

the shovel furthest from the point, while the lighter particles are washed towards the point and are swept off into a basin with the finger. Some more water is now added and by a rotary motion the ore is brought together in the centre of the shovel and the operation repeated. The experimenter will by experience be able to tell when to stop the vanning. All the water is then drained off, the ore dried gently and swept off the shovel with a camel's hair brush. When the whole of the ore taken has been vanned the tailings in the basin are gone through again and the whole of the concentrates obtained weighed, thoroughly mixed together and fifty grains of them assayed by scorification. If the experiment has been successful the weight of the gold found by the assay should increase in direct proportion to the decrease in the weight of the ore through vanning.

Filtration.—In the extraction of gold by wet methods one of the greatest difficulties which has to be encountered is that of filtering away the auriferous solution from the tailings; sometimes in an ore of a very slimy nature it will take days for a small quantity of liquid to percolate through it, unless some means for hastening the operation is used.

The nature of the filter beds used varies considerably: sometimes they are made of sand placed in layers of different sizes, beginning with a bottom layer of coarse sand or broken quartz, and after several layers decreasing gradually in size, finishing with a top layer of fine sand.

Another form of filter bed is made of canvas supported on strips of wood or by a grooved block of wood with holes in the grooves, so that it supports the canvas in places, while at the same time it gives ample area for the liquid to drain through into the grooves and then flow away through the holes.

When any means such as suction underneath the filter bed or pressure on the surface of the liquid is adopted to hasten filtration, the canvas bed lends itself more readily to the process than that composed of layers of sand, because the pressure has a tendency to force the sand into the precipitating vat where it will cause much trouble.

Laboratory experiments may be made on the rates at which water will percolate through an ore, both by natural means and by artificial means, such as suction or pressure, but of course these experiments are not strictly comparable with those on a larger scale, because there must necessarily in a small experiment be more smooth surfaces (in proportion to the amount of ore) between the ore and the sides of the vessel which contains it, and there is considerably less resistance to the passage of the liquid down these smooth surfaces than through the ore itself.

The following experiments will be found useful in finding out the difference in the rate at which water filters through various ores, and also the effect suction or pressure has on accelerating the filtration.

The apparatus shown in the figure will be found convenient for taking the rate at which water percolates through an ore. A is a glass cylinder capable of holding about two pounds of ore, having a ground glass rim B which fits into the vessel C; round the rim D of the cylinder A is tied a piece of stout closely-woven canvas.

For the experiment weigh out a pound of ore ground through a "60" sieve and place in the cylinder A; measure the height of the column of dry ore, then pour in water until the ore is moist throughout; when the water commences to come through at a regular rate, place a weighed beaker under the exit tube and note the time. Always keep a head of a half to one inch of water on the surface of the ore. When about half a beaker (say half a pound) of water has come through, note the time, remove the beaker and weigh it; thus a known quantity of water coming through the ore in a known time gives the rate of filtration. When the remaining water has been drained away from the ore in the cylinder, measure the depth of ore in the cylinder. From this experiment the operator will know what depth of dry and wet ore respectively he will have in his leaching vat when treating the ore on a commercial scale, and he will gain some idea of the rate at which water will filter through it.

Filtration Hastened by Pressure.—For this experiment the same apparatus will do and the same ore may be used; a cork must be placed at the mouth of the cylinder A and be tied down; through it runs a glass tube reaching to the bottom of the vessel Z, at the bottom of which is about two inches of water; another glass tube X passes about an inch through the cork into the vessel Z; to this a Bunson valve is attached; this valve consists of a piece of rubber tubing with a small slit in it, and having a piece of glass rod inside it, so that when the pressure of the air is greater inside the glass tube than in the vessel Z it stretches the rubber and allows air to pass through the slit into the vessel; but if the pressure of air in the vessel is greater than that in the glass tube, it presses the slit tightly against the glass rod, and so air cannot escape. The other end of the glass tube X is connected with a small force pump. Air is now forced in and drives the water over into the cylinder A; when about an inch of water is on the surface of the ore the tube Y is raised out of the water. It is better to have a small pressure gauge fitted into the cork of the vessel Z, so that an even pressure may be kept up. The tube Y is lowered into the water from time to time, so as to always keep a head of water from a half to one inch on the surface of the ore.

The time and weight is taken as in the previous experiment and the two results compared together will show the advantage gained by employing pressure.

Filtration hastened by Suction.—It is sometimes more convenient to employ suction underneath the filter bed instead of pressure on the surface of the ore, and the same cylinder may be used together with the apparatus described below. The glass vessel A in the figure is fitted with a cork, through which pass two tubes B & C; B leads from underneath the filter into the vessel A, while C leads from the vessel A into the glass tube D and has a Bunson valve on it inside the glass tube, the other end of the tube D is fitted with a cork through which passes a glass tube leading to a suction pump. A small vacuum gauge should be fitted to the vessel A to tell how much the pressure in it is below that of the atmosphere. A pound of ore is

placed in the cylinder, and thoroughly damped, half a pound of water is weighed out and poured gradually on the surface of the ore, always keeping a head of from half to one inch on it; and the suction pump is started. The time the half pound of water takes to run through gives the rate of filtration.

