Momentum = Mass × Velocity.,

This notion of momentum is a very important one and should be thoroughly understood.

A row-boat may strike a dock head-on with considerable speed and do little or no damage to it; but if a large ocean liner should strike it in the same way the dock might be cut in two. It is the momentum which does the damage.

A modern 12-inch gun fires a projectile of 850 lbs. with a velocity of 2,900 feet per second. The momentum is enormous, and we are not surprised when the shot crushes through massive fortifications or penetrates the most heavily armoured ship.

PROBLEMS

1. A man weighing 150 lbs. and running with a velocity of 6 feet per second collides with a boy weighing 90 lbs. and moving with a velocity of 9 feet per second. Which has the greater momentum?

2. Compare the momentum of a car weighing 50,000 kilograms and moving with a velocity of 30 kilometres per hour with that of a cannon-ball weighing 20,000 grams and moving with a velocity of 50,000 centimetres per second.

3. A pebble weighing $\frac{1}{2}$ ounce falls freely down a mine shaft for 8 seconds. Compare its momentum with that of a 20 lb. weight thrown with a velocity of 5 feet per second.

4. A gale of 60 miles per hour striking one's hand or cheek does no damage, but if the air is laden with sand it does. Explain this.

24. Force. Let us return again to our base-ball. Consider it lying on the ground. It is evident that if no outside agent interferes, it will continue to lie there at rest.

Next, throw it along the ground. It rolls for a while and then comes to rest: but the smoother the ground is, the longer it continues to move. If it is thrown along a level asphalt pavement it rolls a much longer time and moves much further. If we throw it along good smooth ice it rolls further still—several times as far as on the ground.