



Gylden Magick

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April 2024

PRACTICAL MAGICK & UNIVERSAL ENERGY FOR EVERYDAY LIFE

Editor's notes

by Gylden Fellowship

Welcome to **GYLDEN MAGICK** – the spiritual magazine from [Gylden Fellowship](#) that spans both traditional and newer pagan beliefs and practice.

Dear readers of **GYLDEN MAGICK**,

It's April (the **Seed Moon**) – I've been reflecting on seeds and new projects. Since Ostara, the hours of daylight have been growing steadily. As we look around, all of nature is flowering after the winter: buds are on the trees, seeds start to germinate and spring flowers appear everywhere. The power of the sun increases each day as the nights get shorter.

Dates for your diaries – not least **Hanamatsuri** (the Buddha's birthday) on 8 April, **First Cuckoo Day** on 14 April, **Rama's Day** on 17 April and **Earth Day 2024** on 22 April

(this year's theme is **Planet vs Plastics**). The First Cuckoo Day was a traditional marker to herald the Spring – anyone who heard the first cuckoo was destined to enjoy good luck. And we look forward to **Beltaine** (at the end of the month).

This edition has a definite emphasis on spring - the altar colours for this period leading to **Beltaine** are green, purple and yellow. But no ads – after all, we're like a pagan public library and all the information is free.

We continue with our regular series about celestial forecasts, sacred art, history, folklore, Beltaine and environmental issues. Our crystal expert, Charlie, turns her attention to garnet and ruby. Our science writer, Mark, has several pieces this month, examining meta-science. One looks at polar stratospheric

clouds, another covers shark teeth analysis and the third considers fusion energy.

In past years, we would be frantic with preparations for the Wandering Witches' Fayre, but not so in 2024. We will go along to catch-up with friends and look forward to the return of all the festivals, camps, fayres and markets in a post-covid world.

Thank you for all your feedback and many blessings.

Gylden Fellowship admins

For more info, why not join [Gylden River LRC](#) or [Gylden Fellowship](#) groups on Facebook today and see our archives or new briefings?

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April crystals: ruby & garnet

By Charlie Foreverdark

Actually, **garnet** can be found in several guises, as listed below. It's a correspondence stone for April.

- Red garnet
- Melanite
- Rhodolite
- Andradite
- Hessonite.

Garnets are found across the world and are relatively easy to source. The cost of rough or tumbled stones is not so bad, but buying garnet as a gemstone is not required for healers! Garnet was a popular ornamental adornment among royalty and aristocrats. So, what are the **main healing properties**?

- Garnet is a good stone for meditation and aligning your chakras. Lay on your back on a yoga mat and, with your legs uncrossed, place a garnet over the pubic bone, the heart, and between the feet and begin to feel all seven chakras easing gently back into alignment.
- While the garnet is balancing your root chakra, you'll find that it's clearing out any negativity too by taking away your fears and worries.
- Garnet is a crystal that is a symbol of physical love and the relationship between loving partners. If you're in a relationship, use garnet to deepen your romantic love. If you're single, garnet enhances the laws of attraction.
- Keep a garnet on your crystal shelf and let it represent the earthy tones created from the life-giving elements of the planet. It's rich lustre and unique vibration gives us the strength to take charge of our lives and make a move in the direction of progress and reaching a higher state of consciousness.
- The easiest way to experience the healing properties of garnet is to wear it as jewellery, perhaps in a ring, necklace or amulet.
- Garnets bring healing to the circulatory system and improve the heart function.

Typically associated with passion, love and wisdom, **rubies** are one of the most popular gemstone choices for jewellery today. Discovered 2500 years ago in India, ruby is one of the traditional cardinal gemstones (together with amethyst, sapphire, emerald, and diamond). The term, **cardinal gemstone**, refers to the historical (and continued) use of these five gemstones by royalty and for religiously significant purposes. The word, **ruby**, comes from the Latin - **ruber or rubeus** - meaning red. I have composed the following blog full of all the fascinating factoids that I uncovered about the beautiful red stone.

A ruby is a red-hued variety of the oxide mineral, **corundum**, comprising of the two elements, aluminium and oxygen. In its purest form, corundum is colourless. Trace elements that become part of the mineral's crystal structure cause the variations in colour. Other coloured varieties of gem-quality corundum are called **sapphires**; however, sapphires are coloured by impurities of titanium, iron, and aluminium oxide. Chromium is the trace element that causes the red of a ruby. The strength of colour depends on how much chromium is present: the more chromium, the stronger the red. Corundum specimens that are light pink tend to be referred to as pink sapphires and the name, **ruby**, is reserved for only the deeply rich red specimens. The range of reds vary within the individual deposits and locations. Traces of iron tend to create a darker, duller and more brownish red. Chromium can also cause *fluorescence*, so rubies will naturally fluoresce under UV light.

