

But, nothing daunted, your correspondent denies that carbonic acid is heavier than the common air, or which amounts to the same thing, he asserts, that by this great "Law of the diffusion of gases," "*it goes up,*" and the lighter air "*comes down,*" and ridicules the idea, in his "*stills and swimming*" paragraph, that this constituent of the atmosphere is at times found so dense as to be capable "of being poured out of a tumbler."—Mr. Tredgold gives the weight of a cubic foot of air in grains, (specific gravity being 10.000) to be 527.0—of carbonic acid gas, 803.8. Mr. Pilkington says: "Carbonic acid gas is nearly twice as heavy as atmospheric air, and it may therefore be poured from one vessel into another, or retained in a cask and drawn off like other liquors."

Being ignorant of chemistry myself, I beg to turn Mr. *Carbonic Acid* over to these gentlemen. It is true that in these times of the rapid advancement of science, there is no knowing what new discoveries your correspondent may have made. He may have some new light far ahead of these old-fashioned gentlemen; for a man who has discovered that there is a "larger quantity of carbonic acid in the upper regions of the atmosphere, and about high mountains, which is brought down by the winds," than in the lower regions,—and that too in the face of his own "law of the diffusion of gases,"—can discover any thing!

Now, with respect to this great "law of the diffusion of gases," I believe every school-boy knows that the common atmosphere is made up of nothing else; but the real question, here, is, not whether these constituents will become mixed and diffused, so as to form what we call air, but whether they will, under peculiar circumstances, separate and, to a great extent, remain so; and also, whether, being separate, they will, under peculiar circumstances, remain so. If your correspondent means any thing by his argument, it must be that they will not. I want no stronger argument than that they will, than the instances to which he himself alluded, viz.,—the "Grotto del Cane" in Italy, and the "Valley of Death" in Java. Both of these places are perfectly open and exposed to the whole atmosphere, yet no "diffusion" takes place; for, whilst in the former, a man breathing from strata, five or six feet above the ground remains unharmed, his dog almost instantly expires; and in the latter, men walk over the plains with impunity, whilst they are whitened by the bones of animals which have perished in accidentally running across them.

We all know, as a matter of fact, that this destructive gas, is *accumulated*,—not in all cases generated,—in wells, pits and caverns, in injurious quantities; and why not, pray, in wells, pits or caverns, which we call *cellars*? And if it would endanger the health of families to have this atmosphere in the Grotto del Cane, or on the surface of the ground, in the Valley of Death, forced up by our hot-air machines into their dwellings erected over them, why may it not be injurious in the case of our common cellars?

From your correspondent's assertion, that this destructive gas, at Carlsbad and the Rhine provinces, "*is given out from the earth,*" and that it

is "*exhaled*" from the "*bottom of wells,*" &c., he leaves it to be inferred that it is never found, in "*injurious quantities,*" except whilst it is in transit *from the earth to the "upper regions,"* where, he says, it is found in "*larger quantities*" than near the surface of the earth. This I deny.

The proofs that a deadly malaria sweeps over and covers the ground, especially in calm weather and at night, are so abundant, that the difficulty is to select and confine them within such compass as will not weary you or your readers. Mr. William Hosking, architect, and C. E., observes, (speaking of ventilation,) that "air may thus be drawn from a foul quarter, as in the case of a church surrounded by a burying-ground, &c."—*Chambers' Chemistry*:—"It (carbonic acid) is found during fermentation and putrefaction, and accumulates in old wells, pits and caverns, &c." It "*accumulates,*" he says, in these places. I have said nothing more. And being thus accumulated, it is "*forced up into every apartment of the dwelling by our hot-air machines.*" But, says further, the same authority: "Carbonic acid is found in air in every part of the globe, which has an important influence in numerous changes at the surface of the earth." The italics both here and elsewhere are mine.

But I will not encumber your columns in a work so clearly of supererogation. If "*Carbonic Acid*" does not know that the air at the surface of the earth is less pure than in the "*upper regions,*" and, in fact, that the principal causes of disease are the miasmatic substances arising from the decomposition of animal and vegetable matter, undisturbed by winds, everybody else does; and this brings me to the consideration of his last assertion, worthy of notice, which, as it is short, I will give in his own words: "It is scarcely necessary to state that the assumption of cholera, consumption, scrofula and elephantiasis, being caused by exposure to carbonic acid alone, is unfounded,—in fact as are many of the statements to which I have alluded." Charles Hood, F. R. S., in his work on the ventilation of buildings, says: "The subject of ventilation has now, however, attracted more public attention; and we may therefore hope that the important means of improving the public health will henceforth be more fully considered; and that the time may come when architects will consider it as great a defect to neglect providing the means for admission and discharge of the air required for ventilation, as they would to omit the doors and windows of the buildings they are called upon to design and erect. The vast importance of ventilation was most forcibly demonstrated by the evidence taken before the Committee of the House of Commons, on the health of towns. *Scrofulous diseases are stated by the medical witnesses to be the result of bad ventilation;* and that in the case of silk weavers, who pass their lives in a more close and confined air than almost any other class of persons, *their children are frequently subject to scrofula and softening of the bones.* Most of the witnesses stated that *a deterioration of the race, undoubtedly occurs among those classes most exposed to bad ventilation;* and they consider that bad air deadens both the bodily and mental ener-