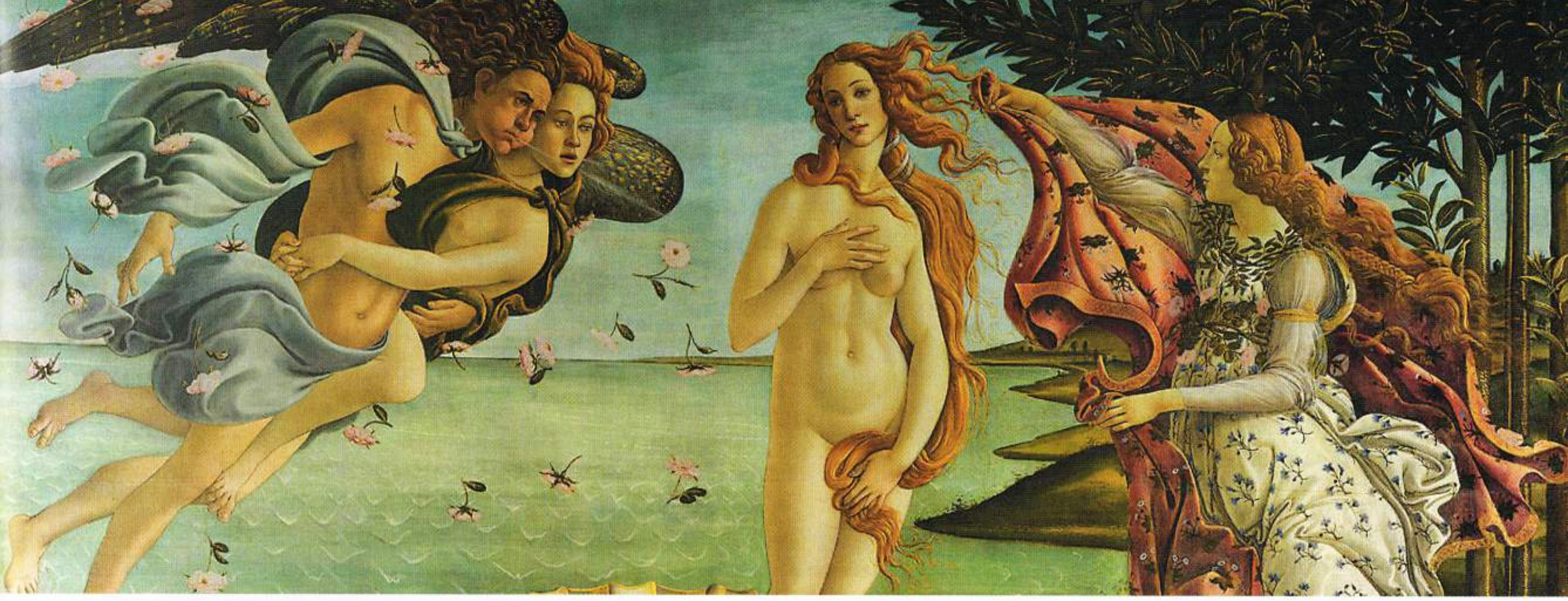
Venus at mid transit, 6 June 2012

catching the Goddess

Venturing into the outback to watch his obsession, Venus, transit the Sun, adventurer Thomas E. Muller shares some awful and interesting truths about this other-worldly beauty.



Sensuous Venus arises from the sea in Botticelli's painting *Birth of Venus*, 1484

"Never perhaps in the world's history did morning dawn on so many waiting astronomers as it did on the 9th of December, 1874."

That was Henry Chamberlain Russell, the New South Wales Government Astronomer, penning his excitement about the momentous event that was about to take place. Now, 138 years later, I was struck by the same feverish anticipation. I had set my alarm clock to the ridiculously early hour of 4:30 a.m., even though sunrise was more than two hours away. Fumbling through the cupboards of my budget motel room in Katherine, Northern Territory, I found a chipped mug and made myself an instant coffee with cold water from the sink tap.

The time had come to scout out a place for setting up my camera and tripod when, eventually, the sun came up. I grabbed my head lamp and went outside, walking in the chilly darkness along an abandoned World War II runway full of potholes and looking for a likely open space not obscured by tall bushes and trees. The sun would still be low on the horizon when the six-hour spectacle began, so I needed a clear view.

It was D-Day, 6 June 2012 and I had spent eight years preparing mentally for this moment – the 2012 Transit of Venus. This is when Earth's nearest planet is precisely aligned between Earth and the Sun and, viewed by observers on Earth, Venus can be seen slowly crossing the Sun's disc. Transits of Venus are one of the rarest predictable astronomical events; they occur in pairs, eight years apart, and then nothing until either 105.5 years later or 121.5 years later. Venus has transited the Sun only six times since 1639, the year when it was first observed by just two people – the young English astronomers Rev. Jeremiah Horrocks and William Crabtree.