(To be Continued)

DIGBY COUNTY MIRACLE.

REMARKABLE EXPERIENCE OF A WELL-KNOWN SEA CAPTAIN.

Captain James McKay tells his Story of Suffering and Release—His Recovery was Deepaired of and He Longed for Death—"The Darkest Hour is Just before the Dawn," and with it Came a Ray of Hope—Health and Strength Again Restored.

(From the Weymouth, N. S., Free Press)

Probably one of the best known men in Digby county, N. S., is Capt. James McKay, of Tiverton. The captain is known among ship owners as a first-class mariner and pilot, has been chiefly engaged in the West Indies trade and has been very fortunate with the vessels under his charge. Some three years ago Captain McKay had a very severe attack of grippe, which gradually developed into more serious troubles, until his life was despaired of. It was with deep regret that his employers and friends saw him sink gradually under a terrible disease, until his death seemed only a question of a few weeks. At this time, when the physicians could do nothing for him, he was induced to try Dr. Williams' Pink Pills, and by that wonderful medicine was restored to health and strength. Captain McKay's almost miraculous recovery created no little amazement, and as much interest was manifested in it, both in his own village and in the adjacent places where he is so well known, the Free Press thought the matter of sufficient importance to the public to get a statement of the facts from Captain McKay, and accordingly detailed a reporter to interview him with that end in view, when the following facts came into his possession:

"I have heard," said the reporter "that your recovery was wonderful and was brought about entirely by the use of Dr. Williams' Pink Pills. Would you let me have the particulars of your illness and restoration to health?"

"Certainly," replied Capt. McKay. "I have told the story a hundred times already, but as the truth never wears out once more won't hurt, and besides I always think that I may be aiding some person who is now suffering as I suffered, and giving them a clean bill of health. To begin at the beginning, I had a grippe about three years ago and that tied me up pretty well. I wasn't fit to take charge of a ship, so sailed south as far as Milk River, Jamaica, as nurse and companion for an invalid gentleman. The weather at that season was simply melting, and I use to lie on the deck at night, and in my weakened condition got some kind of a fever. When I reached home I was completely used up and continued to get worse until I could hardly move about. At times my limbs would become numb with a tingling sensation, as though a thousand needles were being stuck into me. Then my eyesight began to fail. It was difficult for me to distinguish persons at a distance. My face became swollen and drawn, and my eyes

almost closed. At times my flesh would assume a grayish color and remain for days in that state, being at the same time cold and death-like."

"Could the doctors do nothing for you?" enquired the reporter.

"Seemingly not. They gave advice, sent medicine, and rendered their bills promptly, so that I think they derived the most benefit, for under their treatment I did not improve a bit. At last I got so bad that I lost all ambition. I suffered terribly, was only a burden to my friends, and actually lounged for death, which all thought was soon in store for me. But the darkest hour is just before the dawn. I had become so bad that I hardly cared how soon I slipped my cable, for I was now almost completely paralyzed, but at this time the statement of a man down in Cape Breton, whose case was somewhat similar to mine, came to my notice. He attributed his cure to Dr. Williams' Pink Pills, and I thought that there might be a chance for me, though I confess I had at that time but very little faith in any medicine. To make a long story short I began the use of Dr. Williams' Pink Pills and soon found that they were helping me, and their continued use put me on my feet again, and I went to work after months of enforced idleness, to the great astonishment of my acquaintances, who never expected to see me around again. Since that time I have recommended Dr. Williams' Pink Pills to several persons, who have used them with good results, and I feel it my duty to advise their use by people who are run down or suffer from the effects of any chronic ailment. I believe they saved my life, and you may be sure I am grateful."

The Dr. Williams' Pink Pills for Pale People are manufactured by the Dr. Williams' Medicine Co., of Brockville, Ont., and Schenectady, N. Y., a firm of unquestioned reliability. Pink Pills are not looked upon as a patent medicine but rather as a prescription. An analysis of their properties show that these pills are an unfailing specific for all diseases arising from an impoverished condition of the blood, or from an impairment of the nervous system, such as loss of appetite, depression of spirits, anæmia, chlorosis or green sickness, general muscular weakness, dizziness, loss of memory, locomotor ataxia, paralysis, sciatica, rheumatism, St. Vitus' dance, the after effects of a grippe, all diseases depending upon a vitiated condition of the blood, such as scrofula, chronic erysipelas, etc. They are also a specific for the troubles peculiar to the female system, correcting irregularities, suppressions, and all forms of female weakness, building anew the blood and restoring the glow of health to pale and sallow cheeks. In the case of men they effect a radical cure in all cases arising from mental worry, overwork, or excesses of any nature. These pills are not a purgative medicine. They contain only life-giving properties, and nothing that could injure the most delicate system. They act directly on the blood, supplying its life-giving qualities, by assisting it to absorb oxygen, that great supporter of all