

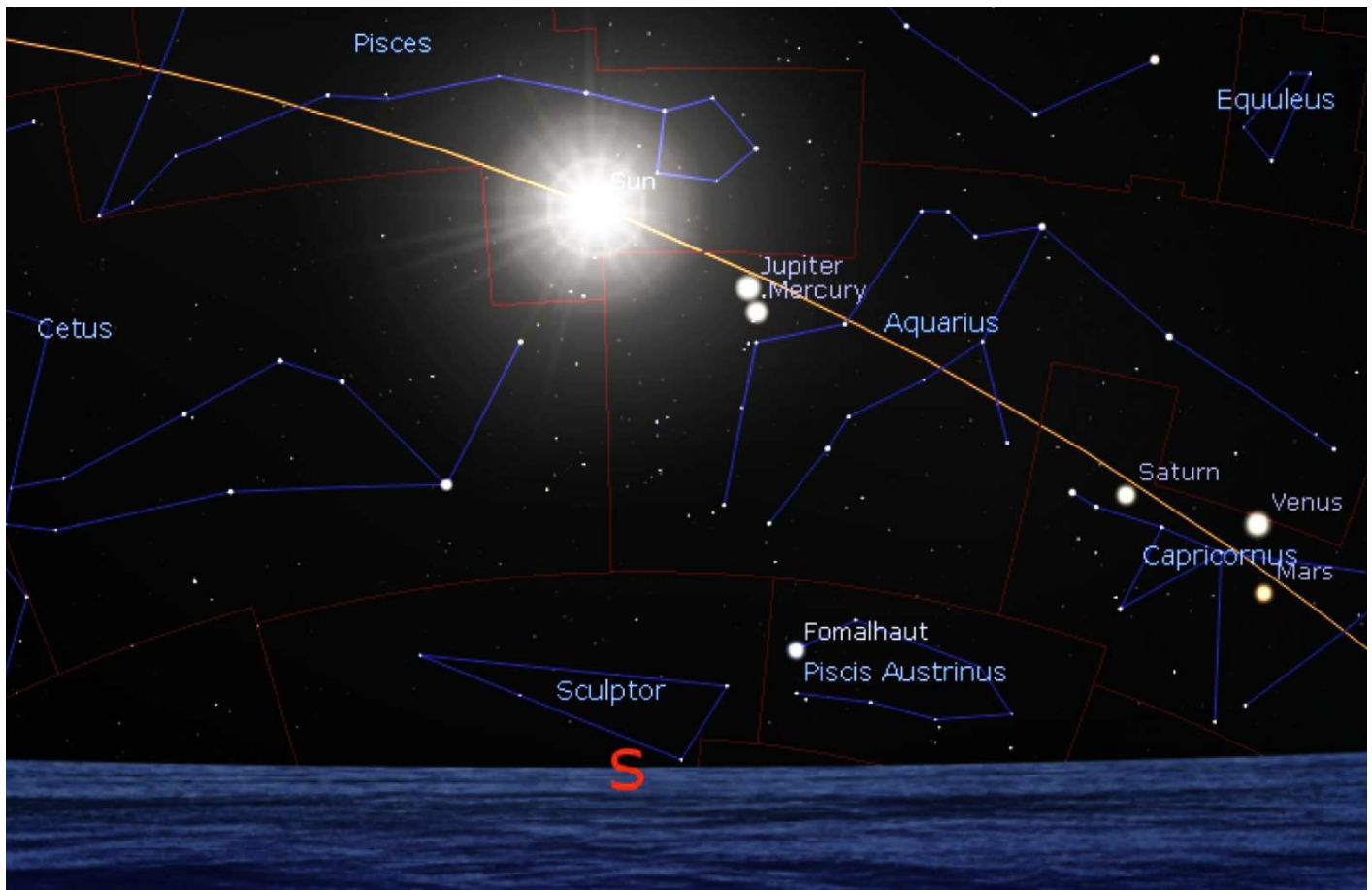


Prime Meridian (153) March 28, 2022

Further milestones in the history of our planet.

On March 20, 2022, we passed through an equinox - the Northern Hemisphere's Spring Equinox. In Beacon Wood, Kent, spring flowers, primroses (*Primula vulgaris*), were out on the hillside.

Threat to human communities; could the Russia-Ukraine conflict spiral into an "Ecosphere War" - undermining our living world?