Eight years ago, I had glimpsed the 2004 Transit from my backyard in Gold Coast, Queensland, but Venus was still in transit when the sun went down. This time, the eastern half of Australia was prime territory for viewing the entire transit. And it would be my last chance. Beautiful, mysterious Venus would not be dancing naked in front of the sun until her next performance on 11 December, 2117. No one alive today would see another Transit of Venus – certainly not my children, but perhaps my grandchildren, if they find the Fountain of Youth. Best positioned to view the next Transit would be my great-grandchildren and they can reminisce that it was their great-grandfather who witnessed the last spectacle, way back in 2012, in the Australian outback.

Months earlier, I had searched for a good place to observe and photograph the Transit by checking the long-term weather statistics for various parts of Queensland and the Northern Territory. With a June average cloud cover of only 17 percent, the best in Australia, I picked Katherine as my destination. Flying into Darwin and hiring a car, I took the Stuart Highway and headed 320 km south to Katherine. Just two days before, I had photographed the partial lunar eclipse of 4 June.

By sunrise, I was out at the edge of the old runway, setting up my tripod and fitting the solar filter to the front of my camera lens. It was a fiddly job and I was just a rank amateur at astro-photography. Then, I waited. And waited. My pulse was up, my tension heightened; I was becoming nervous. "Where's Venus?" I asked myself, constantly glancing at my watch. She's late! Doubt began to set in. Is today really the 6th of June? Did astronomers make a mistake in their calculations?

Suddenly, my thoughts were besieged by the piercing noise of jet engines shattering the outback silence. Five of Australia's newly-purchased F-18 fighter jets came screaming across the sky above me, having taken off from nearby Tindal Royal Australian Air Force Base. Where, on Planet Earth, were they headed? My mind wandered briefly: the Japanese would never have dared bomb Darwin if these nimble monsters were around in 1942.

At precisely 7:45 and 23 seconds, I detected a faint blur at the bottom of the sun's disc. Could this be just a sunspot? Venus had made her appearance and, by 8:03, she was fully inside the sun's edge. The Goddess was in action. For the next six hours, a black dot would crawl across the face of the sun, looking very much like a scorched pea rolling slowly across a yellow dinner plate. Three large sunspots, in the shape of a triangle, were also visible. Venus reached the transit centre, halfway across her solar journey, at 11:00 a.m. Then she began the remainder of her passage, returning to the sun's edge and finally disappearing altogether at 2:15 p.m. I felt a tinge of sadness, knowing I would never again see her performing like this.

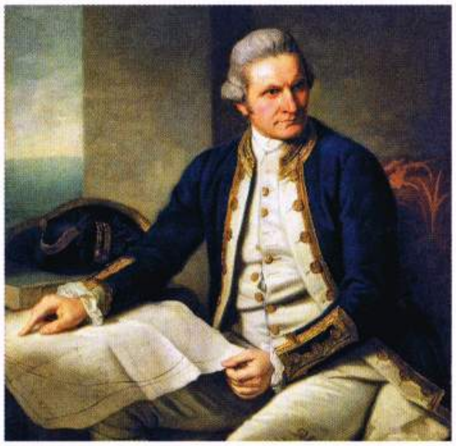
Ah, Venus – revered by poets, painters and musicians across the centuries, her torso adorns museums of antiquity and boxes of gourmet chocolates. The ancient Greeks called her Aphrodite. Daughter of Zeus, she was the Goddess of Desire who rose naked from the foam of the sea and, surfing on a scallop shell, stepped ashore on the island of Cythera. The Three Fates assigned only one divine duty to Aphrodite, namely to make love. And that she did freely, renewing her virginity in the sea when necessary and sleeping with Olympian gods and mortals, by whom she bore so many of the deities populating Greek mythology. When the Romans eagerly adopted this mythology whose roots span four millennia, she became Venus, Goddess of Love and Beauty.

For most of history, Earth's sister planet remained a complete mystery. After the Moon, Venus is the brightest object in the night sky; it is the morning star part of the year and the evening star at other times. But it wasn't until the 20th century that we discovered the shocking truth about the planet of beauty.

