Fig. 2. the posterior and under Side, which rested partly upon the *Prostatæ*. This Side of the Stone was attach'd to the Bladder.

a. the Place where the Body of the Bladder was contracted in Form of the Neck of a Gourd.

b. the Extremity, which was lodged in the Beginning of the *Urethra*.

c. the Impression made by the Nail of the Forefinger of my left Hand, in passing it between the Stone and the Inside of the Bladder, in order to detach them from each other, and to dilate the Bladder sufficiently to introduce the Crocher.

II. *The Description of an Hygrometer made of a* Deal Rod: *Being Part of Two Letters from Mr.* William Arderon, *F.R.S. to Mr.* Henry Baker, *Fellow of the said* Society.

SIR, * * *

Read May 8. 1746. IN *October* last I contrived and made an Hygrometer; the first Hint whereof I received from Observations on the Swelling of Deal Doors against Rain.

I perceived this Wood expanded itself very considerably, laterally, or across its Grain: And this I imagined, if properly made use of, might shew, not badly, the different Degrees of Moisture or Dryness in the Air.

These Thoughts set me upon searching the *Philosophical Transactions* (as I do most commonly, when I take

I take notice of any thing remarkable in the Works of Nature or Art), to ſee if any ingenious Perſon had recorded his Opinion upon this Subject: And I found (N°. 127.), that an anonymous Author had made ſeveral Attempts to conſtruct Hygrometers of Deal Boards *; and again (N°. 129.), that Mr. *J. Coniers* had added ſome Improvements thereto; but, as the Method taken by theſe two Gentlemen ſeemed liable to ſome Objections, I determined to make a Trial on a Plan and Form intirely different from theirs; and have been ſo fortunate to find it ſucceed greatly beyond my Expectations.

My Way was thus:

I procured a Piece of coarſe Deal Board; moſt of it, if not all, Sap. From this I ſawed ſeven Pieces croſs the Bate or Grain, 10 Inches long and an Inch broad; and as the Board was juſt an Inch in Thickneſs, I thereby conſequently obtain'd 7 Parallelopipeds of an Inch ſquare each.

Theſe 7 Pieces of Deal I joined together, lengthways, with ſtrong Glew; which made a ſquare Rod of 70 Inches long.——I found it neceſſary to place theſe ſmall Pieces in ſuch a manner, when I glewed them together, in reſpect to their Grain, as is repreſented in the two Figures annex'd, to prevent their forming themſelves into a Sort of Curve; which they naturally do, if they are placed all the ſame Way; and I found myſelf obliged to fix the Rod in ſuch a Number of Brackets as appear in the Drawings, in order to keep it ſtrait. I placed

* This Author ſays, Poplar would do much better; but of that I have had no Trial.

I placed this Rod, at firſt, perpendicular to the Horizon, betwixt two Pieces of Wood of the ſame Thickneſs, and nailed againſt the Cieling of my Room; but then I had one Side only expoſed to the Air: However it acted tolerably well, which encouraged me to try to make it more perfect; as you'll find delineated TAB. I. *Fig.* 3. and *Fig.* 4.

Both theſe Deal Rods were placed againſt the Cieling of my Room with Brackets, and were buttoned down into ſquare Mortiſes in each Bracket with ſmall Pieces of Deal, that fitted their Tops exactly. Hereby all their four Sides became expoſed to the Air; and the only Difference between them is, the increaſing the Effect of their Variation by two different Methods.

To the Rod at *Fig.* 3. I added two Levers: The firſt of which *A B D* had its ſhorter End *A B* but 3 Inches in Length, and its longer *B D* 12; conſequently the End *D* moved through 4 times the Space that the End *A* did.

The ſecond Lever *E F G* I fixed to act with the other before mention'd. The ſhorter End *E F* of this Lever was 3 Inches, and the longer End *F G*, 45 Inches; whereby the Effect of the other Lever was increaſed 15 times, and that of the Deal Rod 60 times. So that if the Rod lengthens but one Tenth of an Inch, the Point of the Lever *G* moves 6 Inches; and if the Rod lengthens but one Inch, the Point *G* moves 60.

The longer End of the ſecond Lever in *Fig.* 3. muſt be made ſo much heavier, that it may move down freely by its own Gravity whenever the Bar ſhortens.

