A Hospital for Wheat.

In all countries where wheat is the main crop the farmers are often subject to losses from various causes one of which is a fungoid growth generally known as smut which attacks certain kernels of the wheat, changing the gluten and starch into a black dust. When the grain is threshed this black dust adheres to the good kernels of wheat, and greatly depreciates its value. It is estimated that the loss to the farmers of the United States from this cause is at least $18,000,000 a year. The loss to the Canadian farmer through smut and wet is considerable and may be better realized when it is known that nearly three-quarters of a million bushels of "sick" wheat were treated in the hospital during the past year.

The farmer is also very liable to sustain serious loss if at the time of harvest the weather is wet, and this is particularly so in a new country where there are no barns and in many cases the grain remains in the stook until it is threshed, to minimize such losses by restoring damaged or "sick" wheat to a natural state was the principal reason for the starting of the large "hospital" or cleaning and drying elevator at Port Arthur.

The grain is received by carloads after a journey of 450 miles from the prairie grain section of Manitoba. Before its arrival it has all been inspected by a Dominion government grain inspector. The wheat found to be smutty is graded into three grades according to the degree of smut adhering to the wheat. The cleanest of this wheat is cleaned by the aid of scouring and brushing machines, until all vestige of smut is removed, and the very smutty grain is thoroughly washed, afterwards dried and cleaned.

When smutty wheat arrives at the elevator the car is drawn into the building and the grain unloaded by the aid of a steam shovel upon an open screen, through which it falls to the foot of the elevator pit. Here is an endless belt, stretched between two pulleys, one at the lowest point of the building and the other at the top, and to it is riveted steel buckets into which the wheat runs. It is then carried to the top of the elevator leg and discharged into a scale hopper. The wheat is then weighed by the scales and discharged into bins over the cleaning machinery and after being thoroughly cleaned by the scouring machines, it is reweighed and the clean grain stored for shipment. The very smutty wheat is treated in the same way, except that before going through these machines it is washed and dried. The loss in weight varies from 2 to 5 per cent. The result is a perfectly cleaned grain, weighing 3 to 4 lbs. heavier per measured bushel than when received, with its milling qualities equal to a similar grade of wheat that had not been damaged by smut and with all its dirt and seeds removed.

Wet wheat is divided into three grades, which are called

1. "Tough," containing an excess of 1½ per cent. of moisture and dirt.

2. "Damp," containing an excess of 4½ per cent. of moisture and dirt.

3. "Wet," containing an excess of 11 to 15 per cent. of moisture and dirt.

After this wheat is unloaded and weighed it is discharged into bins over the dryers. Each drier contains about 400 bushels of wheat.

The drying bin is composed of a number of screens clothed on each side with wire cloth. The space between these sheets of wire cloth is filled with grain, between, and separating each screen, is an open space so that the air can enter and circulate through the grain in the screen. Two rows of these screens stand side by side separated in the centre about two feet, and into this is blown heated air, which can only escape through side openings and by passing through the wheat. It is by the passing of this warm air through the wheat that the wheat is dried. The time required to dry a lot of wheat varies from one to three hours according to the amount of moisture present.

The air is heated by being drawn through steam-heated coils by the same fan which drives the heated air through the wheat. The hot air, laden with moisture after passing through the wheat is discharged outside the elevator.

When in operation the fans, which are driven by steam power, are started. The screens of the drier are filled up with wheat discharged into them by opening the slides of the bins above. They are thus filled without any manual labor, except what is necessary to level off the wheat on the surface. After sufficient hot air is run through it is shut off and the fans then drive cold air through the grain until it is cooled. Lower slides are then drawn, the grain falls out of the drier, and it is immediately re-filled with wet wheat. The dried grain is conveyed by a steel conveyor to the foot of an elevator which lifts it to the top of the building, where it is re-weighed and the amount of loss and waste in drying ascertained. It is now passed through the cleaning machinery, and is then ready for shipment.

Grain treated by this process has proved to be fully equal in every way to the best wheat of similar grade that had not been damaged by rain or dampness. In fact, it must be considered superior, as it can be stored away and kept without any fear of damage. There is now wheat in store, dried more than two years ago, which is in every respect free from all smell or trace of damage.

