



XLI. Remarks on the apparatus for restoring the action of the lungs

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example does not fall under the rule of *subtraction*; and hence the operations of algebraic *addition* cannot be "restricted" to quantities of like signs; neither can the operations of algebraic *subtraction* be so "restricted:" hence a *mixture* of operations must inevitably take place under each rule: and hence it is fairly inferred, that the terms addition and subtraction are not sufficiently comprehensive in meaning to denote that *mixture* of operations coming under each of these rules.

March 1822.

I am, sir, &c.

W. X. Y.

P.S. I have confined my remarks to the author's first letter, because his second appears to carry its answer along with it.

XLl. *Remarks on the Apparatus for restoring the Action of the Lungs.* By JOHN MURRAY, F.L.S. M.W.S., &c. &c.

To Dr. Tilloch.

Feb. 15, 1822.

SIR, — YOU were good enough to admit into your pages some remarks of mine on the important subject of suspended animation, accompanied with a sketch of my invention: a finished form of that apparatus, it has already been stated, was presented by me to the Royal Humane Society. That invention embraced all the desiderata which, as far as occurred to my mind, could be accomplished by mechanical means, with provision for the occasional introduction of chemical agency. I founded my deductions on Dr. Carson's very ingenious and beautiful description of the machinery of the lungs, and Messrs. Allen and Pepys's accurate researches on respiration; and I conjoined my own experiments on suspended animation with these.

That I had "a single eye" to the cause I meant to serve, is an inference warranted by my own feelings, and one which will be fully sanctioned by those who know me best. The simple approbation of the Royal Humane Society was the only return in expectancy. I would indignantly spurn every other consideration in what I conceive to be an imperative duty.

The following is introduced, I am free to confess, with a view of bringing the question of suspended animation fairly before the public, and of soliciting objections (if there do exist any well-grounded counter opinions) to the apparatus which I have recommended for restoring the action of the lungs. Having thrown down the gauntlet, I shall endeavour to answer these counter conclusions (provided always the antagonist be *non-anonymous*) with what skill I may: if worsted in the conflict, I trust I shall not be found to persist in error.

Con-

Considerable service to the cause *must* accrue from agitating this important topic, which has too long slept in inglorious repose. It may lead to an improvement or still greater simplification of the mechanism I have advocated. The "bellows" but ill indeed fulfills its purpose, and on a future occasion I shall adduce such considerations and reasons as *may* prove it so, and thus have to refer to some experiments of my own, which may be at once interesting and useful.

The following is a copy of the first official reply I received from the Secretary of the Royal Humane Society, dated 10th of December last :

"Your polite communication and apparatus were laid before the Monthly Committee, who have instructed me to lay it before the Medical Committee for their opinion, and in the mean time to convey their best thanks to you for the interest you have taken in the important cause of suspended animation," &c.

This is so far well : the other communication from the Royal Humane Society, dated 2d instant, is more equivocal, and less flattering to hopes founded on such disinterested motives as are mine :

"I have the honour to inform you, by the instructions of the Medical Committee, that I laid your apparatus before them for their opinion; and that, having duly considered the same—It was resolved, 'That the form of the bellows used by the Society was preferable to Mr. Murray's apparatus, in the opinion of the Committee, as an instrument to be generally recommended for inflation.'—There are two things very important in all apparatus of the kind, to be *generally* recommended by the Society, viz. simplicity and cheapness. The first, that there may be as little obstacle as possible, in a moment which is generally that of confusion and trepidation; and the latter, that the funds of the Society may be adequate to the greatest possible extension of its means of doing good." The Secretary is pleased thus to continue: "I think your apparatus very ingenious, and very well calculated to make experiments on animals relative to the subject of resuscitation; it admits of variety, and may lead to some valuable facts: and, in the hands of a person accustomed to its use, it may be applied readily to cases of suspended animation in the human subject," &c.

Now, if I am to understand that the only objections to its *general* adoption are the *cost* and *complexity* of the mechanism, I engage to prove that in *both* these particulars the advantage rests with my apparatus. As to price, if I am not misinformed, that now recommended would be a *fraction* only of the cost of the other "used by the Society;" and as to the question of its com-

complexity, it is simplicity itself; the veriest hind could use it. "It admits of variety," indeed, and that of an important description when the combining circumstances, which aid or defeat the return of the "answering spirits back from death," are considered in all their varied phenomena.

Should I receive no comment or elucidation from any friend embarked along with myself in the same grand cause of humanity, through the medium of your pages, I shall at my early leisure point out the essential points in which I conceive the "bellows" deficient, and the numerous advantages which I believe attendant on the employment of the apparatus I have invented and presume to recommend. My inferences shall be deductions drawn from experiments instituted by myself: and also well-authenticated proofs, from other sad and unsuccessful cases, of the inutility of the "bellows." My ardour in the cause is too powerful to be chilled by hypothetical opinion, and too vivid to be quenched *without a cause*.

I have the honour to be, sir,

Your very faithful and obliged servant,

J. MURRAY.

XLII. *On the Solar Eclipse which will happen on the 28th and 29th of November 1826; being the principal Results of a Calculation for Greenwich.* By Mr. GEORGE INNES of Aberdeen.

To Dr. Tilloch.

SIR, — I SEND you for insertion in your Magazine, the results of a calculation for Greenwich, of the solar eclipse which will happen on the 28th and 29th of November 1826. The elements have been found from the Solar Tables of M. Delambre, and the Lunar Tables of M. Burckhardt.

Although the moon's apparent semidiameter exceeds that of the sun, yet, by reason of the moon's great north latitude, the eclipse will not be total at any part of the globe, as the central path of the penumbra will pass beyond the north pole. For the same reason, at those places where the eclipse will be visible, the parallaxes in latitude will not be very different; and therefore also the digits eclipsed will be nearly the same to all places in Great Britain: but as the moon will be at a considerable distance from the nonagesimal, the times will be affected by the parallaxes in longitude, which vary with the situation of the place.

The elements are as follow:

Ecliptic