

The Sky: Connecting Science and Symmetry with Reverence

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Abstract:

The celebration of equinoxes and solstices predates the major religions of the world. Studying the vastness of the sky offers a connection between science and the human desire to understand the symmetry and order of the universe. This paper will focus on the vernal equinox, how ancient civilizations deciphered it and made it into an event with religious and cultural significance. The Zoroastrians are among the many people of the world who have celebrated the vernal equinox through the ages and continue to do so today.

The author, who is a practicing Zoroastrian, will use the vernal equinox as an example of an event in the sky that connects the cultural traditions and religious teachings of her faith to science. Since Zoroastrianism teaches reverence for the physical world and emphasizes human choice and good thinking, it demonstrates the reconciliation of science and religion. With 2009 being the International Year of Astronomy, it is fitting to create awareness, and appreciate our common roots by studying and celebrating the sky.

Introduction

The Sky—it connects us through space with our fellow human beings and through time with our ancestors. Ruled as we are by clocks and calendars, it is difficult for people living in our era to imagine life without objects that give precise information about the passing of hours, days and years. And yet, it only takes a few steps back in history to realize that the foremost clock available to us is the one up overhead, the sky.

The incredible images from our worldwide array of telescopes, and specially the Hubble, only help to emphasize the vastness of the universe and the rich diversity of objects it holds. At the other end of the spectrum is the micro-world, which explored with microscopes, is no less enthralling. As humans we have an innate desire to understand, to explain, to express in words, to paint pictures, and gain intellectual satisfaction. The fundamental questions of who we are and where we come from and where we are going are not limited to any one culture. But a common thread that runs through the spiritual heritage of diverse cultures is that the ‘divine is up overhead.’

E. C. Krupp says, “We know where up is. It’s overhead, high above us. Up is the sky. Up, however is a lot more than direction, it’s an idea. Getting up (in the morning) is a return to consciousness and action. We stand up for things we believe in and ethical behavior makes us upright. If we are informed, we are up-to-date. Upgrade means to improve, upbeat is optimistic, depressed we are down. If the computer is up it is powered for operation and results. When it is down it doesn’t work. Up means much more than ‘overhead.’ For a two-letter word, it’s a rich mine.”¹

And what about the brightest object up there—our Sun? Our knowledge of what makes it shine is less than a century old, but humans from eons past have recognized its importance to our life on earth. Does it travel in the same path all the time? Does its path vary for different locations? Will it stop shining

¹ Krupp, Edwin C. *Beyond the Blue Horizon*. (New York: Oxford University Press, 1992), 22.

some day? Does its heat and light stay constant or does it vary over time? While the last question may have impact for the current debate on global warming, solutions to many of the other questions have been explored and answered by our ancestors, who as farmers, were much more conversant with the movement of our star, than the average person in the 21st century.

The Vernal Equinox

Growing up in urban Karachi, Pakistan I did not have much need or opportunity to think about the annual path of the Sun. As Parsi Zoroastrians, we were used to being minorities in an Islamic country, but we enjoyed excellent educational opportunities, with freedom to study, travel, and work in interesting professions. March 21st was celebrated among my Parsi Zoroastrian community as *Jamshedi Navroze*. The day began with my mother making “chalk designs” on the doorstep, and my father hanging up strands of flowers in the doorways—both customs of Hindu origin. Wearing new clothes, we visited the fire temple and prayed in the ancient language of Avesta before the consecrated fire. After visiting older relatives, we gathered for a family meal at our grandmother’s home. We learned, of course, that March 21st represented the vernal equinox, but living in Karachi with its mild climate, the date did not have much impact other than to know it would be getting warm soon.

Studying astronomy has taught me the true significance of the vernal equinox. It is the date on which the Sun rises due east and sets due west for all locations on Earth. It is the date on which all locations enjoy twelve hours of sunlight and twelve hours of darkness. For the northern hemisphere the days will keep getting longer until the summer solstice, which occurs around June 21. It is also the date on which the sun’s path, called the ecliptic, coincides with the celestial equator. Since the Earth’s axis is tilted at 23.5 degrees, the northern hemisphere tilts towards the Sun from December to June. But on the two equinox dates in March and September, the Earth’s orientation makes the sun shine equally on both hemispheres, resulting in the 12-hour day and 12-hour night. *Although the vernal equinox is commonly associated with a date, it is really a location in the sky, and when the sun reaches this location, it is the exact moment of the equinox.* For astronomers, the equinox and solstice positions mark important cardinal points in the sky from which many measurements are made.

