

PEAT FUEL MANUFACTURE IN CANADA.

(Continued from page 157.)

level, and supply the loss from the filtration back into the bog.

The vessels constructed by Mr. Hodges to carry the peat-converting machinery were about 80 ft. long, 16 ft. beam, and 6 ft. deep. As we trust shortly to publish the vessels and machinery recently constructed by Mr. Trevithick, improved from Mr. Hodges' plans, we need only now give a general description of the latter. A pair of large screws with cutting blades, and 11 ft. in diameter, were placed at one end of the boat and driven through gearing by an engine placed in the stern of the vessel. These screws cut their way through the bog, forming a channel 19 ft. wide, and from 4 ft. to 6 ft. deep, and as the water flows in as fast as the peat is taken out, the vessel floats and moves onwards as the screws advance, generally at the rate of about 15 ft. per hour.

The rate of feed given to the screws is variable, and may be increased from 1½ in. per revolution, to 3 in. or 4 in., according to the density of the material through which they have to pass. They are partially enclosed in a shield, through the rear of which a continuous stream of peat passes, and is delivered into a well in the bow of the boat. The services of two men are required to clear the peat of any pieces of wood, roots, and other useless material which may be fed in by the screws. In some cases it is necessary to clear away the roots, which are occasionally brought up in large masses by the screws, before the peat passes through the shield. From the well, the peat is lifted by an elevator, and discharged into a hopper and thence into a part of the machinery which arrests such roots, pieces of wood, fibre, &c., which have not been previously removed, after which it is pulped and flows through the distributing trough. The whole of this process is effected without any hand labour, excepting that required for clearing the wood and fibre arrester, and for occasionally adding water to the pulp, if it should not be of a proper consistency.

The distributing trough projects at right angles to the vessel, as shown in the engravings published on page 157. When required, a second length may be added to the trough, in order that the further end of the pulp bed may be reached, it being necessary to tie back the extended distributor to a light staging on the top of the boat, and to a counter-balance on the other side.

Passing from the pulping machinery, with a consistency of thick mortar, the peat spreads itself over the area prepared to receive it, covering the ground to a depth of 9 in., and pressing down the mosses and vegetation which have been left upon the surface. The low bank formed at the side of the canal from the material stripped off the area to be excavated prevents the pulped peat from flowing back into the water, and on the further side of the pulp bed, 90 ft. or thereabouts from the canal itself, a second retaining line is made, with a double thickness of turf.

Equally as necessary as levelling the pulp bed is the operation of equalising the layer of digested peat over the whole area. Upon this thickness being uniform, depends, in a great measure, the toughness of the finished peat, and the hardness of the skin which is given to it, and which is invaluable in enabling the finished fuel to throw off rain, and to resist cracking under the heat of the sun.

In a couple of days, or even in a less time during hot weather, the pulp, which has been partially dried from above by exposure, and beneath by the numerous covered drains in the bed, consolidates, and shows occasional cracks. This is the indication for the next operation—that of cutting the peat transversely. This is effected by means of a number of curved knives, placed 6 in. apart, and mounted on a frame, which is drawn to and fro over the whole surface, until it is scored with furrows at intervals of 7 in. Two men, one on each side of the pulp bed, are required for this operation, which, by a little practice, is rendered very easy. Within a few days after the transverse cuts have been made, the peat is—unless the weather has been unfavourable—in a fit condition to be cut longitudinally. The sketch represents the operation, which should be carried on as soon as the peat is solid enough to bear the weight of a man standing on a plank. The instrument used in making the longitudinal cuts is a sheet iron disc, which is easily forced down through the thickness of peat to the bed beneath. The distance apart of the cuts is 18 in. It is necessary in this operation to observe that the peat is severed for its whole depth, in order to facilitate the further drying and draining of the whole, into the cuts formed in the pulp bed. A longer time is required before the peat slabs or bricks, 18 in. long, 6 in. wide, and 9 in. thick, are hard enough for stacking. In favourable weather a fortnight should be sufficient. The operation of stacking is performed by men and boys, working in gangs of one man to three boys; the former separates the bricks from each other, if the previous operation should have failed to do so, and the latter lift them from the peat bed, and pile them in groups of five—four on end, leaning together, and touching at the top, and a fifth resting on the upright ones. In this condition they remain for several days, after which they are turned over, and stacked as before; ultimately they are loaded upon barges on the canal, and floated down to store. The cost of this stacking process is but slight; a gang of one man and three boys can lift and pile 4000 bricks a day, and the work of turning and restacking is carried on by gangs of two boys each, who can handle 4000 bricks per day.

