

at that time prevented me from doing so, but having leisure at present, I thought a copy of it in your widely-read paper might be acceptable to your many readers. It reads as follows:

The time is fast approaching, if not already here, when modern and improved structures will replace the sod hut, the log house, and the light, fragile building of the early settlers. Your Minister of Agriculture was very anxious that the merits of cement concrete structures should be thoroughly explained to you, as it would give you another class of buildings to choose from. That is the object of my being here, to explain as clearly as possible how these structures should be built. I will now try to do so as briefly and intelligently as I possibly can. I do not wish to inflict upon you a long, tedious address, but will just touch on the main facts. I would rather that our meeting should assume the form of a general discussion, as I will have many questions to ask you in reference to your materials and climatic influences. Whilst I am quite familiar with the work in Ontario, the conditions are different in your province, and during my address, if any statements are not clearly understood by my hearers, please stop me that I may explain any point more fully.

Now, gentlemen, it is probably due to you that I should say that I am a cement manufacturer, and that my address to-day will give you information in the use of all cements, that I do not wish to talk "shop" or my own business, and that I have no cement to sell to you, as we cannot supply the demand in our own province. There are in the neighborhood of from twenty to twenty-five different cements in the market. I believe they are all good, with the exception of two or three, when properly used.

The Portland cements, I believe, are all good. Sometimes some of those cements brought from the Old Country are damaged by being stored in damp places, and in many instances by being kept too long. I fully believe that our Canadian Portland cements are quite equal to the foreign brands. A most excellent Portland cement is the Sampson Brand, manufactured by the Owen Sound Cement Co. For all sorts of farm structures, our best brands of natural Rock cement are quite equal to any of the Portlands, and at about one-half the cost. The natural Rock cements set very much slower, but in the end I believe will out-wear any of the Portlands, when properly used. The natural Rock cement requires different treatment from the Portland, which I will try to explain.

It is absolutely a waste of time and money to attempt to build concrete structures of any kind, with fine, soft, or earthy sand or gravel. There can be no chemical action or crystallization when such material is used, and very fine sand, though clean, must be condemned as being wasteful. It takes too much cement. The ideal gravel is clean and coarse, say gravel from the size of wheat grains to that of walnuts, with a little sand through it. I wish you to understand this point particularly, and perhaps I can best illustrate it in this way. Take a piece of gravel as large as a walnut. All that piece of gravel requires in a concrete structure is the slightest coating of cement, and crystallization will take place. Now suppose that you should crush that same piece of gravel into a fine, almost dusty sand, and you will have a thousand little particles to unite. Just think how much surface you will have to cover, and each particle of sand, it matters not how small, must have a coating of cement or there will be no chemical action. I want to say here that a cement concrete made of the ideal gravel, such as I first described, will make stronger work—ten barrels of such gravel to one barrel of cement—than it would be possible to obtain from one barrel of cement to one barrel of sand. You will now see the importance of selecting proper material. To mix cement concrete a large platform should be laid of boards or planks, and the concrete mixed in the following way.

MIXING CONCRETE.

The usual proportions we use in Ontario for walls and lower concretes of our stable floors are generally six barrels

of gravel to one of cement, thoroughly mixed dry before putting in any water. Make a hole in the centre of the dry mixture, pour in a pail of water, take shovels and push a little of the dry mixture next the water into the centre until the water is nearly absorbed. Then pour in more water, and push in the material in the same way until it is all thoroughly moist. Now turn the concrete completely over twice, using shovels to do this and it is ready for use.

As to the depth of foundations required for the building, you know better than I what your climate requires, but our general practice in Ontario is to build the basement walls of barns from ten to twelve inches thick above the foundation footings. I consider a wall ten inches thick strong enough for any barn basement. If properly built you cannot put weight enough upon them to injure them in any way. Our foundations are prepared by excavating to a depth below the frost in clay sub-soils. Where we have sandy foundations we excavate to where the material is uniformly solid, in many cases not necessarily below the frost because we find the foundations are not disturbed by freezing in sandy soils. We usually dig the trenches eighteen inches wide and to the depth required, fill in these trenches by spreading over the bottom of the trench two or three inches of concrete, then, if they can be obtained, roll in large stone, hammer them down solid, fill in more concrete and small stone till the surface level is reached. Be careful to hammer the stone well into the concrete to make the foundation solid. I believe a firm foundation is the most important thing for all structures. Now build the walls above the footing foundation exactly in the centre of this footing. That will give you, if a ten-inch wall, a four-inch projection on each side of foundation. There are various ways of building walls; sometimes studding are set up all around the building inside and out to guide the plank, and sometimes nothing but inside and outside corners are used with bolts for the lower edge and wooden clamps for the upper edge of planks.

This is the most expeditious and economical plan when ordinary care by the builder is used. In the latter case for outside corners the best plan is to spike two planks together, say 6 inches or 8 inches wide, spiked together at right angles, just as you would the corner boards for a frame building. In the inside corner of these planks that form the triangle put in a levelled strip, made by ripping a 1½ inch square scantling diagonally. That will make levelled strips for two corners. Nail these in the inside angle, set up the triangular pieces at the outside corners. The inside of those triangular pieces, when set on end at the corners, will form the outside wall line. For the inside corners of the structure set up a 4 x 4 scantling in the inside angle: this will give you the wall line of two inside walls. When the planks are set up ready to build walls, wheel in the concrete, mixed as before described, spread it in between the planks about 3 inches thick. Place small field, or any other stone, in the centre of the walls, keeping them about 2 inches from the outside and inside planks. Hammer down firmly, then take a narrow mason's hammer, or an old axe will do very well, and ram the concrete firmly between the stone in the centre of the walls and the plank on each side. Fill in on each side, and ram until the concrete is about 2 inches above the stones already placed. Keep repeating this operation until the walls are built all around the building to the top of the planks. When the planks are filled, commence to raise the planks that were filled first, and keep building on in this way until walls are completed. This is a rather hurried description of how walls should be built, but any Canadian manufacturer of cement who is anxious to sustain the reputation of his goods, and that his patrons may obtain the best work, will send a man who thoroughly understands concrete work, at his own expense, to educate people in every locality, where the work is not understood just how to do the different kinds of concrete work. I could show you how to do this work better in half a day than I can by telling to you for a week. There are little details which need at-