Knowing that the vernal equinox is a Zoroastrian celebration from prehistoric times, the question of how this day was identified begs for some answers. Without a compass, how did ancient people know what is due east? Without a clock how did they know which day enjoyed exactly half light and half darkness? And without written records, how did they transmit this information from generation to generation?

Many ancient civilizations have identified solstice and equinox dates, and celebrated the occasions with feasts, sacrifices and ceremonies. Perhaps the most ancient solstice marker is Stonehenge dated around 3000 BCE. The astronomical alignment of the Egyptian pyramids, built in the same era remains a quest for historians and archeologists. As an agricultural society dependent on the river Nile, the Egyptians are known to have related the flooding of the Nile with their new year, which occurred around the time of the summer solstice. But it was the appearance of the brightest star Sirius just before sunrise, known as the heliacal rising of Sirius, which helped pinpoint the imminent inundation of the river banks.²

One of the earliest equinox artifacts may be a cylinder seal from the Babylonians, who celebrated their new year with an *akitu* ceremony at the spring equinox. This cylinder-seal dated at the Akkadian period (2360-2180 BCE) shows a sun god emerging between two mountain peaks surrounded by other symbols of renewal like fish swimming in water.³ The emergence of the sun signified an annual cycle that the Babylonians recognized, and venerating this cycle was a necessary practice to maintain political power which would be evident by the sun's cooperation.⁴

Perhaps the grandest celebrations for the vernal equinox were held at the Persian palace known by its Greek name, Persepolis. Started by Darius the Great in 520 BCE, and built by many monarchs, this monumental palace was the center of the Achaemenian Empire, which stretched from the River Indus in the east to the Nile in the west; Asia Minor in the north to Egypt in the south. Darius was a descendent of Cyrus the Great, the same Cyrus who freed the Jews from their Babylonian captivity and is known for being a champion of human rights for all the citizens of his empire. Kriwaczek notes that, "it was under Cyrus that Iran became the core of the first universal, multiracial, multi-faith empire".⁵ Surviving the ravages of time at Persepolis are the intricately carved grand staircases, showing a procession of ambassadors from across the vast Persian Empire, bearing gifts for the king from their regions. This event is known to have taken place on the spring equinox and the celebration called *Noruz* remains a special occasion in much of Central Asia today.

Only a thousand years ago, during the tenth century⁶ the Maya built El Castillo also known as the Pyramid of Kukulcan in northern Yucatan. On the day of the vernal equinox, about two hours before sunset, as the sun hits the northwest corner of the pyramid, the nine high steps cast shadows to form a pattern of lighted triangles on the wall of the 91 shallow steps, and this pattern of light and dark resembles

² Krupp, Edwin C. *In Search of Ancient Astronomies*. (New York: Doubleday & Co, 1978), 32.

³ Krupp, Edwin C. *Echoes of The Ancient Skies: The Astronomy of Lost Civilizations*. (New York: Harper & Row, 1983), 203.

⁴ Aprim, Fred. *Akitu and Newruz*. [www.fredaprim.com/pdfs/2004/Akitu and Nuroz.pdf](http://www.fredaprim.com/pdfs/2004/Akitu_and_Nuroz.pdf)

⁵ Kriwaczek, Paul. *In Search of Zarathustra*. (New York: Alfred A. Knopf, 2003), 171.

⁶ Krupp, Edwin C. *Beyond the Blue Horizon*. (New York: Oxford University Press, 1991), 96.

the back of a serpent. As the sun gets closer to the horizon, the lighted triangles disappear, making it appear as if the symbolic serpent has slithered into the ground. Even after a thousand years, seeing the serpent descend down the pyramid is a major equinox event in Mexico and huge crowds gather at El Castillo every year to watch the moving images made by the Sun on a Maya temple.