Ruby is the most significantly valuable variety of the corundum mineral specimens. Top quality, highly saturated rubies can command the highest per-carat price of any coloured gemstone. The most uniform and highly saturated rubies are referred to as **Pigeon's Blood** rubies and it is particularly rare for rubies of this quality to appear in specimens of over 5 carats. The most renowned Pigeon Blood rubies typically form in marble. Marble hosted rubies acquire their intense red colour owing to the particularly low iron content of marble. In other locations, rubies can be found in basalt rocks, which have higher iron content. The iron content within the chemical make-up creates darker and less intensely coloured stones. Higher iron content also masks the fluorescence. In the pictures below, the rough stone is red garnet and the gemstone is ruby.



Rutile inclusions are common within rubies, and can even increase their value. Beautiful star rubies are formed when light is reflected or diffracted off fine parallel fibres or needle-like inclusions of rutile/hematite. This causes an occurrence known as **asterism** in which three or six-point stars are visible in the stone.

Rubies mined from specific parts of the world (such as Myanmar) have been found to have a bluish-purple secondary colour – they are **dichroic**, meaning that when light enters the translucent stone, it will be split into two distinctive colours. In order to enhance the red beauty of the slightly purple rubies, jewellers will often set them in yellow gold as it neutralises the bluish tones, allowing the stone to appear even more impressively red. White gold or platinum tend to be better choices for contrasting the more yellow/orange-toned rubies.

As with many other stones (including sapphire, aquamarine, tanzanite, amethyst, citrine, blue topaz, blue zircon and tourmaline), most rubies in the jewellery market will have been heat-treated to improve their colour and clarity. When it comes to jewellery, heat treatment is generally considered to be an acceptable part of the processing. In fact, unheated natural stones are rare and can command prices up to 70% higher than the heat-treated examples. Some lower quality ruby specimens are even treated using a type of flux or an oil that fills and masks any fractures and cavities. Responsible marketeers will always disclose any procedures that the finished piece has undergone.

Rubies are exceptionally durable, and highly resistant to scratching. Their durability and beauty make them perfect for daily wear, and, thus, a popular choice for jewellery. **Scoring a 9 on the Mohs hardness scale**, rubies (and sapphires) fall just shy of diamond – the perfect 10. Unlike diamonds (which are graded according to a strict system of letters), coloured gemstones such as rubies aren't graded using any kind of objective system. Instead, gemmological laboratories use master stones as a reference point for hues, tones and saturations of new specimens.

Since 1908, it has been possible to create synthetic rubies within a laboratory. Whereas natural rubies are formed under the Earth's crust over the course of 20 million years, the lab-created versions are synthesized under much quicker controlled laboratory conditions. Synthetic rubies have the advantage of being cheaper than natural rubies. They also tend to be produced without the flaws that are inherent within natural stones. From a chemistry perspective, the lab-created rubies have identical chemical properties to the natural stone. Like all things, the appearance of rubies is ultimately subjective. To some people, lab-created rubies look unnaturally perfect and are devoid of the character that is present in an earth-created gemstone. To others, the lack of natural flaws and inclusions may appear an advantage.

As with most gemstones, the market is saturated with fakes and knockoffs. Unlike synthetic (lab-created) rubies, fakes will typically be made from materials such as glass or from cheaper gemstones. These are chemically different from genuine rubies (whether naturally occurring, or synthetically grown) and won't have the same level of strength or a convincingly similar appearance. Scratch testing is a reliable way of ascertaining if your stone is the genuine article or not.

1. Rubies are mentioned four times in the Christian Bible (though red gems were sometimes referred to as carbuncles). In Exodus 28:17, carbuncle was one of the stones in the High Priest's breastplate. A comparison is made between the value of wisdom and rubies in both Job 28:18 and Proverbs 3:15. And then, "the price of a virtuous woman" is said to be "far above rubies" in Proverbs 31:10.
2. In the ancient language of Sanskrit, ruby is called **ratnaraj**, which means king of precious stones. The ancient Hindus believed that those who offered fine rubies to the god, Krishna, would be granted rebirth as powerful emperors.
3. In Myanmar (formerly Burma), a source of rubies for many centuries and the location of the incredible Mogok ruby mines, ancient warriors believed that rubies bestowed invulnerability in battle. However, it wasn't enough to just wear the rubies or carry them into battle. Instead the warriors participated in rituals where rubies were physically inserted under their skin and deep into their flesh, making them a part of their bodies, and supposedly granting them the power of invincibility.
4. In the Middle Ages, superstition decreed that rubies contained the power of prophecy. People believed that rubies would supposedly darken in colour to warn of impending danger, then lighten again once the peril had disappeared.
5. Historically, red spinel was often mistakenly called ruby, as it can look very similar and is often found within the same mineral deposits as rubies. However, red spinels can now be identified using some relatively simple gemmological tests. Spinel was referred to as the great impostor of gemstone history and some of the most famous rubies (and indeed sapphires) featuring in crown jewels around the world are actually spinels. Unlike rubies, which are made of corundum, spinel is composed of magnesium aluminium oxide. However, as it forms in the same rock matrices and under the same geological conditions, it is entirely unsurprising that ancient gem traders were unaware that spinel had a different chemical composition and would subsequently misidentify the stone. There are famous examples of spinel being misidentified as ruby, including a 170-carat bright red spinel named **The Black Prince's Ruby** and also the 361-carat Timur Ruby which was presented by the East India Company to Queen Victoria in 1851.
6. In 1973, Queen Elizabeth received a ruby tiara containing 96 rubies that had been presented to her as a wedding gift from the Burmese people.
7. To commemorate the 50th anniversary of The Wizard of Oz, Harry Winston created real ruby slippers set with 4600 rubies; a reference to the magical ruby slippers whose heels Dorothy clicked thrice to return to Kansas.

