

Star of Bethlehem may burn brighter in our own time

By Emily Morrison
The miracle of the Star of Bethlehem requires no explanation for those whose faith makes the celebration of Christ's birth the holiest and most meaningful expression of spirituality in "the long calendar of the year." Yet haven't we all wondered on occasion, as we looked up in amazement at the vastness of the night sky, whether the brilliant light followed by the three Magi had some astronomical significance that underscored its heavenly message of peace to all humanity?

Since the late 1960s, the Rochester Museum and Science Center's Strasenburgh Planetarium has almost annually projected onto its curving dome the intriguing story of how astronomers and historians have worked together to scientifically "explain" the Star of Bethlehem. In 1981, "The Star of Christmas" was temporarily supplanted by a new planetarium Christmas show, but a 1978 revision of the original show was back again last Christmas season, by popular demand. "Our Christmas show has probably played at 30 or 40 other planetariums around the world," says Strasenburgh Planetarium producer/astronomer Fran Biddy. "Hundreds and hundreds — and perhaps thousands — of church groups have come to see both shows."

This Christmas season, neither version is being shown, while the Cinema-360 Space Shuttle show that previewed here last summer finishes out its extended run. Revised previously in 1978 to bring the story up to date with then current scientific findings, the planetarium's popular Christmas show has been temporarily "retired," while planetarium astronomers work on a new Christmas story to be presented in 1986.

Past scripts reveal a mosaic of fascinating theories and speculations as to the astrophysical nature of this mysterious heavenly body that lit the way to the manger in which Jesus was born. "The stars have changed little since that first Christmas, 20 centuries ago," reads the 1981 version, "and the imagination, now as then, can add order to the heavens by tracing patterns which slowly ride across the sky but never change their shape."

Against the enduring backdrop of the migrating constellations (including the Northern Cross, a cluster of stars that stands upright on the northwest horizon at about 9 p.m. during each Christmas season), the star of Bethlehem must have appeared. "In order to answer the elusive question of its nature, we must explore both history and the heavens, beginning by an adjustment in time and location," according to the 1978 script, the most pertinent one on record to the subject of the mystifying star.

Basing their deductions partly on the scriptures, in which St. Luke tells us that shepherds kept watch over their flocks by night, historians speculate that Christ must have been born in the spring during lambing season, the only time of year that such careful guard is necessary. Furthermore, the date of Christ's birth was very likely several years earlier than our calendar records. According to a theory that stems from the writings of Jewish historian Flavius Josephus, the biblical villain King Herod died during a lunar eclipse. By tracing back eclipse cycles, astronomers determined (or at least thought they had, according to theories in vogue prior to 1981) that such an event occurred in March of 4 B.C.

The 1978 script cites several other aids for determination of the accurate date of Christ's birth, among them biblical accounts of the flight into Egypt and the practical reason for Mary and Joseph's journey. "We know that Mary and Joseph were on their way to their hometown to pay a tax, and from recent archaeological discoveries made in Turkey, we have learned that there were three great taxations in the Roman Empire in 27 B.C., 7 B.C. and 14 A.D. Because communication was slow in those days, we have allowed a few years for word to circulate through the most remote corners of the Roman Empire."

The dates when these events are estimated to have occurred overlap in the years 7 B.C. to 5 B.C. "From an even more precise evaluation," reads the planetarium's script, "the time can be narrowed down to the spring of the year 6 B.C."

Early Christmas celebrations, held of necessity in a still overwhelmingly Roman

culture, came to be associated with the pagan festival known as the "Saturnalia," believed to have been annually observed in the Roman Empire after December 21. To avoid further persecution by the Romans, early Christians staged their own unobtrusive religious celebrations under the unwittingly protective umbrella of Saturnalian revelry.

If these calculations are accurate, then the next step involves tracking the movement of the heavens back in astronomical time, until we arrive at the night of the first Christmas, or so the theory goes. Astronomers offer the following rationale to set the stage for the presence of the brilliant star in the eastern skies:

The Earth undergoes three basic motions; it rotates (or spins), it revolves (around the Sun), and it also precesses. The Earth's precession is a very slow, almost imperceptible wobbling motion. It takes nearly 26,000 years to complete one cycle and so becomes important only when we consider relatively long time periods. The Earth's north pole hasn't always pointed to the present-day North Star; nor will it always point there.

By speeding up this agonizingly slow motion, the nearly 2,000 years that have come and gone from the time of the first Christmas flash by. In moments, we are near zero, or more precisely, 6 B.C. No longer is

our familiar North Star located over Earth's north pole, and the stars are those seen when Caesar Augustus was emperor in Rome, and Herod the king of Judaea.

Next come two long passages from St. Luke and St. Matthew, encapsulating the glad tidings of Christ's birth, the Magi, and the Christmas star, as well as the grim pursuit by King Herod of the newborn child. "For centuries," reads the passage immediately following the quotation from scripture, "astronomers have tried to determine just exactly what natural explanations might be offered for the celestial part of this event."

The core of any scientific theory on the matter depends, of course, on what is meant by the word "star," according to the script. Whereas in modern times the term refers to the points of celestial light we now define as stars, ancient peoples equated the word "star" with light of any kind, including that of sun, moon, planets, stars, groups of stars or planets, comets and meteors.

"An intense meteor shower or a single brilliant meteor makes an attractive and dramatic star, but it doesn't have one of the qualities we seek in the explanation of the Star of Bethlehem, and that is the lingering nature that allowed it to lead the Wise Men on their journey," the script goes on. A bright comet might satisfy all of the de-

finite requirements for the Star of Bethlehem, since bright comets may be seen for several months — yet comets during this era were regarded as evil omens.

Perhaps, astronomers contend, the star was a nebula, a nova, or even a pair of binary stars. "Stars go through an evolutionary process beginning with birth from celestial clouds of gas known as nebulae," states the theory. "They grow up, mature and finally, as the millennia pass, grow old and, one by one, fade out. Some stars, however, age more spectacularly. There are places in the heavens where pairs of stars called binaries revolve around each other. Late in life, the matter flowing from one star to its companion is heated to tremendous temperatures, triggering an explosion known as a nova."

Such a nova may appear in the sky as a "new" and extremely bright star that may linger for days, weeks or even months. Three English astronomers who have examined ancient Chinese and Korean chronicles have revealed that two possible novas occurred in the eastern pre-dawn skies in the spring of the years 4 and 5 B.C.

"Could the Star of Bethlehem have been a nova?" ask planetarium astronomers, who point out that it certainly did present a bright and lingering light. This theory, however,

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