ſo much heavier, than the Air of the former place was, when the *Mercury* ſtood at 29½ inches.

But in making ſuch compariſons, we muſt not forget to conſider the Situation of the ſeveral places, if we mean to make Eſtimates not only of the weight of the Atmoſphere, but of the weight and denſity of the Air. For, though the Scales wil ſhew (as has been ſaid) whether there be a difference of weight in the Atmoſphere at the two places; yet, if one of them be in a Vale or bottom, and the other on the top or ſome elevated part of a Hill, it is not to be exſpected, that the Atmoſphere, in this latter place, ſhould gravitate as much, as the Atmoſphere in the former, on which a longer Pillar of Air does lean or weigh.

And the mention, I have made of the differing Situation of Places, puts me in mind of ſomething, that may prove another uſe of our *Statical* Baroſcope, and which I had thoughts of making tryal off, but was Accidentally hindred from the opportunity of doing it. Namely, that by exactly poyſing the Buble at the foot of a high Steeple or Hill, and carrying it in its cloſe Frame to the top, one may, by the weight requiſite to be added to Counterpoiſe there to bring the Beam to its Horizontal poſition, obſerve the difference of the weight of the Air at the bottom, and at the top; and, in caſe the Hill be high enough, at ſome intermediate Stations. But how far this may aſſiſt men, to eſtimate the *Abſolute* or *Comparative* height of Mountains, and other elevated Places; and what other Uſes the Inſtrument may be put to, when it is duly improved; and the Cautions, that may be requiſite in the ſeveral caſes, that ſhall be propoſed, I muſt leave to more leaſure, and farther Conſideration.

The Particulars.

Of thoſe Obſervations of the Planet Mars, *formerly intimated to have been made at* London *in the Months of* February *and* March *A.* 166⅔.

To perform, what was promiſed *Num.* 11. of theſe Papers, *pag.* 198; 'tis thought fit now to publiſh the Particular Obſervations, concerning the ſpots in *Mars*, and their motion, as they were made with a 36 foot Teleſcope, and produced in

writing before the *Royal Society*, the 28 *March* 1666. by Mr. *Hook*, as follows;

Having a great deſire (ſaith he) to obſerve the *Body* of *Mars*, whilſt *Acronycal* and *Retrograde* (having formerly with a Glaſs of about 12. foot long, obſerv'd ſome kind of Spots in the Face of it,) though it be not at preſent in the *Perihelium* of its Orbe, but nearer its *Aphelium*, yet I found, that the Face of it, when neer its Oppoſition to the Sun (with a Charge, the 36. foot-glaſs, I made uſe off, would well bear) appear'd very near as big, as that of the Moon to the *naked* eye; which I found, by comparing it with the Full Moon, near adjoyning to it, *March* 10.

But ſuch had been the ill diſpoſition of the Air for ſeveral nights, that from more than 20. Obſervations of it, which I had made ſince its being *Retrograde*, I could find nothing of ſatisfaction, though I often imagin'd, I ſaw Spots, yet the *Inflective veins* of the Air (if I may ſo call thoſe parts, which, being interſpers'd up and down in it, have a greater or leſs Refractive power, than the Air next adjoyning, with which they are mixt) did make it ſo confus'd and glaring, that I could not conclude upon any thing.

On the third of *March*, though the Air were ſtill bad enough yet I could ſee now and then the Body of *Mars* appearing of the form A: which I preſently deſcribed by a *Scheme*; and about 10. minutes after, as exactly repreſenting what I ſaw through the Glaſs, as I could, I drew the *Scheme* B. This I was ſufficiently ſatisfied (by very often obſerving it through the Tube, and changing my Eye into various poſitions, that ſo there might be no kind of Fallacy in it) could be nothing elſe, but ſome more *Dusky* and *Spotted* parts of the Face of this Planet.

March 10. finding the Air very bad, I made uſe of a very ſhallow Eye-glaſs, as finding nothing *Diſtinct* with the greater *Charge*; and ſaw the appearance of it as in C, which I imagin'd, might be the Repreſentation of the former Spots by a leſſer charge. About 3 of the Clock the ſame morning, the Air being *very bad* (though to appearance *exceeding clear*, and cauſing all the Stars to twinckle, and the minute Stars to appear very thick) the Body ſeem'd like *D*; which I ſtill ſuppos'd to be the

the Repreſentation of the ſame Spots through a more confuſed and glaring Air.