Gylden
Magick
April 2024

Sacred art: Rama's Day (17 April - Hindu)

Celebrating the birth of Lord Rama who is an incarnation of Lord Vishnu. It falls during March-April (the 9th day of the first month of the Hindu calendar).

Collated by Gylden Fellowship







Environment: 30 Days Wild

By The Wildlife Trusts

This year marks a milestone for The Wildlife Trusts' flagship annual event, *30 Days Wild*, as it celebrates its 10th anniversary in June. The nature challenge has grown from 12,000 participants in its first year to over half a million last year alone. *30 Days Wild* has helped people to get outside, enjoy and connect with nature as part of their everyday lives. Millions of participants benefit from countless acts of wildness over the past decade.

This June promises to be a bumper *30 Days Wild* – people of all ages and abilities are urged to participate and The Wildlife Trusts are offering free herb seeds and inspirational guides to everyone who signs-up to do a small, wild thing every day during June.

Iolo Williams, wildlife presenter and Vice President, The Wildlife Trusts, says: "Embrace the outdoors with The Wildlife Trusts' *30 Days Wild* challenge! Imagine a month dedicated to exploring the wonders of nature, from the majestic red kites soaring above to the humble bees buzzing in our gardens. Let's make every day an adventure, be it birdwatching with a slice of bara brith (a rich fruit loaf made with tea from a Welsh recipe) in hand or planting wildflowers to support our native wildlife. This June, step outside, breathe in the fresh air and go WILD!"

Supported by players of People's Postcode Lottery, *30 Days Wild* encourages individuals, families, schools, and businesses to connect with nature on a daily basis during what many argue is *the* best month for wildlife spotting. It could be going on a snail safari, eating your breakfast outdoors or closing your eyes to listen for bird song, to more adventurous endeavours such as outdoor yoga or forest bathing. This year's participants will receive a special 10th anniversary pack, designed to make their 30 days even more fun.

Research has consistently highlighted the positive impact of nature on well-being. A study found a significant increase in people's health, happiness, and connection to nature through participating in *30 Days Wild*. People reported feeling more relaxed, reduced stress levels and a greater motivation to protect wildlife which lasted long after the campaign ended.

The University of Derby conducted a 5-year evaluation of 30 Days Wild participants from 2015-2020: it found that people reported they felt happier and healthier from taking part, with positive effects lasting for at least two months afterwards.

Also, it's **National Mammal Week** on 22-28 April. The Mammal Society is all about science-led, evidence-based conservation. As such, members have access to research briefings, e-bulletins, conferences, regular journals, training, etc. More details may be had from www.mammal.org.uk and lots more can be found in the Spring 2024 issue of *Mammal News*.



Celestial notes

By Joanna Bristow-Watkins, Harmony Healing

As we progress into April, a theme emerges which venerates spring, renewal and fertility as well as nourishment. Known for April Fool's Day and April Showers, the month often hosts Easter, as it does this year. In the forest, we start to see (and smell) the beautiful bluebells, a marker of ancient woodland, which generally reach their full splendour in May.

The month of April was supposedly named after the Roman Goddess, Venus (leading to Her Veneralia festival on 1 April), originally named Aphrilis after her equivalent Greek Goddess, Aphrodite (Aphros) or the Etruscan version Apru. To the Anglo-Saxons, April was called Easter-mōnaþ - Easter Month or Month of the Goddess Ēostre. No prizes for guessing which Christian Festival took its name from this annual festival.

April begins with April Fool's Day plus the Roman Festivals of Veneralia & Fortuna Virilis, as well as Easter Monday also on 1 April. In the Roman calendar, April also hosted Magna Mater on the 4th & Floralia on 28th, widely believed to be connected to Beltane. April is also a month for some international awareness days including Autism Awareness Day on 2nd, World Health Day on the 7th and Earth Day on 22nd. In the UK, we celebrate St George's Day and Shakespeare's birthday on 23rd.

