

of the powder. Its oxidation by saltpetre appears also to produce a higher temperature than is made by charcoal, thus accelerating combustion, and increasing by expansion the volume of gas generated.

Powders made from exactly the same materials, mixed in the same proportions, will differ greatly in "explosiveness," which has been defined as the rate at which powder burns, or is converted into gas. This quality depends chiefly upon the following properties:—The extent of evaporation; the purity of the powder; its hardness; the size of the grains or pieces; the shape of the grains; and the amount of glaze. In the manufacture of powder it has to pass through ten processes—and finally, proof. After the ingredients have been purified, and the charcoal and sulphur pulverized and sifted, they are brought to the mixing house, where they are very accurately weighed out in 50-lb. charges—that is 37½ lbs. of saltpetre, 7½ lbs. of charcoal, and 5 lbs. of sulphur—as this is the largest charge authorized for the incorporating mill, which is placed in a hollow drum containing a fly fan, which rotates in an opposite direction, and with three times the speed of the drum. This rotatory motion is kept up for five minutes, when a complete mixture has been effected, and the charge is removed and passed through a copper sieve into bags. The composition is next taken to the incorporating mill, which consists of a pair of iron or stone circular runners, revolving on a flat plate or bed, about 7 ft. in diameter; the stone runners weighing about 3½ tons, and the iron about 4½ tons, both kinds making eight revolutions per minute. From two to six or seven pints of distilled water are required to facilitate incorporation, and to reduce the effects of an explosion. As the goodness of the powder depends upon this process, only experienced men are employed, and the mills work by day-light. At this stage the "cake" is proved, and, after a small piece has been corned, about half-an-ounce is flashed on a glass plate, and if any white or yellow spots are found, it is a sign that proper incorporation has not taken place. The ingredients for the Snider-Enfield rifle, known as R.F.G., are worked for 5½ hours under the stone, or 4 hours under the iron runners; whilst for the Martini-Henry rifle, known as R.F.G.² they are worked for 7 hours. Common service powder is only worked from 2½ to 3½ hours. There is more danger of an explosion during incorporation than in any other process of manufacture. The machinery is automatic; the charge in one mill cannot exceed 50 lbs.; and the mill-men only enter the mill occasionally to add water to the charge, or to give it a shove over; whilst, at the Government works at Waltham Abbey, they wear incombustible clothing, with a cap fitting over the ears, and gauntlets of the same material. The roof and front, and rear sides of the mills, are usually constructed of very light boards, or even of canvas on a wood frame; whilst the partitions between each set of runners are of solid masonry. Directly over the bed of each mill is a flat lever-board or "shutter," in gear with a tank of water, so arranged that when the "shutter" is raised on its pivot by an explosion, the water is upset into the bed. A horizontal shaft connects all the "shutters" in a group of mills, so that the explosion of one mill at once drowns all the remaining charges; whilst, if necessity requires, the whole of the tanks can be emptied by hand.

(To be continued.)

### PERSONAL.

Lieut.-Col. Villiers, D. A. G. of M. D. No. 3, was at Port Hope on Dominion Day. He witnessed a representation of the bayonet charge at Batoche.

Surgeon-Major Neilson, of "B" Battery, lately returned from the Soudan, has been granted two months' leave of absence.

Lieut. Halliwell, Sergt. Christie, Col. Sergt. Wrighton, Corp. Halliwell, and Pte. Downer, wounded at Batoche, and Capt. Lazier, of the Midland Battalion, arrived in Winnipeg on the 2nd, having left Saskatoon about a week previous. They came via Moose Jaw, and had a very pleasant trip. There also arrived at the same time, on leave, Capt. Trotter, Montreal Gar. Art., from Regina; Capt. Dillon, 7th Fusiliers, from Clarke's Crossing; Corp. Thompson and Pte. Johnson, of the Queen's Own from Battleford. They all left for the east the next day.

The French Senate has voted 10,000 fr. for a public funeral to the late Admiral Courbet.

The Montreal volunteer officers have decided to give a grand picnic at St Helen's Island to the North-west volunteers on their return to that city.

General Crooks has organized his campaign against the rebellious Apaches. With scouts and infantry he will enter the Sierra Madres and endeavor to capture or kill Geronimo and his band. Should they attempt to return to the reservations in Arizona or New Mexico they will be intercepted by cavalry stationed along the line.

### CORRESPONDENCE.

FROM GENERAL MIDDLETON'S COLUMN.

FROG LAKE, JUNE 16, 1885.

