Motion of the Pendulum No 1. gradually decreaſing all the while, as the other increaſed; and in three Quarters of an Hour after, it ſtopped. I then left the Pendulum of No 1. at Reſt, and ſet No 2. a going, making it deſcribe an Arch of 5°; it continued to vibrate leſs and leſs, till it deſcribed but about 3°; in which Arch it continued to move all the time I obſerved it, which was ſeveral Hours. The Pendulum of No 1. ſeemed but little affected by the Motion of No 2. I tried theſe Experiments ſeveral times over, without finding any remarkable Difference. The freer the Room was from any Motion (as Peoples walking about in it, *&c.*) I found the Experiments to ſucceed the better; and once I found No 2. ſet a going in 16′ 20″, and No 1. at that time ſtopped in 36′ 40″.

I ſhall not offer my Opinion to this Honourable Society, concerning the Cauſe of theſe *Phænomena*, or at leaſt not till I have farther examined it by the Help of ſome more Obſervations and Experiments.

VI. *Further* Obſervations *and* Experiments *concerning the two* Clocks *above-mentioned*, *by* the Same.

IN the preceding Paper I had the Pleaſure to communicate to this Honourable Society, an Account of the extraordinary Influence I obſerved two Clocks to have upon each other, and which was attended with ſuch Circumſtances, as I believe had never before been taken Notice of. I ſhall now beg Leave

Leave to lay before you ſome farther Obſervations I have ſince made, which will, I hope, in great meaſure, account for the Facts then related.

In my former Account I took Notice, that the two Clocks were in ſeparate Caſes, and that the Backs of them reſted againſt the ſame Rail; that the Pendulums, when at Reſt, were about two Feet aſunder, and weighed about 23 ℔ each, and were made to move with ſuch Freedom, that a Weight of 3 ℔. would cauſe either of the Pendulums to deſcribe an Arch of three Degrees. The moſt remarkable Particulars then obſerved in them were theſe: If the Pendulum of one of the Clocks, which (for Diſtinction ſake) I called N° 2. was left at Reſt, and that of the other, which I called N° 1. was ſet a going, this would, in about 16 Minutes, communicate ſo great a Quantity of Motion to N° 2. as would make its Pendulum deſcribe an Arch of above two Degrees, and would ſet the Work a going: That the Motion of the Pendulum of N° 1. conſtantly decreaſed as that of N° 2. increaſed, and after about 30 Minutes it did not deſcribe an Arch ſufficient to free the Teeth of the Wheel from the Pallets, ſo that the Clock ſtopped. At the ſame time the Pendulum of N° 2. deſcribed an Arch of five Degrees, which was two Degrees more than it would have done, had it not been affected by the Motion of N° 1. Upon leaving the Pendulum of N° 1. at Reſt, and ſetting N° 2. a going, the Pendulum of N° 1. was found to be but little affected, and never moved ſufficiently to ſet the Work a going. Theſe ſeemingly different Effects, which the two Clocks had upon each other, I ſhall now endeavour to account for.

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The Manner in which the Motion is communicated to the Pendulum at Reſt, I conceive to be thus: As the Pendulums are very heavy, when either of them is ſet a going, it occaſions by its Vibrations a very ſmall Motion, not only in the Caſe the Clock is fixed in, but, in a greater or leſſer Degree, in every thing it touches; and this Motion is communicated to the other Clock, by means of the Rail, againſt which both the Caſes bear. The Motion thus communicated, which is too ſmall to be diſcovered but by means of ſome ſuch-like Experiments as theſe, will, I doubt not, be judged by many, inſufficient to make ſo heavy a Pendulum deſcribe an Arch of two Degrees, or large enough to ſet the Work a going; and indeed it would be ſo, but for the very great Freedom with which the Pendulum is made to move, ariſing from the Manner in which it is hung. This appears from the very ſmall Weight required to keep it going, which, when the Clock was firſt put together, was little more than one ℔. And if the Weight was taken off, and the Pendulum made to ſwing two Degrees, it would make 1200 Vibrations before it decreaſed half a Degree, ſo that it would not loſe the $\frac{1}{3000}$ part of an Inch in each Vibration. Indeed if the Weight was hung on, the Friction would be increaſed, and the Pendulum would not move quite ſo freely; but even in that Caſe it was found to loſe but little more than the $\frac{1}{2000}$ part of an Inch, or about three Seconds of a Degree, in one Vibration; and therefore if the Motion communicated to it from the other, will make it deſcribe an Arch exceeding three Seconds, the Vibrations muſt continually increaſe till the Work is ſet a going.