For those who celebrate the chance to get outdoors, we have a [Total Solar Eclipse](#) on the night of 8 April (though not fully visible in the UK), the [Lyrids Meteor Shower](#) peaking, as usual 21 April, and Full Moon on Wednesday 24th at 00:48 (hence our [Full Moon Meditation](#) is evening of 23rd). We have our Forest Bathing public session at Harry Edwards Healing Sanctuary's private woodland (near Shere, Surrey) on [Saturday 20 April](#) when there should definitely be bluebells, of which there are thousands at Harry Edwards. We have [Saturday 4 May](#) reserved for anyone wanting to gather together a group for their own exclusive private bluebell session.

Celestial Forecast is compiled by Joanna Bristow-Watkins of Harmony Healing, the original is published at Joanna's [Monthly Celestial Forecasts](#). It is created using many sources but notably the [Moonwise Calendar](#) and Lia Leendertz's various Almanacs. Whilst considerable effort is made to ensure accuracy, this is not an exact science and sources are sometimes contradictory!



Monday 1 April is April Fool's day. A day for practical jokes, April Fool's Day may originate from the move from the Julian calendar to the Gregorian calendar. This moved the start of the year almost three months, from the Spring Equinox to the start of January! Those who refused to recognise the new calendar and still saw April as the start of the year were labelled, April Fools.

Monday 1 April, in addition to being April Fool's Day, is also the Roman celebration of *Veneralia* and *Fortuna Virilis*. Both celebrations seem loosely connected with Venus who is honoured on this day and whose advice is sought on matters of love.

Monday 1 April 2024 is also Easter Monday: this is Bank holiday in the UK.

As mentioned earlier, whereas the Easter celebration in the UK is based on the Gregorian Calendar, but the Orthodox Easter celebrations are based on the Julian Calendar. The Orthodox Church uses the Julian calendar to determine their holy days. Easter for the Orthodox Church will always fall sometime between 4 April and 8 May each year; this year is really late, Friday 3 May-Monday 6 May.



Tuesday 2 April is *World Autism Awareness Day*, taking place annually on 2 April since 2008. It was set up to encourage Member States of the United Nations to raise awareness about autistic individuals throughout the world. Whilst the United Kingdom celebrates Autism Awareness Week around World Autism Day, other countries, including the United States, celebrate World Autism Month throughout April.

A suggested way to demonstrate that you support people on the autism spectrum is to wear blue. This could be a special blue shirt you can purchase from a non-profit source like [Autism Speaks](#) or simply a blue ribbon or some blue clothing.

Thursday 4 April is *Magna Mater* in the Roman calendar. This is the festival of Cybele, Phrygian Great Earth Mother. Her priests took on female clothes and identities to commemorate her lover (or, in some sources, her son) Attis, who was castrated and died of the wounds, but was later resurrected.

Sunday 7 April is *Soulful Sunday at Indigo Moon Holistics*, Guildford, Surrey.

We are there all day: 11.30-12:15pm, we are offering an Indoor Forest Bathing Taster Experience. While there's nothing to compare with mindful, sensory meandering out in nature, in 45 minutes we aim to give you a taster of understanding and experiencing how using our senses consciously can bring us to a place of calm, and benefit our physical, mental and emotional functions. Research shows that spending mindful time in nature can improve our hormone, immune and respiratory functions; reduce anxiety and depression; as well as boost the quality of our sleep, our memory and creativity, amongst other benefits.

Should you wish, you will be listening to, smelling and touching natural items in new ways, and taking away tips to use in times of stress. Then, imagine what three hours in woodland could do for you! We already have bookings so please book in with Indigo Moon.

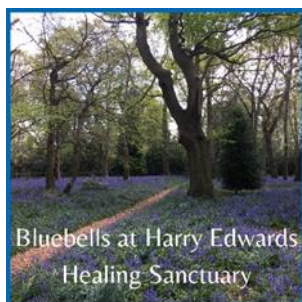


Starting at 12:30pm, there will be a 45-minute workshop introducing khemitology, which is Egyptology according to the oral traditions of the Egyptian tribal elders. As there is capacity for a maximum of 10 participants and we have limited space left. please book in with Indigo Moon to avoid disappointment. Fascinated by Ancient Egypt? Feeling frustrated in your spiritual development? Join Joanna Bristow-Watkins for a live demonstration and interactive presentation on Reyad Sekh Em® - A unique high energy combination of sound, colour, crystals, angels, alchemy and elemental healing rays inspired by the land of the Pharaohs.