SCIENCE AND MECHANICS.

Cement roofs are coming into very extended use in Prussia. The cement is ground in steel mills and laid on with a thickness of only one-eighth of an inch. The roof is therefore a light one, weighing less than eight pounds to the square foot. With German prices, the cost is fifty-two cents to the square foot.

The curious phenomenon of regelation can be exhibited by placing a block of ice on a netting of fine wire. The ice will be melted by the wire, and passing down through it, will become frozen in a mass again below the wire. A simple wire can in a similar manner be drawn slowly through a block of ice, which unites again behind the wire, finally showing no sign of having been cut at all.

Among the papers read at the recent meeting of the Institution of Mechanical Engineers was one by Mr. Robert Winstanley, of Manchester, which contained a description of a

coal-cutting machine with rotary motion, worked by compressed air. The writer stated that the machine could cut through hard coal which colliers could scarcely be got to work, and that at the Platt-lane Colliery of the Wigan and Whiston Coal Company, where one was in operation, the work done by it was equal to that of forty men.

SENSATION IN THE MOUSE'S EAR.—Dr. Schobl of Prague has made the distribution of nerves to the ear of the mouse a subject of special examination, and calls attention to the fabulous richness of this organ in nerves, the bat's wing being in comparison but poorly supplied. According to the doctor's estimate, a mouse's ear of ordinary size presents on an average 6,000 nerve terminations, or, for both ears, 12,000. The function of this elaborate development is probably, as in the case of the bat's wing, to enable the animal to guide its way through dark narrow passages.

SEWAGE AS A CEMENT.—The *Builder* states that a process for the manufacture of an excellent hydraulic cement from sewage is to be seen in operation at Ealing, about five miles from London. A mixture of eight parts of lime and one of clay is thrown into the sewer and allowed to run down the sewerage about half a mile. The sewer then delivers its contents into a long tank in which the solid matter deposits, and the water passes out free from odour and almost colourless. The deposited mud is taken from the tank and dried; it is then passed through a pugging mill and brick machine. The bricks thus formed are finally calcined in a kiln, and the result is a hydraulic cement equal to any Portland cement in the market.

Carbolic acid, which, after a run of popularity quite equal to any which has been enjoyed by a chemical product, had somewhat subsided into the position of an ordinary article, has had its fame somewhat renewed by its employment in an uncommon direction. The tanners have taken possession of it, and find by experiment that it is just the thing for them in the hot days of July and August. One of their greatest troubles was to prevent hides from decomposition at this period, and they have been obliged at times to employ very strong measures with them, which, while they preserve the hides, spoiled them in a certain degree, by making the leather less valuable than it would have been if it could have been subjected to the regular treatment of the tan-yard. It is found that carbolic acid preserves the hides from decay, and it is even said improves the leather to such a degree that the tanners all wonder why they had not found out the usefulness of the article before.

