rally believed that certain brands of powder produced to-day are all that could be desired; but with the general adoption of repeating rifles for the armies of the world, with the indications that military onslaughts in the future will be made at very long distance by trained sharpshooters, or at short distance with repeating rifles with the greatest rapidity of fire, both these changes bring into greater prominence the chief defect of the present black powder, viz.: the solid, hard residue, which, after firing, is left firmly adhering to the bore of the piece. The residue blown into the air in the form of smoke is also frequently very objectionable. The nitro-powders, which have been known for some years, are, to be sure, comparatively free from the great defects of the black powder, as they leave comparatively little residue; but they have defects from which black powder is comparatively free. These defects are, hanging fire, uneven combustion, susceptibility to dampness unless glazed, difference in the composition of different lots, and change in strength by keeping. It is one of the impossibilities to fully chronicle the march of progress in this direction; but it is safe to say that in every country of the world where powder is produced, there are skilled chemists striving to produce a powder so much sought for. French and German inventors are particularly active in this matter, and, if what we glean from our foreign exchanges is correct, the work of Col. Brugère, of the French Ordnance Board, is most successful, as it is stated that military cartridges of .32 calibre are being manufactured, which are loaded with the powder invented by this gentleman. In this country there is no inactivity in this work, the desired results are not fully accomplished, but progress is being made rapidly.—*The Rifle.*

Improved Gunpowder.

THE charcoals hitherto used in the manufacture of gunpowder have been of comparatively low densities and inflammable natures, as well as highly hygroscopic. Mr. A. H. Durnford, of the Dartford Conservative Club, has, therefore, patented an invention, the object of which is to prepare a soft charcoal, which shall have an extremely light density, ignite at a low temperature, and exhibit very slight hygroscopic properties, and by its use in the manufacture of gunpowder to produce a gunpowder possessing the qualities of great energy and propelling power, combined with moderate pressures when fired in a gun. The invention consists chiefly in the production and use in gunpowder of a charcoal prepared from cork. The cork is put into cylinders and subjected to a destructive distillation by heating the cylinders to such temperatures as will produce the charcoal required. The improved gunpowder is made from mixtures consisting of, first, saltpetre and cork charcoal, in the proportion of about 80 and 20 per cent. respectively; second, saltpetre, cork charcoal, and sulphur, the latter ingredient being in a proportion varying from about 1 to 10 per cent. It is claimed that the gunpowder produced by Mr. Durnford's process is comparatively smokeless and non-hygroscopic.—*Scientific American.*

A Bomb Test.

A WASHINGTON dispatch says: "The inventor of a new kind of bomb, for which a patent is pending, came to see the Commissioner, who happened to be out. He brought with him a specimen bomb, which was inclosed in a pasteboard case, and he showed it to the Commissioner's private secretary, Mr. Will Montgomery. The inventor said that it would go off as soon as it touched water, and this specimen would make a noise when exploded like a fire cracker. The private secretary had some curiosity to see the bomb tested, and sent out and procured a pail of water. When the bomb was thrown into the water the effect was startling. The water was forced up with violence to the ceiling, and fell in a shower pretty well all over the room, while the noise of the explosion was like the report of a cannon. As soon as the few spectators could wipe the water out of their eyes, they pronounced the test a great success."—*Scientific American.*

Army Furbishing versus Military Efficiency.

(Communicated to the "Broad Arrow.")

