

## LUMBERING IN POLAND.

It may be of interest to those who are engaged in the lumbering business in the United States, to hear an account, once in a while of how these operations are performed in other countries, and thus be enabled to make comparisons. Mr Quinn, the Commissioner of Crown Lands in Quebec, gives the following description of the lumbering business in the valleys of Eastern Prussia and Poland:—All parties to whom I was introduced seemed earnestly inclined to afford me all the information possible relative to the trade of Danzig. They are straightforward, open and candid men, and did not appear to have anything to conceal of a general character with respect to the business. They all complain that the standing timber is fast disappearing, that it is rising in price at each and every succeeding sale, and that the distance they have to haul is constantly increasing. Mr Grade, of the firm of Messrs. Albrecht & Co., of Danzig, said timber not requiring to be hauled more than 12 to 15 English miles is considered handy river. To have to haul six to eight German miles (30 to 40 English) is by no means unusual. Afterwards it has to be driven a great distance by a tortuous, tedious and expensive route. A great proportion of the lumber brought to the market is made a long way to the south and southeast of Warsaw, and much of it is brought from Galicia, in Austrian Poland. The general custom of selling the standing timber is as follows: A certain limit or circuit is sold, which is supposed to contain a specified number of trees, suitable to be made into timber, for a round sum or for so much per tree. The number of trees is generally overrated, but such is the competition among purchasers that they submit to this. The purchaser is bound to take off the quantity within a given time, if to be found; but in no case is any deduction made. He is not allowed to take more than the number stipulated for, should they even be there, without paying additionally for them. Every tree which is cut down counts, whether rotten or otherwise. I went with Mr Albrecht and looked over all the lumber in the river, down to the harbor. There are but little remaining after the spring shipments, and none of the new timber had then arrived. It was expected in a few days. The timber is separated into three classes—1st, 2nd, 3rd. Mr Albrecht told me that to get any considerable quantity of first quality is very difficult and expensive, and scarcely any of it is to be had without having to be hauled 30 or 40 English miles. The value of first quality redwood here at present is 55s per load, free on board; 2nd, 45s; 3rd class about 41s per load. The freights just then were very low, not more than 15s per load to the east coast of England. Large quantities of redwood are now being sawn up by the different establishments here into deck plank for the English and French Governments. The prices paid by the French Government are for 1st, quality 21s sterling for 40 feet long, 3 inches thick, and 9 inches broad; and two-thirds that amount for 2nd quality. There must not be any pith in those planks, and they must show heartwood the whole length, of at least seven inches wide. I find that the production of last winter does not exceed that of the previous year. A considerable quantity of redwood is also being prepared here, intended for the defences at Southampton, England. The pieces are all to be 35 feet long, 12 inches square, and to show a certain amount of heartwood on all sides. The price to be paid is 65s per load, free on board—a price with which the sellers seem well satisfied. The timber purchased from the Prussian Government in almost all cases is cut down and squared at their expense. A portion of the timber is also got out round the full length of the trees. It is then sold by public auction—the square timber by the foot, the round timber by the piece. The latter timber is brought down without being squared, and part of it shipped as spars. The remainder is sawn and manufactured into different descriptions of scantling.

As to the forests of the Baltic provinces, strictly speaking they are now nearly all cut down, at least the larger sized trees are, and those now obtained have in many cases to be transported a distance of some 20 or 30 versts (14 or 20 miles), on axle or sledge. In general

the latter mode of conveyance is preferred, as it is the cheaper of the two. From this it will be seen that a good deal depends on the kind of winter we have, as good sled roads are desirable for the transport of timber to the edge of the water, by which it is floated down in spring at the breaking up of the ice. This department of the trade, I may mention, is almost entirely in the hands of the Israelites. To give you some idea of the extent of timber trade in Riga I may mention that there are annually exported about 2,600,000 of railway sleepers, and about 300,000 logs of square timber, which are hewn in the forests, all the chips and branches of which remain there to rot, and make manure for the next forest that grows in their place. There is no attempt made to clean out such refuse, in fact there is no fostering care whatever employed in such things, it is entirely left to nature. Anything can be made here, such as squared timber, railway sleepers, etc., and it is a very rare thing indeed to replace any of the forests that have been so wrought out, by planting young trees in their stead, nature is allowed to do that herself, and of course will accomplish it in a series of years. There are still a few forests in these provinces held by the crown, the first cost of which is so high that at present prices it almost precludes merchants from working them to advantage.

