LONGITUDE

Here lies the real, hard-core difference between latitude and longitude-beyond the superficial difference in line direction that any child can see: The zero- degree parallel of latitude is fixed by the laws of nature, while the zero-degree meridian of longitude shifts like the sands of time. This difference makes finding latitude child's play, and turns the determination of longitude, especially at sea, into an adult dilemma-one that stumped the wisest minds of the world for the better part of human history.

Any sailor worth his salt can gauge his latitude well enough by the length of the day, or by the height of the sun or known guide stars above the horizon. Christopher Columbus followed a straight path across the Atlantic when he "sailed the parallel" on his 1492 journey, and the technique would doubtless have carried him to the Indies had not the Americas intervened.

The measurement of longitude meridians, in comparison, is tempered by time. To learn one's longitude at sea. one needs to know what time it is aboard ship and also the time at the home port or another place of known longitude-at that very same moment. The two clock times enable the navigator to convert the hour difference into a geographical separation. Since the Earth takes twenty-four hours to complete one full revolution of three hundred sixty degrees, one hour marks one twenty-fourth of a spin, or fifteen degrees. And so each hour's time difference between the ship and the starting point marks a progress of fifteen degrees of longitude to the east or west. Every day at sea, when the navigator resets his ship's clock to local noon when the sun reaches its highest point in the sky, and then consults the home-port clock, every hour's discrepancy between them translates into another fifteen degrees of longitude.

Those same fifteen degrees of longitude also correspond to a distance traveled. At the Equator, where the girth of the Earth is greatest, fifteen degrees stretch fully one thousand miles. North or south of that line, however, the mileage value of each degree decreases. One degree of longitude equals four minutes of time the world over, but in terms of distance, one degree shrinks from sixty-eight miles at the Equator to virtually nothing at the poles.

- What is one rule that defines where the Equator (0° latitude) must be? 1.
- 2. What is another name for the equator used in this passage?
- What two things must you know to calculate you longitude while at sea? 3.
- 4. How many degrees have you traveled if your "local time" is different by four minutes from your home port's time?
- 5. If you travel one degree of longitude over the surface of the Earth, how many miles have you traveled?