Sunday 7 April is World Health Day. The message of World Health Day is simple: giving people access to healthcare without the prospect of financial hardship. The theme for 2024, is **My health, my right**. According to the website, this theme was chosen to champion the right of everyone, everywhere to have access to quality health services, education, and information, as well as safe drinking water, clean air, good nutrition, quality housing, decent working and environmental conditions, and freedom from discrimination.

Monday 8 April @ 19:20 is the Pink New Supermoon and a Total Solar Eclipse. Visible only in Mexico, USA and Canada. According to Nasa, it will be the last total solar eclipse visible from all of USA until 2044. It will be partially visible from Europe, including the UK, as a partial eclipse. Find out more at [Earthsky.com](https://earthsky.com).

The **New Moon Abundance Ritual** should be carried out within 24 hours after the New Moon. It needs to be after the New Moon because the moon should be waxing (getting bigger again) to carry the manifestation energy. There are video instructions on my [Facebook Page](#) or [You Tube Page](#). New Moon is a good time to work on your Vision Board for the rest of 2024.



Saturday 20 April, 11am - 2pm, public Forest Bathing session in the grounds of Harry Edward's Healing Sanctuary, £39.77. Immerse yourself in the healing elements of nature and connect deeply with all your senses. Spend 3 hours in the woods mindfully connecting to your surroundings and living fully in the present moment. Join us for a leisurely amble through charming private woodland; observe and connect with nature, smell the bluebells, stroke the bark,

listen to the birds. The session culminates with a treelaxation, our unique nature meditation under the canopy of trees. A deeply relaxing and rejuvenating experience, and which, despite the title forest bathing, does not involve any swimming!

Some of the scientifically proven benefits of spending time in woodland include reduced stress levels, stronger immune system response, and a stabilised cortisol cycle. This 3-hour session which will take place in all weathers except high winds or electrical storms. Book by 2pm the day before via our the [Harmony Healing shop](#). Email katieandjo@harmonyinnature.uk to receive our forest bathing monthly event update.

Sunday 21 (late) until dawn Monday 22 April is the Lyrids Meteor Shower. The Lyrids are an average shower, usually producing about 20 meteors per hour at their peak. These meteors can produce bright dust trails that last for several seconds. This year, the shower peaks on the night of 21/22 April, although some meteors can be visible from 16-25 April.

Look for meteors radiating from the constellation of Lyra after midnight, the later you view in the morning of the 22 April, less meteors will be below the horizon and, therefore, more will be visible, but as sunrise approaches, light pollution will hamper viewing.

The proximity of the Full Moon on the 23 April, means light pollution could make viewing difficult. However there is a possibility of 10-15 per hour! See earthsky.com for more. Best time to watch: late evening to dawn on the nights of 21/22 and 22/23 April.

Monday 22 April is Earth Day, which is heralded as a pivotal opportunity for people, corporations and governments to join together to create a global green economy. The theme for 2024 is **Planet vs. Plastics**. This calls to advocate for widespread awareness on the health risk of plastics, rapidly phase out all single use plastics, urgently push for a strong UN Treaty on Plastic Pollution, and demand an end to fast fashion, see more at earthday.org. It is hoped that coordinated efforts now will be recognised by future generations as a turning point.



Tuesday 23 April is St George's Day in England, celebrating England's patron saint, St George. England's National Day is celebrated on the anniversary of his death, which is on 23 April. According to legend, St George was a soldier in the Roman army who killed a dragon and saved a princess. The English flag is the red Cross of St. George, which is widely displayed as a symbol of national identity. It's also supposedly Shakespeare's birthday and death day. However, 23 April is not a Bank Holiday.

Tuesday 23 April, 7.30-9.30pm UK time (GMT+1) is our [Full Moon Unity Consciousness Meditation](#), as the Full Moon is happening in the early hours of Wednesday.

During this session, we connect with other like-minded people and together we work through a mindful chakra balancing process using colours and etheric crystals, with the aim that all participants will experience a degree of unity consciousness. Participants all receive a deeply healing experience. Cost to participate is £20 by online BACS payment (£1 admin fee added for PayPal, concessions to RSE/VFoA graduates), book at the [Harmony Shop](#).

This activity serves as a good taster of Joanna's work in general and the virtual format of our Zoom based programme. And, most importantly, it's a step towards making a difference to the global predicament. To find out how working on your own spiritual consciousness can help humanity and the planet by raising the overall human consciousness levels, see Joanna's [You Tube explanation](#).

Wednesday 24 April at 00:48 (Tuesday night/Wednesday morning) UK time (GMT+1), is Pink Full Moon.

We are holding our Full Moon Meditation the night before, see entry above. Between Full Moon and the next New Moon is considered as a good time energetically for detoxing the body. For details of Full Moon timings for the year, as well as instructions for an Angela McGerr Angelic Meditation with Gabriel, see [Harmony Healing Full Moon](#) link.



