

spring; and that water in this instance rises above its own level. But we might get to work and surround these "spa holes" with ditches to the hard earth, and not dry up the "spring"; and then we might cart away the "spring" and all its bed of muck, and find nothing but dry earth, without any spring holes at all; and if we pile up enough of this muck anywhere in one place we shall have a "spring" in it. As a consequence of this peculiarity, we find that swamps are always miry. They may have any amount of fall in them, but the water cannot wholly run off. In fact it forms faster than it can run off. It is as though we lay a sponge on a table, and fill it with water until saturated. This much it will pretty fairly hold. Then pour on more and the water will "seep" out of the sides below; and this is what our swamps are doing all the time.

Let me say that in the application of the muck to the manure, we should begin before the manure is produced, and spread a good quantity wherever either the solid or liquid is to come. Then when it is made, say once a day, or once a week, spread the dung, and over it place a layer of muck of about the same quantity. By doing this, the dung can never heat, and the chemical operation can continually go on.

I have observed, and indeed it was the principal motive with me in contemplating this article, that putting the green barn manure into the potato drills poisons the crop. The tubers grow scabby, small, and sour, and rotten, whereas by the use of the muck all these difficulties are avoided, and we get a good and sure crop. I have observed in the month of June that the unmix'd dung seemed to heat with the warm rain and hot sunshine, giving aid and comfort to a small and active black fly that devoured the leaves of the potato wholesale, and thus added to what other difficulties the tuber had to contend with down below.

I am here going to request somewhat of the clemency of your readers a little further upon a topic rather apart from the subject proper of this article, but which yet has a very important bearing upon the subject of agriculture. I have noticed that some of the Granges have made a move, by way of resolution, to approach the Legislature with the object of procuring lecturers on the all important branches of agriculture, chemistry, geology, botany, &c., in order that farmer's sons and others shall have an opportunity of profiting by these lectures.

I wish to state emphatically that the Legislature has already done this same. Already five or six institutions in different parts of Nova Scotia receive aid from the Government of this Province to do just what the members of the Granges

and agricultural societies would request. As a connecting link, in the nomenclature at least of such a course of study, I would suggest mineralogy. The study of mineralogy just about covers what I would express by inorganic chemistry. Geology can be nearly all learnt by the fireside, from a well written, well illustrated treatise upon the science, or at least almost as well and thoroughly as at college, and far better than at any lecture. I have tried it both ways. But after all, the proper field for studying geology is a field of rocks.

Not in the lecture room, but in the college class, is the place to study inorganic or organic chemistry, and in the laboratory, where all may take a hand in experimenting. As for botany, well, it can be learnt at college or school, only we shall have to be out of doors much more to learn it than in the school. We cannot learn agriculture or any other science by a course of lectures, any more than we can learn medicine by such a course. The best place to learn agriculture is on a farm; only let the accompanying course of tuition—maybe self-tuition—be systematic, and as far as possible thorough. As for chemistry in any department, it cannot be picked up miscellaneously, or by the generalizing system of the manuals, or agricultural newspapers. The student must, at some time or other, begin at the proper beginning. Nor can we learn organic chemistry apart from the inorganic. Such a science does not exist. The student of agriculture might as well commence with silicic acid as with carbonic acid, with alumina as with ammonia.

Nor can all the botany we shall learn apart from the philosophy of plant growth, be of much use, except as a fancy appendage or accomplishment. Botany is, in fact, included, in its most important and practical sense, in a true knowledge of applied chemistry.

With all I have said, I wish to say to all farmers' sons who intend becoming students of science, in any form or branch, go to an intelligent master of these things, and buy the books he recommends, and learn what you can yourselves. If you cannot form a club, buy all the books yourself. Do not spare the cash or be frightened about the money. I dare say that out of five parts of natural science you may or can learn four parts by private study; but for the fifth part, you must attend the class. Never mind the lecturers; do not believe in them. They may do their part quite efficiently; but you cannot learn by them.

I had almost forgotten to recommend to all young persons the study of animal physiology, and the philosophy of animal life, in every particular that such knowledge can be acquired. CLOVERDALE.

The following is from the *Agricultural Gazette*, London:—"NOVA SCOTIA.—Six cows and heifers and three young bulls of the Polled Aberdeen and Angus cattle breed have been recently selected by Mr. Robert Bruce, of Great Smeaton, and were shipped on Tuesday, November 22, by the Royal Mail steamship *Hibernia*, of the Allan Line, from Liverpool, for the Government of Halifax, Nova Scotia. The cattle were as follows:—Fame (4539), a 2 years and 10 months old heifer; King of Diamonds (1818), an 18 months old bull, and Marksman, a 9 months old bull calf, bred at Ballindalloch, sire Young Viscount (736), dam Maria 2nd (3015). These three are from Sir G. McPherson Grant's herd at Ballindalloch. Fame is a very good cow all over; she descended from one of the oldest Ballindalloch families, some of her ancestresses having made high prices. King of Diamonds comes from stock that have been successful in the prize ring at the Scottish shows and at the Paris International Show in 1878. The sire and dam of Marksman were famous prize-winners at the Aberdeen and Highland Societies of Scotland shows; and his sire was also the winner of the champion prize at the Royal Agricultural Society of England International Show at Kilburn in 1879, and was sold for a very high price. Moonlight 2nd (4603), a 1 year and 10 months old heifer, is a well-grown, thick, strong heifer, with capital quarters, and thick coat of hair. She is from Mr. Skinner, of Drumin, Ballindalloch, and is descended from high-priced and prize stock on both sides. Honesty 4th (3757), from Mr. Robertson, of Aberlour Mains, is a very good straight cow, 4 years old, with well sprung ribs, good top and hip quarters. Besides being a prize-winner herself, her sire Cluny (1283), grandsire Clausman (398), and great-grand sire Young Panama (232) were all 1st prize-winners. On her dam's side she is descended from the well-known Drumin Lucy tribe. Signet 3rd (4355) and Purity 5th (4357) are both from Mr. J. Strachan, of Wester Fowles. They are two well-grown heifers, rising 2 years old. Milly 3rd (3471), 4 years old in March last, a fairish cow, with good loin and long quarter and with a good udder. She comes from Mr. J. S. Findlater, of Balvenie. Jock o' Benton (1894), a soggy bull calf, just ten months old, looks like making a large bull of great length, straight back, and masculine head. He is bred by Mr. C. Stephenson, of Balliol College Farm, Newcastle, Northumberland."

THE short-horn bull "Viscount Oxford," formerly owned by the Amberst Agricultural Society, is now on Prince Edward Island, and is highly valued as the animal that has brought the best stock ever seen on the Island.