

true that Spence had insulted Dr. Schultz's wife during the latter's forced absence, surely the Dr. could have taken satisfaction without seizing the man in bed! Yet it is such as he who represent themselves as the "Canadian party" in the settlement, and Governor Archibald will fail in his mission if he does not take the first opportunity of teaching them, and the half-breeds alike, that whoever takes the law into his own hands transgresses it, and will be punished accordingly. With respect to the volunteers, we are glad to learn that Col. Jarvis has taken most stringent measures to insure discipline, and prevent any of the soldiers from mingling in the local or tavern brawls at Winnipeg.

Since writing the above we have found the following in the *Toronto Globe*, which we are glad to notice puts a still more favourable face upon Manitoba affairs. It will be noticed that Dr. Schultz's rash course receives a very mild condemnation:

"On Friday last, Captain Herchmer, of the Red River Expedition, returned to this city from Fort Garry. He was accompanied part of the way by Col. Jarvis, who has been called from his command at Fort Garry to give evidence in an important lawsuit at New York, and it is probable he may have to go to England for the same purpose. He expects to be back at Fort Garry in about two months. Meantime, the chief command of the troops devolves on Col. Casault. Capt. Herchmer brings the intelligence that the story of the shooting of Lepine is a hoax, though there is no doubt as to the cause which was said to have led to the alleged shooting. A report of Lepine's death, similar to that which reached Toronto, was circulated in Fort Garry before Capt. Herchmer left there; but when he reached Pembina he saw some half-a-dozen persons who had seen Lepine alive and well subsequent to the date of his reported death. He is living in a little village on the American side, about 30 miles from Pembina, and is apparently in no danger of molestation. Riel is also living in enforced retirement in an obscure village on the south side of the boundary line. It is reported he is afraid to show himself at Pembina, lest the United States troops stationed there lay violent hands upon him. He incurred their wrath while he was playing despot at Fort Garry, by giving up to the American authorities some of their number who had deserted and taken refuge in his dominions. These deserters and their friends threaten to execute summary vengeance upon the ex-President if he comes within their reach.—Capt. Herchmer's representation of the condition of affairs at Red River is reassuring, and calculated to remove the apprehensions many in this country have entertained respecting the observance of law and order in the settlements. Fresh from the country, with a pretty familiar knowledge of the state of affairs and the sentiments of both sections of the people, he entertains no fears of private revenge usurping the place of law. The excitement over the Goulet affair is dying out. The feeling against the Volunteers, founded on a false report of their participation in Goulet's death, is giving place to a correct view of their conduct. It is a fact, capable of positive proof, that not a single volunteer followed Goulet in his race for the river where he met his death, with the exception of a bugler of Capt. Herchmer's company—a mere lad who followed out of natural curiosity. As he is a Roman Catholic, the report that was circulated in the excitement of the moment, that Goulet's death was caused by Orangemen's revenge, is absurd. The Volunteers are in excellent health and their general behaviour is admirable. The great body of the people of both sections are anxious for peace and the establishment of properly constituted courts for the maintenance of law and order. The danger, if any there be, is from the extremists of both sides. Capt. Herchmer states that some regret is felt that Dr. Schultz has not taken a more moderate course since his return, and one more calculated to strengthen the hands of those whose efforts have been for peace. The course the Lieutenant Governor has taken so far appears to be wise.—He has called to his Council moderate men, and according to the account Capt. Herchmer gives the people generally, English and French, are waiting anxiously, but confidently, for further action on his part, and are ready to second all his efforts to promote the peace and prosperity of the settlement. Capt. Herchmer had a comparatively quick trip down. He made arrangements at Pembina for the conveyance of Mrs. Archibald and family to Fort Garry, and it is likely they have by this time arrived at their future home."

ON SEWAGE SYSTEMS.

BY J. BAKER EDWARDS, PH. D., F.O.S.

The A B C system of purification which has been adopted at Leicester, Hastings, and a few other small towns in England, is founded on a patent granted W. C. & R. G. Sillar, and W. J. Wigner, and is sometimes called "Sillar's Process." It consists of adding to the liquid a mixture of:

Alum	600 parts.
Blood	1 "
Clay	1900 "
Magnesia	5 "
Manganate of Potash	10 "
Burnt Clay	25 "
Chloride of Sodium, (Salt)	10 "
Animal Charcoal	15 "
Vegetable Charcoal	20 "
Magnesian Limestone	2 "

1998

These substances are mixed together and added to the sewage until the whole of the suspended matter be precipitated—the clear water is then allowed to flow away and the sediment collected, partially dried and mixed with oil of vitriol. When dried, it is applied to the land as manure. It is evident that to purify the sewage of a large city, large quantities of material have to be handled, which implies a heavy charge for labour, and involves the demand for, and the consumption and removal of an enormous mass of manure.