Sunday 28 April is the Roman fertility festival of flowers and crops called Floralia, that later developed into celebration of sexuality and may have influenced the subsequent celebrations for Beltane and May Day. Bright coloured clothes are worn (if any!), races and shows are performed.

Tuesday 30 April, is the Pagan Eve of Beltane; celebrations begin with people dancing around the fire clockwise, singing. Sometimes, two fires are set and cattle are driven between the fires to purify them.

Dew gathered from the grass at dawn is used in potions for luck and indeed it is believed to be lucky to roll naked in the dew!!! On Beltane, it is traditional to drink from a well before sunrise.

Wash in the morning dew, and adorn yourself with greenery. Watch the sun come up, dance round the Maypole, and otherwise abandon yourself to the season.

Round Full Moon Cakes are eaten and blackberry, elderberry, dandelion wine or cider is drunk. Sacred springs are visited and healing water is drunk.

Fusion energy update

By Mark Sharpen

OK then, this piece takes a brief look at **nuclear fusion engineering**, which looks set to be a major source of energy for everyone in the future, providing that some of the key issues can be resolved. Using nuclear fusion for businesses and homes will be one of the greatest engineering challenges in human history.

In order to recreate the energy-generating physics at the centre of the sun (which uses *a lot* of gravity to squeeze atoms together), reactors have to compensate for this lack of mass with an immense increase in heat. At around 100 million degrees Celsius, light nuclei in the form of an electron soup known as **plasma** can overcome strong electrical repulsion and fuse via quantum tunnelling. That's fine, but there's a problem: containing that ultra-hot plasma for long enough to sustain energy-producing reactions. Containing plasma involves eliminating instabilities where magnetic field lines containing plasma break apart (known as **tearing mode**), which immediately spells the end of the fusion reaction.

Scientists from Princeton University, as well as the Princeton Plasma Physics Laboratory (PPPL), are employing AI to avoid these plasma tears and trying to keep future fusion reactions from breaking down. Using the U.S. DIII-D experimental fusion reactor in San Diego, researchers demonstrated that their AI model (trained on experimental data) could detect the tearing instabilities, some 300 milliseconds in advance. Although that's not enough time for us to react to an instability, AI can readily change parameters to avoid the tear and keep the reaction stable.

"Tearing mode instabilities are one of the major causes of plasma disruption, and they will become even more prominent as we try to run fusion reactions at the high powers required to produce enough energy," said author, Jaemin Seo, a professor of physics at Chung-Ang University in South Korea, who performed the work as a postdoctoral researcher at Princeton. "Previous studies have generally focused on either suppressing or mitigating the effects of these tearing instabilities after they occur in the plasma, but our approach allows us to predict and avoid those instabilities before they ever appear."

Teaching AI to control a fusion reaction is similar to how other AI models are trained for complicated tasks, namely lots of data and ultra-quick pattern recognition. This AI model used a reinforcement learning algorithm that allowed the program to work out best containment methods via trial and error within a simulated environment. Eventually, the program learned to achieve high power output without the instability. Co-author Azarakhsh Jalalvand, also part of the Princeton group, compares training the AI model to learning to fly an aircraft, saying "a controller needs lots of time on an intricate simulator before they've learned enough to try out the real thing."

Now that the AI has passed the tests, the researchers need more data on the AI's performance at the DIII-D reactor. And if all goes well, the team could begin training the program to recognise other fusion instabilities too. After that, research starts on the development of new materials capable of withstanding the immense heat of fusion for not just minutes, hours, or days, but *years* if the technology has any hope of one day powering homes across the world.

The Wonderful



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**Saturday 6th April &
Saturday 2nd
November**

FREE ENTRY

10am ~ 3pm



Folklore: wyrms

By the Storyteller

With St George's Day due on 23 April, we could have a dragon-based story, but we're looking at the provenance of tales and it's worth noting that dragons tend to fall into several types. One type is the **basilisk** (think of *Harry Potter and the Chamber of Secrets*); another type is the **firedrake** (such the one in *Beowulf*). However, we're considering **wyrms** this time.

The most common English dragons in our folklore are giant serpents or worms, derived from the Saxon words, *wyrm* or *vurm*. These creatures have no wings or legs, but do have scales and poisonous breath – and can reform if cut into pieces (like other worms). Such monsters occur throughout local legends, such as the Lambton Worm (near Durham), and Bram Stoker wrote a short novel in the 19th century entitled *The Lair of the White Worm* that drew upon these legends. It should be noted that wyverns are dragon variants with the legs and wings of eagles and the bodies of serpents.