What is it about the equinox that has connected cultures over vast distances? While we can understand the cross-pollination of ideas and information from the Egyptians to the Babylonians and the Persians, how did the Maya who were separated by two vast oceans from Eurasia come to venerate the same event in the sky? It is also interesting to note that while solstice celebrations are more common among northern civilizations, people in the temperate latitudes seem to favor the equinoxes.

Prophet Zarathushtra

To connect the vernal equinox to the cultural and religious practices of my personal experience, let us detour to Zarathushtra, the Prophet of Ancient Iran. While some western scholars claim he lived from 628-551 BCE, Hinnells⁷ suggests his time frame to be between 1400 to 1200 BCE. Some Greeks placed him around 6000 BCE which may be untenable.⁸ The currently accepted range of dates is from 1700 BCE to 1200 BCE, about 100 years before Moses and 1000 years before Buddha.

The location of Prophet Zarathushtra's birth and life are similarly unknown, but it is probable that he lived on the central Asian steppes, between the Aral and Caspian seas, north and east of Iran. Trained as a priest in the older traditions of his family, Zarathushtra left home at the age of twenty and according to legend, received divine revelation ten years later on the day of the vernal equinox. Although he faced an uphill struggle to convey his message, he ultimately succeeded and at least three major Iranian dynasties of recorded history, the Achaemenians, the Parthians and the Sassanians followed the Zoroastrian religion.

The teachings of Prophet Zarathushtra which predate those of other prophets like Moses, Buddha, and Confucius, have survived in the form of hymns called the Gathas, which are probably the most ancient piece of literary excellence in the form of poetic verse. The verses are known to have been composed by the Prophet Zarathushtra himself, in the ancient language of Avesta which has many linguistic similarities to the Sanskrit of the Rig Vedas. In fact it is through the study of the Vedas that the language of the Gathas has been deciphered and translated and we also get a sense of the timeline when these ancient verses were developed.⁹

⁷ Hinnells, John R. *Persian Mythology*. (New York: Peter Bedrick Books, 1985), 9.

⁸ Nanavutty, Piloo. *The Gathas of Zarathushtra*. (Ahmedabad: Mapin Publishing, 1999), 13.

⁹ Nanavutty, Piloo. *The Gathas of Zarathushtra*. (Ahmedabad: Mapin Publishing, 1999), 16.

The Gathas have been transmitted through time by oral tradition, with priests memorizing the verses and conveying them to the next fifty generations.¹⁰ It was only in the first century during the reign of the Parthian King Valkash (51-79 CE) that many of the prayers recited orally for centuries were finally written.¹¹ The compilation of all the Zoroastrian sacred scriptures is now collectively known as the Avesta. But the language of the entire collection compiled through the ages varies from the Avesta of Prophet Zarathushtra's era, to the Old Persian of Achaemenian times and the Pahlavi and Pazand languages which were used during the Sassanian dynasty.¹²

The Gathas are seventeen hymns, divided into five chapters, and each chapter has its own meter and cadence. For example, the first chapter called Gatha Ahunavaiti has three lines in each of its verses. Gatha Ushtavaity has five lines in each verse etc. The symmetry of the arrangement points to a highly intelligent composer-poet, who not only enjoyed divine illumination, but also had the mental brilliance to translate his thoughts into words that have survived through the millennia. The names of each of the five chapters give a sense of their contents. Gatha Ahunavaiti emphasizes free choice. Gatha Ushtavaity is the Gatha of illumination. The holy spirit and loving service are the central themes in Gatha Spenta Mainyu and Gatha Vohu Kshathra respectively, ending with the fulfillment of the highest wish in Gatha Vahishta Ishti.

