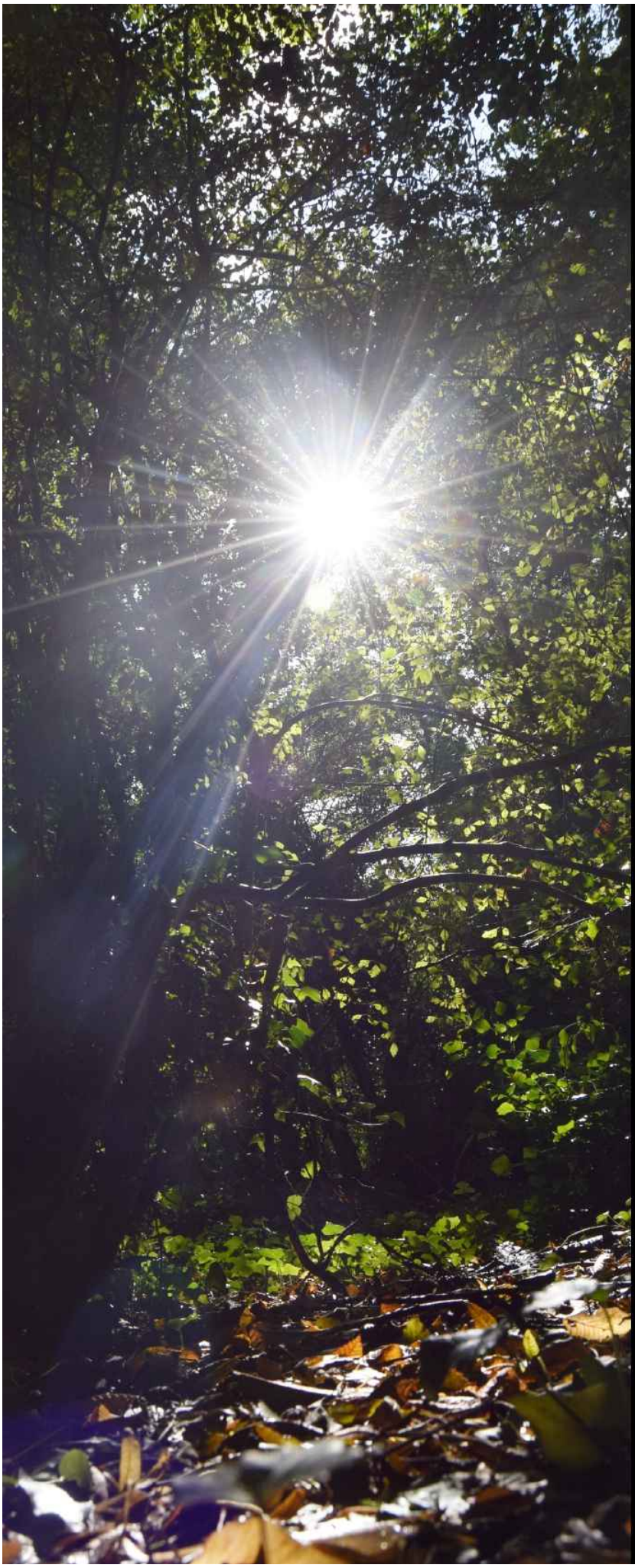


Prime Meridian

(94) September 30, 2018

On September 23, the Northern Hemisphere passed through its 2018 autumn equinox.

Here in South East England, the days are now quickly shortening and the nights are longer. Trees remain in leaf for now, but some of them are already turning yellow and even orange.

The Sun set at the North Pole. The summer shrinking of Arctic sea ice ends and researchers are watching closely to discover how small it became this year. It will not have been as small as that of 2012, but it will be one of the smallest on record. In the ice-bound South Pole, the Sun is up until late March, 2019.

We look at 2018's hot summer and we ask about the implications for climate change. In this issue, we focus on June.

Our photo shows the Sun beaming down through woodland during the afternoon of September 23 in the area of West Kingsdown, Kent.