Spring Equinox March 20, 2022

A modified *Stellarium* image of the Sun, planets and stars, around mid-day. The ecliptic (orange) is the path of the Earth's orbit around the Sun (or the path of the Sun as seen from Earth). The planets follow a similar path, and on this occasion, all five of the naked-eye planets could be seen, from Earth, to the west of the Sun. Below: Sunrise at New Ash Green, Kent.

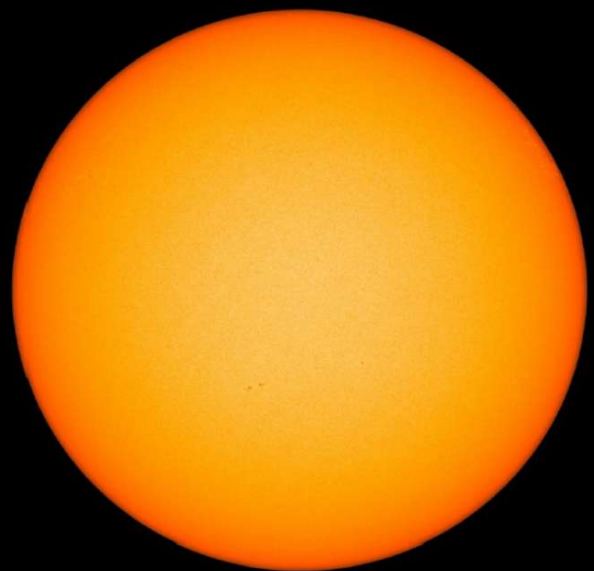
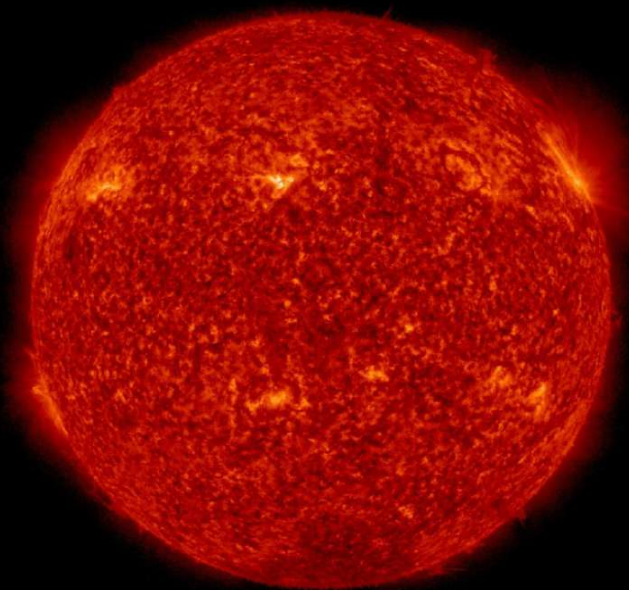


