

Mountain Skies

July and August 2002

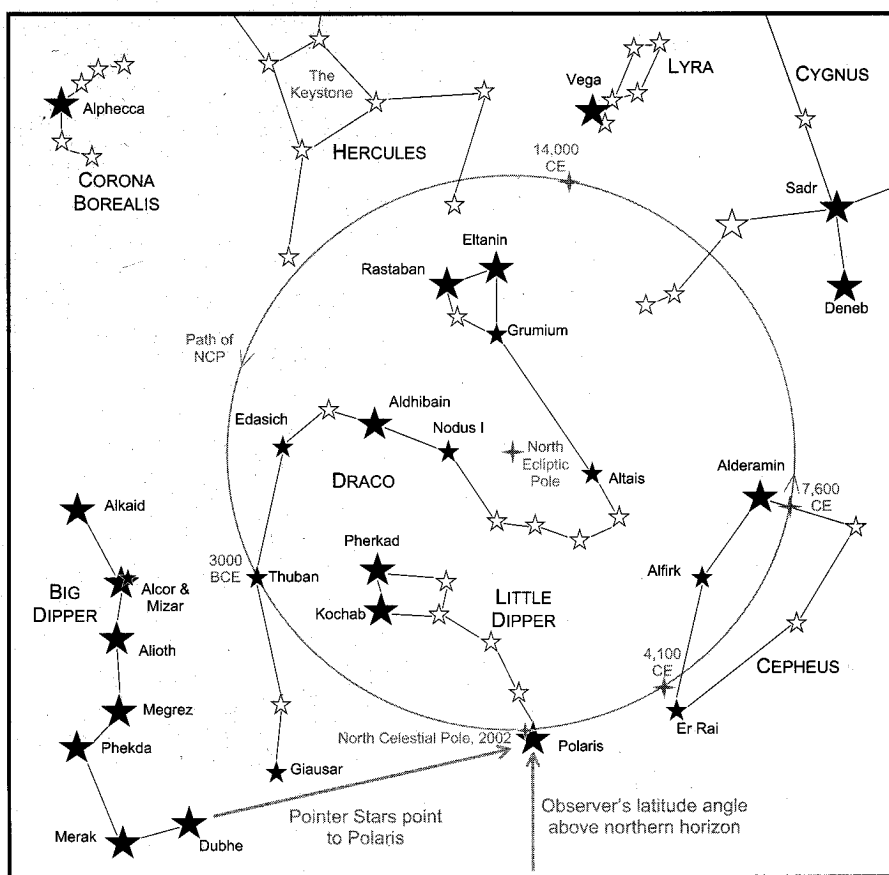
AFTER THEIR GRAND SHOW in the evening sky during April and May, the planets have slowly dispersed so that July finds Venus, Mars, and Jupiter lingering in the dusk, while Saturn and Mercury have passed to the west side of the sun and emerged into the morning sky. Jupiter and Mars set while the sky is still bright. Jupiter will pass behind the sun on July 20. Mars, moving across the sky faster than Jupiter, stays east ahead of the sun until it's overtaken on August 22. Both planets will then emerge in the morning sky as fall returns to the North Country.

Venus, though bright enough to be seen even in the bright dusk, is within 20° (about the width of your stretched hand, from thumb to pinky held at arm's length) of the horizon and sets within two hours of the sun. Look for this brilliant world to gather with the waxing crescent moon on July 12 and August 11.

In the morning sky, Mercury was at its greatest distance from the sun on the day of the summer solstice, June 21. Since then it has plunged back toward the sun in the sky as its orbit takes it behind our local star. Saturn, on its slow plod across the sky remains in Taurus where it has been since it passed into this constellation with Jupiter in late May 2000. Jupiter moved in to Gemini in July 2001, but Saturn will linger in Taurus until the last day of August when it will move into Orion. However, it's not done with Taurus, as its retrograde motion will take it back into Taurus on November 22.

