I. *An Account of the Experiments ſhewn by* Sigiſmund Auguſt Frobenius, *M. D. F. R. S. at a Meeting of the* Royal Society *on* November 18, 1731, *with his* Spiritus Vini Æthereus, *and the* Phoſphorus Urinæ, *from the Minutes of that Day, by* Cromwell Mortimer, *M. D. R. S. Secr.*

HE took a Solution of *Phoſphorus* in the Æthereal Spirit of Wine, *which he called Liquor Luminoſus*, and pour'd it into a Tub of warm Water; whereupon it gave a blue Flame and Smoak, attended with ſo ſmall a Degree of Heat, as not to burn the Hand, if put into it.

He pour'd ſome of his Æthereal Spirit of Wine upon a Tub of cold Water, and ſet it on Fire with the Point of his Sword [which being firſt heated a little, he touched with it a Piece of *Phoſphorus* lodg'd before-hand on the Side of the Tub]. After the Deflagration the Water was cold.

He then ſhewed a very extraordinary Proceſs with *Phoſphorus glacialis Urinæ*, or *Stick Phoſphorus*, of Mr. *Ambroſe* Godfrey *Hanckewitz*.

He had a very pompous Machine, which he calls *Machina Frobeniana, pro reſolutione Combuſtibilium.* (*inventa anno* 1730.) It is really an Improvement of the common Bell, under which the *Oleum Sulphuris per campanam*, is commonly prepared. This Machine conſiſted of a concave Plate

of Glaſs in TAB. *Fig.* 1. AB, with an Hole in the Middle C, which communicated by a Glaſs Pipe C D, with a Glaſs Receiver E E F, which ſtood underneath the Plate A B. Upon the Plate A B ſtood a maſſy Golden *Tripus*, ſuſtaining a Baſon, about four Inches Diameter G H, having within it another ſmaller one I K, of the ſame Métal, about two Inches and a half Diameter; this was heated a little: He then took ſmall Pieces of *Phoſphorus* out of a Baſon of Water, which he ſoak'd up with brown Paper, ſo that the *Phoſphorus* might be quite dry, which he put into a Spoon, and flung it into the ſmaller Golden Baſon I K; where it immediately took Fire: Then he lower'd down a large Glaſs Bell L M O, of about eighteen Inches Diameter, and containing three quarters of a Sphere; the Rim L M being exactly ground to fit cloſe on the Plate of the Glaſs A B. This Glaſs Bell was ſuſpended by a Wooden Circle P Q P Q, to which were faſten'd four Cords, that united into one Knot at R, and from thence went a Rope over a Pulley S, in the Crown of the Machine, and coming down by the Side of one of the Pillars, ſerved to raiſe up or let down the Bell.

At the firſt firing of the *Phoſphorus*, the whole Bell appeared Luminous, and full of Flame for a few Minutes: When the Deflagration of the firſt Spoonful was over, he flung in another, and ſo on, 'till there were two Ounces of *Phoſphorus* conſumed, from which were ſublimed a large Quantity of *Flores* into the Bell, and ſome fell down upon the concave Glaſs A B. The Bell at firſt felt cold, and never grew more than moderately warm. As the *Flores* began to cover the Inſide of the Bell to

ſome

ſome conſiderable Thickneſs, the Flame was not ſeen thorough ſo brightly as before, but the whole appeared of a light Azure, or Sky-colour, which *the Doctor liken'd to the Formation of the Firmament:* The *Flores* ſublimed *he liken'd to Snow.* Then the Bell being drawn up again, and the Golden Baſons taken out, there remained in the ſmaller Baſon an almoſt fix'd red *Earth*, or *Caput mortuum.* On the Admiſſion of the cold Air, the Snow [*Flores*] began ſoon to melt as *per Deliquium*; which *he compared to the Formation of Dew and Rain*; and as it dripp'd from the Inſide of the Bell upon the Concave Plate A B, it ran through the Hole in the Middle of it C, by the Tube C D, into the Receiver E E F; where it was collected in Form of a clear tranſparent Liquor, ſomewhat clammy like Gum-water, which *he called Water.*

Some of the *Flores* mixed with any combuſtible Matter, as common Olive-Oil, *&c.* and put into a Golden Baſon ſet over a Lamp, fired immediately, and flamed like *Phoſphorus*, being, in reality, *Phoſphorus* regenerated, and burnt away to a Subſtance like Tar.

Some of the clammy Water was put into a Golden Baſon ſet on a Lamp, and by augmenting the Fire *per gradus*, in about a quarter of an Hour's time, when all the airy Bubbles were exhaled, the Liquor became hard like Gum, which had been diſſolved in Water, and was nearly dry, and perfectly tranſparent: *This he called Vitrum Molle.*

Next Day he made ſome more of this *Vitrum Molle*, which he put into a Crucible heated red hot, and then ſet it in a Wind-Furnace, and gave it the

greateſt Heat for a quarter of an Hour; when the Matter in the Crucible appeared fluid, like melted Glaſs. He then poured it out into an Iron Pan; the Matter remained red hot ſome time; when it was perfectly cold, it was hard, tranſparent, and brittle like common Glaſs; but it ſoon began to relent, and in twenty-four Hours was almoſt all turned to Water again.