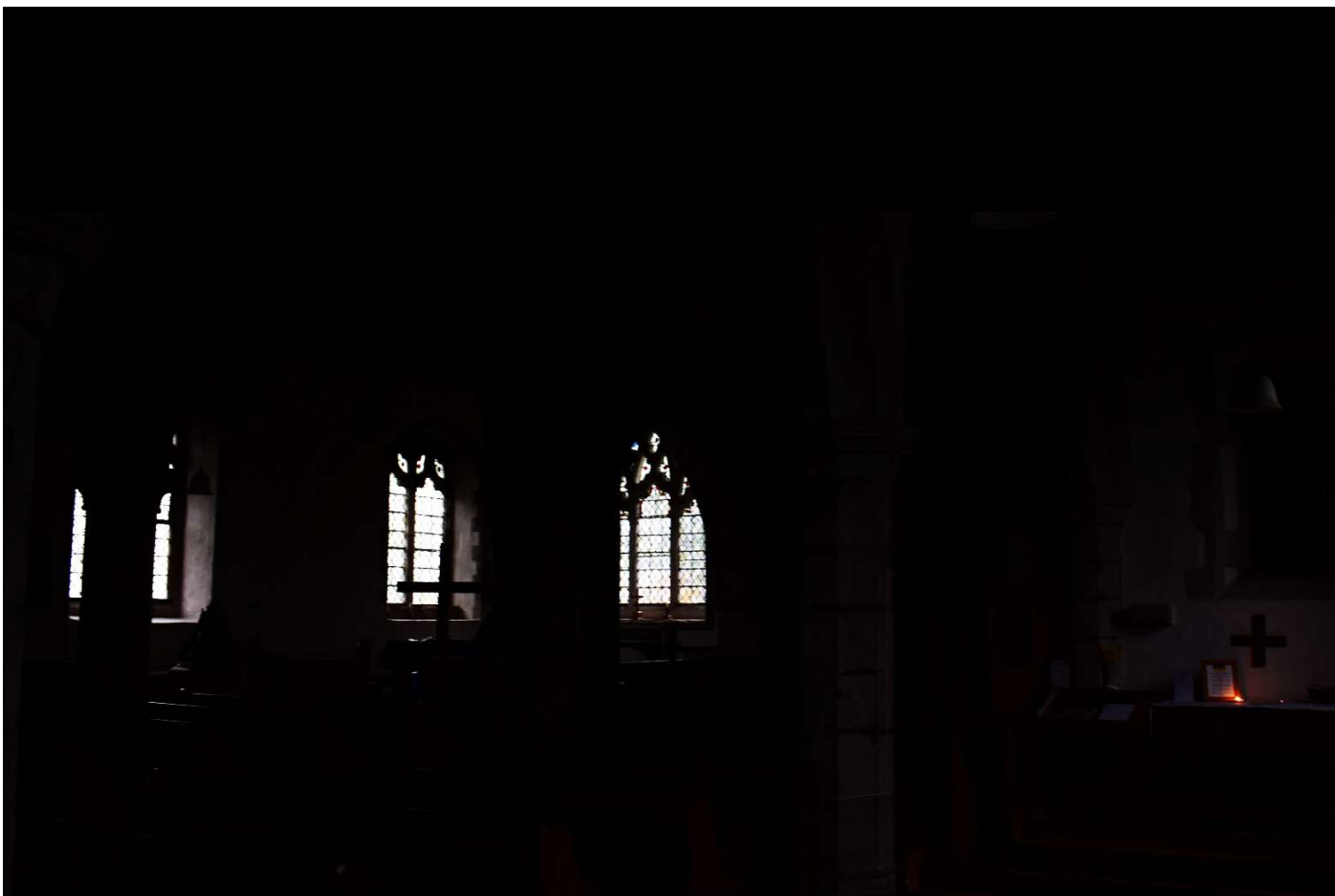
Amundsen-Scott South Pole Station 2022-03-20 12:35:02



Above: The South Pole experienced its Autumn Equinox. Below the Sun from the NASA Solar Dynamics Observatory. The (left) spectrum shows the chromosphere and transition upwards into the corona (14:48:42). The pressure is extremely tenuous and the movements of particles are effectively at a temperature of 50,000K. Right: We look farther down, into the photosphere. Note “limb darkening” is seen as the observer looks away from the centre into deeper, cooler areas (14:15:00). The photosphere can be approximated as 6,000K.

The exact moment of the Equinox was 2022 March 20, 15:33 UT.





A candle lit to invite prayers for the people of Ukraine and the world at this time. St Peter & St Paul Church, Ash, Kent. March 1, 2022.

The Earth Crisis - global events remind us that the Crisis is not just about climate change.

Ordinary Ukrainians, many young and otherwise expecting their lives waiting ahead of them, are facing, with immense courage, a professional army. (although perhaps not so well equipped as thought, and with, one suspects sagging morale).

The world is wary to assist, following Russian statements that intervention would constitute a threat that could be answered with nuclear weapons. Invasion, mass killing and injuring of civilians, rounding up and transport of populations elsewhere, and huge numbers of refugees seeking to escape, appear to us to be astonishing events to be happening in modern Europe. We have to remind ourselves, however, that the Second World War lies within a human lifetime. That is the speed at which our runaway overturning of our world is underway, and leaving intense hatreds in its wake.

This adds deadly complications to the deepening Earth Crisis. We remind ourselves of the immense, self-inflicted damage by humans to humans and the world on which our species live.

Conflict threatens to undermine our planet's global ecosystem.

One of the most important reasons for tackling climate, and other global dangers, is to safeguard human communities. Instead, the Russia-Ukraine conflict has revealed that some national leaders, as has been the case throughout human history, have profound contempt for the lives of ordinary people. This being the case, we must question to what extent, in the real world, there could be effective international co-operation on climate and the multiple complications of the Earth Crisis.

Should we now be fearing what can be called an “Ecosphere War” - a conflict which might cause serious harm to the Earth's global ecosystem (ecosphere)? The possibility of such runaway human impact on the ecosphere deserves to be investigated in future issues.

