If now the earth were homogeneously magnetized throughout instead of being heterogeneously magnetized, the line joining the equivalent magnetic poles, if prolonged, would pass through the points on the earth's surface where the dip is equal to 90°, and this line would be the magnetic axis of the earth. Now only about $\frac{7}{10}$ of the total force of the earth's magnetism can be referred to a homogeneous magnetization, the remainder being due to the inequalities in the earth's magnetization. Hence we must neither expect the points of vertical dip to lie diametrically opposite to each other nor the magnetic axis of that uniform magnetization part to coincide with a straight line passing through the earth and connecting the vertical dip foci. The former line passes through the earth's centre and connects the points on the surface, lying respectively in latitude 78°.3 N., longitude 67°.3 W., and in latitude 78°.3 S., longitude 112°.7 E., while the latter does not pass through the centre of the earth, but off to one side.

In consequence of the heterogeneous magnetization of the earth, a magnetic meridian line is not a straight line leading to the focus of vertical dip, but a very devious line indeed. And thus a great circle passed through the direction pointed out by a compass needle at any given place will not pass through the dip focus or so-called magnetic pole, and the intersection of two of such circles will not coincide with the magnetic pole of Ross. The average position of the successive intersections of the great circles thus drawn would coincide more nearly with the points above given, where the magnetic axis penetrates the earth's surface.[1]

[1] Before leaving the matter of the "magnetic poles" of the earth, it will be well to call to mind the definition due to Gauss, viz., that the magnetic poles are the points where the potential of the earth's magnetism has a maximum and minimum value. Now *if* the entire force of the earth's magnetism could be referred to a potential; if, for example, no part of terrestrial magnetism is due to electric currents which pass from the air into the earth or *vice versa*, *then* the points of maximum and minimum potential would coincide with those of the dip foci. But if a part of the earth's magnetism cannot be referred to a potential, then the two sets of points need not necessarily coincide. There would appear to be some indication that a small part of the earth's magnetism is of this nature.