

SCIENTIFIC.

CARBONIC ACID'S REPLY TO MR. RUTTAN.

MR. EDITOR:—I take the liberty of replying, as quickly as possible, to the letter of your somewhat unnecessarily irate correspondent, as contained in the February number of the *Agriculturist*. In so doing, I may be permitted to preface my letter with a few remarks on the style of his communication, and on the line of argument adopted; in both of which it is to be hoped, for the sake of the rising generation, he may not find many imitators.

Mr. Ruttan's letter teems with quotations from printed works on chemistry, ventilation, &c.; a circumstance which seems to indicate that Mr. R. is not always so perfectly consistent as such an accomplished logician might be expected to be—for he expresses himself as strongly opposed to book learning, and expatiates on the superiority of brains, and originality of thought. The latter qualities do not seem to have assisted him very materially in his communication, further than in inducing him to shirk the question at issue, wilfully to pervert my statements and misquote his own, and last, but not least, in rendering him utterly incapable of comprehending the meaning of the very authorities whom he quotes.

In paragraph No. 2, Mr. Ruttan blames me for writing under a "fictitious name, and for attacking him in the dark"—forgetting that my letter was merely a correction of statements and not a personal attack, as his article most assuredly is; and overlooking the semi-jocular, and I think I may say good-natured, style of the communication, a tone which it would have been wiser for him to have imitated, rather than have indulged in the acrimonious invective and offensive personalities which pervade his reply. From the extreme virulence which he exhibits, one would almost be inclined to believe that the learned gentleman must be exceedingly raw to wince at such a trifle.

I shall not allow Mr. Ruttan's satire to drive me from my incognito; I do not believe it is so profound but what his acuteness has already penetrated the mystery; and in any case, you, Mr. Editor, are at perfect liberty to furnish him with the name of your correspondent if he should desire it. I would merely add that if my incognito is to be considered as an excuse for his very savage but perfectly innocuous pokes—I must not be blamed for retaliating in the same spirit.

Mr. Ruttan's style of defence consists partly in misquoting those portions of his own statements which I criticised, and then attacking me as if I had found fault with the corrected one. Thus in paragraph 9, he states that I deny that carbonic acid is heavier than air, which is not true, and that I also deny the possibility of its being poured out of a tumbler—which is equally wanting in veracity. In his original letter he says, "so nearly does it sometimes approach to the density of water" whereupon I proved this assertion to be an exaggeration, water being several hundred times heavier. The numbers adduced by him

have a bearing on the corrected, but none whatever on the original passage.

Another plan adopted by Mr. Ruttan is to take little or no notice of my correction of his errors respecting carbonic acid, but to accuse me of denying the benefits of ventilation. A more unjustifiable proceeding can scarcely be imagined as the sole reference in my paper to ventilation is contained in a compliment to Mr. Ruttan. I most fully agree with him and the authorities he quotes in the great importance of ventilation, but that has nothing to do with the subject at issue, viz., carbonic acid. Mr. Ruttan has jumbled up miasin, carbonic acid and offensive gases; until it appears that he himself does not know one from the other. In fact, in paragraph 5, he says "if it be not carbonic acid, it certainly is something."

Comment on this is unnecessary—it is slipping out of a discussion with a vengeance. I might here fairly conclude my letter; for, to fight against such arguments as that, is but combating a shadow; but there are some few points in Mr. Ruttan's communication which I should desire to answer, even at the risk of occupying more space in your valuable journal than the subject deserves.

In paragraph 6, my learned friend parades his own logic and depreciates mine, leaving out of consideration several circumstances which materially diminish the validity of his immaculate reasoning. There is rather more carbonic acid in the upper regions of the atmosphere and about mountains than at the surface, as has been shown by Gay Lussac, Saussure, and others, the reason being that which I have already stated. The diffusion of gases is not instantaneous, but takes some time to be thoroughly effected, and hence it is natural that air at a height of 10 or 20,000 feet should contain rather more carbonic acid, and will always do so unless the supply of carbonic acid, which is being carried up by the ascending current, be stopped. I repeat, that, if places filled with carbonic acid were left freely exposed to the air and not receiving fresh additions of the gas, they would soon become perfectly healthy. The Grotto del Cane (*Grotto del Canes*, in the plural, according to Mr. R.) is not freely exposed to the air, and in it as well as in the Valley of Death, the gas is mixing with the air as fast as it can; but, owing to its pouring rapidly out of the earth, and its high specific gravity compared with air (not water) and its consequent comparative slowness of diffusion, a stratum always remains over the surface of the ground. I assert that Mr. Ruttan's statement that gases, when once mixed, will separate, is utterly and wholly incorrect, as every beginner in physics knows full well.

Paragraph 18 requires no answer, as it contains little more than some strong wholesome abuse; but, in 20, Mr. R. empties upon me the vials of his wrath for being so excessively accurate, even to the 1-10,000th part of a grain. In no part of my communication have I even mentioned such a quantity, but that is of no consequence to Mr. Ruttan, who does not stand upon a little misrepresentation when he wishes to make a poke. He supposes that I am "a practical chemist, what we call a learned man" (an entirely new and original definition) and advises me to trust less to