

## THE OLDEST AMERICAN OBSERVATORY ?

By

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In the midst of the steaming jungles of the Yucatan Peninsula of Mexico, lie the ruins of the ancient Mayan city of Chichen Itza. Amongst the ruins is a very strange building, a round tower with a top shaped somewhat like a dome. The roundness of this building is strange, since all of the other buildings at Chichen Itza are either square or rectangular. Investigations have shown that this building was used as an astronomical observatory, and, indeed, the shape of the top of the tower does remind you of the dome of a modern astronomical observatory. The tower has been named Caracol Observatory. 103

The Mayans did not have telescopes. Their observations were made by sighting through the various doors and windows of the observatory. This work was important because it helped keep track of the positions of the Sun and the Moon, and these positions, in turn, determined the calendar and seasons which told the Mayan farmer when to plant his seeds and to harvest his crops.

There were four doors in the lower part of the tower. They were built so that they faced exactly North, South, East and West. Thus, the building acted as a compass, showing the various directions. 202

The upper portion of the tower was constructed in such a way that the astronomers, who were probably the priests of the tribe, could make sightings along certain lines, using their unaided eyes. There is a small chamber in the upper tower and from it, three passages lead to the outside, ending in the three windows which are visible from the ground. The astronomer would stand in the central chamber and sight from the inside end of the tunnel to the outside end on the opposite side. Since there were three passages and each one had two inside corners, there were six lines along which the astronomer could sight. What could be learned from these sightings? 315

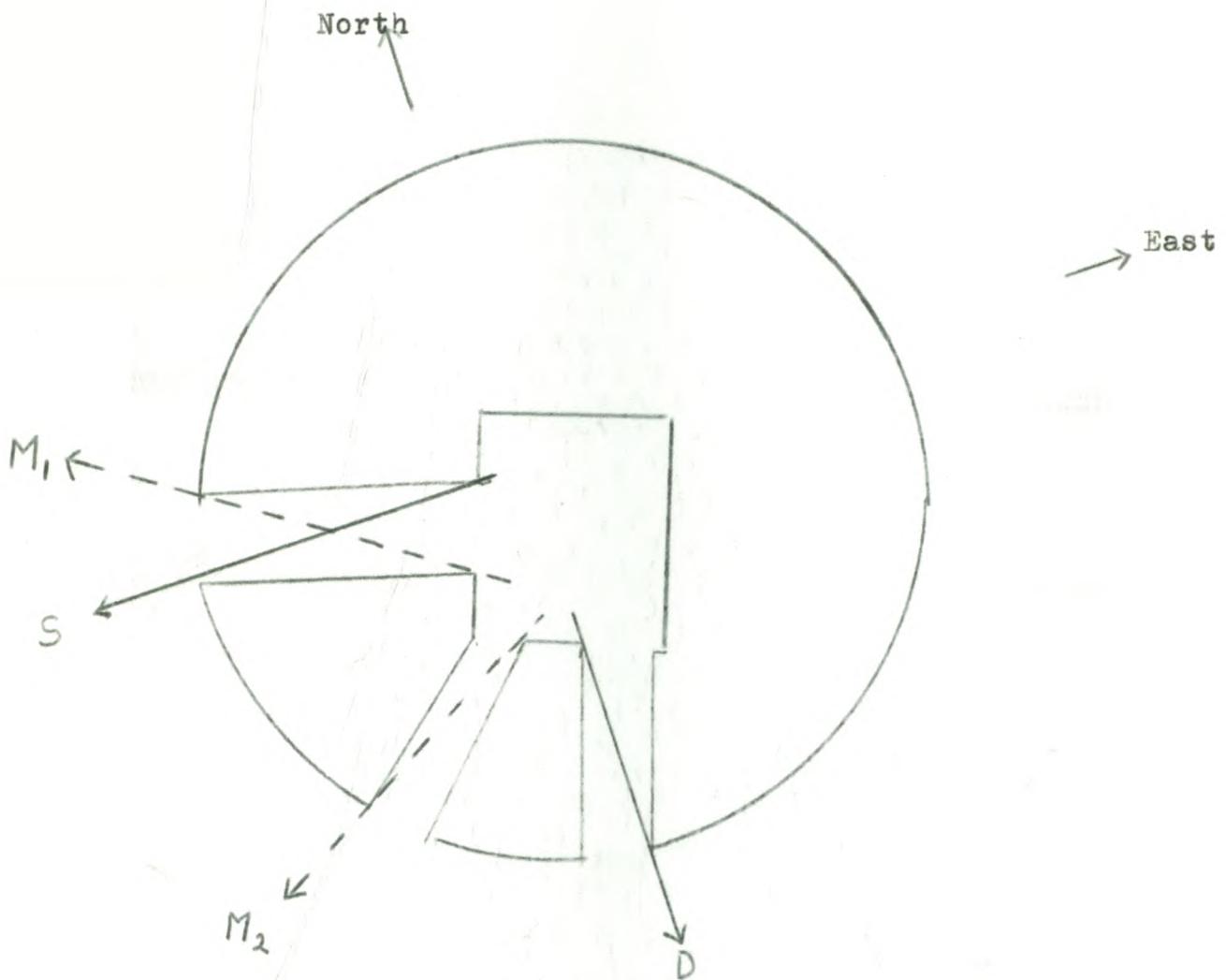
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If you watch the sunrise or sunset every day, you will see that the Sun sets in a slightly different position from where it was the day before. This is also true of sunrises. The Sun sets farther and farther north along the western horizon until June 21. Then it sets farther and farther south on the horizon until December 21, when it begins to come northward again. It is this apparent motion of the Sun which determines the seasons. June 21 is the first day of Summer, while December 21 is the first day of Winter. The mid-points, March 21 and September 21 are the first days of Spring and Autumn, respectively. 428

The Moon also moves its rising and setting points north and south but in a slightly more complicated way than the Sun.

The ancient astronomers at Caracol Observatory had constructed their windows so that when they sighted through them on March 21 or September 21, the Sun was setting on that particular point on the horizon. So, by watching the sunset day after day, they could tell that Spring or Autumn had begun when the Sun set along that particular line of sight. The Sun sets along that line ONLY on March 21 and September 21, and so, was an excellent and accurate marker of the seasons. 534

The American astronomer, Anthony Aveni, has studied Caracol closely and has determined that some of the other sight-lines were connected with the setting of the Moon and with the motions of the planet Venus. He believes that Caracol was built around the year 1000 A.D., when the Vikings were exploring the eastern coast of Canada, and Europe was in the midst of the Dark Ages. While Europeans lived in ignorance and superstitious fear of the sky and the objects in it, ancient Mayan astronomers were studying the motions of astronomical bodies from Caracol Observatory at Chichen Itza. 632



- $M_1$  -- The point of farthest North moonset
- S -- The direction of Sunset on March 21 and September 21
- $M_2$  -- The direction of farthest South moonset
- D -- Due south direction