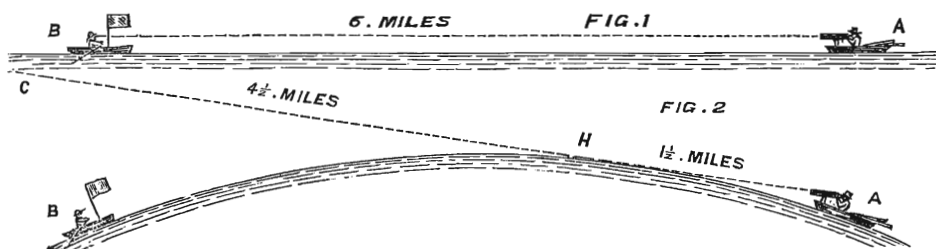


A H C, and therefore altogether invisible. If M. Wallace will join me in inviting the public and in trying the above experiment, the expenses to be defrayed between us, and the particulars to be published specially and formally in the ENGLISH MECHANIC, I will follow him *seriatim* into any farther discussion of the subject which he may deem desirable. He and your readers will surely agree that to test the groundwork of any superstructure is the first duty of all concerned. Meanwhile I may state that the very ingenious sketches, in your last number, at this stage of the inquiry are not sufficiently pertinent; but any one will see at a glance from Fig. 1, page 94, that if the earth is a globe the sun would always rise and set at an angle greater than 90 degrees from the zenith, or below the horizon, H.H. My own experiments, made from numerous positions both on sea and land, have proved that such a sunrise or sunset is never to be observed in nature, but often, and in some directions (notably observing sunrise from the eastern coast of Ireland, opposite Liverpool Bay), it is precisely as represented in Mr. Wallace's sketch, Fig. 2, or as it would be on a plane.

As to the representation given in Fig. 3, of the horizon being below the line S S, I can only say that it is contrary to every carefully-made observation of my own. But to seek to decide such an important point by the erection of two little sticks upon a rock near the sea is not sufficient. The slightest possible change in the position of the axis of the eye would make a considerable difference in the apparent position of the horizon. Let a perfectly smooth block of marble or wood be fixed and "levelled" on the sea shore; on looking over it towards the sea, the horizon, or boundary of the water, will in every instance, and from every altitude, appear to rise, and be distinctly visible in a line with the marble surface. The fact of the sun not being visible all over the earth at any one time, which Mr. Wallace thinks is a proof of rotundity, is a matter which cannot well be explained without the aid of



diagrams; and as I am not certain whether you will so far indulge your readers as to have such diagrams engraved, I will refer to the subject, by your permission, on another occasion. I again ask will Mr. Wallace accept my invitation to publicly, institute some fundamental experiment, such as that described in the diagram Fig. 1, of this letter? PARALLAX.

1, Hawley Villas, Chalk Farm-road, London, October 17.

[2833.]—None can doubt that your correspondent, Mr. Alfred R. Wallace, has shown a large amount of moral and personal courage in his attempts to stay the great zetetic wave which is now setting in from every quarter. History is valueless if it has not taught us that no flood tide of opinion has ever yet been stemmed by mere daring and reckless opposition. I hope that Mr. Wallace will now set his fellow philosophers an example of good sense, in carefully weighing the arguments of those who differ with him in opinion; and in taking care that his own methods of investigation are above suspicion (of special pleading) and fully worthy of the subject he defends. Let me remind him that in the Bedford level experiment he did not fulfil the conditions which had been agreed upon. A false quotient was thereby evolved, and however anxious he was to secure the existence of a favourite theory, he has produced a contrary effect. Men in these days are unusually critical; and if a shadow of unfairness appears are perhaps too ready to denounce the whole. With every respect for Mr. Wallace, as a gentleman, a philosopher, and a scientific pioneer, I ask him to consider the importance of the following experiment, which I have tried on many different occasions, and to repeat for himself, or to allow me to challenge him to a well-advertised public performance of it on any suitable occasion. The surface of standing water is either convex, concave, or horizontal. The experiment shown in the following diagram shall decide. A boat with a good telescope as at A, was fixed underneath the arch of Welney-bridge, on the old Bedford canal. Another boat with a flag was sent out towards the old bridge, a distance of six miles. The eye of the observer (myself) at A, was exactly twelve inches above the water. The altitude or top of the flag, at B, was five feet. The boat, the flag, the man, and the working of the oars were all distinctly visible during the whole distance. The only conclusion derivable from this experiment is that the surface of six miles of standing water is horizontal. If concave, the boat would have sunk below and then risen up to the line of sight, A B, and if convex, the line of sight would have been a tangent touching the water at H (Fig. 2), a distance of less than a mile and a half from A. The distance from H to the boat B would be more than four and a half miles, and according to the received doctrine of rotundity would have been twelve feet below the horizon H. The top of the flag being five feet above the water would have been seven feet below the line of sight,