would appear from the article on Ventilation, contained in your last number.

In order to remove from the minds of your readers so unfavourable an impression, I shall now proceed to correct a few of your correspondent's errors with regard to my properties and places of residence, and should you, Mr. Editor, be in any doubt as to the correctness of my statements with respect to these points (on which you must allow I ought to be pretty well informed), I would beg to refer you to any respectable work on Chemistry, for confirmation of my assertions. In so doing, I will speak of myself in the third person, for the sake of convenience.

The paragraph in Mr. Ruttan's communication, to which I would more particularly direct attention, is as follows :- "A few, fancying themselves a good deal wiser than their neighbours, do bring a few square inches of the external air, taken from the surface of the ground, to their hot-air stove. This practice is little better than the other, for here they get pure carbonic acid-especially at night and during calm weather. Providence has ordered that this portion of the atmosphere should be heavier than any of the others, in order that vegetation may have the full benefit of that which is its very life; and the fact is notorious with scientific men, that so near the density of water does this become that it can, at times, be poured out of a tumbler. And this is the material with which many respectable and intelligent men fill their dwellings !!! So that, besides this miasma engendered in your cellars, generated by the decomposition of all these edibles, they are the receptacles of constant streams of carbonic acid pouring in at the windows."

1. The statement of carbonic acid being nearly as dense or heavy as water, seems to be a rather powerful exaggeration, as the following numbers will show. 100 cubic inches of carbonic acid weigh 47.3 grains; say, in round numbers, 48 grains; 100 cubic inches of water weigh 25,250 grains: water is, therefore, five hundred and twenty-five times heavier than carbonic acid. If Mr. Ruttan's statement were correct, it would be well to inquire whether the persons who had filled their houses in this manner, were in the custom of entering their rooms on stilts, or whether they provided themselves with swimming jackets, as they must have done if their houses were filled with a substance nearly as heavy as water.

2. "On the surface of the ground, we have pure carbonic acid, especially at night, and during calm weather." The following numbers will show the incorrectness of this statement. 10,000 parts of air contain as a maximum $6\frac{2}{10}$, carbonic' acid. This quantity is increased at night by about ³⁴/₁₀₀ths. The quantity is increased during stormy weather (not diminished) by about wing to there being a slightly larger quantity of carbonic acid in the upper regions of the atmosphere, and about high mountains, which is brought down by the winds. This increase of carbonic acid is, however, exceedingly small and scarcely perceptible.

So far, then, from the air at the surface of the ground being pure carbonic acid, it only contains five tenthousandths, or seven at the most; the incorrectness of the statement is selfevident, for, if it were true, how could all the rats, mice, moles, and other smaller animals contrive to exist? Air which centains only nine per cent. of carbonic acid, causes suffocation, for then both the inspired and the expired air contain about equal quantities.

3. But a still more serious error runs through the whole of Mr. Ruttan's statements with regard to the manner in which carbonic acid accumulates and remains on the surface of the carth, in wells, mines, caverns, and between the joists of buildings.

" Providence has ordered that this portion of the atmosphere should be heavier than either of the others, in order that vegetation may have the full benefit of that which is its very life." Are we to understand from this that the carbonic acid being heavier sinks down through the air and collects on the earth? The sentence will scarcely bear any other interpretation; but it is certain that if Providence had been pleased to arrange matters in this manner, the present discussion would never have occurred, inasmuch as there would have been a stratum of carbonic acid over the earth's surface sufficient to sufficcate the whole of us. Fortunately for us, there is a provision of Providence, an allwise. an all-admirable one, which totally prevents any such accumulation.

Mr. Ruttan seems never to have heard of the Law of the Diffusion of Gases, a law of the very greatest in.portance in the economy of Nature, which may be briefly expressed as fol-"Two or more gases, however different, lows: when brought into contact rapidly mingle together until a perfectly uniform mixture is produced." The diffusibility of the gas overcomes the force of gravity; the lighter descends, the heavier ascends, until complete uniformity is obtained. Mr. Ruttan's arguments seem based on the supposition that no such law exists. The diffusing or mixing takes place through the smallest apertures. Let Mr. Ruttan fill a bottle with carbonic acid, or any other gas, deleterious or otherwise, and close it all but one pin-hole; or let there be attached to the mouth of the as a minimum 37, and in general about 415 of bottle a twisted narrow tube fifty feet long :-- in