Some of the Gathic verses are questions that Prophet Zarathushtra asks God about the nature of the universe and humanity, and there are answers inherent in them. Within these verses we find many fundamental Zoroastrian principles like the presence of the good and evil spirit and the freedom that all human beings enjoy to choose the path they will follow. Nanavutty translates section 30.2 in Gatha Ahunavaiti as

“Listen to the noblest teachings with an attentive ear.
With your penetrating mind discriminate between these twin mentalities, man by
man, each one for his own self.
Awake, to proclaim this Truth before the Final Judgment overtakes you.”¹³

God is called Ahura Mazda, the lord of wisdom, and He is man's friend, never to be feared, and He is an ally to help humanity progress towards perfection.¹⁴ In this task men and women are aided by six cardinal virtues – good mind, truth and righteousness, determination and strength, devotion and love, which all lead to the desired states of perfection and immortality. These six principles are also called the

¹⁰ Boyce, Mary. “The Teachings of Zoroaster” chapter in *A Zoroastrian Tapestry*, Edited by Pheroza Godrej and Firoza P. Mistree. (Ahmedabad: Mapin Publishing, 2002), 19.

¹¹ Nanavutty, Pilo. *The Gathas of Zarathushtra*. (Ahmedabad: Mapin Publishing, 1999), 13

¹² Mistree, Khojeste P. *Zoroastrianism - An Ethnic Perspective*. (Bombay: Zoroastrian Studies, 1982), 116-117.

¹³ Nanavutty, Pilo. *The Gathas of Zarathushtra*. (Ahmedabad: Mapin Publishing, 1999), 78.

¹⁴ Dhalla, Maneckji. *History of Zoroastrianism*. (Bombay: K. R. Cama Oriental Institute, 1994), 32.
God as man's friend is evident in Gatha Ushtavaity 46.2

Amesha Spentas and their Avesta names are Vohu Manah, Asha Vahishta, Kshathra Vairya, Spenta Armaiti, Haurvatat and Ameretat. As Zoroastrian children are taught, any task, even homework, if it is performed truthfully, with a clear mind, determination and devotion, will yield success.

Zarathushtra constantly implores Ahura Mazda to grant him insight and wisdom. Good thinking is a continual, active process that is a very central theme in the Gathas. One of my favourite Avesta words is “ushta” which has been translated as happiness, illumination, bliss, prosperity and joy. Taraporewala considers the root “ush” as meaning “to shine,” and traces the word Zarathushtra to consist of two words, Zarath (golden) and Ushtra (light), or “He of Golden light.”¹⁵ One of the first prayers a Zoroastrian child learns is called Ashem Vohu and it has only 12 words, two of which are ‘ushta.’ In the Ushtavaity Gatha, the word ‘ushta’ occurs repeatedly in a sentence which is translated as “Who brings to others light, himself gets light.”¹⁶ As a teacher I choose to interpret this sentence in a very personal way – that is, the work I do daily not only helps others, but increases my own sense of self worth. The deeper meaning of ushta is profound. It means the satisfaction and inner joy one feels when there is comprehension, understanding and insight. An elegant mathematical proof, a lucid theory of nature, a beautifully choreographed piece of music, an inspiring string of words—they are all examples of ushta. For me personally, there is no dissonance between the teachings of Zarathushtra and science. The theories of science are all manifestations of human beings’ good mind. In fact science is the epitome of clear thinking, with rationality and logic ultimately leading to truth. Every insight into nature is ushta personified.

One of the finest hymns in the Gathas, is the one identified as Yasna 44. In it Zarathushtra asks many questions about the nature of the material and moral universe, and while the answers are not easily evident, the implication is for all individuals to find their own answers and thus attain enlightenment.¹⁷

Gleiser notices the parallels between the goals of science and religion as both aim to achieve “an abstract ideal of perfection which transcend the human dimension.” However, religion affords emotional comfort which science cannot provide, and the rationality offered by science is not always evident in religion¹⁸.

Connecting the Dots—From Pre-history to Persepolis

The ceremonial palace of Persepolis is also known by its Persian name, *Takht-e-Jamshid*, which means the throne of Jamshid. We grew up calling the vernal equinox *Jamshedi Navroze*, or the new day of

¹⁵ Taraporewala, Irach J. S. *The Gathas of Zarathushtra*. (Bombay: B. I. Taraporewala, 1962), 11.

¹⁶ Taraporewala, Irach J. S. *The Gathas of Zarathushtra*. (Bombay: B. I. Taraporewala, 1962), 369. This line occurs as the first line in the first stanza of the Ushtavaity Gatha and is repeated as the first line in the last stanza of each hymn in the Ushtavaity Gatha.