The grain is shipped out of this elevator either by cars or vessel. The grain is elevated to the top of the elevator, weighed, and then runs by its own weight into the vessel or car.

The working of this plant has been of great assistance and protection to the farmers of Manitoba and the Northwest Territories, also to the shippers of grain over the Canadian Pacific railway, for in the past grain was sometimes received in a condition that it was impossible to warehouse it. In fact, sometimes it was not really worth the transportation charges, being a total loss to the unfortunate shipper. Now everything can be taken care of and saved with no loss to the owners, and no charge except for cleaning at the elevator.

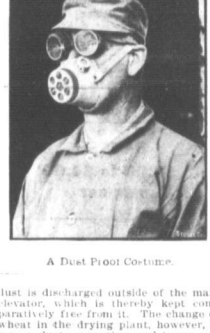
The various cleaning operations to which the grain is subjected naturally creates a large amount of dust. This dust is discharged outside of the main elevator, which is thereby kept comparatively free from it. The change of wheat in the drying plant, however, is a very dusty operation, and to prevent the dust getting into the eyes and lungs of the men operating the plant, they are furnished with dust proof lung and eye protectors.

General View of Elevator.

Wheat is often received mixed with oats. One of the machines in this elevator has been successfully used for removing the oats from the wheat. The operation of the elevator is not entirely confined to wheat, though that is by far the principal grain received. It is fitted with machinery for clipping oats and otherwise preparing them and barley for the market.

The elevator is conducted as an open one; that is, any owner of grain, whether farmer or dealer, can ship his grain to this elevator to be treated. The charges for each particular operation are the same to everyone without preference. The capacity of the elevator for drying and cleaning has been gradually enlarged according to the requirements. The drying capacity is from 20,000 to 30,000 bushels per twenty-four hours, with an additional cleaning capacity of from 10,000 to 40,000 bushels per twenty-four hours, according to the condition of the wheat received and the amount of work necessary to clean it.

Vessel Loading Wheat



A Dust Proof Costume.

Crows Nest Pass Coal Lands.

One of the conditions of the contract between the Dominion government and the Canadian Pacific Railway in connection with the construction of the Crow's Nest Pass railway was that the government should reserve 50,000 acres of coal lands belonging to the C. P. R. and situated in the neighborhood of the Crow's Nest Pass. These lands are one-fifth of the coal lands granted by the British Columbia government to the British Columbia Southern Railway Co., whose charter was acquired by the C. P. R. The value of these coal lands to the Dominion government lies in the fact that it will enable them in a very large measure to control the prices of coal to the mining centres. The time has now come for the government to select these lands and Col. Taylor, chief engineer of the Pittsburg Coal Co., has been chosen to make this selection. Col. Taylor is said to be one of the best mining experts in the United States.

Very few people are aware of the immense wealth of coal contained in these deposits. The total estimated area of the coal lands covers about 230 square miles with a total thickness of over 216 feet. In this thickness there are some irregular intervening layers of non-combustible materials or impurities in the coal, but after making a generous allowance for these and deducting some of the smaller seams, it is estimated that there will be a thickness of 110 feet of good coal. Calculating on this thickness, one acre of coal lands would yield 153,480 tons, and as there are 230 square miles, equal to 147,200 acres, it will be at once seen that the coal supply is almost inexhaustible.

This coal area is described as being in shape like a long, pointed triangle with its base to the south. Its greatest length is about 35 miles, north and south, and its greatest width about 13 miles. The quality of the coal is good and it is of a very superior coking quality, but there are some difficulties and dangers to be encountered in mining which it may be difficult to entirely overcome. Owing to the bituminous character accumulations of gas are encountered, but with proper ventilating apparatus there is little to be feared from this source. The great thickness of the seams and the tenderness of the coal will, it is expected, also prove to be obstacles in the way of cheap and complete extraction. Great pressure upon the workings will probably be experienced, as the levels run in seams from the bottoms of the valleys, some 3,000 feet below the surface of the plateaus, but modern engineering science may be depended upon to overcome these difficulties. On the whole the conditions for mining are regarded as favorable.