He ſaid, "If this *Vitrum Molle* be again entirely "reſolved in the Air, which will take up near four-"teen Days time, by diſtilling off the Water, and "letting the Remainder melt *per deliquium* again, "'till all the ſaltiſh Matter be reſolved into Water, "there remains an inſipid whitiſh Earth, which "fluxed in a Glaſs-Furnace, gives a true fixed "Glaſs."

II. *An Account of ſome Experiments upon the* Phoſphorus Urinæ, *which may ſerve as an Explanation to thoſe ſhewn to the* Royal Society *by Dr.* Frobenius, *on* November 18, 1731, *together with ſeveral Obſervations tending to explain the Nature of that wonderful Chemical Production, by Mr.* Ambroſe GODFREY Hanckewitz, *Chemiſt, F. R. S.*

I Repeated the Experiment of the Deflagration of *Phoſphorus* under a Bell, which had been firſt ſhewn to the *Royal Society* by Dr. *Frobenius*, but

Fig. 1.

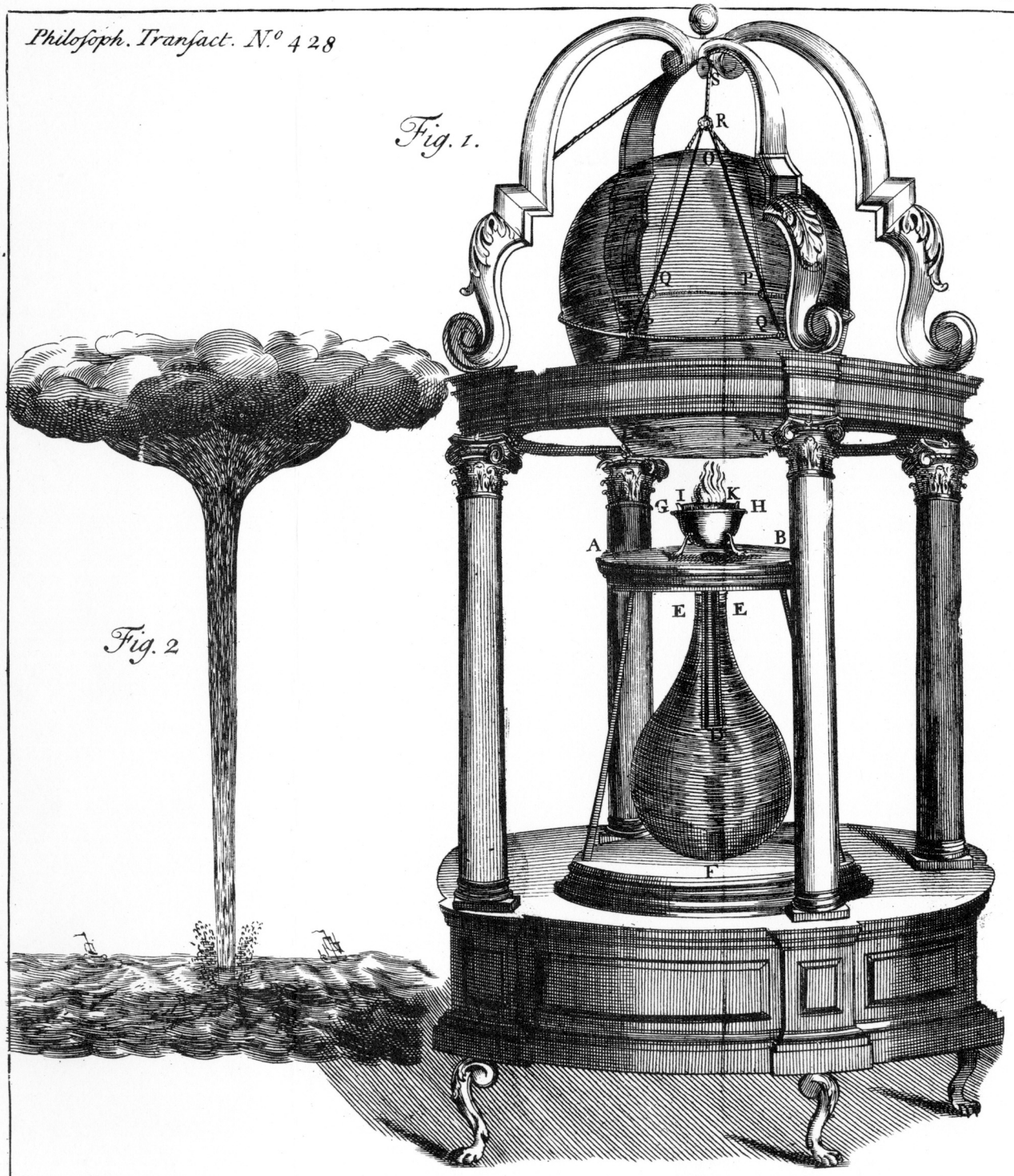

Fig. 2