It may not be amiſs to mention here, that this Pump, which was uſed at the ſaid New Canal, was eight foot and a half long, and one foot eight inches broad at the top, and about eight inches broad at the bottom where it is inſerted in the Box, and did caſt out eight Gallons at a ſtroke, and twenty one ſtrokes being made in one minute, there was delivered about 169 Gallons in a minutes time; whence 'tis eaſie to compute, what quantity is thrown out in an hour.

If it be asked, why the Pump and the Bucket is not of the ſame breadth throughout as high as the Bucket moveth? I anſwer, that it cannot be allowed of any other faſhion than a tapering one, becauſe that the celerity of the motion in the narroweſt part of the Pump would thereby be obſtructed in its ſupplying the delivery of the Water, which is thereby provided for the evacuation anſwering to the bigneſs of the uppermoſt broader part of the Pump.

Note, that this kind of Pump may by the ſame contrivance be made of a Tree bored through with a Taper-bore; and a Basket may be uſed at the bottom of the Pump inſtead of the Box-Colender.

Some Conſiderations of an obſerving perſon in the Country upon Numb. 133. *of theſe Tracts, ſent in a Letter to the Publiſher of* May 2, 1677.

SIR,

YOur Tract of *Numb.* 133. is very pleaſing for the great variety of good Arguments, ſome very curious, ſome very uſeful, all very conſiderable.

1. Your Preface is brief and modeſt. And never were noble Travellers better furniſht with learned and accurate Inſtructions, and with exact and compleat Exemplars, as appears in ſeveral of your Breviates. In the *firſt* Volume you ſuggeſt ſome of the moſt remarkable *Inquiries* for many foreign Countries: You begin with Artificial Inſtruments, *N.* 1. *p.* 31; more particularly for the Sea, *N.* 8. *p.* 140, further explain'd *N.* 24; and with an Inſtrument for drawing any Object in perſpective, *N.* 45. And now Mr. *Moxon*, Mr. *Seller*, Mr. *Green*, Mr. *Morden* and others are abundantly furniſhed with Sea-plots for all Navigations, Projections, Mathematical Books and Mathematical Inſtruments for all occaſions of Travellers by Sea or Land. Neither *Anacharſis*, nor *Democritus*, *Pythagoras*, nor *Apollonius Thya-*

Thyaneus, could boaſt of ſuch furniture for their Philoſophical peregrinations. And, beſides the Learned *Greſhamiſts*, you have many expert Teachers of theſe uſeful Arts. And a Free-School is lately erected by his Majeſties munificence, to inſtruct forty young Scholars in Geometry, Navigation, and other parts of the Mathematicks. Mean while our Univerſities and noble Palaces are, ſome of them, provided of Furnaces and Chymical Expedients; ſome for Aſtronomical Obſervatories, ſome for Conſervatories: To draw ſtill more Philoſophy from them all.

2. The Agreſtic Advertiſements may mind ſome Gardiners, and Nurſery-men, and Country-gentlemen, to do much good for themſelves and for their Country: And may mind Worthy Merchants, to bring us home the beſt Vegetables for Food, Drink, Medicine, or other good uſes; and may excite a more general induſtry, to ſilence all juſt complaints of the want of good employment in *England*.

3. Mr. *Leewenhoecks* Microſcopical Diſcoveries are exceeding curious, and may prompt us to ſuſpect, that our Air is alſo vermiculated *, and perhaps moſt of all in long Calms, long-laſting Eaſtern Winds, or much moiſture in Spring-time, and in ſeaſons of general Infections of Men or Animals. Lord *Bacon* in his *Nat. Hiſtory* makes a Collection of Prognoſticks of Infectious years, ſuch as could be made without ſuch curious Inſtruments. By which perhaps in time we may be premoniſhed of Infections. And if we may be certain of ſeaſons of great danger, I think we may be certain of effectual Remedies, by Gods bleſſing: As we find by Experience, that *Fires* and *Smothers* duly order'd, ſo as that the Winds may drive and carry them all over our Orchards and Gardens, do infallibly deſtroy all Caterpillars and other noxious Inſects: And to interrupt the Calms and other annoyances of the Air, we may apply all the helps recommended in *Muffet's Improvement of Health*, *c.* 4. *viz.* by noiſe of Bells, Guns, Drums, Trumpets, Tabrets and other Muſical Inſtruments; by the chearful ſhouts of the people, and by cleanſing all our Towns and Villages by Fire and pure Water, which will be more effectual, if it be done every where at the ſame ſet time, as when the Feſtival Bonefires were in uſe all over the Kingdom.

* *But this Obſerver could hitherto never find this, as he intimates in the ſequel of that Diſcourſe, which perhaps may be publiſhed hereafter.*

4. Signor *Caſſini*'s account of the Satellites of *Saturn* are very remarkable. We hear of no expedients to view the back-parts of *our Moon*; but poſſibly by future improvements of Teleſcopes we may make ſome gueſs of the back parts of ſome of the Moons of *Saturn* or *Jupiter*, as Monſieur *Bullialdus* hath found blind ſides of the Starry Firmament, as we call it.

5. 'Tis well for us, that Mr. *Ray* is an indefatigable perſon. For, this his latter Task requires a mans age to perform it ſo exactly as he hath done: Beſides his other great labours, and what we expect from his help for the *Hiſtory of Animals*.

6. *Aero-chalinos* was very neceſſary after ſo many wonderful diſcoveries of *Air* in general. Much rich Oar is already digg'd out of the Heart and from the bottom of Rocks and Mountains; but we want many hands to melt it down, and to form it into Utenſils. Theſe ſubtile Fluids do encompaſs us in vaſt proportions, and do beſiege us both with ſtrong and ſtormy violence, and with treacherous and irreſiſtible Inſinuations. May the happy Author perſevere, and proſper in compleating the large branch of moſt ſubtile and no leſs uſeful philoſophy.

7. I do not remember, I ever ſaw any thing that might be compared with this laſt philoſophical Account of *Muſick*; nor indeed any thing before, that could ſatisfie my own poor and dull ſcruples. And many of theſe Obſervations do ſeem to me to open a door for great depths, and great variety of Philoſophical information. I was not a little delighted to read in Mr. *Boyle*'s Tract of *Mens ignorance of the Uſefulneſs of Natural Things*, in his Second Tome of the Uſefulneſs of that Philoſophy, p. 14, That *equal wire-ſtrings, made of differing mettals, and having a due Tenſion, will yield ſounds differing as to ſharpneſs, by determinate Muſical Notes or the Diviſions of them, &c.* I do not know, whether this Author, *Merſennus*, or any other, hath examined, How far the proportions of Metalline mixtures, or the nature of other ſonorous bodies, may be indicated by this Muſical Expedient. Many ſuch hints and overtures may be had in this acute, or rather harmonious diſcourſe.