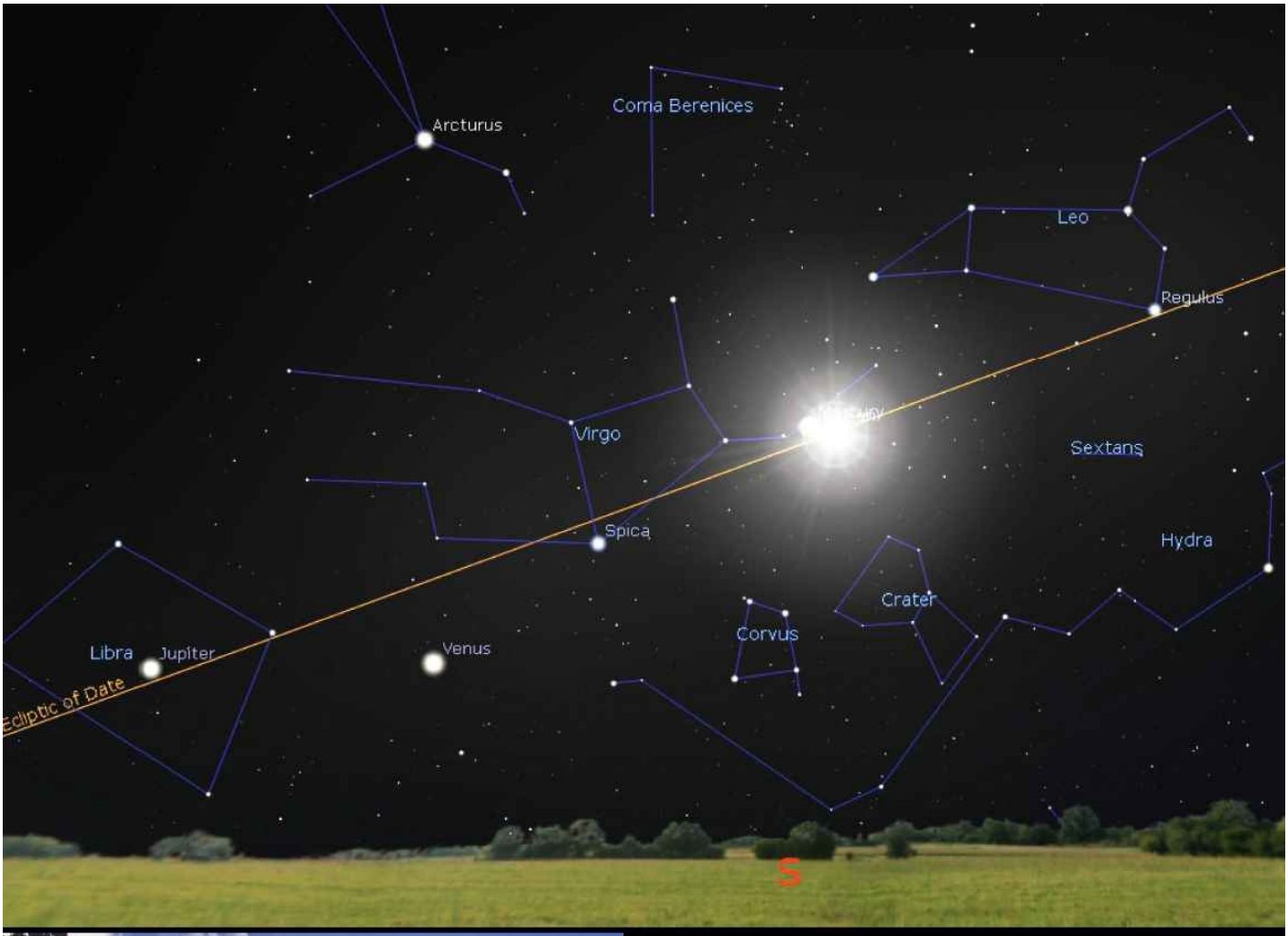
We live on a beautiful planet – and there is still time to save it.

On Sept. 27, the *Evening Standard* (London) carried an article from Rohan Silva (Co-founder of Second Home). "Emerald cities: how capitals are saving the planet" stressed the fundamental need of human beings to engage with nature. He cited the works of the influential biologist Edward O. Wilson. Born in the USA in 1929, Wilson has published the concept of what he called "biophilia." Put simply, this states that humans have an innate affinity with nature. It's a straightforward and persuasive idea. Silva explained, "As he said when he gave a speech on biodiversity at my company, Second Home, a few years ago: "We're a biological species that co-evolved in a biological world, so of course we have a deep affinity for ecosystems and living things."" Wilson, E. O. (1984). *Biophilia*. Cambridge: Harvard University Press.