Actually, Sussex and Surrey have a wealth of folk legends relating to dragons, including the Cissbury Serpent, the Crawley dragon and the serpents/worms of St Leonard's Forest. The popular term for them is *knucker*, derived perhaps from the Saxon word *Nicor*, meaning water monster. At Lyminster (near Arundel), there is a deep pond known as the Knucker Pond and it was the lair of a terrible dragon that preyed on local children and residents in the Middle Ages. It even killed knights, but was killed finally by a local man who tricked it into eating a poisoned pie. Here's another myth that has its roots in reality – **the Green Dragons**.

Once upon a time, over 1100 years ago, there was a small village called Wermehalte. That was its recorded name in the Domesday Book, but the vill itself had been settled for at least 200 years before that. It was literally carved out of the middle of a forest in what we might call Middlesex, but in those days, much of the land to the west of London was either deep forest or sandy heathland.

Not too many people lived in Wermehalte. Its name came from the Saxon terms for dragon (wyrm) and forest (halte). Basically, it was an area of trees, frequented by wyrms. These were not basilisks or fire-breathers, but much, much worse – large, green serpents with poisonous fangs, perfect for hiding amongst trees and thick undergrowth.

Consider the danger, if you can – each time a villager went to collect firewood or a child went to pick blackberries or mushrooms, was that a sudden movement in the bracken? Was the green of the leaves hiding the scales of a wyrm? Over the years, many children went to forage for food and never returned home; likewise, several unwary travellers strayed into the woods and only their remains were found by the path.



Finally, the situation became so bad that King John ordered the vill of Wermehalte to be emptied and the homesteaders were moved to other places, far from the forest. This cunning plan didn't really work though, as the starving green wyrms began to attack other small settlements on the edges of the woods. So, the king ordered the forest to be razed to the ground – all the trees were felled and it became a scrubland of bracken, old stumps and brambles. Where did the wyrms go?

Some left, ending up in other places and other tales, such as Clandon, St Leonards and Basingstoke. Others, it is said, dug caves under the hills and still sleep underground. Over the centuries, London expanded and factories or houses were built, but still the wasteland of Wermehalte stayed untouched. Until 1874, that is, when the Victorians decided to build on the site – and this is now the location of the famous prison, Wormwood Scrubs!

Dragons were believed to live either underground or at the bottom of the sea, namely Nidhogg, the great Midgard Serpent that lay at the roots of the world tree, Yggdrasil. That is why so many Danish ships had dragons carved on their prows – as a symbol of bravery, to frighten opponents and to protect the crews against sea monsters. There are links to giant snakes that lived after the dinosaurs had died out, such as the *Titanoboa* or *Gigantophis garstini* or *Palaeophis colossaeus* (banded sea snake). And there are still many folk tales surrounding present-day serpents, namely king cobras, Burmese pythons, rock pythons and anacondas.

Actually, thinking about wyrms, it is worth noting that there's a very local folk tale about a wyrm and that's the **Dragon of Clandon**.

This is a folk tale from 1796, when a lot of press-ganged soldiers (due to fight Napoleon) deserted from Newhaven: sleeping rough and foraging for food. One of them came north to the Guildford area and his only friend was a stray dog that went with him everywhere.

Unfortunately, the deserter was caught by local police, the dog was shooed away and the deserter was sentenced to death by firing squad. While in jail, he heard a story that a large dragon was terrorising the people of West Clandon (just outside Guildford) – so he asked the local magistrates for a pardon, if he killed the dragon.

The offer was accepted, the deserter was given a bayonet and taken to West Clandon. Well, there was no dragon to be seen, just some large mounds in a field (it's still there – Deadacre Field) until one of the large mounds opened an eye. It was the dragon and rose to its full height, all long claws, poisonous fangs and spiky tail. The deserter stabbed again and again, but his bayonet bounced off the dragon's scales and then the creature managed to stab him with its tail.

Suddenly, from behind the dragon, the deserter's old friendly dog appeared, jumped out and bit the dragon's neck. The dragon fell and the deserter was able to stab its heart via the softer skin underneath. So, the deserter (and his dog) had won and he was pardoned. The people of West Clandon were very grateful and the battle is remembered to this day: a plaque to commemorate the event is kept in the Church of St Peter and St Paul.



Polar stratospheric clouds

By Mark Sharpen

Polar stratospheric clouds are also known as **nacreous clouds**. They are rare and very high, known mainly for the coloured light they reflect after sunset and before sunrise. The colours are reminiscent of the colours which reflect from a thin layer of oil on top of water, an effect known as iridescence.



Nacreous clouds form in the lower stratosphere over polar regions when the Sun is just below the horizon. The ice particles that form nacreous clouds are much smaller than those that form more common clouds. These smaller particles scatter light in a different way, which is what creates the distinctive luminescent appearance.

Due to their high altitude and the curvature of the Earth's surface, these clouds are lit up by sunlight from below the horizon and reflect it to the ground, shining brightly well before dawn and after dusk. They are most likely to be viewed when the Sun is between 1° and 6° below the horizon and in places with higher latitudes, such as Scandinavia and northern Canada. For this reason, they are sometimes known as polar stratospheric clouds. Nacreous clouds only form below -78°C so are most likely to occur during the polar winter.

