

102 times its weight 10 degrees. Water is the greatest absorbent of heat of any known substance. If we take equal weights of water and iron, and raise them to the same temperature, it will be found that the water contains ten times more heat than the iron. The heat required to raise one pound of water one degree will raise 4.4 pounds of air to the same height. Again, if one pound of mercury be heated to 160 degrees, and one pound of water to 40 degrees, and mixed together, they will give a temperature of 45 degrees. But if the water be heated to 160 degrees, and the mercury to 40 degrees, and then mixed together, they will give a temperature of 155 degrees. The five degrees taken from the water will indicate an increase in the mercury of 115 degrees. On the other hand, the 115 degrees taken from the mercury will only indicate 5 degrees in the water; showing that the different bodies have different capacities for heat.

Water, although the greatest absorbent, is a poor conductor of heat. It can be boiled in a vessel only a few inches in depth, and emit steam from its surface, without materially increasing its temperature at the bottom. The ease with which steam gives out its heat is of great annoyance to the engineer and also of great service in the steam engine by its rapidity of condensation. Many devices have been resorted to to prevent the radiation of steam, such as jacketing and superheating it in the boiler. Superheating has been applied in various ways, and the poor conductive property of steam makes it possible to have steam at different temperatures in the same boiler, unless a very active circulation is kept up. If pure steam be superheated beyond the point of loss by radiation, it becomes subsaturated or surcharged with caloric, and acts upon the iron of the boilers and engine with a deleterious effect. Oxydizing the same, when superheated or subsaturated, its absorbing properties are increased on account of its inclination to become saturated or attain its normal condition. If expanded in a cylinder, it will take up a portion of the water that may have been formed by contact with the colder surface of the engine. When expanded it falls in temperature, and it follows that the temperature being reduced, the boiling point is also reduced, which allows the greater portion, if not all the water so formed, to flash back into steam, it having obtained the same temperature as the steam at its highest pressure.

A sudden ebullition, which produces what is sometimes called priming, is caused by the same law of pressure regulating the temperature of the boiling point; for water can be heated to any degree to correspond with the pressure applied of its own vapor, and might be so confined as not to evaporate at all. The solvent property of fresh distilled water is known to produce the brown substance found in pipes and on the tubes of boilers using it, causing what is termed pitting of the iron. This brown product by analysis is found to contain 79 per cent. of the oxide of iron and 15 per cent. of water with 1 per cent. of silica. Steam having similar properties as distilled water, when superheated, acts still more powerfully on the iron of the boiler, superheater or engine; and because of this corrosive property in surcharged steam, superheating to any extended degree has been abandoned by many engineers. An eminent engineer who is unfavorable to superheated steam explains superheating thus: "In order to utilize the maximum effect of steam, it is not necessary to overheat it. After a pure steam is formed, that is, when all the particles and bubbles of water are evaporated, water which accompanies the steam in such a form has the same temperature as that due to the surrounding steam pressure, preventing it from vaporizing, and when it passes through the superheater the temperature is greatly increased, while the pressure remains the same. It being in connection with the steam room in the boiler, allows the water to vaporize, and a pure steam is formed.

Pure steam is the vapor from water, free from watery particles, all foreign substances or other compound gases than oxygen and hydrogen, and of a temperature equal to the temperature under which it was produced. Subsaturated steam is that under which it was evaporated, and it can be raised to any degree of heat the vessel will endure in which it is contained, its absorbing properties becoming greater with each degree.

## VIEWS AND INTERVIEWS.

### Business Negatives.

The aggressive man, especially in business, where all is supposed to be "go," will usually receive a generous share of praise from those around him. He deserves it. Aggressiveness is a desirable qualification. It is a positive element of character that can, as it were, be seen and handled, and is more readily comprehended than any mere negative force. Yet as Milton has intimated in his own beautiful way there is such a thing as doing nothing sometimes and accomplishing more than those who are all bustle and stew. "They also serve, who only stand and wait." What not to do is oftentimes as important as what to do. The "don't's" of life are as essential as the "do's." The small boy's definition of "salt" as "the stuff that makes potatoes taste bad when you don't put any of it on," is suggestive of more than a mere laugh. There is a sound business philosophy beneath the humor, and of a kind that in the present times, when business affairs are somewhat rocky, might be worked out with profit by many business men.