My colleages and I have been closely involved in the quest to discover other habitable planets, but this is an extension of our love for the Earth. There is, however, other human responses to our world. Among them are greed and short-sightedness. There is also a deep-seated drive of modern humans to create new ideas and physical possibilities. This opens a more complex discussion about ethics than mere selfishness. Technology, including advances in agriculture and the medical arenas, are responsible for enormous improvements in human life. Unable (sometimes unwilling) to predict all the consequences, we create transport and heating, but release green house gases; cheap materials, but threaten marine life by dispersing plastics throughout the oceans; and providing brighter lighting at home and in the roads, but they hide the spectacle of the stars and make the glow-worm a rarity where once it was commonplace. The list is seemingly endless and each challenges us with its own benefits and disadvantages posing moral predicaments. We extending our hand to fellow campaigners in the hard choices ahead as we fight for planet Earth and thereby in protecting its human communities.

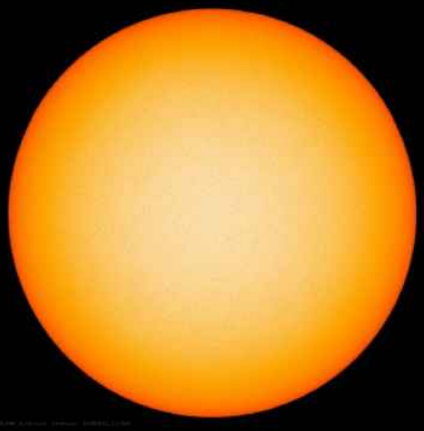
Martin Heath, Editor.

Below: As September 2018 came to its end, the appearance of autumn was now well underway. The view of September 29, 2018 looks at a hedgerow beside harvested fields near Hartley above Longfield. Kent. The fields are presently being disputed as local people lock horns against the expansion of housing.



Autumn Equinox 2018.

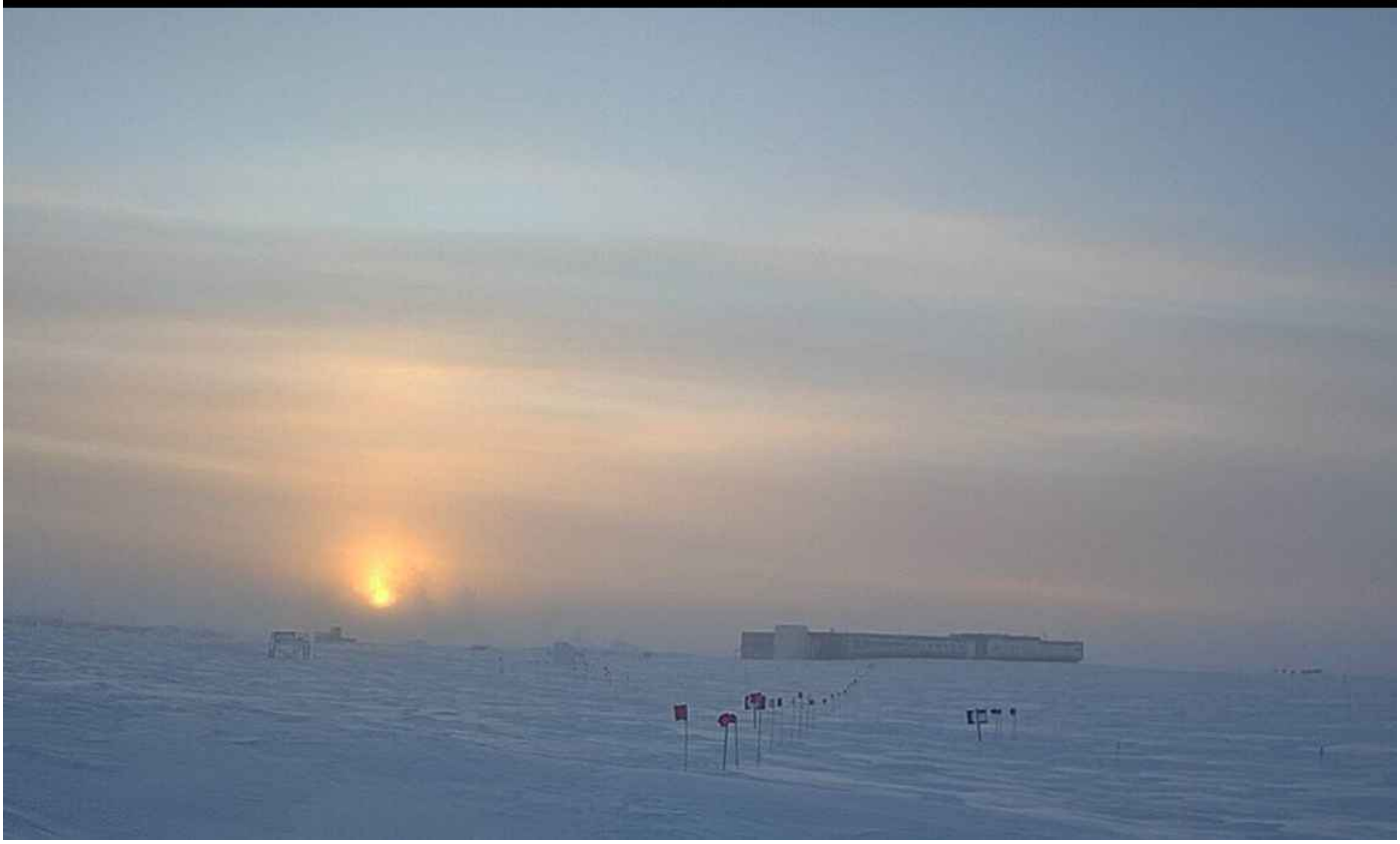
This *Stellarium* image of the Sun, planets and stars simulated the absence of Earth's obscuring atmosphere. It shows the day of the autumn equinox at around noon. The planets Jupiter and Venus lie to the east of the Sun, but both followed the Sun shortly after sunset. Mercury, also to the east, lies closer to our star. The day of the autumn equinox began with clouds and rain, but during the afternoon, the Sun emerged (West Kingsdown, Kent). NASA's Solar Dynamics Observatory (below) revealed the 10th day devoid of spots.



