Heavens Above - A Chronicle - 14 - September Nights

As mentioned in the Introduction Section, this is a collection of my columns that specifically relate to things best observed in the month of September. In most cases, they could also be observed in August and October at later or earlier times respectively.

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1. Scorpius For Viewing

for 30th September 1998

You've heard of snakes in the grass, but scorpions in the sky? Scorpius is a magnificent constellation, impossible to miss.

It is one of those constellations that actually looks like what it is supposed to be.

If you face south-west at 7.30pm, about half-way to the horizon (45 degrees) you'll see it, with its head nearest the horizon. There are four stars in a straight line, representing the scorpion's head, or claws, then a long curving spine with its wicked tail hooked over at the end.

Greek mythology has it that this is the scorpion that stung Orion's foot and killed him. However, it also has a prominent place in Aboriginal sky figures, as Ingalpir the Crocodile. (The crocodile's head is the scorpion's tail and vice versa.)

Scorpius is a delight to stand and stare at. It is so big, just hanging there, with its angry red star in the middle and its 'barbed' tail imbedded in the rich star fields of the Milky Way.

But it's also a delight to amateur astronomers, with fascinating multiple stars and clusters almost queuing up to be studied in binoculars and telescopes. You can enjoy them too. Here's a few of them.

At the scorpion's 'heart' is a bright red star, Antares, which means 'like Mars' or 'rival of Mars' because it looks like the Red Planet. Antares is a spectacular star. It is very red, very old and very very BIG. So big that if you put it in the centre of our solar system, it would swallow up all the planets (including Earth) up to Mars. That's why they call it a Supergiant.

At the other end of Scorpius, just off its tail, are two attractive clusters of stars, visible to the naked eye as fuzzy patches and in binoculars as distinctively shaped groups of stars. They are called M6 and M7. (Why the M? It stands for Messier. That's another story for another time).

M6 and M7 have about 80 young stars each, travelling through space together like a school of small fish. We call these Open Clusters. They are very pretty in binoculars, and if you look long enough, you can see patterns in the stars.

Some people say M6 looks like a butterfly, while M7 looks like an X inside a Christmas tree. But then maybe they're just suffering the delirious effects of a scorpion's sting.

(NOTE: This constellation is named Scorpius – NOT Scorpio. The latter is its name in astrology, not astronomy.)

2. Some Easy Pointers

for 29th September 1999

When people ask how to find the Southern Cross, they are usually told … “First find the two Pointers, then…” Poor Pointers, always the bridesmaids, never the bride.

They are very easy to find, they tend to leap out at you. This month they are slightly west of south, about 30 degrees above the horizon with one right above the other, pointing down at the Cross. The top one is the First Pointer and the other the Second Pointer.

One reason they are so easy to find is that the First pointer, called Alpha Centaurii (and by the ancients Rigel Kentaurus), is the third brightest star in the entire sky. The second Pointer, called Beta Centaurii (or Hadar) is the twelfth brightest. Put them together and they make a pretty bright sign.

The two deserve some personal recognition. They represent the front hooves of the Centaur whose legs and belly straddle the Southern Cross. In Aboriginal astronomy, they are the knees and shin of the emu Tchingal, protecting Bunya the possum (the Cross).

Looking at them, you’d expect the two to be similar types of stars and similar distances. Wrong! Alpha is unique, the closest star to our Sun, only 4.36 light years away. And it’s not one star but two, both very like our Sun. A small telescope will easily split them apart.

Beta is about 100 times as distant and is a blue giant star, 10,000 times brighter than our Sun. They couldn’t be much more different.

Distance certainly is the great equaliser.

3. Shooting Arrow

for 12th September 2000

Just in time for the Olympics (Sydney 2000 that is), the Arrow is in our sky these nights. A very small and simple constellation, Sagitta is easy to spot and looks very much like its namesake – an arrow – flying eastward.

Greek mythology isn’t clear on exactly who shot this arrow into the sky, but it was either Hercules off to the west, Aquila the Eagle above it or the centaur archer Sagittarius high above to the south. My money is on Herc.

To find Sagitta, face north and about 45 degrees above the horizon you will see the three stars of Aquila, in a straight line pointing downwards from right to left, with the bright Altair in the centre. Immediately to the north of (that is below) Altair, you will see a group of four fainter stars looking like an arrow, or dart. That’s Sagitta. The two stars on the left above each other are feathers in the arrow’s tail, while the other two are the shaft and the arrow head. The arrow is fairly small, only about one half the width of the Southern Cross.

The showpiece of Sagitta isn’t even in Sagitta but in the constellation below it, Vulpecula – the Fox. But it is easier to think of it in Sagitta. Exactly 3 degrees or 6 Moon diameters directly below the arrow head, binoculars will reveal a small but distinct hazy patch about one quarter of a Moon diameter. This is M27, the famous Dumbbell Nebula which is a mere 1,000 light years away. Someone out there is pumping iron for the Olympics.