As scientific instruments became more sophisticated and spacecraft were sent to probe the atmosphere and surface of Venus, the findings confirmed that Venus is a volcanic hellhole. The impenetrable layer of cloud encapsulating the planet was 96 percent carbon dioxide and a ferocious greenhouse effect was running amok on the planet. The lava-covered surface temperature is a furnace-like 475 degrees Celsius and the crushing pressure exerted by the toxic atmosphere is more than 90 times the air pressure at sea level on Earth. The planet's barren, rocky landscape is peppered with volcanoes. Beautiful Venus: hers was the most volcanic body in the Solar System.

the Goddess of Desire who rose naked from the foam of the sea and, surfing on a scallop shell, stepped ashore on the island of Cythera

But why all the fuss about the Transit of Venus? Thank British Astronomer Royal, Edmond Halley, for this. In 1691, Halley proposed using the Transit of Venus as a means of calculating Earth's distance from the Sun and, from that, discovering the size of our Solar System – the holy grail of astronomy. By measuring the exact time and duration of the Transit of Venus from widely separated locations on our Planet, astronomers could use geometry to deduce how far away Venus was from Earth, and Earth from the Sun, and finally have a scale for the heavens.



Explorer Captain James Cook

Moody Partial lunar eclipse, 4 June 2012

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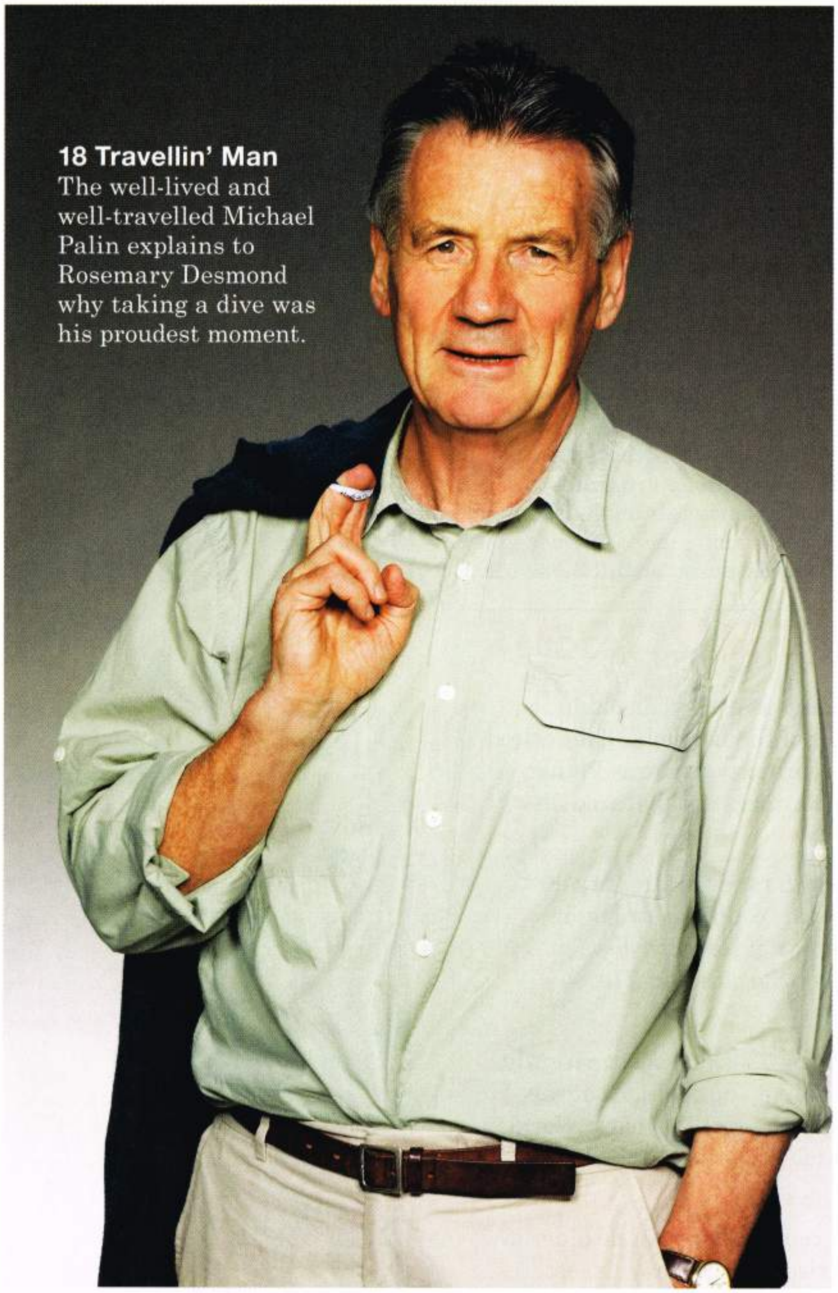
Halley died before the next Transit of Venus of 6 June 1761, but his idea became the challenge and marked a new era for scientific discovery in the Age of Enlightenment. For the first time in human history, scientists from across the globe, funded by their governments, would work in international collaboration on a single goal, pooling their observations so that the distance to the Sun could finally be determined. The world of science was changed forever. Astronomers from Britain, France, Russia, Germany, Italy, Sweden and the American colonies became the Indiana Joneses of science. They travelled under great duress in difficult conditions with their telescopes, clocks and drawing pads to far-flung places like St. Helena, Sumatra, Siberia, Constantinople, Pondicherry, Lapland, the Cape of Good Hope, and even into war zones as the Seven-Years' War raged across Europe and the French and British colonial possessions.