To the Editor of the Militia Gazette,

SIR,—I shall commence at Prince Albert, where we went into camp on May 19th, and try to give you an account of our travels and adventures since that date. At Prince Albert our column—Gen. Middleton's—consisting of the Grenadiers, Midland, 90th, "A" Battery and Winnipeg Field Battery, camped for three rainy days in as muddy a spot as it would be possible to imagine. There was no drill, and the duties, such as guards, piquets, &c., were made as light as possible, for Gen. Middleton is practical in the extreme, and knowing there was no enemy within fifty miles of us, and appreciating the hard work his men had been doing during the past few weeks, takes every opportunity of giving them needed rest. On Friday morning we—the Midlanders—started on the steamer *Northcote* for Battleford, with the General and his staff on board; the Grenadiers and 90th followed on the same evening on the steamers *Baroness* and *Marquis*. We arrived at Battleford on Sunday evening, May 24th, after a very pleasant trip, but did not disembark until morning, as it was after nine when the boat landed. Colonel Otter's column turned out strong to receive us, and as the steamer sailed up towards the beautifully situated town of Battleford, cheer after cheer greeted us, and we returned them with vigor. The Ottawa contingent of our battalion at once rushed ashore and in a moment were in the arms of our fellow citizens the Sharpshooters. It was a joyful meeting. Reveille sounded at four next morning; and at six o'clock, having had an early breakfast, we marched up and pitched our tents on the finest military camping ground it has been my fortune to see. Orders were at once read, calling a parade at 11 o'clock to do honor to the birthday of our beloved Queen. The parade was a grand success, and consisted of "horse, foot and artillery," about 700 strong. Before we arrived in Battleford Col. Otter's column were in the habit of throwing out very large piquets, the number of men required each day for duty being 130, but on our arrival they were reduced to 90. The large proportion consisted of outlying piquets, which went on duty at 6 p.m. and came off at 6 a.m., the men parading with great coat and one blanket and a rubber sheet apiece. It was miserably cold work for the men, but the second day after our arrival they were discontinued by order of the General, and the hearts of many were filled with joy. On Tuesday Poundmaker and his chiefs surrendered. The scene in front of the General's tent was one which will be long remembered by those who had the pleasure of witnessing it. Within the rope-enclosed square, in an armchair, sat our General, stern and severe of mien, surrounded by a brilliantly uniformed circle of officers, and opposite him, sitting upon the ground, was Poundmaker, handsome, dignified and impassive, with all his blanket-clad chiefs squatting around him, and closest of all the old Indian queen, his mother. Poundmaker and his brother are remarkably fine looking specimens of their race, but the others were a most villainous looking collection. The pow-wow lasted for three hours, and was listened to with intense interest by us all, and long before this will reach you you will have known the result. We spent the rest of the week in Battleford, doing two hours' drill a day, and enjoying ourselves immensely. The monotony of camp life was varied by football and cricket matches, and the chief topic of conversation among all ranks was our early return home, which seemed very imminent, as an order had come out calling for volunteers to remain behind. On Saturday all prospects of an early break up of the campaign were swept away by the receipt of news of Gen. Strange's fight with Big Bear, and the additional news that Big Bear was in camp 18 miles north of the river, a few miles from Fort Pitt. We were all up at four o'clock next morning, and at half past five we marched down to our old steamer, the *Northwest*, the 90th and Grenadiers taking the *Marquis* and *Alberta* respectively. As only a short absence was expected we only brought half our tents with us—three per company—and all extra baggage was left at Battleford. Everyone was enthusiastic at the near prospect of a brush with the enemy, and when I tell you that the sight of the hospital sergeants cutting out bandages upon the cabin table did not dampen our ardor in the least you can judge how bloodthirsty we had all become. During the trip up the river we were hailed by numerous scouts, who gave us the latest information, but we saw no sign of Indians. On Tuesday morning a scout came on board, who informed us that Big Bear had fled—news that filled us all with the deepest disgust, for we had hoped to capture the old fiend this time and thus wind up the campaign and restore the prisoners to their friends. At noon we came across the scow that had come down the river from Gen. Strange's camp, and took it in tow. There were about a dozen of the 65th men upon it, and none of them seemed any the worse for their adventure. We spent the night on the steamer and went into camp early next morning. We were seven miles from Fort Pitt—the men packing in fourteen to each tent, while there was only one tent for tea officers; a great change for both officers and men, but nobody grumbled, for we are old hands at campaigning now. Before noon the camp presented a very novel and beautiful appearance, as our men utilized their time in building "tepees" of young poplars, which abound in this part of the country, and in which leafy habitations they seemed to derive as much comfort as the occupants of the tents. Envyng the proprietors of the leafy houses their happiness, I constructed a "one man tepee" of poplar branches, with my white canvas sheet for a roof, and when I crawled out of it in the morning after a delightful sleep I found a large cross erected at the head of it, and my epitaph written in staring black letters upon the white canvass roof. I enjoyed the joke immensely in spite of its rather ghastly appearance. I shall stop here, as I think I have written enough for one letter, but before closing I shall tell you a few facts upon the all important subject of our rations. Our commissariat on the whole has been excellent, especially when the difficulties of transportation are taken into consideration. Our bill of fare is not by any means varied, but at no period of the campaign have we been reduced to anything like short rations; the worst being an occasional absence for a couple of days of such articles as sugar, beans or bacon, but that was in the earlier part of the campaign. Our clothing is in a fearful state, and a large number of our men are almost without footwear of any kind. All spare out sacks are used for patching clothes, and the appearance of the men smacks very much of convicts. A new issue of uniform is daily expected. Tobacco cannot be had for love or money. In my next letter I shall give you an account of our Bear hunting expedition out north, which I hope will prove interesting to our friends at home.

FORTYTH ORDER.