Among the threats of international conflict might be:

Difficulties for countries on opposing sides of the confrontation to overcome hatred and distrust to the extent that they must work together to defend the global environment.

Long-term economic harm for all involved in sanctions against Russia, and their resilience to other challenges, of the Earth Crisis.

Food distribution e.g. Russia and Ukraine together provide about a third of global wheat production, while Russia is essential in fertiliser production.

There will be an impact of any break down of energy supplies from Russian fossil fuels, despite hopes of countries achieving zero greenhouse gas emissions from 2030 or onwards.

Conflict has the potential to spiral out of control into conventional war in other parts of Europe, or, in worst case scenarios, nuclear exchanges.

The Earth Crisis could, in principle, culminate in an Extinction Level Event for our own and many other species.

The pursuit of countries through divergent and irreconcilable “truths” about fundamental events, with authoritarian regimes challenging liberal democracy.

This is a time for profound thought, followed by sober action.

Hope: The bravery of Ukraine's defenders has encouraged many nations to unite, uniquely, with speed and determination. This momentum for international co-operation must somehow be seized as an historic turning point for us and our threatened world.

Editor Martin Heath, Editorial assistance Penelope Stanford.

As scientists investigating the possibilities of other habitable worlds and possible civilisations, current events on our own planet can only be of close relevance. That is not academic, because here and now, we are in the midst of the Great Acceleration (described by the International Geosphere-Biosphere Programme) of human impact on the Earth. It is taken to have begun in the mid-20th Century, and current events, and the outcome of our species, are part of this every faster process.

<http://www.igbp.net/globalchange/greatacceleration.4.1b8ae20512db692f2a680001630.html>

As we stress, the Earth Crisis is complex, with threats arriving from many directions at the same time. None of these threats exists alone, but interact, and cannot be understood or turned around as something separate from the others. It crosses academic disciplines, and so we need another kind of expertise that can put together overviews. The concept of an “Ecosphere War” is not just playing with words. It is not a cynical way to grab a piggy-back on current events that threaten to outcompete climate on the news agenda.

Climate and nuclear weapons have both received much media attention.

The *Washington Post* (Sarah Kaplan & Brady Dennis, Feb. 28, 2022) warned us:

“Humanity has a ‘brief and rapidly closing window’ to avoid a hotter, deadly future, U.N. climate report says”

“In the hotter and more hellish world humans are creating, parts of the planet could become unbearable in the not-so-distant future, a panel of the world’s foremost scientists warned Monday in an exhaustive report on the escalating toll of climate change.”

<https://www.washingtonpost.com/climate-environment/2022/02/28/ipcc-united-nations-climate-change-adaptation/>

Alliance for Science: What the science says: Could humans survive a nuclear war between NATO and Russia? (Mark Lynas, March 10, 2022):

“a war involving less than 1% of the world’s nuclear arsenal could shatter the planet’s food supplies”

“researchers reported that an India-Pakistan nuclear war could lead to crops failing in dozens of countries — devastating food supplies for more than one billion people. Other research reveals that a nuclear winter would dramatically alter the chemistry of the oceans, and probably decimate coral reefs and other marine ecosystems”

<https://allianceforscience.cornell.edu/blog/2022/03/what-the-science-says-could-humans-survive-a-nuclear-war-between-nato-and-russia/>

We must not assume that the impact of conflict on Earth’s ecosphere becomes relevant only in the extreme circumstances of nuclear war.

Determined attempts are being made by ruthless and power-hungry authoritarian regimes (eg, Russia, China and North Korea) to undermine liberal democracies on a global scale. So far, the entry of Ukraine refugees into European countries has been met with widespread compassion. At the same time, however, floods of displaced people add to the challenges faced by Western democracies, which are already stretched by the Covid pandemic - which has a potential to be a destabilising factor. As conflict impacts on human communities, human activity will impact of the ecosphere.

What are the implications for Net Zero carbon emissions?

Writing in *The Independent*, Vince Cable noted that the implications of the war would not be limited to Ukraine, and that a consequence could be a need to use coal, undermining the global effort to combat climate change.

“There is a parallel universe. While we hear about the mind-numbing horrors of the Russian bombardment of Ukrainian cities, there is also cheerful news about British athletes winning medals in the Beijing Paralympic Winter Games. Manchester United is up against Manchester City. There is a devastating war in Eastern Europe, but the rest of the world goes about its business and pleasures. So far. . . . If there is an oil blockade, a gas blockade may follow. But gas supplies are inflexible in the short run. There would be a scramble for scarce reserves of liquid natural gas, and those with deep pockets (read: China) would corner the market, escalating prices. In a blow to the world’s “net zero” efforts, coal could see a renaissance.”