The most of the timber exported from Riga at the present time comes from the provinces of Smolensk and Vitopsk, along the banks of the river Dwina and its tributaries, but owing to the great distances at which some of the woods are situated from water communication with the river there is a good deal of extra expense incurred for the transport, and this is increasing yearly, consequently the price of timber is getting much higher to work out this one problem. In addition to the above exports there is another large demand which must make a big hole in the woods yearly, viz. There are 1,500,000 of fir logs, averaging 24 feet in length, rafted down from the above mentioned provinces annually, and cut up into 3 inch planks and boards, and exported to England, France, Belgium, Holland and Germany. Notwithstanding the great quantities, I am told that the increasing demands can be met for a great many years to come, subject to an increase in price owing to the extra transport to water communication, which is indispensable to the trade. As to the titles of official reports or documents issued by the Government, there is no one here can enlighten me on the subject, all saying they never heard of any such things. There are no wholesale joinery establishments here at present, but formerly there was one in connection with a large saw mill which was burned down about 18 months ago, and that part was not rebuilt, as it was considered by the proprietors to be a bad speculation.

## GOOD ADVICE.

It has been noticed, says a contemporary, that boiler explosions are especially frequent in the morning. Take, for example, an engine which works during the day with steam at six atmospheres. The workmen leave the factory at 7 P. M.; about six o'clock the fireman reduces his fires and leaves the boiler with the gauge at four atmospheres. On returning the next morning, at 5.30, he generally finds the gauge at 1.5 or two atmospheres, with a fine water level. He profits by the reserved heat, which represents a certain expenditure of fuel, as an economist he utilizes it and drives his fires, to be ready for the return of the workmen, without suspecting the dangers concealed in the water which has been boiling all night. He does not feed his boilers, because they are at a good level. In other words, he prepares, unconsciously, the conditions which are most favorable to superheating and a consequent sudden and terrible explosion, which will be attributed to some mysterious and unknown cause. Treves recommends that, before starting the fires in the morning, the fireman should restore to the water the air which it needs, by injecting it, with the aid of pumps and suitable tubes, into the lower portions of the boiler. As the gauge of the pump indicates a pressure which is superior to that of the remaining steam, all danger is removed; the fires can be driven, ebullition goes on nominally, and explosions become naturally impossible.

## STEAM ENGINEERING.

Have just finished five years of "tramping." In that time have come in contact with thousands of stationary engineers. A few of them are capable of filling far better positions than they have. Some, if they could have had the advantages of education, would have engraved their names on the portals of engineering fame. As it is, they are ornaments to their profession. The majority of the men who have charge of the immense steam power of this country, who are sorry to say, are mere machines, laborers, hewers of wood and drawers of water; men who cannot calculate the safe pressure of boilers, or correctly adjust a safety valve,—one of them once told us that a safety valve raised two inches from its seat—they know nothing of the laws of combustion, expansion of steam, in fact nothing regarding their business; they scoff at an engineer who reads, stigmatizing him as a "book engineer," "theorist" and "parlor engineer." With such, it is like casting pearls before swine to argue, but with the "book engineer" it is pleasure; he knows something besides "what he learned in a shop." We often wonder if those "practical engineers" carry into other walks of life their hatred of men who read and call them "book lawyers," "book doctors," "book druggists," "book ministers," etc. We contend that if reading, and by reading we mean earnest research, will prepare the lawyer, the doctor, the druggist or the minister for their respective callings, then it will the engineer, for in our opinion he is called to meet graver responsibilities than they. The lawyer may neglect his client, the doctor his patient, the druggist make a mistake in a prescription, the minister neglect the proper word at the proper time, and what is the result? In none of these cases can more than one suffer, one life be lost. How is it with the engineer? He ought to realize his position; he must never neglect, never forget, never mistake; if he does, death and destruction comes not only to himself, but to hundreds of his fellow men. He is his brother's keeper, and he ought to prepare himself by all honorable means to perfect the knowledge of steam, its use and abuse. Let him never be ashamed to ask for information, or have a work on engineering be seen sticking out of his pocket; for the time will come among engineers when education will triumph over ignorance, when the stoppers and starters will be placed where they belong, and the man who knows will take the reins. We could fill whole papers of incidents and conversations with these so called "engineers" that many of your readers would be inclined to doubt. If manufacturers of engines would insist that competent men be engaged to handle their wares, half the battle would be won, their goods would give better satisfaction, and all be benefited.—Tramp.

