

XI. *An Improvement proposed in the cross Wires of Telescopes, by Dr. Wilson, of Glasgow. In a Letter to the Astronomer Royal.*

College, Glasgow, Oct. 25, 1773.

S I R,

Redde, Dec. 23, 1773. **I** Have lately put in practice a method of improving the cross wires, that are made use of in astronomical telescopes, which has pleased me so much, that I propose, in this letter, to give you an account of it, knowing that you are always warmly interested in the success of any thing of this nature.

It has been hitherto a desideratum to draw silver wire fine enough for astronomical uses. I need not mention the inconveniences, attending our being limited in this particular, as they will, of their own accord, occur to you. I therefore proceed to describe the means, I have fallen upon, of obviating the difficulty. This, in practice, is extremely simple, and consists in nothing but in flattening the finest wires, which are now drawn. I have made the experiment, upon silver wire, which is marked 500 to the inch. Having prepared

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pared a small block of steel, the face of which was made very flat and smooth, a number of the wires were stretched across it, at considerable intervals, by having their ends fastened, by pitch, at each side of the block. This done, I took another block of steel, of the same size, the face of which had been made likewise flat, and the top of it rounded, the better to determine the stroke of the hammer; upon applying this, over the wires lying upon the first block, which was firmly fixed in a vice, and giving a smart stroke with a hammer of about five pound weight, I found all of them flattened in a very even manner.

That I might have no difficulty of fitting these wires, so flattened, into the telescope, I purposely made the face of the steel blocks a small matter narrower, than the width of the brass ring, in our transit instrument, upon which the cross wires are fixed. By this means the wires retained their roundness at both ends, and so were easily fixed across the ring, by the screw-pins, when their fine edges regarded the eye. By means also of a simple contrivance, which will readily occur in practice, I made the horizontal wire to go across the others, so as just to touch them. This horizontal wire was a round one, of  $\frac{5}{16}$  of the inch, which I purposely used along with the others, that I might form some judgment of the effects of flattened ones, when viewed along with it in the field. I accordingly found a very striking diminution of the visible subtense of these wires, when compared with the round one; and this so considerable

considerable, as I am persuaded could not be obtained with round wires, unless they could be drawn to two or three thousand to the inch.

From what I perceived, in the experiment of flattening the wires, I do not see but that this diminution, if it were requisite, might be carried a great deal further.

I am, &c.

ALEXANDER WILSON.