

as well as other bodies, expands by heat, for its particles are thrown to a greater distance from each other. Heated air, therefore, must be bulk for bulk lighter than cold air, and will consequently rise and give place to that which is cold and heavier. If the air resting upon any spot be more heated than that which surrounds it, there will be a constant flowing in of cold streams from every direction, and those persons who are situated to the north of the spot will experience a north wind, while those to the south a south wind; but those who are on the spot where all these several currents meet will suffer violent and tempestuous weather. When this process is extensive and violent, hurricanes and whirlwinds are produced.

We may often learn principles that may be applied to the investigation of nature, from comparatively insignificant results. Artificial winds are constantly circulating through our houses. Smoke rises because it is mingled with hot air, and the deficiency of air which is thus produced in an apartment, is supplied by the cold air which rushes through the crevices of the doors and windows. But our fires communicate at the same time an increased temperature to a portion of the air in the room, which consequently rises; and it will always be found, in every building, that the hottest air is at the top. On this account there are always two currents in a room, one outward, and another inward, as may be easily proved; for, if a lighted candle be placed near the top of the door, the flame will be blown outward by the heated current which is making its escape; and if at the bottom, it will be blown inward by the cold current which is rushing in. The same process is going on in nature on a larger scale, and the principle which explains the one is applicable to the other. Take the land and sea breezes, which occur in all the islands of the torrid zone, as a proof of this statement. During the hottest part of the day the winds set in from every direction towards the centre of the island, for the sun's rays produce more heat by their reflection from land than from water. When the sun ceases to throw its rays upon the region, the land cools, and that portion of air which had been heated by them will begin to descend, and currents will be produced off the land, occasioned by the spreading or equalisation of the atmosphere.

But the principle to which we have referred is not sufficient in itself to account for all the phenomena we witness as