¹⁷ *Ibid.*, 87.

¹⁸ Gleiser, Marcelo. *The Prophet and the Astronomer*. (New York: W. W. Norton, 2001), 14.

Jamshid. The common word in these terms is Jamshid—the name of a mythical king who lived in pre-Zoroastrian times.

Also known as Yima, King Jamshid is said to have been the source of creation, the first mortal and the earliest king.¹⁹ He is said to have taught his subjects how to extract metals, make bricks, weave cloth, ferment wine, distill perfumes and medicines and navigate the seas. Although he lost his royal powers when he forgot humility, he is also supposed to have identified the equinox.

In other legends, King Jamshid is the grandson of the grandson of the first human. His exploits have been immortalized in a very important piece of Persian literature called the *Shah Nameh*—or Epic of Kings—composed around 1000 CE by the Iranian poet, Firdausi Toosi. Levy calls the *Shah Nameh* an amalgamation of the *Odyssey*, the *Book of Genesis*, *Paradise Lost*, *The Canterbury Tales* and *Shakespeare*.²⁰ Persian literature and art are replete with the stories from this monumental work consisting of 60,000 couplets. And although many millennia separate the mythical Jamshid from 11th century poet, literary license allows Firdausi to write, “With the aid of the royal Farr, he (Jamshid) fashioned a marvelous throne, which at his bidding was lifted by demons into the air. He sat upon the throne like the sun in the firmament. To celebrate, that day was called a new day- the festival of Now-Ruz- the first day of the new year”.²¹ If Jamshid represents early Bronze Age humans, it indicates that rituals to welcome a new year at spring were already being celebrated well before the time of Prophet Zarathushtra.

It is also believed that Prophet Zarathushtra encouraged his followers to practice communal festivals associated with the seasons and the most important festival was Noruz celebrated at the spring equinox. Each of the seasonal festivals venerates one of Ahura Mazda’s creations, and fire which is held in special reverence by Zoroastrians was the creation honored at Noruz. Spring signifying the resurgence of life after the rigors of winter was indicative of an annual renewal when righteousness wins and leads to a rejuvenation of the universe.²²

The Achaemenian kings continued the tradition of celebrating Noruz and elevated it to the status of a national day, with a grand procession of subject nations congregating to pay homage to the king. The palaces at Persepolis may have been built as a special ceremonial site to host this event. On the stone staircases of Persepolis, there is a strange symbol of a lion attacking a bull. This motif occurs twenty-

¹⁹ Choksy, Jamsheed K. “The Theme of Truth in Zoroastrian Mythology” chapter in *A Zoroastrian Tapestry*, Edited by Pheroza Godrej and Firoza P. Mistree. (Ahmedabad: Mapin Publishing, 2002), 150.

²⁰ Levy, Reuben. *Shahnameh – The Epic of Kings*. (Tehran: Yassovoli Publications, 2003), x.

²¹ *Ibid.*, 6.

²² Writer, Rashna. “No Ruz: The Ancient Persian New Year That Lives On” *Fezana Journal*, Vol 23, No. 2, Summer 2009, 16.

seven times at Persepolis²³ and it is also found in many other pieces of Persian art. The symbolism of this image has baffled archeologists, as the bull is a much-revered icon in Zoroastrian literature and mythology, and considered to be “the soul of the universe.” Why should it be portrayed in a subservient position to a lion?



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Archeoastronomers recognize that ancient civilizations have left many clues about the skies they viewed. The 88 constellations of current times include 48 that are known to have existed since antiquity. The Arabs named many individual stars after 1000 CE, but the constellation patterns were known to the Greeks who derived them from the Babylonians and Egyptians. Today we have many constellations that have Latin names, based on Greek myths, with Arabic names for individual stars. Of particular interest is the set of constellations called the “zodiac” - the circle that hosts the sun throughout the year. Living under light-polluted urban skies, it is easy for us to dismiss constellation patterns as the fanciful imaginings of our ancestors, but there must be a reason why some constellations include many bright stars, and some have almost none that are obvious.