The Winter is left behind and the Spring Equinox brings the Sun to the South Pole.

The images were collected from the South Pole Webcam, which is run by NOAA and the NSF at the Amundsen-Scott South Pole Station.

On July 9 (06:21:38), the aurora australis was bright in a dark starry sky. A waxing Moon was circling close to the horizon on July 19 (00:51:50). Although the Moon was not yet full, the webcam could only show it as a round blob. The red light on the ground was artificial. July 25 (01:51:51) the half-a-year-long night sky was growing gradually brighter. Jupiter (right) and Spica, a massive blue star about 250 light years, away were visible in the aurora. Dawn was undeniable on August 23 (23:27:55), when two bright planets, Jupiter (upper right) and (lower) Venus were clear and Spica was visible. The Sun was bringing daylight on September 23.



Seasons in South East England

June 2018

This was one of the warmest June's on record.

Our region was the warmest, but this was not a record breaker.

Over the entire UK, this was the third warmest June in a series from 1910. At 14.8ºC, the mean temperature was 1.8ºC above the norm. England was warmer at 15.8ºC (plus 1.8ºC), but the Met Office's SE & Central S, was the warmest in the UK at 16.6ºC (1.8ºC).

According to the UK Met Office: "June was also a very dry month for much of the UK. For much of England and Wales it ranks within the top five driest Junes on record (figures dating back to 1910), with a record set in the 1920's being broken for the South-east and Central Southern England region where 3.0 mm of rainfall was recorded, just 6% of what you would expect for the month as a whole."

Above and left: Daisies on the Northfield at New Ash Green, Kent and big bales. nearby in a field a June 2, 2018.

The weather was heading towards the warmer months. On June 6, the sky was blue and filled with white cumulus clouds. It looked down on a landscape of a green field of wheat and green woods. Ash, Kent.

On June 21, the Earth passed through the Northern Hemisphere's summer solstice. The Sun had risen above the trees at Ash. Sunlight pours through gaps of trees and onto the woodland floor at Hartley Bottom. Views from Northfield at New Ash Green, including a display of pyramidal orchid (*Anacamptis pyramidalis*).

On the first day of June, the white flowers of elder (*Sambucus nigra*) were seasonally conspicuous. This picture was taken on Dartford Heath, Kent. On June 2, in the wood around Northfield near New Ash Green, the fungus was known as the chicken of the woods (*Laetiporus sulphurous*). On June 8, the lake at, Dartword, Kent, a blue tailed damselfly (*Ischnura elegans*) of the family Coenagrionidae and (below) a female blue tailed damelfly. June. June 9, on Northfield, a holly blue butterfly (*Celastrina argiolus*).

On June 6, the UK's coldest temperature (-1.0°C) was recorded way up in Altnaharra, Sutherland, in the far north of Scotland; it fell to about 9°C at Heathrow, Greater London, but its coldest on 9.5°C June 13 coldest June 22 less than 9°C. On June 28, The highest temperature for the UK was 33.0°C was at Porthmadog in Gwynedd (Wales). The warmest day at Heathrow, Greater London, approached 30°C on June 25.

