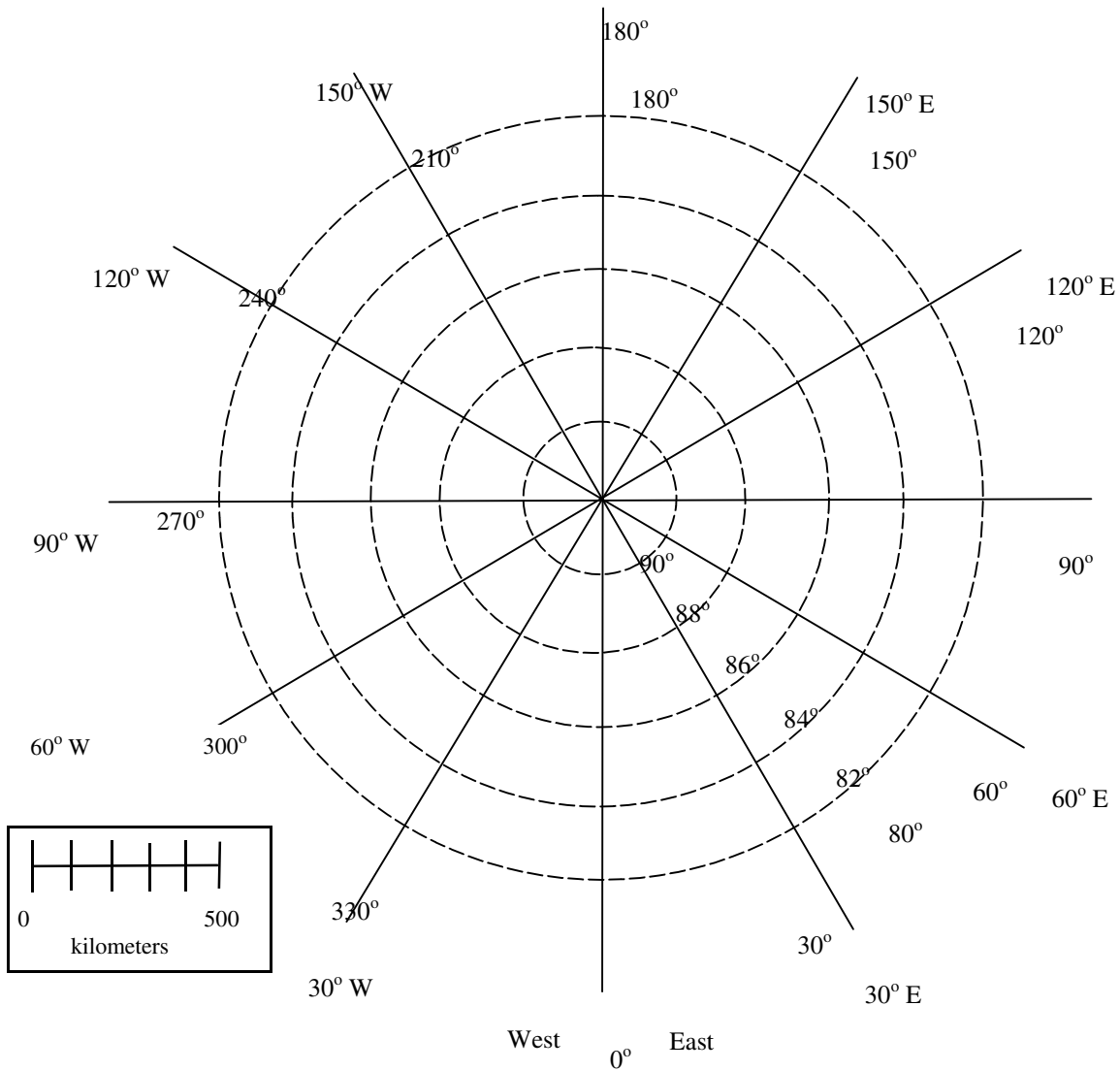


VIII... Wandering Poles in the Last 2000 Years

Before igneous rocks cool and harden, the liquid magma is acted on by the magnetic field of Earth. This causes some of the iron atoms in the rock to align with the magnetic field and "point" toward the magnetic north pole of Earth. When the rock hardens, these iron atoms are locked in position "pointing" toward the magnetic north pole. When scientists analyzed rocks formed at different times in the past, they found that the magnetic pointers did not point to the same location on the Earth. They interpreted this to mean that the position of the magnetic North Pole had moved over time. The magnetic North Pole is still moving today and, using modern instruments, we can measure this movement from year to year.

The following table shows the estimated position of the North Geomagnetic Pole over the past 2000 years. (This table is taken from *The Earth's Magnetic Field* by Ronald Merrill and Michael McElhinny, published in 1983 by Academic Press, page 100.) Plot the following positions on the map provided.

Year (AD)	Latitude	Longitude
1	86.4	121.4
100	87.7	143.9
200	87.7	160.3
300	88.9	131.9
400	86.0	316.3
500	86.1	343.5
600	85.6	6.6
700	84.1	33.4
800	81.8	28.0
900	80.2	38.0
1000	81.3	76.0
1100	85.3	110.0
1200	84.3	135.2
1300	83.2	189.1
1400	84.8	228.3
1500	86.3	301.5
1600	85.6	316.7
1700	81.1	307.1
1800	81.1	297.1
1900	82.3	288.2
1980	82.1	284.1



Look at the locations of the pole at 1000 AD and 1100 AD.

1. How far did the pole move? _____
2. How far did the pole move (in km) in one year? _____
3. How far did the pole move in meters in one year? _____
4. Approximately how far did the pole move per day? _____
5. Estimate when the Geomagnetic North Pole was at the same location as the Geographic North Pole (Latitude = 90°). _____
6. What assumptions must be made to answer Question 5?