and oxigen do not meet, but communications takes place through these very thin membranes, the carbonic acid watery vapor passing out and the oxygen passing in. The surface presented by these little cells is in the aggregate very great. It is estimated by different physiologists at from 132 square feet to 2642 square feet, or about eight times the surface of the body by others.

Pure country air countains about four parts of carbonic acid in 10,000. The analysis of the air in three school-rooms showed eighteen ten-thousandths, twenty-three ten-thousandths and thirty-seven ten thousandths of carbonic acid respectively. The children in those rooms certainly could not make a very bright appearance. An analysis of the air in several churches gave on a average thirty-six ten-thousandths of carbonic acid. Now this being a heavy gas, and inclined to settle to the floor, have we not an explanation of the phenomena of the children first falling to sleep during the service, then the older members of the congregation; while the preacher, high up in the pulpit, is all the time bright and active, being above the injurious gas ?

Let us quote a few historical events to show the effects of impure air. In 1756, in Calcutta, India, 143 persons, English residents, were by the natives thrown into a room twenty feet square, and the door closed. The room contained but two small windows; they were compelled to remain there all night. In the morning 120 were dead; but 23 survived that fearful night, and some of those afterwards died of low fevers. This is some of those afterwards died of low fevers. This is known in history as the "Black Hole of Calcutta." Seven years ago, the ship Londonderry met a storm at sea. The passengers became alarmed, and, interfering with the management of the ship, were shut in the cabin. In a few hours one hundred were dead; there was scarcely a survivor; and all because some one did not know, or remember, that men and women require fresh air. In Dublin Hospital, before ventilation was introduced, 3944 persons died in four years; after the introduction of ventilation, the mortality was reduced to less than one-tenth. In the same city, in the lying in hospital. before ventilation was introduced, one fifteenth of all patients admitted died ; afterwards, one-eightieth. In Glasgow barracks there were fifty-eight cases of fever in two months; after ventilation was introduced, but four cases occurred in eight years. These instances might be almost indefinitely increased, but enough have been mentioned to show that ventilation is a necessity.

How shall we effectively ventilate our homes, churches and schools? Carbonic acid is a heavy gas, therefore it will sink to the floor; the effete animal matter will sink; and it is claimed that we must remove them by flues near the floor. This has been the theory for some time, but in practice it is found imperfect. Others say, these or the distance of these heavenly bodies. Now in Impurities being heated as they leave the lungs, will arise, and hence must be removed near the ceiling; but this in practice also fails of perfect ventilation. The fact is, a portion must be removed at the floor and a portion near the top of the room. Care must always be taken to place the ventilating flues near the chimney, that they may be warmed in winter, else no circulation can be established in them, as experience has amply shown. A room in an ordinary dwelling is very well ventilated by occasionally opening a door, and by this means the air from both the top and bottom of the room is changed.

Shall we ventilate our sleeping apartments by lowering the windows and letting in the cold night air? Night air is pure, and cannot injure a person on that account; but when we are in bed and closely wrapped external air introduced into the delicate lung texture millions of miles, which we reach in three hundred

may cause serious injury and disease; moreover, windows being lowered, drafts are liable to ensue, and colds and catarrhs result; and during sleep the vitality of the body being lowered, we do not breathe so frequently, and much less carbonic acid is eliminated, and hence we need a less amount of fresh air. A person can sleep uninjured in any ordinary bed-room, even though there is no provision for ventilation during the night; but the air should be thoroughly changed for several hours during the daytime, and if possible, a plentiful supply should be admitted to the room.

School-rooms can be ventilated during intermissions by raising several of the windows and opening the door. Teachers will find this plan to pay most liberally. The children will be brighter, the teacher will be more cheerful and in better mode for work, and altogether the day will pass with fewer of the accustomed school-room jars and troubles. Not only should the school-room be furnished with fresh and pure air, but the teacher should earnestly try to impress upon the students the importance of proper ventilation as one of the most vital hygienic measures, and thus prepare them for lives more useful and happy than they could otherwise be.

And what can we say of ill-ventilated churches ? They are certainly monuments of men's stupidity and folly, and stand in direct antagonism to the laws of our Creator. He gave us air, pure and wholesome, to breathe. How, then, can it be possible to lift up the mind in worship and adoration in an atmosphere foul and polluted? Moreover, in crowded assemblies there may be considerable danger of the air becoming so poisonous as to engender organic disease.

The atmosphere at all times maintains a constant composition. By what forces is this accomplished? By the animal and vegetable kingdoms, which mutually coun-terbalance each the other. The animal absorbs oxygen from the air, and expires carbonic acid; the plant absorbs the carbonic acid and sets free oxygen for the use of the animal; and the process continues, in exact balance, one of the most wondrous provisions in the world for man's happiness.—Pensylvania School Journal.

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## A trip Heavenward

Reader, did you ever try to comprehend the magnitude of what we familiarly call the "Solar System," and the magnificent scale on which it has been constructed ? Perhaps by a homely illustration you may be impressed with the vast meaning of the terms that are necessarily employed in speaking of the size order to do this I propose to you a flying visit to these worlds. We will charter a railway train and give it a speed of forty miles an hour and twenty-four hours a day. This will give us nine hundred and sixty miles a day. We will start the train at the Creation as rendered by Moses, and put it in charge of the first human pair fresh from the hands of the Almighty, and start for the worlds above. Of course it will be most appropriate and natural that our train under the guid-ance of the newly-wedded pair should first make for the moon, and so moonward we fly and reach that pale cold world in two hundred and forty days. The ride has thus far been without jar or accident, although perhaps the longest honeymoon trip upon record of which so much can be said. Leaving the moon, we up, the body is often very warm, and then the cold strike out boldly for the sun, a distance of ninety two