

# PHILOSOPHICAL TRANSACTIONS.

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Monday, May. 18. 1668.

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*An Account of an Experiment concerning Deafness. A New Discovery touching Vision, made in France. A letter written to the Publisher concerning some Anatomical Inventions and Observations, &c. Some Observations concerning the Comet, that hath lately appeared in forrain parts, communicated from Italy and Portugal. An Account of some Books. I. GEOMETRIÆ PARS UNIVERSALIS, & quantitatum Curvarum transmutationi & mensuræ inserviens, Auth. F. A. C. GREGORIO, Scotto: Where are inserted some remarks, imparted by the same Author in two Letters written to a member of the R. Society. II. AN INTRODUCTION to ALGEBRA, translated out of High-Dutch into English by THO. BRANCKER, M. A.; much altered and augmented by D. F. P. III. AN ESSAY towards a REAL CHARACTER and a PHILOSOPHICAL LANGUAGE, by JOHN WILKINS, D. D. &c. IV. STANISLAI DE LUBIENIETZ THEATRUM COMÆTICUM, &c.*

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### *An Account*

*Of an Experiment, concerning Deafness, communicated to the R. Society, by that Worthy and Learned Divine Dr. William Holder, as followeth;*

**A** Young Gentleman, known to divers of the R. Society, was born Deaf, and continued Dumb till his Age of 10. or 11. years. His mother, when she was great with him, received a sudden fright; by occasion whereof, the child's head and face were a little distorted, the whole right side (as I remember) being somewhat elevated, and the left depressed; so that

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the passage of his left Ear was quite shut up, and that of the right Ear proportionally distended, and too open. This Gentleman being for some time recommended to my Care, amongst other things, I spent some thoughts in searching the cause of his Deafness in the Ear, whose passage was open. And having found, that the Auditory Nerve was not perished, but that he could hear the sound of a Lute-string, holding one end thereof in his Teeth; and had some perception of any very vehement sound, I supposed the defect to lie in the want of due Tension of the *Tympanum* of his Ear; whose Use I took to be, onely to preserve the Auditory Nerve, and Brain, and inward parts of the Ear from *outward* injury by cold, Dust, &c. and to be no more to Hearing, than glass in the window is in a Room to seeing, *i.e.* as the one intromits Light without Cold or offence to those in the room, so the other permits Sound to pass, and shuts out what else might offend the Organ; as appears in the Experiment of breaking the *Tympanum* of a Dog, who hears never the worse for some few weeks, till other causes, as Cold, &c. vitiate the Organ.

But for the Free passage of the Sound into the Ear, it is requisite, that the *Tympanum* be tense and hard stretched; otherwise the laxness of that membrane will certainly dead and damp the Sound. And because the *Tympanum* is fixed in the circumference thereof to the *Annulus Ossæus*, and so is not capable of Tension that way, in such manner as a Drum is braced; there remains another way, by drawing it at the Center into a *Conoid* form. And that is the principal office of the 3. *Ossicles*, viz. the *Malleus*, *Incus*, and *Stapes*; whereof the *Stapes* is fixt to the inner Bone, and part of the *Malleus*, to the *Tympanum*, and the *Incus* between them joyn'd on one part to the *Malleus*, and on the other to the *Stapes* by *Ginglymoide* Joynts, such as in which the upper and lower double Teeth meet one another. And by the help of a Muscle drawing the *Incus*, these three bones, which otherwise could lye more streight, are brought to a Curved or Arched posture; and the *Stapes* being fixt unmoveable, the *Malleus* yields, to bring the terms of that line nearer, in proportion as it is curved, and draws the Center of the *Tympanum*, stretching the surface of it from a *Plain* to a *Conoid* figure, within the same  
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**Circumference.** And I conceive, the action of this Muscle does ordinarily and constantly draw the *Tympanum* to a moderate Tension; but when we have occasion to listen, and give a more particular attention to some sound, the action of that Muscle is then more intense, and the *Tympanum* is drawn to a more than ordinary tension, so to facilitate the passage of the Sound.

Now as to the case of the young Gentleman before mentioned, I supposed either the Muscle by that convulsive starting Motion in the Womb to be overstrained, and to have lost its Action; or the *Membrane* by that greater aperture of the Organ to be over-stretched, and afterwards to remain so flaccid, that it was beyond the activity of the Muscle and Curvature of the *Ossicles* to give it a due Tension; or peradventure there was a concurrence of both Causes. Which due tension, if by any remedy it might be restored, I assum'd, that he might recover his hearing in that Ear: To which end, I advis'd the Excellent Lady his Mother, to consult with Learned Physitians, if by some adstringent Fumes, or otherwise, he might find help.

And for Experiment, I thought of a *Temporary* way, by the impulse of any *Veheement* sound; as of a Drum beaten near him: which sound, during its continuance, must needs give the *Tympanum* a Tension, by driving and swelling it inwards, as a fresh gale of wind fills the sayles of a ship; and the Experiment succeeded according to my expectation: For so long as I beat a Drum fast and loud by him, he could *hear* those who stood behind him, calling him gently by his Name (which he understood, having learned to speak and pronounce it among other words;) and when the Drum ceased, he did not hear the same Persons, when they again very loud called him by his Name. And by this we tryed several times, by beating the Drum again, and ceasing it; and he still heard them, when the Drum beat, and heard them not, when it stopt.

Since that time, a Gentleman about *Oxford-shire*, sometimes Student of *Christ-church*, being in a great degree of Deafness, after I had told him of this Experiment, call'd to mind, that he never heard so well and easily, as when he was discoursing with Company in a Coach, whilst it went fast, and made a great rumbling noise in *London-streets*: by which he was induced to be-

lieve, that the Impediment of his Hearing was of the like nature with the other.

*A New Discovery touching Vision.*

*This is the Title of two or three printed sheets of paper, lately sent from Paris to the Publisher, by the no less Obliging than Ingenious Monsieur Justel; In which are contained both an Epistle of the Discoverer Monsieur L' Abbe Mariotte, of Dyons, to Monsieur Pecquet, and the Answer to it. Of both which we cannot omit to give the Reader the substance in English, as follows,*

**H**AVING often observed in Anatomical Dissections of Men as well as Brutes, that the *Optick Nerve* does never answer just to the Middle of the bottom of the Eye, i.e. to the place, where is made the picture of the Objects, we directly look on; and that in man it is somewhat higher, and on the side towards the Nose; to make therefore the Rayes of an Object to fall upon the Optick Nerve of my Eye, and to find the consequence thereof, I made this Experiment;

I fastn'd on an obscure Wall, about the height of my Eye, a small round paper, to serve me for a fixt point of Vision; and I fastned such an other on the side thereof towards my right hand, at the distance of about 2. foot; but somewhat lower than the first, to the end that it might strike the *Optick Nerve* of my Right Eye, whilst I kept my Left shut. Then I plac'd my self over against the First paper, and drew back by little and little, keeping my Right Eye fixt and very steady upon the same; and being about 10. foot distant, the second paper totally disappear'd.

That this cannot be imputed to the Oblique position of the second paper, is hence evident, That I can see other Objects further extant on the side of it: so that one would believe, the second paper were by a slight taken away, if one did not soon finde it again by the least stirring of one's Eye.

This Experiment I made often, varying it by different distances, and removing or approaching the Papers to one another proportionally. I made it also with my left Eye, by keeping my Right shut, after I had fastned the Second paper on the Left side of my point of Vision; so that from the *Site* of the parts of the  
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