But there were widespread measurement problems with the transit timings, and the distance to the Sun calculated from the pooled data was fraught with imprecision. Venus offered the 18th century community of astronomers one last chance to get it right. That was the Transit of 3 June 1769, eight years later. Off they went again, setting aside their patriotic agendas and risking life and limb to come back with better data.

The British Royal Society, under the patronage of King George III, dispatched Lieutenant James Cook on the *HMS Endeavour* to observe and time the Transit from Tahiti. Under clear skies, Cook, botanist Joseph Banks and astronomer Charles Green made observations. When the worldwide results were analysed, astronomy finally had its heavenly yardstick: the distance between Earth and Sun came very close to today's established value (using radar waves bounced off Venus) of 149.6 million kilometres.

And it was the 1769 Transit that decided Australia's and New Zealand's histories. Transit work finished, Cook opened his sealed orders from the Admiralty: he was to set sail, westward, in search of the unknown southern continent, Terra Australis Incognita. In one of the great navigational triumphs of history, Cook accurately charted many South Pacific islands, New Zealand and the east coast of Australia – which he named New South Wales – and proclaimed them to be British possessions, as instructed. Had it not been for the Transit of Venus, European settlement of these lands might never have taken place and Australia might have been a very different nation today.

Thank you, Venus, Goddess of the Heavens. ■



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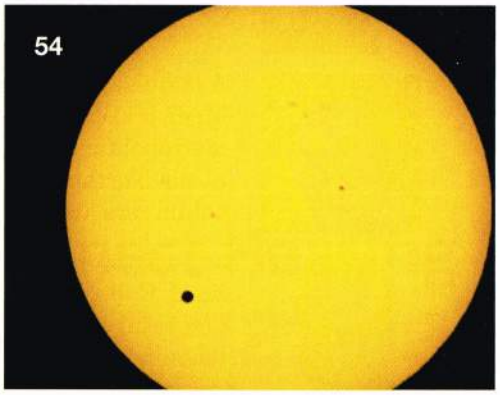

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Cover Michael Palin with the world at his fingertips
Photo John Swannell ©

editor

50something
AUSTRALIA'S WIDEST CIRCULATING OVER-50S MAGAZINE

At university, I got an "A" for an essay I wrote on the Cuban Missile Crisis in my Russian politics class. This, of course, has entitled me ever since to nod sagely whenever the words "Crisis", "Cuban" and "Missile" have come up in casual conversation.

So when it came to the big events of October 1962 for the "50 This Day Then" section this issue (p13), the Cuban Missile Crisis was mine, all mine, to write about. Who'd have thought National Seniors would have a Russia hand on its payroll!

But I stumbled. What did I write all those years ago? What made that essay great? What were the key points?

All I could remember was that it came down to leadership style – Khrushchev and Kennedy, the world's most powerful men, at the height of the Cold War; fear and innuendo; hot red buttons at their fingertips; a civilization on the brink of nuclear annihilation…who would break first!

Then a blank. A cold, steely, empty blank. Nothing else came to me.

So I googled it. Wow. In the course of my work I use the internet every day but the historical information online now is incredible. From site to site I jumped, pouring through declassified CIA documents, maps, memos and images of missile installations taken by U-2 spy planes and low-level Navy reconnaissance aircraft which, in 1962, were used to brief President Kennedy. If you're interested, see http://www.gwu.edu/~nsarchiv/nsa/cuba_mis_cri/

If you know a fascinating website drop us a line at 50something@nationalseniors.com.au and perhaps we'll find a permanent spot to run a couple of the best each issue.

Sarah Saunders

contributors

Thomas E. Muller was smitten by astronomy as a 10-year-old in Year 4 of school, and never lost his wonder of the heavens. The retired professor and life member of National Seniors now explores Planet Earth as a freelance travel writer. His adventures are featured on www.ThePlanetaryPrize.com

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