

VI. *A Caution to be used in examining the Specific Gravity of Solids, by weighing them in Water.* By James Jurin, M. D. R. S. Secr.

AS it is oftentimes of good Use to know the Specific Gravity of solid Bodies, a great Number of Experiments have been made upon this Subject by Members of the *Royal Society*, and other Curious Persons; the Result of which has been publish'd in several Tables in the *Philosophical Transactions*, and elsewhere. But, as it is necessary that Experiments of this Nature should be made with great Exactness, if we would so far depend upon them, as to draw any Inferences from them in Natural Philosophy, it may not be amiss to mention a Caution, which is oftentimes necessary in the making of them, and which I have Reason to think has been generally very little regarded. It is this; That when a dry, porous Body is to be weigh'd in Water; in order to discover its Specific Gravity, it is necessary, by some means or other, to extricate the Air out of all the small Pores and Cavities within it, that the Water may have free Liberty to enter and pervade them. Unless this Care be taken, it must needs happen, that the Air, which possesses those small Cavities, and keeps the Water out, will render the Solid of less Weight in the Water, and consequently of less apparent Specific Gravity than it really is. The best way of avoiding this Inconvenience, is, to set the Vessel of Water, in which the solid

lid Body is immersed, under the Receiver of an Air-Pump, and to extract the Air out of the Body by that means ; which will be more easily and exactly done, if the Water be first heated over the Fire. And where the Conveniency of an Air-Pump cannot be had, the same Thing may be done almost as well, by letting the solid Body continue some Time in boiling Water over the Fire.

But no solid Body must ever be put into hot Water, that will in any measure dissolve, or give a Tincture to the Water.

One Instance of the Neglect of this Caution, may be seen in the Accounts we have of the Specifick Gravity of the Stones taken out of Human Bladders, which have been commonly found to be but about one half, and some of them have been no more than a fourth Part heavier than an equal Bulk of Water. From this it has been too hastily concluded, that these Stones are very improperly call'd by that Name, as not at all approaching to the Specifick Gravity of even the lightest real Stones, that we have any Account of.

Whereas it is much more reasonable to suppose, that those Stones, which have been found to be so light, were such as had been a considerable Time taken out of the Bladder, and consequently had lost much of their Weight by the Evaporation of the Urine, with which they had at first been saturated, and that they had afterwards been tried without the Caution above-mention'd. I would therefore beg Leave to recommend it to those, who shall examine the Specifick Gravity of the Human *Calculus*, that they will either try the Experiment upon Stones fresh taken out of the Bladder, or else that they will be pleas'd to use the

abovesaid Method, to extricate the Air out of their Cavities. If they do this, I am confident they will meet with some *Calculi* (as I have done) exceeding the Weight of some Sorts of burnt Earthen Ware and Alabaster, and approaching very near to that of Brick, and the softer Sort of paving Stone. But it is not to be expected, that they should entirely equal the Specifick Gravity of Stone, found in the Earth ; because the Mixture of some Portion of the Animal Oil and Volatile Salt, with the stony Substance of the Human *Calculi*, must needs lessen the Specifick Gravity of the whole Concrete.

I shall mention one other Observation, relating to this Subject ; which, however trivial it may seem, yet to me was very surprizing, when I accidentally discover'd it. It is, That the Substance of all Wood (as Oak, Fir, &c.) is specifically heavier than Water. To prevent being misunderstood, I must observe, that in Wood, and other Vegetables, there are two Sorts of Vessels ; one of which convey the Sap, and the other contain only Air, for which Reason they are call'd Air-Vessels. When Wood floats, or swims in Water, this Effect is not owing to the Lightness of the Substance of the Wood, but only to its being buoy'd up by the Air contain'd in the Vessels before-said. For when the Air is extracted out of those Vessels, and instead thereof the Water has insinuated it self into them, the Wood will sink to the Bottom. As is very easily shewn in small Chips, or Shavings of Wood, by means of the Air-Pump, or an Infusion in boiling, or even in cold Water for a sufficient Time. And the same is found to succeed in the Roots, Stalks, Leaves, and Seeds of as many other Vegetables as I have yet try'd ; Cork only excepted ; in which last I had no Reason to expect it, con-

sidering the particular Structure of that Substance, as describ'd by the late Learned Dr. *Hook*, in his *Micrographia*.

VII. *A Letter from Mr. Edward Naish, Surgeon in York, to Claudius Amyand, Esq; Serjeant-Surgeon to his Majesty, and F. R. S. Concerning an Ossification of the Crural Artery.*

York, Sept. 11. 1721.

MR. *Conssett*, of *Cleveland* in *Yorkshire*, a Gentleman of Sixty seven Years of Age, who all his Life before had enjoy'd a perfect good State of Health, sent for me on account of a Mortification, which began about a Month before on one of his Toes, and by gradual Advances in that Time had reach'd half way his Leg ; and this without any manifest Cause. This was the State I found him in ; *viz.* a perfect Mortification, or *Sphacelus* of his Foot, and half his Leg. In such a Case, what was to be done ? The Gentleman saw himself dying daily by Piece-meal ; but Heart-whole, as he express'd it, and had a pretty good Pulse. I propos'd Amputation, as the only Remedy, which (I told him) would give him some Chance for his Life ; tho' the Odds was against him. This he readily consented to ; and as soon as I could get my Dressings ready, I went about the Operation ; assisted by Mr. *Mitford*, a Surgeon of *Northalerton*, and Mr. *Moon* of *Stockton*, who before had attended the Gentleman.