And

And that the Motion is communicated in the manner above ſuppoſed, is confirmed by the following Experiments:

A Prop was ſet againſt the Back of the Caſe of N° 2. to prevent its bearing againſt the Rail; and N° 1. was ſet a going; then obſerving them for ſeveral Hours, I could not perceive the leaſt Motion communicated to N° 2. I then ſet both the Clocks a going, and they continued going ſeveral Days; but I could not find they had any Influence upon each other. Inſtead of the Prop againſt the Back of the Caſe, I put Wedges under the Bottoms of both the Caſes, to prevent their bearing againſt the Rail; and ſtuck a Piece of Wood between them, juſt tight enough to ſupport its own Weight. Then ſetting N° 1. a going, I found the Influence ſo much increaſed, that N° 2. was ſet a going in leſs than ſix Minutes, and N° 1. ſtopped in about ſix Minutes after. In order to try what Difference would ariſe, if the Clocks were fixed on a more ſolid Floor, I placed them (exactly in the ſame manner as in the laſt Experiment) upon the Stone Pavement under the Piazza's of the *Royal Exchange*, and ſtuck the Piece of Wood between them, as before; and ſetting N° 1. a going, the only Difference I could perceive, was, that it was 15 Minutes before N° 2. was ſet a going, and N° 1. continued going near half an Hour before it ſtopped. From theſe Experiments I think it plainly appears, that the Pendulum which is put in Motion, as it moves towards either ſide of the Caſe, makes the Preſſure upon the Feet of the Caſe to be unequal, and, by its Weight, occaſions a ſmall Bearing or Motion in the Caſe on that Side towards which the

Pendulum is moving; and which, by the Interposition of any solid Body, will be communicated to the other Clock, whose Pendulum was left at Rest. The only Objection to this, I conceive, is the different Effects which the two Pendulums seemed to have upon each other. But this I hope to explain to Satisfaction.

For, notwithstanding these different Effects, I soon found, by several Experiments, that the two Clocks mutually affected each other, and in the same Manner, though not with equal Force; and that the Varieties observed in their Actions upon each other, arose from the unequal Lengths of their Pendulums only.

For, upon moving one of the Clocks to another Part of the Room, and setting them both a going, I found that N° 2. gained of N° 1. about one Minute 36 Seconds in 24 Hours. Then fixing both against the Rail, as at first, I set them a going, and made the Pendulums to vibrate about four Degrees; but I soon observed that of N° 1. to increase, and that of N° 2. to decrease; and in a short time it did not describe an Arch large enough to keep the Wheels in Motion. In a little time after it began to increase again, and in a few Minutes it described an Arch of two Degrees, and the Clock went. Its Vibrations continued to increase for a considerable time, but it never vibrated four Degrees, as when first set a going. Whilst the Vibrations of N° 2. increased, those of N° 1. decreased, till the Clock stopped, and the Pendulum did not describe an Arch of more than one Degree 30 Minutes. It then began to increase again, and N° 2. decreased, and stopped a second time, but

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was ſet a going again, as before. After this N° 1. ſtopped a ſecond time, and the Vibrations continued to decreaſe till the Pendulum was almoſt at Reſt. It afterwards increaſed a ſmall matter, but not ſufficiently to ſet the Work a going. But N° 2. continued going, its Pendulum deſcribing an Arch of about three Degrees.

