loaf, formerly much used by the laborers. Generally the seed is grown as food for animals, and particularly for poultry, and is estimated by farmers to possess about the same value as corn. It is also extensively grown for soiling purposes while green, and for curing and using for hay, for which it is held in high estimation.

Millet may be grown with success upon ground that would yield a good crop of oats, but best upon light land in good condition. In common with most crops, it richly rewards deep, accurate tillage and plentiful supplies of manure. One of the favorite methods of growing the crop is upon green sward, deeply fall ploughed and harrowed or worked with a wheat-cultivator or gang plough in the spring; and the more care that is taken in having the field clean and finely pulverized, the larger the promise of a good crop, and if a coating of fine manure could be applied, or coarser manure ploughed under in the spring, it would add to the success of the experiment.

A Pennsylvania farmer, whose experience we find recorded in the memoirs of the Board of Agriculture of the State, says he has sown it from the 1st of May to the 20th of June, and invariably secured more fodder than could have been obtained from any grass under similar circumstances. When sown early in May it is harvested early in July, and yields from three to four tons of good hay, and he states the produce of sixteen acres, only four of which had been manured, and from the remaining twelve a good crop of wheat could not have been obtained, to have been forty tons. Of its value for feed he says:

"Whilst my oxen consumed millet in its green state, they performed their work with more spirit and vigor than they had done before, or have shown since, except when with grain. My cattle, of all ages, prefer it to both red and best white clover, meadow or timothy hay." Many

farmers in different portions of the state, with whom we have conversed, hold it in the same high estimation, and many grow it as a regular green feed for dairy cows and working teams during the drought of summer.

There is some difficulty attending its growth for seed, as the birds and fowls are very fond of it, often gathering in large flocks to prey upon the coveted seed. Another difficulty is its ripening unevenly, as the seeds upon the upper part of the stalks generally ripen and not unrequently fall before the lower ones have filled.—To obviate this difficulty it is generally cut when the upper part of most of the heads contain seeds that are hard, and it is at this period that it affords the most nutritious fodder, and is the most easily made into hay.

Millet is recommended, not merely as valuable for food, but as an effectual method of making clean lands without summer fallow, or the more expensive process of a hoed crop. Plough the land late in autumn, and again in May, the latter ploughing not very deep, after which harrow it down, leaving it until the small weeds begin to appear, harrow again, and sow the millet early in June. The crop will come off in August, after the labors of a general harvest, when he land may be well plowed and sown to wheat, or left for a crop of corn the succeeding spring.

From the imperfect manner in which it ripens, the seed will not all grow, and the amount of seed to an acre varies with different farmers from twenty quarts to one bushel. Of the propriety and profits of its cultivation every tiller of the soil will be his own judge. We are fully persuaded much forage can be raised for cattle by the use of millet and also of corn, sown broadcast and in drills, and have not a doubt that farmers can procure the necessary amount of fodder for winter use from less land and at a less expensive rate. The bulk of meadow land in New York does not yield to exceed one and a half tons of good hay per acre for a series of years, and the farmers and dairymen will find this too expensive for profitable farming or dairying at the present price of land. Food for cattle in summer and winter must be obtained at a cheaper rate and from less land, and we think one profitable source will be the cultivation of millet.—[Moor's Rural New Yorker, April 7.

#### Henry Ward Beecher on the Ventilation of Lecture Rooms.

Almost without a single exception, new halls and old ones are unventilated. The committee will point you to an auger-hole in some corner of the ceiling, and tell you that arrangements have been made for ventilation. You might as well insert a goose-quill in a dam to supply all Lowell with water for its mills.

These contemptible little holes, hardly big enough for a fat rat to run in without disarranging his sleek fur, are hardly enough for one breather, and they are set to do the work of a thousand people! Besides, no provision is made for the introduction of FRESH AIR from below, to supply the place of that which is supposed to pass off.

The air trunk of furnaces ought to be double the usual size, and the hot air trunks that lead from the furnace chamber to the room should be four times as large as is usual, so that large volumes of mild air can come in, instead of fierce currents of intensely hot air out of which the moisture has been dried, and the oxygen burnt by contact with a red-hot furnace.

A room that will seat a thousand persons should have no less than four venti-ducts, each one of them larger than a man's whole body.

They can be placed at the four corners of the building; or they may be arranged along the sides of the wall—the number being increased as the diameter of each is diminished. But the square inches of the mouths of the venti-ducts should be at least one third greater than of the mouths of the heat-trunk, which come from the furnace.

As soon as a speaker begins, he usually finds his cheek flushed, his head full and throbbing—bad air is at work with him. The blood that is going to his brain has not been purified in his lungs by contact with good air. It has a diminished stimulating power. It is the first stage of suffocation. For all that is done when a man is hung, is to prevent the passage of air down his windpipe. And if you corrupt the air till it ceases to perform a vital function, it is the same thing in effect; so that a public speaker, in a tainted atmosphere, is going through a long process of atmospheric hanging.

The people, too, instantly show signs of distress. Women begin to fan themselves; children grow sleepy; and well-fed men grow red and somnolent. How people can consent to breathe one another's breath over and over and over again, we never could imagine.

They would never return to a hotel where they were put into a bed between sheets that had been used by travelers before them—no, they must have fresh sheets. They would go without food rather than eat off a plate used by several parties before them. Clean, fresh plates are indispensable.

But, while so delicate of their outside skin and their mouth, they will take air into their lungs that has been breathed over twenty times, by all sorts of persons, and that fairly reeks with feculence; and nothing disgusts them but a proposal to open a window and let in the clean and fresh air, that brings up coat collars and down scowls, and amiable lips pout, and kind tongues declare that they will not go to such a place again if they do not have these matters regulated better for the health!—[Ex.