To

To this Hygrometer I fixed a ſmall Index, ſuch as is common in Mr. *Hauksbee's* Barometers, to ſlip up and down on a Wire, as is repreſented at *K*.

Fig. 4. repreſents another Method I employed to increaſe the Power of the Deal Rod. This may be fixed in a much ſmaller Compaſs, and yet is no leſs capable of ſhewing the minute Differences in the Moiſture or Dryneſs of the Air than the other before deſcribed.

The Deal Rod in this was managed and faſtened in the ſame manner as was ſhewn before. I likewiſe applied a Lever *A B D* to the Top thereof, exactly of the ſame Dimenſions as in the other; but, inſtead of a ſecond Lever, I placed a graduated Circle, with an Index thereto like that of the Minute-Hand of a Clock.

This I fixed to a ſmall *Axis*, which was moved one Way by a ſilken Thread wrapped twice or thrice round it, whereof one End was tied to the longer End of the Lever at *D*, and the other Way by the Gravity of the Weight *W*.

And here, if the Length of the Index *R S* be 15 times as long as the Semi-diameter of the *Axis* which the Silk turns upon, it is evident that our Senſibility of the Rod's Alteration will be increaſed 60 times, *&c.*

The Deal Rod is ſtrongly nailed down at *N*, both in the firſt and ſecond Draught; but, in all other Parts, they have free Liberty of Contraction or Dilatation.

Unleſs I am too much prejudiced in Favour of this Hygrometer, it far exceeds all that I ever ſaw; and I may take upon me thus far to aſſert, that, by acting

ten

ten or twelve Hours before the apparent Change of Weather happens, as this has done ſince I got it finiſh'd; it may very much aſſiſt to form a true Judgment on the impending Changes, when the Wind is in or near the Eaſt or Weſt Point, when the Barometer is of little or no Service.

I obſerve, that Heat and Cold have a conſiderable Power of lengthening and ſhortening the Deal Rod, as well as the Moiſture and Dryneſs of the Air; and this, at firſt Sight, would induce one to imagine, that it would thereby be render'd almoſt uſeleſs; but it is really far otherwiſe; for, by placing it near a Thermometer, it is eaſily rectify'd with reſpect to its Expanſion or Contraction, by Heat or Cold, at the ſame time that it truly ſhews the various Degrees of Moiſture or Dryneſs in the Air. In ſhort, it is an Inſtrument made very eaſily, of Materials to be got almoſt everywhere, and of little Coſt. It is capable of being ſerviceable either by Sea or Land, and may be placed in any Direction.

I have lately finiſhed one of theſe Hygrometers, the Bar whereof is but a Foot in Length, yet, by making the two Levers of Metal, I eaſily make the End of the ſecond Lever riſe and fall 8 Inches. At this Size it becomes portable, and anſwers the End or Purpoſe as well as the other. I am,

Dear Sir,

Your moſt obedient Servant,

Wm. Arderon.

Since

Since my writing this, I have been turning over a little Treatiſe of the ever memorable Mr. *Boyle* upon the Hygroſcope, wherein I find he had made ſeveral Trials with different Sorts of Wood; but then they were turned into the Shape of Bells; which, he ſays, anſwered very well, by comparing their Weights: That their different Weight increaſed or diminiſhed, according to the different Degrees of the Air's Moiſture; and that he had taken notice of the Expanſion of the Wood in Doors and Door-Caſes: But he proceeds no farther than to recommend the different Kinds of Wood to be examined by their Weight.

London, May 8. 1746.

III. *A Letter from* R. Badcock, *Eſq*; *to Mr.* Henry Baker, *F. R. S. concerning the* Farina fœcundans *of the* Yew-Tree.

SIR,

Read May 15. 1746. AS I take upon myſelf a ſort of Share in the Study and Diſcoveries of the Philoſophic World, I eſteem it a Debt incumbent on me to advance that Part of it I have engaged myſelf in, by communicating whatever I find worthy of it. The following Diſcovery is, I believe, worthy your Notice; as, in the Courſe of my Experiments, I never yet met with any thing equal to it.

