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LIVING

The sun stands still

Even though the winter solstice is more an astronomical event than a meteorological or climatological one, it has always had a profound impact on the human psyche

OUR CHANGING SEASONS
Drew Monkman

Most years, a taste of wintry weather is with us well before the calendar gets around to recognizing the official change of season. Still, the media often speak as if snow, ice, and cold are practically freak occurrences if they occur before the winter solstice. In the Kawarthas, as in most of Canada, winter has usually come to stay by Dec. 21.

Even though the winter solstice is really more an astronomical event than a meteorological or climatological one, "the day the sun stands still" ("sol" meaning sun and "stice" meaning a stoppage) has always had a profound impact on the human psyche. Saturday, Dec. 22 will mark both the shortest day of the year and the day in which the northern hemisphere is tipped farthest away from the sun. From our perspective, we will see the sun trace its lowest and shortest path through the sky. The sun will rise at its most southerly point on the southeastern horizon; likewise, it will set at its most southerly point on the southwestern horizon. Even at noon, it will remain low in the southern sky.

Because the sun is following its shortest path of the year through the sky, Peterborough receives only eight hours and 51 minutes of daylight on the first day of winter. Compare this to the slightly more than 12 hours we receive at the spring and fall equinoxes and the incredible 15 and a half hours of daylight we enjoy at the summer solstice. In other words, the amount of daylight right now is only a little bit more than half of what it was back in June.

Early winter brings a time of dark days and sometimes even darker moods. However, by understanding just why December and early January days are so short and cold, you will find this time of year both thought-provoking and really quite enchanting. It all relates to why we have seasons in the first place.

Begin by thinking of a globe. You've no doubt noticed that a globe is tilted on its axis. That's because the Earth, too, is tilted on an angle of 23 and a half degrees. Our planet is like a spinning top, leaning in an off-kilter position. As we orbit around the sun, the northern hemisphere ends up being tilted toward the sun for part of the year, our summer, and away from the sun for part of the year, our winter. As seen from Earth, the sun appears higher or lower in the noon sky, depending on the season.

At noon on Saturday, the sun will shine directly overhead all points along the Tropic of Capricorn, such as Rio de Janeiro, Brazil. Seen from Peterborough, it will appear at its lowest point of the year in the noon sky. At the time of the summer solstice, around June 21, cities located on the Tropic of Cancer, like Havana, Cuba, will see the sun straight overhead at noon. In the Kawarthas, too, it will look extremely high, almost right above us. At the equinoxes, occurring around March 21 and Sept. 21, the noon sun shines directly above the Earth's Equator. Quito, Ecuador, is one such place. From Peterborough, it will appear in mid-sky, right between its June and December extremes.

The consequences of the sun's position in the sky are quite dramatic, especially for places like Peterborough, located almost exactly half way between the Equator and the North Pole. Let's look at winter first. Being so low in the sky, the sun's light comes in from the side, creates long shadows, and scatters over a large area. This, in turn, results in less heating. In June, however, when Peterborough is tilted towards the sun, the sunlight is coming in from almost directly overhead. Shadows are very short; the sunlight is much more concentrated and much more warming occurs.

Karl Egressy, special to The Examiner

For people of northern climes, the winter solstice represents the assurance that the days will once again grow longer and that spring will indeed come.

This can be illustrated by pointing a strong flashlight at a table top. Hold the flashlight close to the table and shine the beam directly down, so that the light focuses on a small area. The table top will eventually feel warm to the touch. This is our summer. To create winter conditions, angle the beam to the side so that the light spreads out over a larger area of the table top. Significantly less heating will occur.

For ancient peoples with no knowledge of science or the movement of celestial bodies, it is easy to imagine that the solstice was a time of profound fear but also awe and amazement. It is an event that was noticed and celebrated by cultures all over the world and, in the opinion of some, was a precursor to faith. Neolithic farmers, whose lives were intimately tied to the seasons and the cycle of harvest, were also very attuned to the movements of the moon, the stars, and the sun. They would therefore see the sun rise and set further and further south each day, notice the hours of daylight grow shorter, and struggle to stay warm in the increasing cold. They would almost certainly have feared the sun's complete disappearance.

Without sunlight, there would be no life. Thoughts would inevitably turn to ghosts and evil spirits. But, just when the world appeared to be on the brink of utter darkness and oblivion, the sun would suddenly stop its southward march in sunrise and sunset points. Its mid-day elevation, too, would cease to be lower and lower in the sky. The sun would essentially stand still for several days, before once again proceeding to move northward and to climb higher and higher in the sky. The joy and reverence that ancient peoples would feel are not hard to understand.

Solstice ceremonies and celebrations existed in cultures the world over. Most were based on a fear that the failing light would never return unless humans intervened with vigil or celebration. Scandinavia's Norsemen celebrated Yule to mark the event. Some of the Norse Yule customs — Yule logs, mistletoe, ham for dinner and even the term Yule — are now traditions of contemporary Christmas.

Ancient Mesopotamians celebrated 12 days of fire building in an effort to "rekindle" the dying sun. The Romans paid homage to Mithra, the Persian god of light, in their Celebration of the Unconquered Sun which took place in December. Pope Julius I in 350 AD declared Dec. 25 as the birth date of Jesus, purportedly to take advantage of these well established solstice festivities dating back to Roman times and to possibly attract new followers to Christianity. Many of the symbols of Christmas such as light and the rebirth of hope harken directly back to solstice celebrations. The Jewish feast of Hanukkah also shares light as its primary symbol.

An amazing number of ancient cultures built their greatest architectural wonders — tombs, temples, burial mounds, and sacred observatories — in such a way that they aligned with the solstices and equinoxes. Stonehenge, for example, is a perfect marker of both the summer and winter solstices.

There are other examples from the British Isles as well. Maeshowe, located on the Orkney Islands of northern Scotland, is an ancient burial mound built of 30 tons of sandstone. It is designed so that its central chamber is illuminated by the setting sun on the day of the winter solstice. Next door in Ireland, there is another huge stone burial mound called Newgrange. Built 5,000 years ago, it was constructed so as to receive a shaft of sunlight deep into its central chamber at dawn on winter solstice. Archeologists believe that the sun would illuminate the ashes of the dead, buried deep in the tomb.

In North America, too, many native cultures seemed to understand the importance of the seasonal turning points of the sun. One of the most famous examples is located in Chaco Canyon, New Mexico. Built 1,000 years ago by ancestors of the Pueblo people, many Chacoan buildings were aligned to capture the solar and lunar cycles. This would have required generations of very accurate astronomical observations as well as very skilful construction methods.

Another common element of many solstice traditions is the evergreen. It is intriguing how the two solstice themes of light and evergreen have combined to make one of the dominant symbols of modern Christmas: the Christmas tree. Conifers represent the tenacity of life in the dead of winter

Our deeply ingrained desire to hold onto many solstice traditions today, everything from candles and evergreens to feasting and generosity, can be thought of as echoes of a past that extends much further back into time than we ever before imagined. These traditions are also echoes of the human capacity for wonder and amazement in the cycles of the celestial bodies and the seasons. For people of northern climes, the winter solstice represents the assurance that the days are will once again grow longer and that spring will indeed come. It also reminds us of the close links between the celebrations of the holiday season and the rhythms of the natural world.

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