line to observe the angle between the distant object and the other end. Only one condition is necessary, and for instrumental reasons-the base line must be of appreciable length with regard to the distance of the object. Such a mode of measurement even may be applied to the moon, which is roughly a quarter of a million miles off, the observations being made, say, at Greenwich and the Cape of Good Hope, since the distance between those places-the base line-is appreciable when compared with the moon's distance. But when we come to the sun the case is different. If we could place two observers on the equator, one in longitude $0^{\circ}$, and the other in longitude $180^{\circ}$, we should then have the largest diameter of the planet as the base line; but, compared with the sun's distance, 7900 miles (the earth's largest diameter, and, consequently, the greatest distance between any two places on it), it is instrumentally nil-our base line is inappreciable-and this, the most obvious and direct mothod, therefore fails.
" It is generally supposed that Halley was the astronomer who first pointed out the flank attack on the sun's distance rendered possible by the transits of Venus over the sun's disc; but this is not the case. The suggestion is due to James Gregory, who suggested in 1663 that observations of Venus or Mercury, when they come between us and the sun, and are seen to pass over his dise, may give us the required information. An attempt to explain this will require a little attention. The method is really founded on one of Kepler's laws, by which mankind became acquainted with the relative distances of the planets from the sun long before they could determine their absolute distances. The thing to be done, therefore, is to measure the distance of the nearest planet from us, and then something like a rule of three sum tells us the distance sought, that is, the sun's distance from us. Now the planet which, in its journey round the sun, comes nearest to us is Venus, and she comes, as we now know, near enough to us to allow us to apply the base line method, as in the case of the moon, were it not for the unfortunate circumstance that, as her path lies within ours, when she is nearest to us she is between us and the sun, and, consequently, has her non-illuminated side turned towards us, so that she is generally invisible at such times. But not always, for sometimes she comes exactly between us and the sun, and appears as a black dot on the sun's face; that is, we have a transit of Venus over the sun.
" Now let us regard the sun as a screen on which the planet is visible. In the first place, an observer at the centre of the earth would see the planet travelling in a straight line over some part of the disc. An observer at the North Pole would see the planet's path projected lower down on the sun; similarly an observer at the South Pole would see the path projected higher up. In fact, as seen from the North and South Poles, the paths of the planet over the sun would be separated by a certain interval.
" Now, suppose the sun to be exactly as far from Venus on one side as the earth is on the other, it is evident that the apparent interval between the two paths would represent on the sun a distance exactly equal to that between the two observers; but we know, to start with, that the distances of Venus from the earth and sun are as 28 to 72 nearly, so that the interval between the two paths will always bear this relation to the distance between the two stations on the earth from which they are observed. If it were possible at the same moment of time to photograph the planet on the sun from two distant stations such as we have imagined, the problem would be at once solved, and in this way. We could determine the length of the line, as seen at Venus, which joins the two stations on the earth at which the observations are made; we could then increase this in the ratio of 28 to 72, to find the exact separation of the black dots representing Venus on the photographs. Hence we could determine the size of the sun, and hence its distance. But,

