

prick'd Lines, the advanced part B, suddenly, and with great swiftness, ran back, and joining it self with the Ends *b b*, formed it self into the Figure C, quivering in the upper part, and darting down perpendicularly in sharp Points, as at D D D; and its Colour from a bright Light changed into the colours of a Rain-bow, but much fainter. It continued this way about a Minute, and then the sharp points D D D, gathering themselves up into C, it changed again into a square Sheet of Light, as at E, and swell'd out at F, as before at B; and advancing leisurely, repeated the same Scene as before, till it seem'd at a great distance to disperse it self into small thin light Clouds; tho'tis probable that to those who saw it in a like Situation, as it travell'd, it might make the same appearance as it did to me. I was very particular in observing it, and the next Morning drew it, and I think very exactly. I should have continued longer to look at it, (which I did for above a quarter of an Hour) but that it was excessive cold; the beginning of it was very like the *Aurora Borealis*, which has been very frequent this Winter here.

V. *Of the Infinity of the Sphere of Fix'd Stars.*
By Edmund Halley, L. L. D. R. S. S.

THE System of the World, as it is now understood, is taken to occupy the whole *Abyss* of *Space*, and to be as such actually infinite; and the appearance of the Sphere of Fixt Stars, still discovering smaller and smaller ones, as you apply better Telescopes, seems to confirm this Doctrine. And indeed, were the whole System

stem finite; it, though never so extended, would still occupy no part of the *infinitum* of Space, which necessarily and evidently exists; whence the whole would be furrounded on all sides with an infinite *inane*, and the superficial Stars would gravitate towards those near the center, and with an accelerated motion run into them, and in process of time coalesce and unite with them into one. And, supposing Time enough, this would be a necessary consequence. But if the whole be Infinite, all the parts of it would be nearly *in equilibrio*, and consequently each fixt Star, being drawn by contrary Powers, would keep its place; or move, till such time, as, from such an *equilibrium*, it found its resting place; on which account, some, perhaps, may think the Infinity of the Sphere of Fixt Stars no very precarious Postulate.

But to this I find two Objections, which are rather of a Metaphysical than Physical Nature; and first, this supposes, as its consequent, that the number of Fixt Stars is not only indefinite, but actually more than any finite Number; which seems absurd *in terminis*, all Number being composed of Units, and no two Points or Centers being at a distance more than finite. But to this it may be answer'd, that by the same Argument we may conclude against the possibility of eternal Duration, because no number of Days, or Years, or Ages, can compleat it. Another Argument I have heard urged, that if the number of Fixt Stars were more than finite, the whole superficies of their apparent Sphere would be luminous, for that those shining Bodies would be more in number than there are Seconds of a Degree in the *area* of the whole Spherical Surface, which I think cannot be denied. But if we suppose all the Fixt Stars to be as far from one another, as the nearest of them is from the Sun; that is, if we may suppose the Sun to be one of them, at a greater distance their Disks and Light will be diminish'd

in the proportion of Squares, and the Space to contain them will be increased in the same proportion; so that in each Spherical Surface the number of Stars it might contain, will be as the Biquadrate of their distances. Put then the distances immensely great, as we are well assured they cannot but be, and from thence by an obvious *calculus*, it will be found, that as the Light of the Fix'd Stars diminishes, the intervals between them decrease in a less proportion, the one being as the Distances, and the other as the Squares thereof, reciprocally. Add to this, that the more remote Stars, and those far short of the remotest, vanish even in the nicest Telescopes, by reason of their extream minuteness; so that, tho' it were true, that some such Stars are in such a place, yet their Beams, aided by any help yet known, are not sufficient to move our Sense; after the same manner as a small Telescopical fixt Star is by no means perceivable to the naked Eye.

VI. *Of the Number, Order, and Light of the Fix'd Stars. By the same.*

AT the last meeting of the Society, I adventured to propose some Arguments, that seemed to me to evince the Infinity of the Sphere of Fixt Stars, as occupying the whole Abyss of Space, or the $\tau\omicron\ \pi\alpha\upsilon$, which at present is generally understood to be necessarily Infinite; and thence I laid before you what may seem a very *Metaphysical Paradox*, viz. That the number of Fixt Stars must then be more than any finite Number, and some of them more than at a finite distance from others. This seems to involve a Contradiction, but it is not the only one that occurs to those who have undertaken freely to consider