High in the north during these summer months, Draco the dragon curls languidly around the dippers in the early evenings. As shown in the diagram, the head is made up of the stars Rastaban (ROSS-tuh-ban, head of the dragon), Eltanin (EL-TAY-nin, the serpent), and Grumium (GROO-mee-um, the jaw). This is

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Looking north at 11 P.M. on July 1; 9 P.M. on August 1; 7 P.M. on September 1, 2002.

also an asterism, The Losenge, which is always above the northern horizon for observers north of the 38th parallel. From the head, the body of the dragon stretches toward Cepheus. Just past Altais (AL-taze, serpent) it curls up and around the Little Dipper marked by Nodus I (the first knot) and Aldhibain (the Hyena). The tail of the dragon lies

between the two dippers, ending in Giasar (JOE-zar, the dragon's head and tail).

Pyramid Puzzle

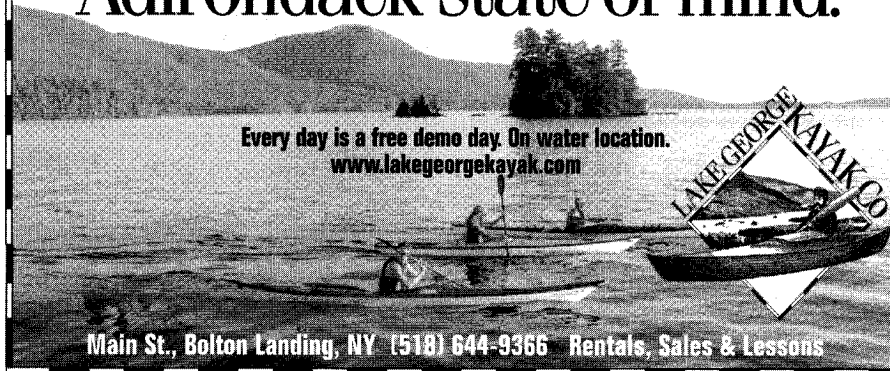
The lumina of the constellation is Thuban (THOO-ban, dragon) which was the Arabic name of the entire constellation. Though not now a well-known or remarkable star,

Thuban was very important to the ancient Egyptians, for it marked the north celestial pole around 3000 BCE as Polaris marks the pole for us now. It is thought that the Pharaoh Khufu, who built the Great Pyramid of Khufu at the north end of the Giza Plateau, had the pyramid engineered with this star and the constellation Orion in mind. Orion was thought to be the resting place of the pharaohs and Thuban was the eternal star that never set, and in fact never moved as the marker of the pole. From Khufu's burial chamber in the pyramid, one shaft was aimed at Orion, the other at Thuban.

The reason why we have a different pole star today is that the axis of the Earth slowly wobbles, like the axis of a spinning top. This motion, called precession, takes about 25,770 years to complete one full revolution. On the diagram, notice that Draco is curled around the north ecliptic pole, the north pole of Earth's orbit, about which the rotation axis precesses (the rotational axis of a top precesses about the vertical). Polaris will be closest to the celestial pole (the rotational pole) in another hundred years. From there, the pole will circle past Er Rai (uh-RAY-ee, the shepherd) around 4100 CE and then Alderamin (al-DARE-uh-min, the shoulder) around 7600 CE, and be close to Vega (VEE-ga) around 14,000 CE. This motion, although slow, is significant over the centuries and even over mere decades. It has been postulated that the Egyptians aligned the pyramids with due north by using the vertical alignment of the stars Kochab (KOH-kab) in the Little Dipper and Mizar (My-zar), the brightest of the close pair of stars in the middle of the Big Dipper's handle. This alignment marked true north only in the year 2467 BCE, and has since drifted to its current position 14° west of north. The very slight error in the alignment of the pyramids has long puzzled scholars since it is much less than the error that would have resulted from use of the pole star or the motion of the sun. However, scholars have recently matched these errors to the drift of the star line from true north and thus claim that the Great Pyramid of Giza was built between 2473 and 2483 BCE. The stars have more to tell us than we can guess.

—Aileen O'Donoghue

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