But obſerving *March* 21. I was ſurpriſed to find the Air (though not ſo clear, as to the appearance of ſmall Stars) ſo *exceeding tranſparent*, and the Face of *Mars* ſo very well *defined*, and round, and diſtinct, that I could manifeſtly ſee it of the ſhape in E. about half an hour after Nine at night. The *Triangular* ſpot on the right ſide (as it was inverted by the Teleſcope, according to the appearances, through with all the preceeding *Figures* are drawn) appear'd very black and diſtinct, the other towards the left more dim; but both of them ſufficiently plain and defin'd. About a quarter before 12. of the Clock the ſame night, I obſerv'd it again with the ſame Glaſs, and found the appearance exactly, as in F; which I imagin'd to ſhew me a *Motion* of the former triangular ſpot: But deſigning to obſerve it again about 3. of the Clock the ſame Morning, I was hindred by cloudy weather.

But *March* 22. about half an hour after 8. at night, finding the ſame Spots in the ſame poſture, I concluded, that the preceeding Obſervation was only the appearance of the ſame Spots at another height and thickneſs of the Air: And thought my ſelf confirm'd in this Opinion, by finding them in much the ſame poſture, *March* 23. about half an hour after 9. though the Air was nothing ſo good as before.

And though I deſired to make Obſervations, about 3. of the Clock thoſe mornings; yet ſomething or other interven'd, that hindred me, till *March* 28. about 3 of the Clock, the Air being light (in weight) though moiſt and a little hazy; when I plainly ſaw it, to have the form, repreſented in I; which is not reconcileable with the other Appearances, unleſs we allow a *Turbinated* motion of *Mars* upon its Center: Which, if ſuch there be, from the Obſervations made *March* 21. 22. and 23. we may gueſs it to be ence or twice in about 24. hours unleſs it may have ſome kind of *Librating* motion; which ſeems not ſo likely. Now, whether certainly ſo or not, I ſhall endeavour, as oft as I have opportunity, further to obſerve.

A particular direction to the *Figures* mentioned in the precedent diſcourſe.

A. *March* 3$^{d.}$ 00$^{h.}$ 20$^{m.}$ *in the morning: the Air having many inflecting*

ing parts diſperſed up and down in it; by the Wheel Barometer, *heavy,*

B. *Another Scheme, which I drew from my Obſervation, about* 10. *minutes after, the ſame morning. Both theſe were obſerved with a very deep Eye-glaſs.*

C. *March* $10^{d.}$ $00^{h.}$ $20^{m.}$ *in the morning: the Air heavy and inflective. Uſe was made of a ſhallow or ordinary Charge.*

D. *March* $10^{d.}$ $3^{h.}$ 00^{m} *in the Morning; the Air very heavy and Inflective, which made it glare and radiate, and be more confuſed, than about* 3. *hours before. A ſhallow Charge.*

E. *March* $21^{d.}$ $9\frac{1}{2}^{h.}$ *poſt merid; the Air light (in weight) and clear, without inflecting parts; the Face appear'd moſt diſtinctly of this Forme. A ſhallow Charge.*

F. *March* $21^{d.}$ $11\frac{1}{4}^{h.}$ *poſt merid; the Air continuing very light and clear, without inflecting vapours. A ſhallow Charge.*

G. *March* $21^{d.}$ $8\frac{1}{2}^{h.}$ *poſt mer. the Air clear, with few inflecting veins in it, and indifferent light. A ſhallow Charge.*

H. *March* $23^{d.}$ $9\frac{1}{2}^{h.}$ *poſt mer. the Air pretty light, but moiſt, and ſomewhat thick and hazy, but ſeem'd to have but few veins, or inflecting parts.*

I. *March* $28^{d.}$ $3^{h.}$ *p. m. much the ſame kind of Air with that of March* 23; *light, moiſt, and a little hazy, with ſome very few veins.*

Obſervations

Made in Italy, *confirming the former, and withall fixing the* Period *of the Revolution of* Mars.

Theſe Obſervations we ſhall ſummarily preſent the Curious in theſe parts with, as they were lately preſented (by Letter from his Excellency the Ambaſſadour of *Venice*, now reſiding at the Court of *France*) to the *Royal Society*, in ſome printed ſheets of Paper, entituled, *MARTIS, circa Axem proprium Revolubilis, Obſervationes, BONONIÆ à JO. DOMINICO CASSINO habitæ*; come to hand *June* 3. 1666.

In theſe Papers the Excellent *Caſſini* affirms;

1. That with a *Teleſcope* of 24. *Palmes*, or of about 16 *Foot*, wrought after S. *Campani's* way, he began to obſerve *February* 6. 1666 (ſt-n.) in the morning, and ſaw two dark Spots in the *firſt* Face of *Mars*.

2. That