

pipe, and thus the heat of which the boiler is robbed by the pumping in.

This elegant arrangement has proved very successful; but the idea is not new. Count Rumford and others have applied the same principle in ventilating apartments. In our anxiety to secure the *warmth* of our rooms, we too often forget the great necessity for preserving the *purity* of the atmosphere which they contain. Air is decomposed by breathing and burning; as well as being charged with many impurities. A constant change of *used* air for that which is fresh, must be obviously necessary for the preservation of health. But to prevent the inconvenience of discharging heated air from an apartment and receiving cold air from without, he caused the *discharging* pipe to be enclosed in the *receiving* pipe; and thus the fresh air was admitted nearly as warm as that in the apartment.

There is an interesting question relative to marine engines, but which is but little attended to, it is how to regulate steam voyages to a certain length. We should say, in ordinary language, that if a steam vessel made her passage to Gibraltar, or to Malta, or Alexandria, in certain circumstances of speed—why not, in proportion, across the Atlantic or any other ocean?

Several points require consideration, 1st, space required for tonnage, 2d, for the boiler and engine, and 3d, for fuel. A vessel is limited by the nature of materials to a certain size; and it is clear that the longer the voyage, the greater must be the space required for engine and fuel. Thus vessels going the longest voyages have always the weakest power. In a short voyage, as from Boston to here, we may put in powerful machinery, because fuel can be obtained in fresh supply at any point.

At the commencement of Atlantic Steam Navigation, it was calculated that each vessel would require two tons of coal for each horse power of the engine. The rate for the "Great Western" is three tons for each horse power. The great effect of these engines is illusive; it depends upon the expansive principle. As it has just been said, we are obliged, in long voyages, to put in weakest power, and that too in a case requiring the greatest power possible.—Hence ocean steamers do not exhibit as much speed as vessels in the coasting trade, as from Liverpool to Dublin.

Dr. L. then adverted to his being employed by the British Government in 1836, on the enquiry of Marine Steam Navigation. He found by examining all the logs, with much care,

that the average speed of steamers going to Malta, &c., was 7½ miles per hour. Steamers going shorter trips might go ten knots an hour. "Some here may say, 'Oh we have heard of British steamers going twelve knots an hour. So have I, but I never met with these vessels.' It is the delusion of believing what we wish to be true. A single trip, with peculiar advantage of wind and tide might be made to this amount; but the general rate is about ten miles an hour.

The Doctor said he did not know the exact rate of the Atlantic steamers, but it is easily calculated—from the distance divided by the time. It is about eight miles an hour. The "Great Western" makes it in eight and a quarter.

Dr. L. spoke of meetings held in Liverpool on this question, at one of which a gentleman declared that American Steam engines had a speed of 16 or 18 miles an hour. He did not state that they were river boats; and much dissent was freely expressed, and at which he took umbrage. He was a distinguished professor, well known in this neighbourhood.—The doctor added, that "I was accused of ruffianism to the stranger. But this is impossible; and more especially to a foreign professor, and in my own country."

The "Mississippi" has engines modeled very like those of English vessels. She has a pair of vertical cylinders. There is some difference in her boilers; and, instead of slide valves, she has balance valves.

The "Missouri," is as you know, being constructed in New York. Here a diagram of her engines was shown. The cylinder is sloped, and the connecting rod lays hold of the piston rod directly. The cylinder being long, admits of the expansive principle. The sloping position is a great advantage in not disturbing her cross timbers; whilst the English engines require them to be divided. It has been proposed to dispense with the chimney by using a blowing apparatus. We have seen that the chimney is used principally to increase the draught of air through the furnace; and that effected by the blower and forced into the sea, leaving a steamer quite like a sailing vessel.—Nothing of machinery shown, nor smoke, and no rolling or pitching in a rough sea could affect its action.—*Dr. Lardner's Lectures.*



There is something captivating in spirit and intrepidity, to which we often yield as to a restless power; nor can he reasonably expect the confidence of others who too apparently distrusts himself.—*Johnson.*