Detailed information from the Met Office can found at:

https://www.metoffice.gov.uk/climate/uk/summaries/2018/june

This page looks mostly at June 22, 2018. At the upper left, we see cherries on a farm in Kent Betshan. This year's crop has been harmed by insect infestation and its future viability is in question. The hedge woundwort (*Stachys sylvatica*), seen here at Hartley generally flowers between June to August, and is notable for a scent that has been compared to mouse urine. Bumblebees and honey bees are responsible for its pollination.

Some flowers had already come to the end of their seasons. At Northfield in New Ash Green the dandelions-like seeds of the goats beard (*Tragopogon pratensis*) and roses whose flowers have gone, and also numerous grasses. Below: Grasses on Northfield (left) June 22 and (right) June 23.

Monthly means for SE and central S England. Max. temp.: 19.4°C (2.7°C); min. temp.: 8.2°C (0.9°C). Hours of sunshine: 269.3 (134%). Rain: 56.4 mm (103%). Anomalies re. 1981-2010 norm in brackets. Data obtained from Met Office on-line monthly reports. Heathrow data is obtained from WeatherOnline.

Green wheat was growing in a field beside the road at Green Street Green, Kent. June 18, 2018.

A field of barley was losing its green at Betsham in Kent, June 29. On the same day, another field of barley, at Green Street Green, had already become ripe.

There was an excellent display of yarrow (*Achillea millefolium*) and poppy (*Papaver rhoeas*) along the edge of a field at Betsham.

Glimpses of summer wildlife in Kent, South East England, as June drew to its end.

The comma butterfly, (*Polygonia c-album*) was seen at Northfield, New Ash Green on June 22. UK Butterflies notes that this species declined from the middle 1800's, but "a spectacular comeback" followed in the 1960's. Another common butterfly is the meadow brown (*Maniola jurtina*) seen in Northfield; June 30. The marbled white (*Melanargia galathea*) was plentiful in Rectory Meadow, Longfield.

Wild flowers were brilliant on the hot day of June 27 on Dartford Heath, Kent. From left and below: The purple rosebay willowherb (*Chamerion angustifolium*), spiky common gorse (*Ulex europaeus*), green without its yellow flowers and the purple flowers of heather (*Calluna vulgaris*), which have been re-introduced.

Global climate: June 2018, was not a record-breaker, but it was among the warmest in a 138 year record.

The USA's National Oceanic and Atmospheric Administration said: “The globally-averaged temperature across land and ocean surfaces was the fifth highest on record for June at 0.75°C . . . above the 20th century average of 15.5°C”. The record began in 1880.

Source: *NOAA National Climatic Data Center, State of the Climate: Global Analysis for June 2018.* Published online. Data is provisional. All the anomalies quoted are positive.

Readers can obtain further information from NOAA:

https://www.ncdc.noaa.gov/sotc/global/201806

This view above right was taken by the Deep Space Climate Observatory (NASA/NOAA) space craft on the Northern Hemispheres summer solstice on June 21, 2018, the day of the summer solstice. Note the dust off the Sahara, which helps fertilises the Amazon. 12:46:00 GMT.

The message from June 2018.

The implications have to be understood in terms of the long term trend, rather than taking one hot summer by itself. However, the data are clear.

Worldwide, NOAA estimated the 5th and NASA the 3rd June since 1880. The Met Office says that the UK experienced its 3rd warmest June in a series since 1910, while England had its 4th warmest and the 3rd driest June. WeatherOnline recorded zero rainfall at Heathrow, except for a minute amount of precipitation on June 17. This is part of the general trend in which the 21st Century continues to witness the warmest temperatures in the record as a whole.

June 30, 2018: A clear day and wheat at Hartley, Kent.



The tide was out on the shore at Gravesend, during the hot day of June 26. On June 26, a comma butterfly (*Polygonia c-album*) was seen in a hedgerow on the edge of Northfield. On the meadow at Northfield, New Ash Green, a pyramidal orchid (*Anacamptis pyramidalis*) was late in its flowering season.

Prime Meridian

Prime Meridian is published by the Ecospheres Project, a research and media collaboration.

This newsletter follows global environmental issues alongside the cycle of the seasons in South East England. It steps back to look at the Earth in its astronomical context and it pursues the search for other habitable worlds.

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