Voices: Is this Europe’s war - or are we facing WWII? Vince Cable March 8, 2022.
<https://uk.news.yahoo.com/voices-europe-war-facing-wwiii->

A comment in the *Mail on Sunday* (March 6, 2022) warned of “The astronomical costs of pursuing a Net Zero utopia.” Whatever one thinks of this paper’s politics, it raises questions about the political and economic realities of the coming world. “We can no longer pretend to live in a safe and stable world” and we “may have to reverse several supposedly green decisions, including the closure of nuclear power stations and a planned phase-out of coal by 2038.” Is “Net Zero’ carbon production sustainable or sensible?”

One must respond that concerns about climate (and other Earth Crisis issues) and national security are not competing concerns from rival political ideologies, but each present us with its own conundra. We may be far from having all the answers in either case. Might we find ourselves in danger of being able to save ourselves from only one threat, at the expense of being able to save ourselves from the others?

<https://www.dailymail.co.uk/debate/article-10582167/MAIL-SUNDAY-COMMENT-astronomical-costs-pursuing-Net-Zero-utopia.html>

Food and resources are potential strategic weapons.

Kambiz Kazemi, Chief Investment Officer at Validus Risk Management, posted a disturbing comment on March 3, 2022:

“it is very important to think of the scenario where Russia, already having taken a massive economic hit and hardship - and with little downside left - would decide to use its commodities as a weapon and actually voluntarily decide to starve the world markets knowing that it will hurt the West by steering economic hardship and fostering public discontent in order to undermine social cohesion and order.”

Kazemi pointed out that Russia produces 40% of world palladium; 17% of world wheat exports (and another 12% exports are produced by Ukraine bringing together to nearly 30% of world exports); 7% of world aluminum; 6% of world nickel supplies; about 10% of daily crude oil production (which is so far not targeted directly by sanction).

<https://validusrm.com/is-the-commodity-super-spike-yet-to-come/>

Writing in the *Converstaion* (March 3, 2022) Wandile Sihlobo (Senior Fellow, Department of Agricultural Economics, Stellenbosch University):

“Russia’s war with Ukraine risks fresh pressure on fertiliser prices”

“Russia is one of the major players in global agricultural markets. The country is a significant exporter of grains, and also integrated into global agriculture as a supplier of inputs, particularly fertiliser. The country is a leading world supplier of the key ingredients of a range of them.”

So far the focus has been on the supply and price of grains and oilseeds. “The war presents upside risks to both because Russia and the Ukraine make significant contributions to global exports of wheat, maize and sunflower oil.”

“This is a global challenge for all farmers, and unfortunately, the ultimate crop yields that farmers harvest is dependent on the use of fertilisers. A reduction in fertiliser use, and the resulting negative impact on yields, has implications for the consumers across the world, particularly in poor countries where agriculture constitutes a significant share of the economy.”

<https://theconversation.com/russias-war-with-ukraine-risks-putting-fresh-pressure-on-rising-fertiliser-prices-178334>

Propaganda is a key factor in conflict.

In the face of the Earth Crisis, with its numerous global environmental dangerous, it will be essential for electorates to receive accurate reporting about the science.

The Russia-Ukraine conflict has reminded us of one of the most disturbing aspects of human behaviour; leaders manipulate populations through means of carefully constructed “truth.” As a dictatorship asserts control, its “truth” can diverge sharply from external reality. A major contention is that after the end of the Soviet Union, under Mikhail Sergeyevich Gorbachev, NATO and the EU should not have extended to the east, posing Russia a strategic threat. On the other hand, hatred was created in particular during mass deaths of the Stalin era. Joseph Vissarionovich Stalin (1878-1953) lead the Soviet Union between 1928-1953. Fears of new Russian re-expansion, with occupation of Russian-speaking areas of Ukraine and the military importance of Crimea, together with the attractive, richer economy of the West, impells Ukraine westward, added fuel to the fire.

Putin talks of a “special military operation” to liberate Ukraines, while the West shows images of cities reduced to rubble and terrified refugees. On March 14, 2022, Marina Ovsyannikova, an editor of Russian Channel One, appeared during a news report and held up a placard declaring “Don’t believe the propaganda. They’re lying to you here.” There was a statement in English “Russians against the war.” Tougher laws had appeared on March 4, 2022, making “public dissemination of deliberately false information about the use of the Armed Forces of the Russian Federation” illegal. So far, she has received merely a fine, but further action could follow.