As a chemical process no objection can be raised to its general character, but it leaves untouched the great noxious exhalations; it does nothing to decrease the evils

arising from foul drains, and it would probably involve, in this country, an accumulation of the matter during the winter months, which would be an additional pest during the summer, from the discharge of large volumes of noxious gas during the chemical operation.

So poisonous is this, that at the Model Works recently erected at Hastings, where no expense has been spared to render the operations perfect, not only were two of the workmen rendered insensible and quickly killed by its inhalation, but the chemist of the works, Mr. Porter, was also suffocated in his attempts to rescue the men. Great caution is therefore necessary in throwing a large volume of such poisonous gases in the air, for where they do not suffocate, they are injurious to health and spread the germs of disease.

This system, if liberally carried out and perfectly managed, is however superior in its results to that which has obtained the patronage of the River Pollution Commissioners, and which consists of the disposal of sewage by irrigation. This plan is adopted at Edinburgh, Norwood, and Croydon, and whilst commercially it may be considered a cheap mode for the disposal of sewage,—yet, in point of Hygiene, it may almost be said that the remedy is worse than the disease.

Dr. Murchison, of the London Fever Hospital, has traced a particular fever to this source, and has devoted a considerable portion of his work to the proof of sewer gases being the primary cause of "pythogenic or enteric fever."

Dr. Letheby assures us that wherever this system has been adopted, "the stench is most sickening and unendurable," and he condemns it most unreservedly as a fruitful source of disease, rendering districts previously healthy almost uninhabitable. And Mr. Creasy, a medical practitioner at Beddington, where the Croydon Works are irrigated, says before the Committee of the House of Commons: "I have known the district ever since it was a sewage farm, and long before that. The first case of typhoid fever occurred in the place in 1867, and from that time to this there has been typhoid fever in every cottage on the estate; and I find around it almost every disease assumes a particular type, accompanied with what we call a *sewage tongue*."

At a model village near Halifax, the system was tried by Mr. Ackroyd, and it was found absolutely necessary to discontinue it in consequence of the serious outbreak of typhoid fever which followed the experiment. So also in the town of Shaftesbury and in some other towns and villages in England where philanthropists have, after much expenditure, suffered disappointment.

A much better prospect of success is afforded by the "earth closet" system, which has been more or less adopted at Edinburgh, Manchester, Salford, and several other large cities and towns in Scotland and Lancashire.

The principle is to separate the solid from the fluid refuse, and to apply the water system to the latter only. The matters in solution will soon be cleansed by the air, and by the myriad army of microscopic scavengers which Providence has ordained to spring into existence to destroy the last remains of organic debris.

The solid sewage is rendered valuable and inodorous by mixing it with ashes and vegetable or animal charcoal. As substitutes for these, common cinders in powder, dry earth, or sand, may be used with success. In the latter case, however, it requires three and a-half times its weight of earth to deodorize and dry it up. Peat charcoal or sea-weed charcoal will deodorize an equal weight of solid refuse. A mixture of these can easily be provided to do the mechanical work of a water-closet without the pestilential consequences of sewer gases; and, moreover, by this method true economy as well as health is secured.

In the city of Edinburgh by this mode £7,000 sterling is realized from the sale of manure from the public conveniences alone, and it is everywhere acknowledged to be a most valuable manure. A proper provision for this public necessity would be a great boon to the inhabitants of the eastern and western sections of our industrial populations, whilst those who adhere to the water-closet system should look well to the water traps entering their dwellings, and insist upon trapping and ventilation in the street sewers. The three methods of treatment, each of which has its advocates in Great Britain, although the conclusions to be drawn from their adoption seem to be obvious, are these:

1.—Irrigation of land with liquid and solid sewage matters untreated.

Result—Typhoid Fever.

2.—Treatment of solid and liquid matters by chemicals, and washing away of fluid matter.

Result—Poisonous gas and impure water

3.—Separation of solid and liquid sewage in collection, absorption of offensive gases, and disinfection.

Result—Valuable odourless manures, and relieved sewers.

It is a matter of the greatest difficulty to turn the attention of the public or the public authorities to this subject, although it is universally acknowledged to be of extreme importance. It is one of those problems which the Chinese have solved for us, and upon which we should be content to learn from them. And although I am compelled to confess that it is one upon which "Doctors differ," still, being in a city in which any change would be an improvement, it behoves us to consider whether we cannot avail ourselves of the experience of the mother country without purchasing it afresh for ourselves.

THE CAVALRY CHARGE AT SEDAN.

