

*Observations of Dr Papin, Fellow of the Royal Society, on a French Paper concerning a Perpetual Motion.*

**T**HE Paper printed in *French* and containing a contrivance for a perpetual motion, being set down in such a manner, that can hardly be understood but by those that are much acquainted with such descriptions: I have endeavour'd to explain it as follow's.

Let *DEF* Fig. 9. be a pair of bellows 40 inches long, that may be open'd by removing the part *F* from *E*: let them be exactly shut every where but at the aperture *E*; and let a pipe *EG*, 20 or 22 inches long, be soldered to the say'd aperture *E*, having its other end in a Vessel *G*, full of Mercury, and placed near the middle of the bellows's.

*A*, Is an axis for the bellows's to turn upon.

*B*, A counterpoise fastened to the lower end of the bellows's.

*C*, A weight with a clasp to keep the bellows's upright.

Now if we suppose the bellows's open'd only to  $\frac{1}{3}$  or  $\frac{1}{4}$  standing upright as Fig. 9th. and full of Mercury, it is plain that the say'd Mercury being 40 inches high, must fall, as in the Torricellian experiment, to the height of about 27 inches, and consequently the bellows's must open towards *F* and leave a vacuity there: this vacuity must be fill'd with the Mercury ascending from *G* through the Pipe *GE*, the say'd Pipe being but 22 inches long: by this means the bellows's must be opened more and more till the Mercury continuing to ascend make's the upper part of the bellows's so heavy, that the lower part must get loose from the clasp *C*, and the bellows's should turn quite upside down; but the Vessel *G* being set in a convenient place keeps them horizontall as Fig. 10, and the  
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part *F* engageth there in another Clasp *C*; then the Mercury by its weight runs out from the bellows into the Vessel *G* through the Pipe *EG*, and the bellow's must shut clofer and clofer untill the part *EF* comes to be so light, that the counterpoise *B* is able to make the part *F* get loose from the clasp *C*; then the bellow's come to be upright again as Fig. 9th; the Mercury left in them fall's again to the heighth of 27 inches, and consequently all the other effects will follow as we have already seen, and the motion will continue for ever. Thus much the *French Author*.

Upon this it is to be observed; that the bellow's can never be opened by the internal pressure, unless the sayd pressure be stronger then the externall: now in this case the weight of the *Atmosphere* doth freely press up the outward part of the bellow's, but it cannot come at the inward part but through the Pipe *GE*, which containing 22 perpendicular inches of Mercury, doth counterpoise so much of the weight of the *Atmosphere*, so that this being supposed to be 27 inches of Mercury, it cannot press the inward part of the bellow's but with a weight equivalent to 5 perpendicular inches of Mercury. From this we may conclude, that the pressure of the *Atmosphere* being weakned within the bellow's, more then it can be helpt by the Mercury contain'd in the same, as may easily be computed; the sayd bellow's standing upright as Fig. 9th; must rather shut then open. Thus, without loosing any labour and charges in trying, people may be sure that the thing can never do.

