T. Why?

S. Because he would be heavier.

T. Would the wind rushing in to take the place of rising air be likely to disturb the air on the other side of the place where the air was rising.

S. I suppose it would if it were moving faster than the air meeting it from the other side. But then air is so light that I do not see that it would make much difference.

T. Perhaps you did not consider that point any more than the other day, when you thought the soft air in the pop-gun couldn't throw a cork fast enough to hurt anybody. Air is very light, but a large quantity of it would have much weight. A cubic foot of air on an average day will weigh about 537 grains. How many grains in a pound? And how many cubic feet in a cubic mile? Some of you calculate the one, and others the other question.

S. Thirteen cubic feet of air will weigh one pound.

T. How many thirteen cubic feet are in the number of cubic feet you have found to be in a cubic mile in round numbers?

S. Over ten thousand million.

T. How many tons in that weight?

S. Five million tons.

T. Now if a cubic mile of air weighing over five million tons were rushing along faster than any boy could run, or than a horse could gallop, what would happen if it met square in front, or at an angle, another mass of air standing still or moving against it?

S. There would be a very great pressure just before the faster moving air could turn the resisting air back.

T. Correct. When you pressed the air in the barrel of the pop-gun, what happened?

S. It went into a smaller space until I pushed the piston so far that the cork bullet flew out. Then the air must have suddenly expanded for it threw the cork out with great velocity. But the swiftly moving wind was not confined in a tube like my pop-gun.

T. No; but you admitted that very vast weights were in motion, and the walls of the hurricane were the earth below and the stiller air on every other side.

S. I suppose there must be compression of air under such circumstances, followed by expansion.

T. We have a strong south-east wind to-day—quite a storm. I suppose this wind is travelling somewhere very fast. But does it blow steadily? I suppose you have all tried it with your umbrellas someway or other or at some time or other?

S. It comes in gusts. Sometimes it appears to be nearly still where you are standing, although you can hear the sound everywhere else. And then all at once it strikes you violently, and once took the umbrella out of my hands. Why should it not rush on steadily to wherever it is going?

T. Water is a little more than eight hundred times heavier than air, although it is not elastic like the air, as you have discovered. But you know what happens in the brook when the water running on smoothly meets a stone?

S. It heaps up over the stone, which delays it a little; but it rushes down faster than ever when it goes down. And when there is only sand, mud or earth below, it digs quite a little hole on the lower side of the obstacle which it overflows.

T. Yes. If the water is stopped by the obstacle, it makes up for the stoppage by falling down from a higher level with more force than if it were not stopped. In like manner the air may heap up to fall away faster than before. But the air is so elastic that it is compressed also, and wherever there is extra pressure at one instant there must be an expansion at the next. Do you see anything to interrupt the free flow of the south-east wind over us here?

S. There are hills, and trees, and houses. So the air stops against these and curls up over them, forming great air whirls, something like what we see going on in currents of water.

T. Now if we suppose that a whirl of air, only the thousandth part of a cubic mile, to be set a-spinning in the midst of the other air, would it have very much effect against, say, a broad side of a building?

S. The whirl of air would be 5,000 tons in weight, so that if it struck a building large enough to face the whole whirl, and it were moving very fast, it would throw it down, or carry it on.

T. Well, that is just the point. The unevenness of the surface of the earth sets ever so many eddies agoing in the wind, although it is all passing us in the same general direction. That is why the wind sometimes gets under the umbrellas, or behind it, when we least expect it. And if in the general motions of the atmosphere, several cubic miles of air moving rapidly in one direction met about an equal mass of air in opposite motion, there would be not only a heaping up of the air above, but a great compression, which would under certain conditions rush out sideways in whirls of tremendous violence.

S. That would be a tornado, would it not?

T. Correct. And if the whirl of air is only sent spinning with sufficient velocity, it may pick up beams and boards, and even straws, throwing them with nearly as much force as if fired from the mouth of a cannon.