The matter has become twisted further when Zhao Lijian of China's Foreign Ministry claimed: “This Russian military operation has uncovered the secret of the U.S. labs in Ukraine, and this is not something that can be dealt with in a perfunctory manner” *The Economic Times* (India). [biolabshttps://economictimes.indiatimes.com/news/international/world-news/china-amplifies-unsupported-russian-claim-of-ukraine-biolabs/articleshow/90159310.cms?from=mdr](https://economictimes.indiatimes.com/news/international/world-news/china-amplifies-unsupported-russian-claim-of-ukraine-biolabs/articleshow/90159310.cms?from=mdr)

We are told also that “Social-media users in China are obsessing over a conspiracy theory claiming the COVID-19 virus was produced by US-linked laboratories in Ukraine” Cheryl Teh, March 25, 2022. uk.news.yahoo.com/social-media-users-china-obsessing-074514092.html

Tackling the Earth Crisis is a matter of urgency. Unfortunately, the world is faced not just by conflict and genuinely different perspectives, but by deliberate lies. We have a tough journey ahead.



Above: Drawn from a TV picture of destruction in the Ukraine.

“Ecology,” “World War” and the “Ecosphere War.”

We suggest the phrase “Ecosphere War” for a conflict that impacts on our planet's global scale ecosystem - the life-support system upon which we humans depend for our existence. Here is some background.

It appears to have been the German researcher Ernst Haeckel (Ernst Heinrich Philipp August Haeckel, 1834-1919), who gave us two terms that have become well-known: “ecology” and “First World War.”

The 1914 to 1918 War had been attributed to an unnamed writer in Maclean's (Patricia Treble) as the “Great War” (August 2, 1914). It was first described, shortly afterwards as the “First World War.” This came from the notable German researcher Ernst Haeckel (Ernst Heinrich Philipp August Haeckel, 1834-1919) who is credited also with introducing the term “ecology” (oecology).

According to Haeckel “There is no doubt that the course and character of the feared ‘European war’... will become the first world war in the full sense of the word.” (Sept. 20, 1914, *The Indianapolis Star*, Page 37). The next huge conflict, 1939 to 1945, was to become called the Second World War.

Another term that appeared was “ecosystem,” which had been devised by Arthur Roy Clapham (1904-1990) at the request of the British scientist Sir Arthur George Tansley (1871-1955). Among scientists who have used the term “ecosphere” has been Richard J. Huggett of the School of Geography, University of Manchester. He decided: “On balance, it seems to me that . . . “ecosphere” is the most appropriate term for all situations where living things and their supporting environment are taken as a whole. It may be applied to the terrestrial ecosphere and to artificial ecospheres, and it could be applied to other planets and satellites that support life.”

We are suggesting that the implications of human conflict may be so extensive that they could undermine the ecosphere.

Huggett, R. J. (1999). Ecosphere, biosphere, or Gaia? What to call the global ecosystem? *Global Ecology and Biogeography* 8, 425-431. Tansley, A. G. (1935). The use and abuse of vegetational concepts and terms. *Ecology* 16: 284-307.



Above: A familiar spring flower, the lesser celandine (*Ranunculus ficaria*) at New Ash Green, Kent. February 27, 2022.

Prime Meridian.

Prime Meridian is published by the Ecospheres Project, a research and media collaboration. This newsletter looks at the cycle of the seasons in South East England and looks out from the Prime Meridian into at the global environmental. It steps back to look at the Earth in its astronomical context. Environmentalists talk of the “Climate Crisis,” but we emphasise that the threat caused by human activity to the ecosphere of Planet Earth goes beyond climate alone. The Crisis involves numerous factors, all of which interact with each other in a complex way. For this reason, we have introduced the phrase “Earth Crisis.”

We pursue also the search for other habitable worlds. This is an area of research in which the editors have been active. It promises to open new vistas in our understand of how our living Earth belongs in the larger picture. At the same time, as space probes head to other worlds in a search for life, we assert the moral duty of space exploration to inflict no harm on life elsewhere from human impact.

Editor: Dr Martin J. Heath.

Editorial assistance: Penelope Stanford and Dr Laurance R. Doyle.

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Email: ecospheresproject@hotmail.com Website: www.ecospheresproject.org

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