## HOW TREES ARE DESTROYED.

The lumberman's axe and the settler's fire, it appears, says the *Lumberman's Gazette*, are not the only agencies in the denudation of land against which precautionary measures must be taken. Browsing cattle are reported as destructive to California forests as fire is elsewhere. A current item states that herds of sheep and cattle are driven up to the mountains every year to graze, and they devour every green thing from the foothills to the meadows on the summit of the ranges. When the grass falls the young seedling trees are eaten off, or the bark peeled so that the undergrowth is entirely destroyed. In Michigan the annual fires of the Indians used to keep the woods clear of saplings and undergrowth and there is no doubt that the forests are denser now than when the Indians occupied the land. The browsing cattle of California seems to be doing for the forests of that state what the Indian's fires formerly did for the Michigan woods.

## Water with Lead in it.

Paralysis, colic, gout, rheumatism, kidney disease, blindness and insanity may all come, it seems, from drinking water with lead in it. Under these circumstances, a simple test for discovering the presence of lead in water may well be useful. It consists of adding a little tincture of cochineal, which, if there be the least trace of lead in the water, will color it blue instead of rose.

## ATMOSPHERIC INFLUENCE ON ADHESION.

The adhesion of belts to pulleys is frequently attributed to the pressure of the atmosphere, and in order to show how much the air influences bolts in this particular, the following simple experiment is presented: Take a circular disc of leather, say three or four inches in diameter, with knotted string secured in its centre, and when well water soaked, press it upon any level wetted surface. The "boys" call this apparatus a "sucker," and it well illustrates the phenomenon of atmospheric pressure, or "suction," as it is usually called. If an effort to draw it away from this surface by the string, it will be found resisting very forcibly, but the gentlest pressure will slide it on the wetted surface; it does not offer the slightest opposition to motion in the direction of its face, nor will it resist removal if raised first at the edge and then peeled off. The atmosphere does not press two bodies together when it can get between them; it is only when excluded by a tight joint that the development of its pressure is possible, and it becomes sensible only when an effort is made to separate them by a force acting at right angles to the plane of their faces.

Another simple experiment shows that when two level, smooth, and clean surfaces come together by a motion like the closing of a book—which is similar to that of a belt coming in contact with its pulley—there will be retained between the two a thin film of air, and, while this remains, the contact of the two is imperfect and the sliding of one over the other is easily performed. Take two iron "surface plates" which have been scraped down to a practically perfect plane, and lay one of these on the other like a belt goes to a pulley, they will be found not to be in contact at all, but as if floating one on the other, and the top one will slide off by its own weight at the least inclination of the lower one. Much of this interposed film of air can be displaced by a sliding of one plate on the other starting say at one corner, with the plates in close contact, and carefully pushing one over the other, holding it the while close to, as if to keep the air out. Then indeed, an obstinate resistance to sliding will be felt, and the friction of nearer contact will be made thoroughly sensible. But this way of bringing surfaces into contact has nothing to do with belt action, except to prove the need of a plastic surface on belt and pulley which will enable them to adhere, while in contact with sufficient force to prevent sliding, and at the same time be uninfluenced by the intermedium of air. And lastly, in order to put the matter to actual test, an apparatus was constructed, such that a leather belt was made to slide on the face of a smooth iron pulley, and also to drive the same iron pulley up to slipping of the belt. In both cases the adhesion or driving power of the belt was held by a spring balance, so that the work of the belt could be observed. Experiments were tried with this mechanism placed in a bell-glass jar on an air pump, plate, with and without air in the jar, and if any difference was observed in the adhesion of the belt to the pulley, it had more in vacuum than when the atmosphere was present.—Cooper on Belting.

## INGENIOUS WOOD CARVERS.

Over the doorway of a building on the west side of New York city is a sign which reads "Artistic Bric-a-brac." In a small square room up one flight of stairs were several tables laden with many curious and interesting productions of German and Swiss artists. "The Swiss peasantry are the greatest wood carvers in the world," the proprietor said. "Carving seems to be as natural with them as eating. They carve out of wood with wonderful ingenuity, anything from a simple paper knife to an elaborate piece of architecture in miniature. Aside from wood carving and some other mechanical occupations they are not good for anything, being very simple, ignorant people but they have a genius for carving, and have a natural skill for copying from nature. Their floral pieces are regarded as masterpieces, and serve as models for young sculptors. It is only necessary to furnish them with a photographic design of what is wanted. Most dealers who import Swiss carvings do this, although the Swiss peasantry produce numberless things