AS a war involving us might be the outcome any day of the present strained relations on the continent, I think it will be well to scrutinise in a few cursory remarks the uniform and equipment of our army, and what it takes of a soldier's time to keep them in order. I beg of your military readers to follow me patiently in what I am about to say on the subject. As pipe-clay, brass-ball, brick-dust, rubbers, and burnishers have been the standing order of the British army from time immemorial, I am afraid what I am about to say will not at first meet with ready approval from all your readers, but I am sure if they will only weigh the matter impartially they will in the end admit the justice of my statements, and that there is real actual need of reform. Time is of great value in the army nowadays. The nature of the uniform and equipment of our army, the habits of our soldiers, and the encouragement given to them to brighten up and make showy everything they wear, are good reasons why much of their time is at present taken up in pressing their greatcoats and uniform, rubbing their brasses, steels, and irons, and altogether preparing themselves to turn out for the inspection of their officers and non-commissioned officers in such a manner as to escape censure, attract notice, and deservedly acquire for themselves the reputation of being clean and well turned out soldiers, and the oftener they parade, either for inspection or exercise, the more their labors are increased, until at last, if they are required under arms frequently, their life becomes almost one incessant daily routine of monotonous and irksome drudgery. The time now spent by the soldier in furbishing his clothing and appointments might with ease be reduced. Why not give him a good plain workmanlike uniform and unpolished appointments, things that might be cleaned without all that expenditure of time, labor and cleaning stuffs? I think and hope Lord Wolseley agrees with me. He advocates the same thing, from the opinion he has expressed about cavalry irons, etc., that they should be lacquered or nickelled. I am quite of the same opinion, and would go farther. I not only think it would be advisable to lacquer, nickel, or bronze everything metal in the uniform and equipment of cavalry, but also that the same thing is necessary for infantry and artillery as well, so that all the cleaning of uniform and appointments necessary in our army might be reduced to a minimum, and could be done with a cloth brush and a rag. Then our soldiers would be able to turn out ready for service at any moment, without all the toil and preparation now required. There is a great deal of labor wasted now in cleaning unnecessary brasses and steel work. The time saved in furbishing up a soldier's kit by the changes I have indicated could with advantage be devoted to further military training and exercises, by which means greater military efficiency would be secured. What we ought to do is to study and practise more for work than for show. But if higher training and military efficiency are to be attained, our officers must prepare themselves for the instruction of their men, and as company officers are now the instructors this is incumbent on all. An opinion is entertained by some that the idea of having every officer an instructor is not good, for it is not one man in a dozen that can impart information to others, though he may know the subject very well himself; therefore, when you can obtain a good instructor in any branch of a soldier's training, he should become the regimental instructor for that branch to the whole battalion rather than that many officers should be trying to do imperfectly that which could be much better done by one person. I have been amused at some criticisms on dress by an Austrian officer who has been on a visit to England. The first thing which attracted his notice was the forage cap of mounted corps, and he discribes it as a cloth disc smaller than the head it should cover, worn on one side, and kept on the head by means of a strap. His opinion on this cap is that it is the most grotesque and absurd thing in any army. With regard to the Glengarry, or Scotch cap as he calls it, worn by the infantry, he says it is less comical, but equally useless. The infantry and artillery, he says, are neat, and their pickelhaube smart and effective. He thinks the English horse and artillery turn out wonderfully, and, except the Russian Imperial Guard, nothing comes up to our household cavalry, and to the smartness of some of our light cavalry, which are, he says, better horsed than the Ziethen Hussars, and quite as showy. With reference to the general subject of dress of all armies, he gives the palm to Russia, and next to Russia he places the Prussian army. The dress of the French heavy cavalry, he says, would be good were it not for the baggy trousers, which are ungainly. Some Spanish corps, he thinks, are smart, but their chacos are hideous, and so also is the head-dress of the Italian soldier. The dress of the Austrian army, which used to be most showy, is now ugly, but it is useful. The Dutch army ranks next to the English army in ugliness.

The Nordenfelt Gun.

ANOTHER exhibition of the 3-barrelled Nordenfelt rifle calibre machine gun was given at the Rideau range on Friday afternoon last. On this occasion His Excellency the Governor-General, the General commanding at Halifax, Lord Alexander Russel, Colonels Panet, John Macpherson, Irwin, Houghton, Lamontagne, Bacon, White, Captain Boulton, R.N., and many other officers of rank in the militia force were present. The weather was fortunately not unpropitious, and as a marquee had been placed over the gun the vice-regal party were well sheltered from the somewhat cold wind which blew freshly across the range.

The mechanism of the gun, its extreme simplicity and freedom from chance of injury or accident, were clearly explained to His Excellency and Lord Alexander Russell, both of whom manifested great interest in the little "peacemaker," as one of our contemporaries has not inaptly designated it.

An ordinary target was placed at 500 yards, but in our opinion this test, although successful in itself, is neither a good nor a fair one when