²³ Hinnells, John R. *Persian Mythology*. (New York: Peter Bedrick Books, 1985), 104.
http://www.livius.org/a/iran/persepolis/apadana-northstairs/apadana_n_stairs_lion-bull.JPG

Gurshtein holds that “the ancient constellations were not an imaginative way to see the shapes of heroes and animals, but they were celestial markers first and were given symbolic names later.”²⁴ Perhaps the three oldest zodiac constellations are Taurus, Leo and Scorpius, since their patterns representing a bull, lion and scorpion respectively, are of pre-Babylonian origin.²⁵ Paleolithic paintings of bulls are found on the Lascaux Grotto in France dated to 15,000 BCE and in other Neolithic settlements in the Middle East from the middle of the 7th millennium BCE.²⁶ As humans began to settle and grow crops, they noticed the extremity of the sun’s path at the solstices and its midrange position at the equinox. It was easier to use the night sky with its varied stars as a calendar, to predict what the daytime sun would do.

Precession is another astronomical event that affords us a useful timeline for our ancestors. The earth’s axis does not always point to the same location in the sky, but it “traces out a cone” like a spinning top. The precession cycle is 26,000 years long, which means that 13,000 years from today, our summer constellations will be visible in winter and vice versa. Since celestial coordinates are measured from the polar and the vernal equinox points, and precession shifts these ever so slightly every year, current star charts are redrawn every fifty years for precision. In the current era, the vernal equinox point lies in the constellation of Pisces, but by 2700 CE, it will lie in the constellation of Aquarius, since it shifts by one constellation every 2000 years approximately. During the era of 4000-2000 BCE the vernal equinox was in Taurus.

On the basis of the precessional shift, Gurshtein has identified three quartets that developed into the zodiac. The Gemini Quartet (prevalent around 5600 BCE) included Gemini and Sagittarius as equinox constellations and Virgo and Pisces as the solstice markers. The Taurus Quartet (around 2700 BCE) had Taurus and Scorpius as equinox and Leo and Aquarius as solstice markers. Aries and Libra were the equinox and Cancer and Capricornus the solstice points for the Aries quartet.

Willy Hartner traced the origin of Taurus, Leo and Scorpius to Neolithic farmers of Mesopotamia, Elam and Persia and dated the drawings of bulls, lions and scorpions to 4000 BCE.²⁷ Even though these constellations did not become equinox and solstice markers until later, it is possible that seasonal astronomy was well in place amongst the earliest agriculturists. Hartner has found lion-bull symbols on an Elamite seal from 4000 BCE, and a Sumerian goblet from 3000 BCE. Finding similar symbols at Persepolis which was built almost five thousand years later, indicates that the lion-bull symbolism must have been particularly important and meaningful to have withstood the long test of time.

²⁴ Gurshtein, Alexander. “When the Zodiac Climbed Into the Sky” *Sky and Telescope*, October 1995, 28.

²⁵ Krupp, Edwin C. *Beyond the Blue Horizon*. (New York: Oxford University Press, 1991), 142.

²⁶ Krupp, Edwin C. “Hard Rain” *Sky and Telescope*, November 2000, 93.

²⁷ Krupp, Edwin C. *Beyond the Blue Horizon*. (New York: Oxford University Press, 1991),143.

Krupp & Hartner have suggested that the symbolism of the lion and bull figures found at archaeological sites is connected to the positions of the constellation of Leo and Taurus. In 4000 BCE with the spring equinox imminent, Leo would have been directly overhead and Taurus would be setting in the west, following the Sun. As the night progresses, the bull “dies”, but ultimately reappears in the east just before sunrise, the heliacal rising of Taurus. Since the Egyptians associated the heliacal rising of the star Sirius to the flooding of the Nile which was their life-line, it is understandable that the Persians would similarly venerate the heliacal rising of the bull which symbolized the “soul of the universe being reborn.” The end of winter would herald the advent of spring and a great festival to celebrate the beginning of a new year was justified. *Although the equinoxes and solstices really mark positions of the sun, it was the stars that helped pinpoint when these solar events would occur.*

