

present in sea-water. Frozen water, he says, is so far purified that it may, in most cases, be used for chemical purposes in place of distilled water. In reference to this, M. Martens adds, that in his photographic excursions among the Alps he found that he could always use the water from the glaciers instead of distilled water, but that dissolved snow did not answer.

Dr. Rüdorff has also made experiments on the freezing of saline solutions (*Bericht. d. Akad. der Wissensch. zu Berlin*, 1862, s. 163). He employed the platino-cyanide of magnesium, the solution of which is colourless; but he found that when the solution was frozen so far that the water left was not enough to hold the salt dissolved, crystals of the well known beautiful appearance were formed. Other curious results were observed with a super-saturated solution of sulphate of soda. When such a solution was cooled below the freezing point and the formation of ice prevented, it was found that a piece of ice dropped in determined the formation of ice, while a crystal of the salt caused the formation of crystals of the salt. A very small piece of the salt dropped in with ice caused the separation of the whole of the salt. He noticed, too, that the lowering of the temperature produced an alteration in the constitution of the solution. For instance, when a solution of the blue salt,  $\text{Cu Cl} + 12\text{H}_2\text{O}$ , was frozen, the unfrozen water contained the green salt,  $\text{Cu Cl} + 4\text{H}_2\text{O}$ . Other curious results will be found in the paper referred to.

#### Exports of Lumber from Quebec.

	1860.	1861.	1862.
Oak, feet ...	2,485,400	1,725,160	1,463,680
Elm .....	1,021,560	1,269,320	1,099,200
Ash .....	88,440	96,560	99,340
Birch .....	462,160	255,320	165,480
Tamarac....	58,240	50,240	57,120
White pine, sq & waney	18,252,600	19,447,920	15,403,080
Red pine ...	2,502,880	2,855,240	2,491,020

The export of the leading items for the last year falls slightly below the average shipments of the five years from 1853 to 1857. The stock at present in Quebec largely exceeds that of any previous season—that of white pine being 19,000,000 feet, against 14,000,000 feet last year, and against 10,000,000 feet, the average amount for the five years named.

#### Apparatus for Estimating the Velocity of Cannon Balls.

The apparatus consists of a frame, across which thin copper wires are stretched horizontally in parallel lines, and of a pendulum of which the vibration is measured. The frame is placed a few paces in front of the gun, or the target, according as the initial or impact velocity is required. The wires, which are so close together that the projectile cannot pass between them, are connected with, and act upon the pendulum, by means of an electrical current passing through them. Any one of these wires being broken by the passage of the shot, the pendulum indicates the force of its vibration, and by working out a mathematical formula the velocity of the projectile is ascertained to the 1000th part of a foot per second.

#### Wonderful Copper Discovery in the Portage Lake District.

Some two weeks ago says the *Lake Superior News and Journal* of Oct. 31st, a huge mass of float copper, weighing at least twenty tons, was discovered on the location of the Mesnard Mine, at Portage Lake. In size it was some sixteen feet long, four wide, and one-and-a-half thick, which is by far the largest float mass ever before found upon the Lake. Such being its prodigious weight, it was patent that it came from a vein near by, as it was impossible that any human agency known to exist in the past, could have moved it a great distance. Beneath it, charcoal was found, and also stone hammers, indicating plainly that the ancient miners, whose history is unwritten, and of whom nothing is known except as traces of their workings are thus found, had either taken it from its bed and placed it in fire, in order to burn the rock from it, or finding it upon the spot where it was now discovered, placed it in the fire for the same purpose. We find those who are of the opinion it was never put in the place where it was found by human agency, for the reason that a large amount of the float copper in small masses, weighing from a half pound to fifty, are found scattered immediately around it. Already some two tons have gathered, and whose existence in proximity with the large mass, would indicate that water and ice may have been the agencies by which they were thus moved and scattered from their original resting place. The agency, however, by which they were thus placed over the surface, it is not so important to know, as their existence, and the more important fact to which they point, viz; that they must come from some vein near at hand. With this conviction, simultaneously with the cutting up of the huge mass, and the collecting of the smaller ones, the work of a most thorough exploration was begun, in order to find the vein from which they came. What was thus reasonably manifest, seems to have been accomplished, for the work of a few days uncovered, about forty feet distant from the huge float, a mass of still greater dimensions in the vein itself. At last accounts, this new wonder had been stripped some five feet in breadth for a length of twelve feet, and three thick, with no indication of growing less at any point. It is opened sufficiently to indicate that it will far exceed the float mass. The vein in which it is found has been known for years. It runs through the Quincy, Pewabic, Franklin, Pontiac, Albany, and Boston, &c., and they all, in the value of their stock, must at least feel the effect of this development. The vein is of the Epidote character, but from some cause seems to spread and soften at the point of this discovery. We have heard it described as an Amygdaleid belt of the Epidote character. The agent of this fortunate mine, is prosecuting the work of opening the vein with diligence, employing all the labour he can obtain. The general impression among the oldest and ablest mining men is that a vein of extraordinary richness has been struck, which will add new interest in this heretofore wonderful district.

#### Iron in England.

The total production of pig-iron in the United Kingdom, last year, is estimated at 3,712,390 tons, the county of Durham supplying 312,030 tons.