### Sawmill Economics.

An impatience, born largely of the times in which we live, causes many men to become neglectful of the details of business. It is forgotten that the largest business is after all only a massing of details. The littles make the muckle. The present, in the judgment of the Southern Lumberman, offers a splendid opportunity for lumbermen, whether manufacturers or retail yard men, to study and put into effect every opportunity to watch these littles, and thereby reduce the expense of handling lumber. "There is such a small margin," says this Nashville journal, "between the cost of delivered logs and the selling price of lumber that the old wasteful methods invite a suspension of business, if not a receivership. Suppose every sawmill man and every yard dealer will take advantage of the present lull in business and consider carefully all the little wastes and useless expenses incurred in his business, it is almost certain that he will find that much of his profits go to waste in the little minor details of his business that in flush times he thought were not worthy of his attention or worth the trouble to look after. In a saw or planing mill the item of oil is generally considered a small matter. In nine mills out of ten one-half of the oil paid for is worse than wasted, because leaky cans and no particular place to put them increase the fire risk and cause loss of time. Tools used about such establishments cost money, and when left around loose where last used are hard to find sometimes when wanted in a hurry, and they have a faculty of disappearing unexpectedly. In a lumber yard piling sticks are often thrown in loose piles to take the weather till again needed, when perhaps many of them are so warped as to be useless. It is not possible to point out every line in which economy is practicable in each individual case. The leading idea should be to curtail expenses that are useless. Every lumberman can think them out for his own business. The very general, erroneous, and most hurtful idea of economizing in the matter of expense in the manufacture and handling of lumber is to lay off the working hands or to reduce working hours or wages. That should be the last resort. First, look over the details of the business, stop the small and useless expenditures before depriving the faithful workmen of employment. The ranks of the unemployed to day would not be so full if a sensible economy had been exercised in all our industrial departments."

### A Knowledge of the Past.

In the brightness of the nineteenth century there are found not a few who pretend to despise the experience of the past. They live in the present, what concern have they with the dead records of by-gone years? The mistake is a fatal one to genuine success in any calling. What we are to day is the natural sequence of what our fathers were before us. The civilization of this age is built upon the savagery of a past age. A trade cotemporary makes an application of thoughts of this character to the young man of to-day who in his lordliness would despise an acquaintance with the com-

mercial history of the past. "If one should suggest to him the propriety of reading the history of commerce and the business history of the world, he would say, these things don't interest me. What I want to know is how to run my business to-day and how to make money. I am not interested in what happened a hundred years ago, nor how the old heathen made money when the world was young. This remark was made over and over again during the American civil war. It was made repeatedly after the war was ended. And yet, because men had never known the history of money, and did not know that it had its rise and fall in price, like any commodity, thousands of men were ruined in New York city by the depreciation (as they called it) in the value of property. Had they been familiar in boyhood with the course of speculation, they would have known when the war began that the value of money was going down, and that they became rich by putting their money into commodities or real property. When the war was over and the value of money began to appreciate, they should have known that this was the time to reverse their operations and exchange their goods and real estate for money, and thus escape from the losing side of the speculation." In troubles that oppress the neighboring republic at the present moment had more healthy financial notions been entertained some years ago the depression that is now bearing down upon so many might have been lessened. The laws which govern the course of trade are as little to be trifled with as the laws of nature. They may be suspended or thrown aside for a time, but they are there. Because "the mills of the gods grind slowly," young men are prone to forget that they grind at all. When they wake up to the fact that they have been ground "exceedingly small," it is too late to learn their lessons over again. The grinding goes on, but lines of business in which they may have prospered for years are suddenly wiped out of existence with a vim that seems altogether out of proportion to the sins they have committed.

### THE AUSTRALIAN TIMBER TRADE.

SOME idea of the present position of the timber trade in Australia can be gained from the report of an influential deputation of timber merchants from that colony, which recently waited on the Colonial Secretary. The information gleaned makes the position, according to Messrs. of London, Eng., about as bad as it can possibly be. The bank stoppages have, of course, had a good deal to do with this state of things, but for a long time past the building trade in and around Melbourne, particularly, has been in a very bad state, and, as a large firm of brokers remark in their circular, "business all around has been more or less at a standstill."

A perusal of this report, says our cotemporary "will show that our Colonial friends have many just and reasonable grounds for complaint, the principal of which is that, in spite of the large number of people (some 10,000 it was stated, employed directly and indirectly) in the timber trade of Australia, and the splendid native timber which that country produced, no less than eight million feet of dressed and sixty million feet of planed timber was imported, we presume, every year. Bound fully as Australia is supplied with wood, most of the varieties cultivated there are hardwoods, which, although admirably suited in many ways for building purposes, entail, of course, a much greater expenditure of labor than the bulk of the wood imported, viz., Oregon pine. This was to be remedied, the deputation suggested, by increased import duties, which is apparently the only way out of the difficulty. The whole trade of Australia is passing through a more serious crisis than there has been experienced for a long time, and the timber trade is evidently taking it as keenly as any other."

### A SAFEGUARD.

When the water is found to affect the boiler plates only in particular places, as at the water level, it is well to use thicker plates at such places, and to arrange them so that the seams do not come within the region attacked by the water.

NORWAY has abolished the export duty on lumber of all descriptions. This duty amounted to an annual income of about three hundred thousand kroners to the government.