velocity of the steam while passing through the entrance to the steam nozzle and this formula is: Velocity equals 3.5953 times the square root of the height of a column of steam of the same uniform density as that of the steam in the boiler required to produce the given pressure on its base.   In our case the absolute pressure is 180 pounds, the height of the column of steam required to produce the same pressure (180 pounds) is 65,076.6 feet, and the square root of this is 255.1, and 255.1x 3.5953 equals 917 feet, the velocity of the discharging jet of steam as it enters the passage to the nozzle.   This we learn is a considerable swifter speed than the water had in coming out of the same boiler.   But, as I have already remarked, the steam expands on its way to the nozzle, its pressure falls, its volume and velocity increase.   Experiments have shown that the ratio of expansion is about 1,624, so that the final velocity of the steam at the moment it passes through the throat of the nozzle would be equal to 917 feet (the velocity of the steam in the entrance to the nozzle) multiplied by 1.624, which equals 1,489 feet.   We have now seen that water and steam issuing from the same boiler, under the same initial pressures, have widely different velocities, and have learned something of the way in which the velocities are ascertained.   What we now know of the difference in these velocities will help us considerably in obtaining a clear, satisfactory conception of the principles upon which the injector is constructed, and to understand why this appliance for feeding the boiler is able to take up water and to force it into the same boiler from which the steam is taken against the same pressure as the steam has that is operating it.   In the injector a jet of steam issuing from the boiler is made to come in contact with a supply of water, cold enough to condense the steam immediately at an opening connected by piping to the water space of the boiler.   The high velocity of the steam, as it condenses, is imparted to the particles of water and this water flowing into the orifice or opening passes into the boiler with considerable force and velocity. The injector is a convenient means of feeding a boiler, but is not economical because of the high velocity at which the water is made to enter the boiler.   Its advantages are its simplicity and convenience and the fact that the water is heated by it before it enters the boiler.   Its disadvantages are that it takes so much steam for the amount of work done and that it is so easily put out of order by some little chip or impurity in the water, or by becoming heated up—as its successful working depends upon the condensation of the steam as it issues from the nozzle in the injector.

Again thanking you for the opportunity of addressing these few remarks to your Club and for your interest and attention, I trust that your Club may continue to prosper in its work of social and educational interests.