

The Pyramids of Egypt and the Americas

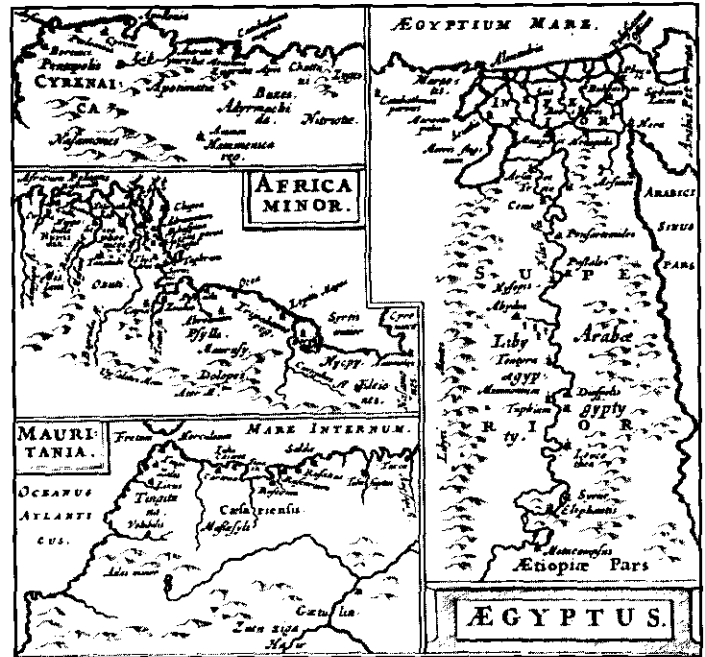
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The Egyptians had great veneration for their dead ancestors, building permanent tombs and temples to enjoy in the afterlife. These impressive structures have long drawn scholars to Egypt, a rich field for ancient historical and mathematical research.

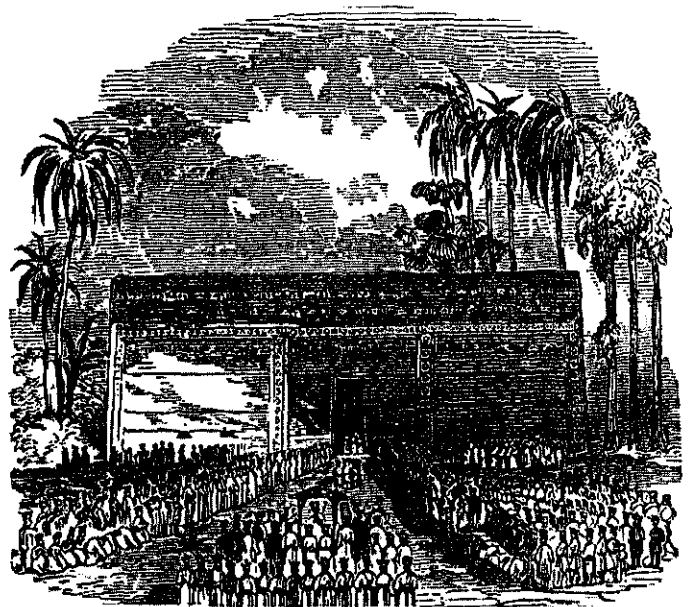
The construction of the Great Pyramid of Gizeh, built around 2600 B.C., required considerable mathematical and engineering skills. Ancient architects used their knowledge of volume, area, estimation, right angles, and perhaps the geometric relationship we now know as the Pythagorean theorem to compute the size, the shape, the number, and the arrangements of the stones used to build the pyramids.

In addition to Gizeh's famous structure, 35 major pyramids stand near the Nile River in Egypt. Each was built to preserve the mummified body of an Egyptian king, which was placed in a secret chamber filled with gold and precious objects. (Sometimes a smaller pyramid for the body of the queen was constructed next to the king's pyramid.) Some scholars believe that pyramids, rather than structures of a different shape, were used for tombs because the pyramids' sloping sides paralleled the slanting rays of the sun, enabling the soul of the kings to climb to the sky and join the gods.

Many centuries later (A.D. 100–900), Central and South American Indians constructed pyramids equal in size and splendor to those of Egypt. The American pyramids differ from their Egyptian counterparts in that they are not “true” pyramids—they have steps. Because these pyramids were not used as tombs, but rather as platforms for temples, the many steps allowed the priests to access the temples for religious ceremonies and rites. The Mayan Temple of the Inscriptions at Palenque, Mexico, is an exception. It contains an elaborate tomb that was probably constructed prior to the pyramid that sits atop.



Seventeenth-century map of ancient Egypt, engraved by Philippe Cluverio.

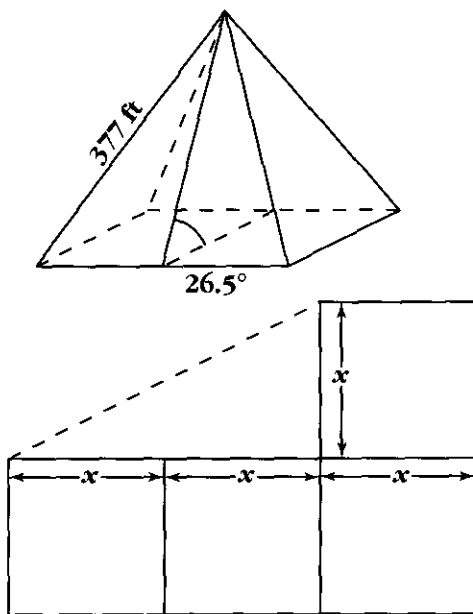


Early engraving of Peru's Temple of the Sun.

Notable American pyramids include the Temple of the Sun, constructed on the northern coast of Peru by the Mochica Indians, and the Pyramid of the Sun (A.D. 150) at Teotihuacán in central Mexico. The base of the Pyramid of the Sun is larger than that of Gizeh. ★

Activities

1. In the Yucatan of Mexico, there is a Mayan pyramid called El Castillo that has a platform on the top and a flight of 91 steps on each of the four sides. (Four flights of 91 steps make 364 steps in all. With the top platform adding a level, there are 365 levels to represent the 365 days of the Mayan year.) To the nearest centimeter, what is the height of the top platform if each of the 91 steps is 30 cm deep by 26 cm high? What is the angle of ascent to the nearest degree?



2. With a straightedge and a compass, construct a scale model of a “true” pyramid out of cardboard.
3. Research the ziggurats of Mesopotamia. How and why were they constructed? Do they resemble either the Egyptian or the American pyramids?
4. In 1985, United States Naval Observatory astronomer Richard Walker solved an ancient puzzle. He discovered that the passageway of Egypt’s Great Pyramid of Cheops did not descend at an angle of 26.5 degrees to point at the North Star, as was previously thought. Instead, the angle results from placing four stones of equal length in the position shown at left. Show that this construction technique creates an angle that measures 26.5 degrees.

Related Reading

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