Using computer simulation programs, I attempted to pinpoint the era for the heliacal rising of Taurus. However I was faced with the limitations of computer simulations earlier than 3000 BCE, since they showed that the heliacal rising of Taurus would have occurred earlier than 5000 BCE. Could it be that even pre-stone age humans were aware of the significance of the equinox and solstices? Does the legend of the mythical King Jamshid “being borne aloft his throne” really describe the rising sun as the sacred bull recovers and spring heralds a new year? What is more reliable is the hypothesis that by 500 BCE at the time of the spring equinox, Taurus would set in the west soon after sunset, while Leo would be at the zenith. It may be this view of the sky that was the source of the lion-bull motifs used at Persepolis. Incidentally, today, because of precession, Taurus sets about four hours after sunset during spring.

Cultural Traditions

The Persians have not left any megalithic structures like Stonehenge or El Castillo, and the carvings on the walls of Persepolis are crumbling and disjointed. But the cultural and oral tradition of celebrating the vernal equinox lives on with gusto into the 21st century! Navroze, Navruz, Norooz, Nowrouz, Nawroz, NouRouz, Noruz, Navroj²⁸ - the spelling and pronunciation varies, but the fact that it is celebrated enthusiastically in Iran, Afghanistan, Tajikistan, Azerbaijan, Georgia, Iraq, Syria, Turkey, Pakistan, and India is a reason to take note.

About a thousand years ago, my Zoroastrian ancestors fled Iran due to religious persecution and sought refuge on the west coast of India. Living among Hindus, they adopted native Indian dress, languages, and many social customs, while safe-guarding the core religious beliefs. Thanks to the East India Company and Oxford University’s Bodleian Library a Frenchman by the name of Anquetil du

²⁸ Dastoor, Dolly. *Fezana Journal*, Vol 23, No. 2, Summer 2009, 2, 11.

Perron brought the ancient literature of the Zoroastrians to the notice of the Europeans.²⁹ The community flourished through ship building and commerce from the 18th century onwards, migrations to other parts of the Indian subcontinent followed, and the community became better known as Parsis.

Fast forwarding to the 1980's, many Zoroastrians immigrated to North America, from all over the world. In trying to establish an identity for our children, we met and mingled with fellow Zoroastrians whose forefathers had continued to live in Iran. After a thousand years, our two separate communities merged again on a new continent and noticed the similarities and differences in our religious and social practices. Noruz, its importance, and the rich heritage associated with it, was one of the noteworthy interchanges that occurred.

In Iran, even today, Noruz is celebrated with éclat. The timing is crucial, and sirens are sounded at the exact moment to announce the arrival of the New Year. A change of seasons is noticeable with an abundance of blooming flowers and a celebratory air pervades the market place with new fashions, and fresh music and special poems. The central decoration in every household is a table laden with many delicious goodies, and also some symbolic items whose names begin with 's' or 'sh.' Called the "haft-e-seen" or "haft-e-sheen" table, it is what the Christmas tree is to many people, an enjoyable social custom with religious roots. For Zoroastrians, the items on the table also represent the seven creations of Ahura Mazda and while there are differing choices, the seven 'sh' items are, shir (milk), sharab (wine), sharbat (sweet drink), shirini (candy), sham (candle), shemshad (box for wealth), shahdaneh (hemp seeds for enlightenment). More popular are the seven 's' items—sonbol (hyacinth), sabzeh (sprouted wheat), seer (garlic), sib (apple), saman (pudding), sekkeh (coins), senjed (dried olives).

Recently I learned of an oral tradition that there is special reverence for locations that enjoy sunrise at the exact moment of the equinox. Also, the Apadana Palace room at Persepolis had a special marked square which would be illuminated by the first rays of the equinox sun.³⁰ On March 20, 2009, sunrise in Chicago was at 6:54 am and the equinox was at 6:44 am. In the spirit of interfaith dialog, the Adler Planetarium allowed a group of Zoroastrians to celebrate this occasion with a sunrise service on the shores of Lake Michigan, standing amongst a stone sculpture called the Milky Way.³¹

²⁹ Kriwaczek, Paul. *In Search of Zarathushtra*. (New York: Alfred A. Knopf, 2003), 39. Anquetil du Perron's life would make an exciting action-adventure movie. In 1718 an employee of the East India Company presented a copy of the Zoroastrian Vendidad to the Bodleian Library, from where a few leaves were copied and sent to Paris. There they caught the attention of the 23-year old du Perron, who was inspired to study them further by embarking on a journey to India in 1754. Although it took him five years to contact the Parsees, and he had a colorful stay in India, he published a translation of the Avesta in 1771 which was not well received. It would take many decades for comparative linguistics to be established, and after 1850 the sacred texts of Zarathushtra were a major topic of discussion among philologists.