Finding them to act thus *mutually* and *alternately* upon each other, I ſet them both a going a ſecond time, and made the Pendulums deſcribe as large Arches as the Caſes would permit. During this Experiment, as in the former, I ſometimes found the one, and at other times the contrary Pendulum to make the largeſt Vibrations. But as they had ſo large a Quantity of Motion given them at firſt, neither of them loſt ſo much during the Period it was acted upon by the other, as to have its Work ſtopped, but both contiuned going for ſeveral Days without varying one Second from each other; though when at a Diſtance, as was before obſerved, they varied one Minute 36 Seconds in 24 Hours. Whilſt they continued thus going together, I compared them with a third Clock, and found that N° 1. went one Minute 17 Seconds faſter, and N° 2. 19 Seconds ſlower, than they did when placed at a Diſtance, ſo as to have no Influence upon each other.

Upon altering the Lengths of the Pendulums, I found the Period in which their Motions increaſed and decreaſed, by their mutual Action upon each other, was changed; and would be prolonged as the Pendulums came nearer to an Equality, which from the Nature of the Action it was reaſonable to expect it would. This diſcovers the Reaſon why the Pendulum

dulum of N° 2. when left at Reſt, would be ſet a going by the Motion of N° 1. whereas if N° 1. was left at Reſt, it would not be ſet a going again by the Motion of N° 2.

For I found by ſeveral Experiments, that the ſame Pendulum, when kept in Motion by a Weight, would go faſter, than when it only moved by its own Gravity. On this Principle, which may eaſily be accounted for, it follows, that during the Time in which the ſhorteſt Pendulum, N° 2. was only acted upon by N° 1. it would move ſlower, and the Times of its Vibrations approach nearer to an Equality with thoſe of N° 1. than after it came to be kept in Motion by the Weight; and by this means the Time which N° 1. would continue to act upon it, would be prolonged, and be more than was required to make the Pendulum deſcribe an Arch ſufficient to ſet the Work a going. But on the contrary, while the Pendulum of N° 1. which was the longeſt, was only acted upon by N° 2. as it would move ſlower, the Difference of the Times of the Vibrations would be increaſed; and conſequently the Time which N° 2. would continue to act upon it, would for this Cauſe be ſhortened, ſo that before the Pendulum of N° 1. would deſcribe an Arch ſufficient to ſet the Work a going, the Period of its being acted upon would be ended, and it would begin to act upon N° 2. at which time its Vibrations would immediately decreaſe, and continue to do ſo till it came to be almoſt at Reſt. And thus it would continue ſometimes to move more, and at other times leſs, but never ſufficiently to ſet the Clock a going.

This Account might be confirmed by many more Experiments I have made relating to this Subject; but as I hope these already mentioned will be thought sufficient to confirm the Truth of what I have advanced, I shall forbear to trespass any longer on your Time, and subscribe myself

Your most obedient
humble Servant,

John Ellicott.

VII. *The* Case *of a Wound in the* Cornea *of the* Eye *being successfully cured by Mr.* Tho. Baker, *Surgeon to St.* Thomas's *Hospital, and by him communicated to the* Royal Society, *in a Letter to Dr.* Mortimer, R. S. *Secr.*

A Young Woman, about the Age of 15 Years, on the 6th Day of *November* 1733, received a Wound just in the Pupil of her right Eye, by the Spear of a common Fork. An Inflammation followed, with great Pain. The whole Eye appeared dark and turbid; and the Humours seemed confused, and blended together. I opened a Vein in the Arm, and drew away 10 Ounces of Blood: I then washed the Eye with a Collyrium of *Trochisci Albi Rhasis*, and common Water, made Blood-warm; and dressed it with a Cataplasm of white Bread and Milk, with a little Saffron in it. The next Day there appeared

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