On the 3d of *March*, ſtrolling round my Garden in Search of Objects, I obſerved a Yew-Tree in Bloſ-

Philos. Trans. N.° 480. TAB. I.

Fig. 1.
p. 183.

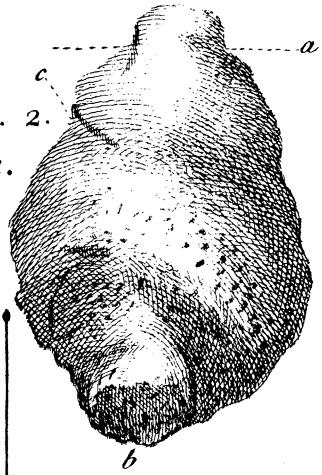

Fig. 2.
p. 184.

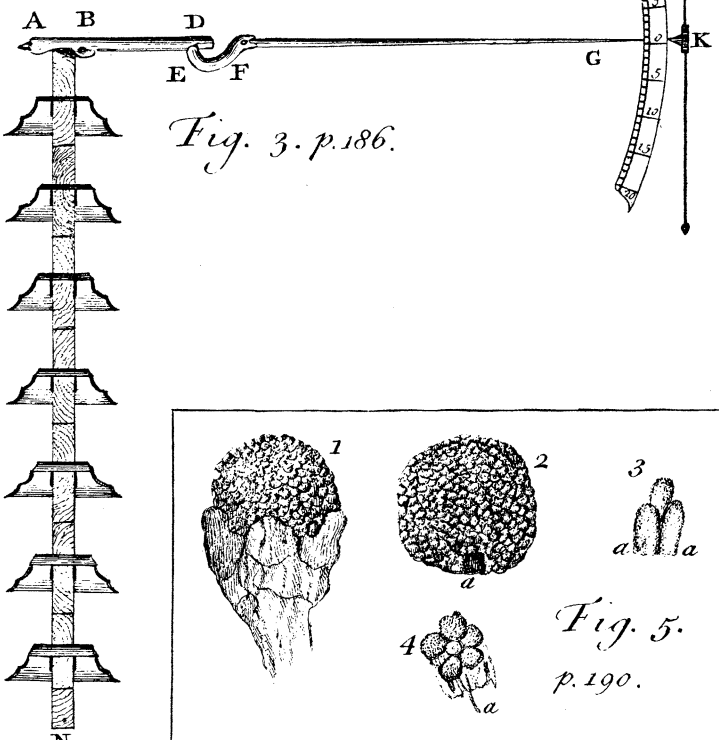

Fig. 3. p. 186.

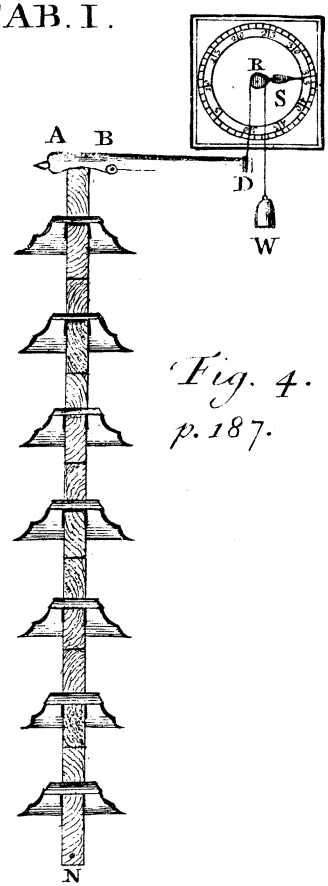

Fig. 4.
p. 187.

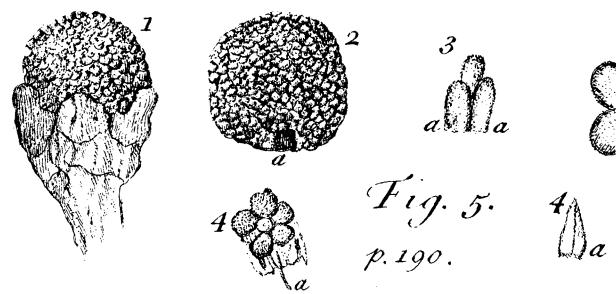

Fig. 5.
p. 190.