³⁰ Rahnamoon, Fariborz. "Nou Rouz 2009" <http://www.ancientiran.com>

³¹ Rivetna, Roshan. "Real NouRuz at the Chicago Planetarium." *Fezana Journal*, Vol. 23, No. 2, Summer 2009, 20.

Conclusion

While the stars are a useful archaeological guide, we have to reflect individually to weigh the value of myths, the source of their existence and their effect on culture. Symbolism is a product of the human mind, which helps us achieve emotional and intellectual satisfaction. It has been used throughout history and it can be a powerful force to rally and connect or destroy and destruct. Whether the symbol is an object like a flag, a person like Galileo, or a celestial event like the equinox, its usefulness lies in how it is used. Like a scientific theory, it is up to the humans who interpret the symbol, to make it beneficial or otherwise.

Take the example of mathematical symbols. While multiplication is a many-step process, expressing it with an 'x' shows compactly what is required. All the sciences have developed elaborate systems of symbols that are as fundamental to them as the alphabet. One cannot do chemistry without learning to read and write chemical formulae or physics without expressing fundamental ideas as equations. The Greek symbol π has a definite numerical value (3.141...) and physical significance (ratio of the circumference to the diameter of a circle). The value of these symbolic processes does not need any further elaboration. Symbols capture the essence of an idea in a compact way that is meaningful to the person who has learned its symbolism. However just as two people can express similar thoughts using different languages, history shows how humanity has used natural phenomena to aid their daily life and if successful, to link the occurrence to something greater.

At the equinox, the sun is at its mid-point: it is not too hot nor too cold like the solstice sun. To me it represents the golden mean – to follow a path that is not at either extreme. While there is some interesting historical significance to the celebration of the vernal equinox, we can use our current knowledge to assign symbolism to it that is better suited to our century. I prefer to think that the equinox represents Zoroastrian ideals, and celebrating it affords a link from the historical past to valuable insight for present times. A life that enjoys a balance between the needs of the body and the soul, and follows a moderate path, helps to ensure happiness and progress.³²

Science requires measurement, and measurements require a standard set of units. The metric system was developed to use the fundamental measurements pertaining to our home planet, earth. Similarly, the vernal equinox represents a date on which all parts of the earth enjoy an egalitarian sun. It is a date that belongs to everybody!

As this paper has shown, astronomy connects humanity through time and space. Galileo Galilei used his spy-glass telescope in 1609 to peer at the moon and the sun and the planet Jupiter. 2009 has been designated the International Year of Astronomy to commemorate 400 years of his achievement. The

³² Hinnells, John R. *Zoroastrianism and the Parsis*. (London: Ward Lock Educational, 1981), 33.

IYA website³³ states that more than a million people have enjoyed the sky in the past six months, thanks to the world-wide efforts of the 142 nations and the many special projects conducted by the organizers. Telescopes can no longer be built by one person or even one nation. Run by multi-national consortiums, they are centers of world-wide intellectual advancement. The images from the Hubble Space Telescope have not only increased our understanding of the universe, but given us reason to pause and marvel at the sheer beauty of the images. And projects like the International Space Station show that we are inching our way towards global cooperation.

The twentieth century has taken humans from their earth-bound abodes into space. And as our telescopes have peered into the distant recesses of the universe, we realize with humility, the inconspicuous qualities of our star and its pale blue dot. The sky does not belong only to terrestrial mortals; it encompasses all the stars in our galaxy and all the galaxies in the universe. The sky truly connects us through space and time and looking up is probably the best thing we can continue to do.

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³³ International Year of Astronomy website. <http://www.astronomy2009.org>

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