We mentioned in a former number, while speaking of the battle of Sedan, the splendid but fruitless charges made by the French cuirassiers upon the Prussian infantry. On another page will be found an illustration of this episode, which is graphically described by Dr. Russell. "Never," he says, "can I forget the prelude. When I saw the French who had lined the advanced trench on the 1st retiring to what I now see was another epaulement, where they were again raked by the flanking batteries of the outer ridge and pounded and brayed by the mamelon guns, I did not know how they had suffered, and could not conceive why they retreated. The Prussians coming up from Floing were invisible to me. Never can I forget the sort of agony with which I witnessed those who first came out on the plateau raising their heads and looking around for an enemy, while, hidden from view, a thick blue band of French infantry was awaiting them, and a brigade of cavalry was ready on their flank below. I did not know that Floing was filled with advancing columns. There was but a wide, extending, loose array of skirmishers, like a flock of rooks, on the plateau. Now the men in front began to fire at the heads over the bank lined by the French. This drew such a flash of musketry as tumbled over some and staggered the others, but their comrades came scrambling up from the rear, when suddenly the first block of horse in the hollow shook itself up, and the line, in beautiful order, rushed up the slope. The onset was not to be withstood. The Prussians were caught *flagrante delicto*. Those nearest the ridge slipped over into the declivitous ground; those in advance, running in vain, were swept away. But the impetuosity of the charge could not be stayed. Men and horses came tumbling down into the road, where they were disposed of by the Prussians in the gardens, while the troopers on the left of the line, who swept down the lane in a cloud of dust, were almost exterminated by the infantry in the village. At the same moment a splendid charge was executed on the Prussians, before which the skirmishers rallied, on what seemed to me to be still a long parallelogram. They did not form square. Some Prussians too far on were sabred. The troopers, brilliantly led, went right onwards in a cloud of dust, but when they were within a couple of hundred yards of the Prussians one simultaneous volley burst out of the black front and flank, which enveloped all in smoke. They were steady soldiers who pulled the trigger there. Down came horse and man; the array was utterly ruined. There was left in front of that deadly infantry but a heap of white and gray horses—a terrace of dead and dying and dismounted men, and flying troopers, who tumbled at every instant. More total dissipation of a bright pageantry could not be. There was another such scene yet to come. I could scarce keep the field-glass to my eyes as the second and last body of cavalry—which was composed of light horse also—came thundering up out of the hollow. They were not so bold as the men on the white horses, who fell, many of them, at the very line of bayonets. The horses of these swerved as they came upon the ground covered with carcasses, and their line was broken, but the squadron leaders rode straight to death. Once again the curling smoke spurted out from the Prussian front, and to the rear and right and left flew the survivors of the squadrons."

ARRIVAL OF WOUNDED SOLDIERS AT SAARBRUCK.

On the evening of the 6th of August, Saarbruck offered a frightful spectacle. The town itself had been bombarded, captured and recaptured, and a bloody fight had just taken place on the neighbouring heights. The streets were filled with troops, with men and women wearing the red cross, with wounded soldiers, and scared citizens. Many of the houses were in ruins, but such as the shot and shell had left unscathed were thrown open for the reception of the wounded who were pouring in from Spicheren. The citizens, at all events, felt themselves safe. The French had been driven off with immense loss, there appeared to be no present danger, and so, forgetting their losses, they devoted themselves with good-will to the task of providing for the sufferers in the battle. The railway-station, which had suffered severely from the bombardment, was converted into a temporary hospital where the wounded—as many as the ruined building could hold—were tended by a corps of nurses, organized and superintended by the Baroness von Rosen. Like many others of the German nobility this lady had devoted herself entirely to the good work of caring for the wounded, and, immediately on the outbreak of the war, had enrolled herself in the ranks of the Red Cross. At Saarbruck she did signal service, and many a soldier wounded at Spicheren owes his life to her unremitting labours. Our illustration represents the Baroness receiving the wounded at the railway station.

. VALETTA.

Since the outbreak of the European war, and still more since the occupation of Rome by the Italians, the island of Malta has attracted no little attention. As a military post of considerable importance it has always been carefully guarded and sufficiently garrisoned, but at the present time it has become the object of redoubled vigilance. The fortifications have been carefully inspected and repaired where necessary, the stock of munitions and provisions has been increased, and, as many of the officers of the garrison are on leave, all further leave has been suspended. At present the entire strength of the garrison is not more than 5,500 of all arms, and the aggregate defences fall short of 500 guns. The troops are under the command of Lieut-Gen. Sir Patrick Grant, who is also Governor of the island. The city of Valetta, the capital of Malta, is, next to Gibraltar, the most strongly fortified position in the Mediterranean. It is situated on a long neck of land, which, with the mainland on either side, forms two large and commodious harbours, known as the Great Harbour and the Quarantine Harbour. The fortifications, which extend for a distance of twenty-five miles, are singularly massive. They consist principally of five forts, St. Elmo, Ricasoli, St. Angelo, Tigne, and Manuel, and the lines of Floriana, extending across the isthmus from harbour to harbour. Forts St. Elmo and Ricasoli guard the entrance to the Great Harbour, and the other three the Quarantine Harbour. The first named is an enormous work of granite, with barracks sunk in the lower bastions for 2,000 men. The troops at present stationed here consist of one brigade of Royal Artillery, two companies of Royal Engineers, the Royal Malta Fencibles Artillery, and six infantry regiments, the 24th, 31st, 48th, 52nd, 64th, and 87th.

The illustration, given on another page, shows the city as