The Dumbbell nebula is a classic example of a so-called ‘planetary nebula’, the expanding shell of a dying star. Our Sun will look exactly like that in about 5 billion years.

4. May I Hang Your Coat?

for 26th September 2000

It’s amazing what you can see in space. Some people think they can see a human face on the surface of Mars, others see shapes in nebulae, like the Dumbbell last column. Do you know that there is actually a ‘North America Nebula’ that looks exactly like the North America continent, Mexico Gulf and everything. It’s bound to happen, given the number of random patterns that can occur and the boundless human imagination.

But this one will tickle your funny bone – a real cosmic joke. You will need binoculars to see it – something to do with that pair you bought for the Olympics.

First you need to find Sagitta, the Arrow in the North that we looked at last time. This week, at 9 pm it will be about North-West and 30 degrees above the horizon, pointing almost dead level.

Find the two tail feathers of the arrow and move about one arrow’s length in the ‘eight o’clock’ direction. You will find, very clearly in your binocular view, a set of stars that looks very much like a simple coat hanger. Six stars in a dead straight line, with a large hook protruding upwards from the centre of the six. If you can’t find it first off, don’t give up. It’s there, about 30 degrees off the arrow’s line about one arrow length behind it.

This asterism – a pattern made by the stars – is actually in the constellation Vulpecula, the Fox. It’s actual astronomical name is Brocchi’s Cluster or Collinder 399 but it has the common title ‘The Coathanger’.

This object has no astronomical significance. It is a fluke arrangement of unrelated stars. Like cloud gazing, it’s fun to just scan the heavens and see odd shapes. But it makes you wonder – who hangs his coat on it?

5. Constellations, Great and Small

for 2nd September, 2003.

In early to mid September, it’s a good time to enjoy some of the smaller, less known constellations. They are close together and easy to find and see.

Look directly north around 8pm and about 20 degrees above the horizon to find the bright white star, Vega. Immediately above and to the right of Vega is a small parallelogram, about the same length as the Southern Cross. This, including Vega, is the constellation Lyra, the Lyre.

Above and east of Vega you’ll see a line of three stars, with a bright white star in the center. That’s star is Altair, in Aquila. Go back

about a quarter the way to Vega and you'll see another small constellation that looks like an arrow, pointing from west to east. That's Sagitta, the Arrow.

Then move east from Sagitta and you'll see another small group of stars that looks like a diamond (about half the size of Southern Cross) with a small stalk above it. That's Delphinus, the Dolphin. The diamond has been named "Job's Coffin."

Though small in size, each of these constellations has objects of interest to see in telescopes. Lyra has the beautiful Ring Nebula (M57), Sagitta has M71, a globular cluster, and the enigmatic Coathanger. Delphinus has a showcase gold and yellow double star.

6. Northern Cross Swans In

for 16th September 2003

If you have access to a reasonably clear northern horizon, there's a nice mixed treat to see this month. First find the 1st magnitude star Altair, about 45 degrees high and directly north. It's the middle star in a slanting line of three. These three stars point down to the left towards Vega, in Lyra. Then about 25 degrees east of Vega and a bit closer to the horizon is another 1st magnitude star, Deneb.

These stars, Altair, Vega and Deneb form the so-called Summer Triangle, because it's directly overhead during summer in the northern hemisphere. It also contains a trio of interesting constellations.

Above and to the right of Vega is the parallelogram of Lyra, and below Altair is the arrow of Sagitta. We looked at these in the previous column.

If you look at Deneb, above and to its left you will see some fainter stars forming a large cross. This is actually part of Cygnus, the swan, with wings spread, neck stretched and flying upwards to the west. Deneb is the swan's tail and its long neck is pointing between Lyra and Sagitta, ending at its beak, the beautiful binary star Alberio. Alberio is a showcase binary star looking even in a small telescope like amber and blue-green traffic lights.

Because of its appearance, Cygnus is referred to as the Northern Cross, especially at Christmas when, from up north, it has a near vertical position in their western sky. James Russell Lowell in his poem 'New Year's Eve, 1844' wrote:

"The Lyre whose strings give music audible
To holy ears, and countless splendours more,
Crowned by the blazing Cross high-hung o'er all…"

Due to its proximity to the northern horizon when seen from 'Down Under', it always looks upside down. From the northern hemisphere, it looks more like a proper cross, though much larger than our Southern Cross.

7. Stellar Geometry

for 7th September 2004

At times, the sky can seem like a school geometry class, most of the common Euclidean shapes and geometry tools are up there. This month, directly to the north we have the striking Summer Triangle. Its base is made of the two bright stars Vega (on the left) and Deneb (on the right), hanging above the horizon. Directly above them is Altair, the brightest of the trio in Aquila. Why is it called the Summer Triangle? Because it was named for the northern hemisphere. I suppose we could call it our Winter Triangle.