In a recent communication from Mr. Herman Haupt, published in Van Nostrand's *Engineering Magazine*, public attention is drawn to "a system of modern narrow-gauge railways," differing in several respects from the wooden railways which have hitherto been advocated and constructed. The writer proposes to dispense altogether with cross-ties,—the rails and sleepers to be in one, and to be imbedded in the ground,—and the rails, instead of being the ordinary width, are to offer six or eight inches of surface to the driving-wheels. He also proposes that locomotive driving-wheels should be furnished with india-rubber tires, the traction of which on wood would be superior, he says, to that of iron on iron. The proper weight of the locomotive he places at six tons, a weight which he thinks would be ample to perform the necessary work. The cost of construction of such a road is laid down as exceeding small when compared even with narrow-gauge iron roads, being stated, in the case of a road built and in operation, at \$200 per mile for grading and \$150 more for timber, hewed and laid in track. One of the chief objections to the use of wooden rails has been based on their want of durability, the weight of the rolling-stock concentrated on so small a surface of rail rapidly wearing it away. Theoretically the broad rail decreases the pressure on its face, in proportion as its transverse section exceeds that of the narrow rail, and we are inclined to the opinion that the real would exceed the theoretical saving in this case. It is well worthy the consideration of railroad men whether cheap—not comparatively, but positively, cheap—roads could not be thus constructed, and operated with light rolling-stock, so as to perform a vast deal of work, do it economically, and earn large profits, with only a small capital stock on which to pay interest or declare dividends. Timber is abundant in Canada, and there are many localities where the material for a railway track is ready to hand, and where abundance of freight would offer just as soon as a railway could be put in operation.

BREAD FROM WOOD.—Professor Liebig says: A new and peculiar process of vegetation ensues in all perennial plants, such as shrubs, fruit and forest trees, after the maturity of their fruit. The stem of annual plants at this period of their growth becomes woody, and their leaves change in colour. The leaves of trees and shrubs, on the contrary, remain in activity until the commencement of the winter. The formation of the layers of wood progresses, the wood becomes harder and more solid, but after August the plants form no more wood, all the absorbed carbonic acid is employed for the production of nutritive matter for the following year: instead of woody fibre, starch is formed, and is diffused through every part of the plant by the autumnal sap. According to the observations of M. Heyer, the starch thus deposited in the body of the tree can be recognized in its known form by the aid of a good microscope. The barks of several aspens and pine-trees contain so much of this substance that it can be extracted from them as from potatoes by trituration with water. It exists also in the roots and other parts of perennial plants to such an extent as to have been employed in the preparation of bread in famines. In illustration of which we quote the following directions, given by Professor Autenrieth, for preparing a palatable and nutritious bread from the beech and other woods destitute of turpentine: Everything soluble in water is first removed by frequent maceration and boiling; the wood is then to be reduced to a minute state of division, not merely into fine fibres, but actual powder; and after being repeatedly subjected to heat in an oven, is ground in the usual manner of corn. Wood thus prepared, according to the author, acquires the smell and taste of corn flour. It is, however, never quite white. It agrees with corn flour in not fermenting without the addition of leaven, and in this case some leaven of corn flour is found to answer best. With this it makes a perfectly uniform and spongy bread; and, when it is thoroughly baked and has much crust, it has a much better taste of bread than what in time of scarcity is prepared from the bran and husks of corn. Wood flour also, boiled in water, forms a thick, tough, trembling jelly, which is very nutritious. —*Scribner's for September.*

MISCELLANEOUS.

There are in the whole world 16,932,000 Freemasons.

A tooth of the Emperor Napoleon recently fetched £6 8s. in Brussels.

There is a farthing famine in Liverpool. Rows of pins are frequently substituted for the coin, and a magistrate's clerk recently deposed to not having seen a farthing for six years.

King Amadeo has made a present of 10,000 reals (2,500f.) to his coachman, who, by promptly whipping up his horses, contributed in a great measure to save the lives of their Majesties.

Some papers report that the Grand Duke of Hesse-Darmstadt is going to contract amorganatic marriage with an opera dancer of the name of Appel. Others state that the union has already taken place.

The German Government has notified the United States Government that it has adopted a metrical system, of which the unit of value is one mark; value in United States gold, twenty-three cents.

An Anti-Game Law League has been formed by the workmen of London, assisted by Mr. P. A. Taylor, M. P.; by G. J. Holyoake, C. Bradlaugh, and other leading Radicals. The platform is total unconditional repeal.

Every person, without regard to race, sex, or condition, who is found in the streets of the cities and towns of Russia in a state of intoxication, is compelled to work at sweeping the streets during the whole of the next day. Here is a valuable hint.

