by falling water ; since if we suppose for instance a cubic foot of water suspended at one end of a rope passing over a drum or pulley, it will, in falling or descending with a certain velocity, be capable of lifting an equal weight suspended from the opposite end of the rope ; less of course allowance for friction.

The 4500 pounds has thus to be doubled to be representative of the power developed by a whole tide of rise and fall or flow and ebb ; and as there are two such tides roughly in 24 hours, which (unlike a horse that must have rest and can only labor for 8 to 10 hours a day) are constantly and automatically at work ; we thus get at the fact that one and every square foot of water surface exercises a power of 18,000 pounds during the 24 hours.

Now a horse power (H. P.) is estimated to be equivalent to to 33,000 lbs. raised to the height of one foot in one minute of time, or, which is the same thing, as explained by the writer at paragraph 275 of his "Divers" already alluded to, 330 lbs. raised to a height of 100 ft. in one minute of time, which brings the thing home to us in this that we can conceive of an able bodied animal raising such a weight with proper tackle and doing it in that time ; as he can walk 33 paces or 100 ft. horizontally in 30 seconds or less and have 30 seconds or more to return in and have another load hitched on : and as he can continue to do this work for say 8 to 10 hours a day ; it is therefore the above figure or quantity of energy developed is called a horse power ; while expressed in a way to subserve a quick process of calculation by rule of three, by one of its factors being reduced to unity.

Thus then every square fit of water surface in such a tidal river as the St-Lawrence from above the gulf, to somewhere above Quebec, or in any other river with an equal rise and fall of tide, is a source of power only equivalent to about $\frac{1}{2}$ or $\frac{2}{3}$ of a horse power in 24 hours.

But a H. P. as just set forth is equal to 33,000 lbs. raised one ft. high in one minute of time or 33,000 foot-pounds ; and in 24 hours there are 1,440 minutes ; therefore must we utilize double the number of feet or 2,880 square ft. of float area to secure the power of one horse working during 24 hours at the rate of 33,000 ft.-lbs. per minute.

And even if we take but 30,000 ft.-lbs. per minute for a