

THE PRESSURE OF WATER.

Water exerts the pressure caused by its own weight and that of the air above it, equally in all directions; and on this principle depends the hydraulic press—one of the most useful applications of a philosophical principle known in modern times. The direction of the pressure is not equal in all directions, but is controlled, in a great measure, by the shape of the containing vessel, as, for example, in a round cup having a flat bottom, the pressure is equal and greatest over the whole base, and gradually diminishes as it ascends the sides, and so in all regular figures. In a bottle having a long narrow neck, the pressure is greatest on the base, and then on the semi-circular portion where the bottle bulges out.

When constructing a canal, or water course, the sides should incline from the base outward, because then, the pressure will be at right angles with the sides, and so exert its force on the earth; whereas, should the sides be perpendicular, the pressure would be a direct thrust against it, and it would require so much stronger embankment to prevent the water forcing its way through. It is advisable also, to form the bottom inclined towards the centre, or in a semi-circular form.

In the case of a dam to stay the course of a long current of water, or to form the head of a mill pool, the form to be preferred is a segment of a circle from side to side, and widening from the top downwards; but should the river or stream be too wide for this method to be adopted, then a straight one can be built, placed at an angle with the course of the stream—like the one on the Schuylkill, at the Fairmount Waterworks—that it may serve to break the force of the stream. If a V-shaped one be thought the best, the apex of the V must be placed against the course of the stream, and not with it; or, in other words, the outside of the letter must form the dam, and not the inside.

MAMMOTH FOREST.—From the *California Farmer* we learn that a grove of mammoth trees has been discovered in Yosemite valley. The first tree that was measured was eighty feet in circumference three and a half feet from the ground; another tree was ninety feet in circumference at the same distance from the ground, while close to the roots it was one hundred and two feet round it, and it was three hundred feet high. The number of trees measured was one hundred and fifty-five, and they are about half the group; none were less than forty feet in circumference and there was one hundred over fifty feet. The largest tree now lies upon the ground; it is charred, and its heavy bark is gone, and yet it measures thirty-three feet in diameter, or one hundred feet in circumference, and must have been four hundred feet high. The *Farmer* concludes by saying:—"This we believe to be the largest tree yet discovered; and this forest we claim as the Parent Forest of the world."

SUGAR MAPLES.—The *New York Tribune* has published several articles setting forth the importance of the soft maple as an ornamental and valuable tree in other respects, and also as a sugar-producing tree. In a late issue it presents the following, from an experienced sugar maker in Vermont:—

"The flow of sap from this variety of the maple is considerably larger than the variety known as sugar or rock maple—probably double in quantity. But it does not contain more than half the saccharine quantity *per gallon* contained by the sap of the other variety. Sugar can be made from the soft maple sap, and also from the sap of the yellow birch (which flows in still more plentiful amount); but the difficulty is that so much more fuel is required to reduce the sap to sugar than is required with that syrup derived from the sugar maple, that it will not pay the cost."

In addition to this difficulty, it is understood that soft maple and birch sap will not granulate into sugar, but will, like the juice of the *Sorgho Sucre*, remain a simple cheap syrup or molasses.

STATISTICS OF CONSUMPTION.—Medical statistics appear to prove that consumption, where prevalent, originates as often in summer as in winter, and the best authorities declare that it is more common in hot than in cold climates. There is more consumptions in the Tropical Indies, both East and West, than in the almost arctic Canadas. The number of the British troops attacked with this disease in Jamaica is annually twelve in one thousand, while in Canada it is only about six. The British government have accordingly resolved upon sending their consumptive soldiers to a cold climate in preference to a warm one.