At an inquest lately held in a town not a hundred miles from Bradford, one of the jurors put the following philosophical question to the surgeon who had examined the body of the dead man:—"When you made the post mortem examination had you to cut open the body?"

A set of clever rogues have begun to poach salmon with dynamite. It is found that this explosive substance, ignited in holes where salmon abound, will kill the fish, leaving a peculiar mark upon it. They took several salmon in this way in the Calder, but they had to go to prison for their cleverness.

Messrs. Rothschild, the bankers at Paris and Frankfort, have received, in recognition of their services rendered to the Russian Government, the insignia of the St. Anne and Stanislaus Orders of the first-class. The head of the London House, Baron Lionel Rothschild, has likewise received a present of a costly malachite vase, value 5,000 roubles.

Mr. Richard, one of the Welsh members of the British House of Commons, and formerly a Dissenting member, has given notice that early next session he will move that a humble address be presented to the Queen praying that she would be graciously pleased to direct her Principal Secretary of State for Foreign Affairs to enter into communication with Foreign Powers with the view to the establishment of a general and permanent system of international arbitration.

The other day two Highland drovers arrived at Leith in the boat, and when travelling up to Edinburgh were overtaken by one of the new steam omnibuses out on trial. As the two drovers had never seen carriages impelled by any other power than horse, they stood lost in wonderment for a time as the engine puffed smoothly past. "Bless me, Donald, did you ever see the like of that before? There is ta coach run awa' frae ta horse! Run, run, Donald, like a good lad, and fricht him back again."

A curious calculation has been made lately by a *savant*, well-known in Paris for his peculiar antipathy to the fly. He collected 8,000 flies in a room measuring two cubic metres. On the floor he spread a pounded loaf of sugar. At the end of four days he went to investigate the result of his experiment. There remained a teaspoonful of sugar. This statistician, therefore, calculates that, sugar being at the rate of thirteen cents a pound, a fly costs the country twenty cents from its birth to its demise, that is, if fed on loaf sugar.

A Parisian recounts that he met recently in a railway carriage *en route* to Toulouse a very agreeable and well-instructed person, who said he was a professional man. He parted with this *compagnon de voyage* with some regret, and with an exchange of cards, the agreeable person adding as he gave his, "it would afford him great pleasure at any time to be useful to him professionally." Politeness forbade him looking at the card till he had got out of sight, when he found it was that of the public executioner of Paris. There was no mistake—underneath the name was the statement of the professional pursuit.

THE BELLS OF EUROPE.—The present bells of Cologne Cathedral, which were cast as early as any others in the fifteenth century, weigh—one 12,000lb., the other 22,400lb. The Kaiserglocke, which will shortly be cast, will be the largest swinging bell in the world; for those at Pekin and Moscow, which are larger, are fixed bells. The diameter on the lower rim will be 13 feet, the height being 17 feet, and weight 50,000 lbs. The following are the weights of some of the largest bells in Europe:—Vienna, 36,000lb.; St. Peter's (Rome), 38,000lb.; Notre Dame de Paris, 34,000lb.; "Big Ben," 32,340lb.; and Erfurt, 27,936lb. According to German papers the Emperor has made a "munificent and truly Imperial gift" by sending twenty-two French guns from the Strasburg park to be melted into the "Kaiserglocke," which is to hang in the south campanile. The weight of these guns is 500 cwt., valued at £3,740.

The following is said to have been a proclamation at the market cross of Inverary last century:—

Ta hoy! Te t'ither a hoy! Ta hoy
Three times!!! an Ta hoy—Whis!!!
By command of his Majesty King George,
and her Grace the Duke of Argyll;
If anybody is found fishing aboon te loch,
or below te loch, afore te loch, or ahint te loch,
in te loch, or on the loch, aroun te loch,
or about te loch,
She's to be persecutit wi' three persecutions!
First she's to be burnt, syne she's to be
drownt, and then she's to be persecutit
wi a far waur death.
God save the King an her Grace
te Duke o' Argyll!