To its east, and rising higher later in the evening, is the Great Square of Pegasus. It will be due north about this time in November. This square forms the torso of the famous mythological flying horse. Immediately above the Square of Pegasus is the Circlet in the constellation Pisces, representing one of its two fish.

Then, in February, due north will be the home of the Winter Hexagon (but of course it will be our Summer Hexagon). This is a large six-sided shape made up of the six (well, seven really) first magnitude stars Aldebaran (Taurus), Rigel (Orion), Sirius (Canis Major), Procyon (Canis Minor), Pollux/Castor (Gemini) and Capella (Auriga). Just to make it almost a circle, you can imagine the red Betelgeuse as the center.

Also in February, if you have a small telescope, if you focus on the Great Nebula in Orion, at its heart is a group of four stars called The Trapezium, for obvious geometrical reasons.

Back to the geometry lesson, there are two triangle constellations in the sky. In December, Triangulum (the Triangle) will be low and due north to the east of Pegasus and Andromeda, while at the same time, Triangulum Australe (Southern Triangle) will be directly opposite due south (located just to the east of the two Pointer stars).

Above that, we have Norma, the Set Square and directly to its west is Circinus, the Compass (of the geometry type).

Wonderful. Our friend Euclid would be in heaven.

8. Swanee, How I Luv Ya

for 21st September 2004

There's a great sky to the north between now and year's end. And this week, due north, and just a hand span east of the bright star Vega, is the striking constellation Cygnus, the Swan. We see Cygnus climbing upwards from near the horizon towards the west, long neck stretched and wings spread. It is also referred to as the Northern Cross.

Cygnus has some exciting astronomical features. One is its beak, the star to the top left. Named Albireo, this is a gorgeous binary star with a bright orange star paired with a blue-green companion. Sometimes called the 'party lights' and one of the most beautiful binaries in the sky, it's best seen with a small telescope.

The other feature is of major historical interest. The 5th magnitude star, 61 Cygni is found halfway between the bright tail-star Deneb

and the right wing tip. Only 11.4 light years away, 61 has the distinction of being the first star to have its distance directly measured by the trigonometric method of parallax. This fantastic feat (for its time) was achieved in 1838 by the great German astronomer Freidrich Bessel. You can see parallax if you look at an extended finger with one eye, then switch to the other eye. Your finger seems to move against the background. The closer stars do the same when seen from opposite sides of Earth's orbit about the Sun, only to an almost immeasurable smaller degree.

9. Butterfly and Christmas Tree

for 18th September 2007

Hanging upside-down high up in the west this month is the beautiful constellation Scorpius, and immediately above that is the famous Teapot in Sagittarius (also seen upside-down). The three-star spout of the Teapot is pointing down towards the Scorpion.

In between Scorpius' stinging tail and the Teapot are two delightful open star clusters. Both are visible to the naked eye as fuzzy patches on a medium to dark night. In fact, they were included in Ptolemy's catalogue, while another pre-telescope catalogue described them as 'the cloudy ones that follow the sting'. They are very clearly seen in binoculars on any night. Look halfway between the two-star tip of the tail and the point of the Teapot spout.

You will see, in binoculars, side-by-side and 4 degrees apart two clusters of stars, with about 80 stars each. The lower one is M6, the Butterfly Cluster. Some people with good imaginations can see the two open wings of a butterfly. The other slightly larger and more scattered cluster is M7, the Christmas Tree Cluster. With most binoculars, these will both be seen in the same field of view, a very pretty sight.

These two clusters are examples of deep sky objects best viewed in low power instruments, such as binoculars. Too much magnification takes you in too close and you can't see the clusters for the stars – so to speak.

10. Who Are You Calling A Lyre?

for 1st September 2009

Lyra is a small but object packed constellation. Named after the musical instrument given to Orpheus to help enter Hades, it is sitting this month directly north, with its brightest star, Vega, just 18° above the horizon. A 4° tall parallelogram above and to its right is the Lyre. There is plenty in Lyra to interest those with binoculars and telescopes.

Vega is a blue-white star only 23 light years away. At magnitude 0.03 (the quintessential zero magnitude star), it is the sky's 5th brightest. Below and 1.5° to its east is a famous double-double star, epsilon Lyrae. Binoculars will easily reveal two 5th mag. stars, while medium sized telescopes at over 100x magnification will show that each of these are binary stars. A quadruple!

The bottom right star of the lyre is delta Lyrae, a beautiful binocular double with blue and orange stars. Between the top two stars is a knock-out telescope object – M57, the famous Ring Nebula, like a small smoke-ring in the sky. 5° to its east is M56, a lovely 8th mag. globular cluster.

Check out this busy little lyre.

(WATCH THIS SPACE FOR FUTURE SEPTEMBER NIGHTS ARTICLES)