the width of the drain at the top. After throwing out the soil by going back and forth in the furrows as long as the plough will turn out the soil, the trench plough is brought into requisition, four horses put on, and the soil loosened as deeply as it can be. This loose soil will get covered with snow at the first snow fall. The snow acts as a protector to keep it from freezing hard, and when the ditchers go to work they find but a thin crust of frozen earth, through which their spades readily penetrate, and, as they work from one end, they complete the drain to the bottom, lay the tiles, and cover as they go along. The tiles can be drawn on the land either late in the fall or with the first sleighing. The soil will be found much drier and better to work in than during the wet season of late fall or early spring.

As frost never penetrates over about two feet, and seldom that, if the soil is such as to require draining, water will appear at the depth at which the tiles are to be laid, in sufficient quantity to enable the tile layers to regulate their work so as to give sufficient fall, which is known by the water passing away through each tile as it is laid. This part of the business is the most important, and should be superintended either by the farmer himself or a person who competently understands the *modus operandi* of draining, for it is of special importance that it be done correctly, otherwise the drains will not work, and the expense of re-opening them would be a serious item.

Draining with Wood instead of Tiles.

In one of my rambles through the country to ascertain the progress of agriculture, I came on a very large section where many farmers were engaged in draining their farms more or less with wooden drains. The land all through that section was generally level or flat, and from the unsatisfactory result of trials with drain tiles, draining with wood has been much practised, and was more generally liked, and was stated to be cheaper. I found that people were constructing drains made of a piece of common pine or hemlock board, six inches wide, and one of seven inches wide, tacked slightly together in the form of an inverted letter V, and placed in the trench dug to receive it; by this course it follows that there was no bottom to the drain, nor was any required; the ditch was dug wide enough to receive the inverted right-angled drain-box, the joints were sawed off square, and if not close enough, a piece of board or chip was placed over the opening or crack where the butts of the drain-boxes met. Generally however, this was quite unnecessary, as a piece of sod was always laid over the joint, and the clay would never pass through the opening in quantities sufficient to produce injury. No perceptible wash at the bottom of the drain was complained of, probably attributable to the clayey subsoil not being liable to wash. The area of such a drain was far in excess of any tile at the same price, and the difficulty of two-inch tiles passing each other a little at the points of contact at the ends, and thereby filling up, was altogether avoided. Some saw mills in the vicinity were cutting drain stuff altogether, and the demand exceeded the supply. Some of the most sensible farmers were busily engaged in partially draining their farms—that is, they were running drains through all the low spots, thus leaving the field as dry in the low as the high parts. When asked why they did not thoroughly drain each field land by land, as they went on, instead of only draining the low, wet portions, I was told that to do this would cost at least $16 to $20 per acre, and would never pay, while many even denied the advisability of so doing. They argued that during our parching summers the dry land did not require draining, provided the wet portions were well relieved from surface and surplus water during the wet season, and I have no doubt practical facts were in favour of such an argument. Agriculture is so uncertain, from the ravages of the midge, that great outlays of this nature would often be ruinous, and farmers in Canada are not always blessed with too much capital. Many, very many, have plenty, and money to loan, even after buying farms for their sons; but where a man goes on a farm late in life, and pays for it and for buildings, live and dead stock, and settles each of his sons on land of their own, he has not usually money to use in draining so very extensively, in order that some one coming after him may reap the benefit; whereas, the partial relief of such draining as I have seen done and described above, yields an immediate return for the outlay. The land is relieved of stagnant water at the time most needed, and in consequence becomes greatly improved, and at small cost in comparison with that which would be incurred in draining the whole farm, as often advised and practised in England. One, and by no means the least, benefit derived, is that frost does not so often affect the growing crop. I have often seen frost lying thick on these low spots in a field when the higher portions were quite exempt. C.

Mole Draining.

This is a class of draining but little understood by Canadian farmers. It is accomplished by an iron cone being dragged through the earth at the depth of ordinary drains in which tiles are used; but it differs from tile drains in the pressure of the cone passing through the earth consolidating the sides of the hole which it leaves in its passage, and thus forming a hardened mass which answers the purpose of the tile, and keeps in repair for many years. There are drains of this kind to be found all through the clay lands of Ohio, many of which have been running for fifteen years, and are still in a good state, and answering the end for which they were originally intended.

The draining instrument is made as follows: First, there is a strong frame, either angular or square, which in the old English fashion, is made to run on wheels of a small diameter, but which, from the slow rate at which it moves, might as well be made with runners, instead of wheels, its only object being to regulate the depth to which the mole or plough part is allowed to go. There are strong handles fitted to this frame, so as to enable the attendants to move it, and the whole affair is made of stout timbers, or iron, and is of great strength and solidity. In the centre piece is a strong mortice, through which passes the coulter of the mole iron, and to the front of the frame the chain or wire rope by which it is dragged is attached by a very strong clevis and connecting bolt. All is made of the greatest strength, and calculated to bear an enormous strain. The coulter of the mole is a bar or rather plate of steel, from six to eight inches wide, and one inch thick, at the lower end of which is fastened the "mole," which is a conical piece of iron pointed with a steel point, and sufficiently steeled to resist wear. This is rivetted on in the strongest manner to the cutter, and consists of two or three pieces, the first calculated to make a hole of from three to four inches in diameter, supplemented by others which are affixed by a strong screw and nut, and which when required will leave a hole of six inches in diameter. This is the largest bore which is used, and this is only used where required to carry a heavy volume of water, the smaller ones being sufficient for the lateral drains. Of course, all these drains are made as level and with as little fall as possible, the smaller irons being sufficient for the lateral drains. The mole centre is moveable, and by a rack and pinion, or by notches and wedges, can be set at any depth down to three feet or more. A very strong chain or wire rope is affixed to the clevis at the head end of the machine, and this rope or chain is operated by a powerful crab or windlass, strongly anchored at the extreme length of the chain, and turned by a bar, to which is attached a span of horses, or oxen.

To commence the work, a hole is excavated at or near the intended outlet, to the depth to which the drain is designed to be made, and the machine is placed over the hole, with the coulter and mole going down into it. The strain is then put on the chain, by turning the windlass or crab, and the mole and coulter are dragged through the ground with almost irresistible force, leaving a clean pressed hole and a clean cut slit leading down to it. This fissure made by the coulter is little more than a fine knife