

being the "true horizon" which bounds the vision of the observer's eye. I am very much surprised to find that a man of Mr. Wallace's scientific acquirements should affirm that if the earth were flat the sun would illumine the whole surface at the same time. This is not in accordance with either the laws of optics or perspective. Look, for instance, at the tops of a long street of houses—the loftier they are the more acute will be the angle of subvention, until they will appear to descend to the point of sight (illustrations of which are constantly to be seen in the magazines, &c., of the day), and if they extend beyond such point of sight, the line will vanish entirely, although the buildings are upon a dead level. Now, if a screen be placed at right angles at the top of the street, so as to represent the visible or "true horizon," and if a man with a bright light were to walk the whole distance of the line on the parapet of those houses, the light would appear gradually to descend to the point of sight, and if the light were carried beyond that point it would disappear altogether; and that is what the sun does when it either rises or sets: in the former case it comes within the range of vision, whilst in the latter it goes beyond it, irrespective of the shape of the earth. I am not arguing that this is proof of the earth being a plane, but that the phenomenon which Mr. Wallace adduces is no proof that it is a globe. In fact, the appearances would be precisely the same were it a plane, as they are assuming it to be a globe. Observe the clouds as they float in the atmosphere; they always appear to be concave to such a degree that if the appearance were caused by the rotundity of the earth then this earth would be a very small globe indeed. Now, if any one could go as far above those clouds as he is beneath them, they would still appear to be concave, only that in the first case they are above his head, and in the second beneath his feet. Mr. Glaisher's experience can bear out the fact. I flatly deny Mr. Wallace's proposition that a plane surface will bear out the conclusions as given in his third diagram. If the height of the eye be 50ft. from the level of the sea, the horizon will rise to the same height, and, as a consequence, the sea level will appear to be sunk 50ft. beneath him, always showing a concave figure; and no problem in geometry (by construction) will produce any other figure—always assuming the given data. The Bedford canal farce proves nothing one way or the other—only Hampden's folly in risking so large a sum with the whole scientific world ranged against him, as well as the public press and popular prejudice, and the avidity with which his opponents "grabbed" his £500. No wonder he abuses them—it is enough to make a saint swear! and illustrates a saying of Sir Richard Phillips about the "execrable superstitions of Newton," and the "woe" to that man who should dare oppose them!

Mr. Wallace alludes to the converts being made by "Parallax" and others to the plane theory. What wonder, when such puerile proofs are adduced in favour of the globular theory? Why, it has never yet been satisfactorily demonstrated that the earth is either a planet or a globe but by the old stock childish arguments of a ship on the horizon, the rising and setting of the sun, &c.—all of which are attributable to the laws of perspective—except, indeed, the "assumed" shadow of the earth upon the moon during a total eclipse of that luminary; and that is only a mere hypothesis, for on the 17th of January, 1870, the middle of the eclipse of the moon occurred at a quarter to three o'clock p.m., when both sun and moon were above the horizon at the same time. Therefore it was utterly impossible that the shadow of the earth could have been the cause of the moon's eclipse. The same thing occurred in July of the same year, and was noticed in the *Daily Telegraph* of the 16th of that month as a singular phenomenon. And well it might be! No mountains can be seen 300 miles off with a curvature of the earth's surface at the rate of eight inches per mile multiplied by the square of the distance. But it is upon record that the Alleghany Mountains have been seen from the Peak of Teneriffe, 2,500 miles off; which would preclude the possibility of the earth being a sphere.

Watford, Oct. 16.

W. G.

THE SHAPE OF THE EARTH

[9792.]—MR. WALLACE'S proofs of the rotundity of the earth are no proofs at all, for the same appearances would result if it were a positive fact that the earth is a plane. What is the "true horizon"? It is the boundary of the vision or vanishing point of sight, in accordance with the known laws of perspective. An observer may be 500ft. above the level of the sea, and the "true horizon" will rise to the height of the eye, whether the earth be a globe or a plane. It is said that orthodoxy is every man's own "doxy," and that heterodoxy is every other man's "doxy," and so is it with the "true horizon" as well as with the meridian: they are everywhere and nowhere in particular—that