



## XLVI. Improvement in the method of forming electrical planispheres

Mr. Rowland Hill

To cite this article: Mr. Rowland Hill (1818) XLVI. Improvement in the method of forming electrical planispheres, Philosophical Magazine Series 1, 52:246, 293-294, DOI: [10.1080/14786441808652050](https://doi.org/10.1080/14786441808652050)

To link to this article: <http://dx.doi.org/10.1080/14786441808652050>



Published online: 23 Jul 2009.



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there is reason to believe that the purification of coal gas, the application of which is daily increasing as a substitute for procuring light, might be effected in a more economical manner, by causing the gas to traverse ignited iron vessels, than by the application of quick-lime. The subject is worthy of a strict examination, both in a philosophical point of view, as well as with regard to practical utility. I have the honour to be, sir,

Your obedient servant,

Liverpool, Sept. 3, 1818.

S. PARKER.

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XLVI. *Improvement in the Method of forming Electrical Planispheres.* By Mr. ROWLAND HILL.

*To Mr. Tilloch.*

SIR, — NEARLY four years ago I had occasion to represent some of the constellations and other figures by electricity. Hitherto this had always been done upon glass; but I wished to construct the constellations on a scale which required larger plates of glass than I could conveniently procure. Paper being a non-conductor of electricity, I was induced to make trial of it, and found that it answered my purpose exceedingly well. At that time I constructed four constellations, viz. the Great Bear, the Great Dog, the Ship, and the Scorpion. I made use of that kind of paper which is called Bristol board; the tin-foil may be stuck upon it in the same manner as it is fastened to glass. I also found gold size (a liquid used by the gilders) to be very well adapted to that purpose; and the figures may be secured more completely by covering the whole with a coat of varnish. Since that time I have represented upon paper a considerable portion of the southern sky. I took several sheets of drawing-paper, pasted the edges together, and stretched the whole upon a circular wooden frame four feet in diameter. Upon this apparatus are represented all the stars of the four first magnitudes within forty degrees of the south pole.

In order to give to the stars of the different magnitudes their proper degrees of relative brightness, I took the following method.

For the stars of the first magnitude, I cut the ends of the tin-foil round, and placed them about one-twelfth of an inch asunder. For those of the second magnitude, the bits of tin-foil were pointed, and the spaces between them made as small as possible. To produce a spark of no greater brightness than the stars of the third magnitude, I made the spaces in the tin-foil similar to the last, and pasted over each a small bit of thin paper, through

which the electric sparks are dimly seen. The stars of the fourth magnitude are made by spaces formed in the same manner, but covered with a thicker piece of paper. Thus I was enabled to give to each star its proper degree of brightness; and by these means I conceive a more exact representation of the celestial bodies can be given, than by any other method as yet known.

In this scheme are represented upwards of sixty stars, besides the two great *nebulae* which appear in the southern part of the heavens. To imitate the latter, I cut two holes in the paper, in the form of the *nebulae*.—Here I passed the train of tin-foil through the paper, and at the back of the scheme carried it round the edges of these holes, leaving a few intervals for sparks. At the back of each hole I fixed a piece of Bristol board considerably larger than the aperture, and bent so that the part opposite the hole should be about half an inch behind the level of the scheme. The paper thus fixed served as a screen to receive the light of the sparks given at the back round the holes; and being by that means illuminated, while the general face of the scheme was in darkness, filled up the aperture as it were with a nebulous whiteness, giving as I apprehend a tolerably just image of the original.

In damp weather these figures, like almost all electrical apparatus, require to be dried before a fire previously to their being used.

The advantages which are derived from the use of paper instead of glass must be obvious. It is much less expensive. By joining together a number of sheets it can be made of any size; and as it will not break, it is much more portable; which last circumstance must recommend it strongly to such as have frequent occasion to remove their apparatus from one place to another. I am, sir,

Your obedient servant,

Hill-top School, Birmingham,

ROWLAND HILL.

Oct. 12, 1818.

XLVII. *On the received Theory of Heat.* By A CORRESPONDENT.

*To Mr. Tilloch.*

SIR, — PERMIT me to lay before your readers my reasons for objecting to the received theory of heat. I am strongly inclined to believe there is no such thing—any more than that there is an elementary principle of sound.

Chemists and philosophers agree that the particles of heat are infinitely smaller than any other particles—that insinuating themselves