Because of the very low temperatures required, nacreous clouds are usually only visible from the UK when the cold air which circulates around polar regions in the stratosphere (known as the stratospheric polar vortex) is displaced and hovers temporarily over the UK. As nacreous clouds form in a polar vortex, they are associated mostly with very cold and dry weather. They are classified into three types, Ia, Ib and II, according to their chemical composition, height and ambient temperature.



Environment: Spring photos

By Sussex Wildlife Trust





SO YOU THINK YOU KNOW ABOUT...CHOCOLATE!

A seasonal quiz for younger folks by Erica Zann

(Editor's note: Erica is on holiday at present, but kindly sent us a family quiz. She'll be back with her **Shrooms** for our May edition. We've highlighted the answers.)



What is the main ingredient in chocolate?

1. Cocoa beans
2. Nuts
3. Bananas

Which company is well-known for making chocolate?

1. Apple
2. Lindt
3. Samsung

In Charlie and the Chocolate Factory, which character fell into a river of chocolate?

1. Veruca Salt
2. Augustus Gloop
3. Mike Teavee

Why is lecithin added to chocolate?

1. To give extra flavour
2. To make the chocolate smooth
3. To blend the ingredients together

Which chocolates include green triangles and golden pennies?

1. *Roses*
2. *Quality Street*
3. *Heroes*

Which chocolate bar is famous for its honeycomb pieces?

1. *Crunchie*
2. *Wispa*
3. *Mars*

Where can you visit Cadbury World?

1. *London*
2. *Manchester*
3. *Birmingham*

Which flavour links a Chomp with a Curly Wurly?

1. *Mint*
2. *Peanuts*
3. *Toffee/caramel*

What is unusual about Green & Black's Dark Chocolate?

1. *It contains 85% cacao*
2. *It has a green colour*
3. *It is a very sweet chocolate*

What is a chocolate mousse?

1. *A creamy dessert*
2. *A toy*
3. *A brown reindeer*

Well done if you answered them all - treat yourself to a sweet treat!

Seasonal magick for Beltaine

By Nic the Witch

This is a Celtic fire festival, celebrated this year on 1 May, which is symbolic of the start of summer. It is known as Beltaine, but also as Calen Mai or Bealtaine. For the Saxons, Beltaine was the time to move the sheep to the upland pastures. The Calen Mai is a Welsh term that refers to the calends of May, traditionally marked by the flowering of hawthorn blossoms. In Ireland, the fires of Tara were the first ones lit every year at Beltaine and all other fires were lit with a flame from Tara.

The festival of Beltaine has a tradition of maypoles, dances, bonfires and offerings to the gods. In rural areas, cattle were driven through the smoke of the balefires, blessed with health and fertility for the coming year. For many Celts in England and Wales, Beltaine was a time of handfasting for the god, Cernunnos, and his bride, Ceridwyn (or Cernunnos and Brighid in Ireland). While the Irish-Gaelic word for May is Bealtaine, the literal translation is *bright or brilliant fire*, derived from the bonfires lit in honour of Bel, the god of light, fire, and healing.

Some Wiccan pathways support a symbolic battle between the May Queen and the Queen of Winter at Beltaine. Other pagans include maypoles, decorated with green and yellow ribbons, in their Beltaine rituals and they dance around the pole in ever-complex patterns. Other pagan practices at Beltaine include spring flower magick, planting of seeds, færy magick and spirit communication. As at Samhain, Beltaine is seen as a time when the veil between worlds is thinner and you could plant a tree or shrub as remembrance for an ancestor.



Here are some ideas for **celebrating Beltaine**, either at home or in an online group.

- Build a sacred fire outside, e.g. in a fire pit.
- Chant or sing Beltaine songs.
- Make a spring crown of flowers.
- Make a basket of spring flowers.
- Weave or braid natural plants like willow, long grass or ivy into pentacles.
- Contact spirits of those who have passed over.
- Creative visualisation of your soul and its dreams, blooming like colourful flowers.

We have come together this day as our ancestors did before us, to celebrate the festival of Beltaine, to welcome in the summer and to ask that it be once again a fruitful time in which to grow our harvest for the year. For the Saxons, this was the Feast of Summer when flocks were moved to the upland pastures and people made ready for the growth of crops. April was a time of fertility for new life in the earth and its people. For many Celts in England and Wales, Beltaine was a time of handfasting for Cernunnos and Ceridwen.

Incense for Beltaine

As we're just approaching Beltaine (1 May 2024), perhaps it would be a nice idea to have some altar incense, regardless of whether it's just for you or for a small group ritual. You can make your own quite easily, using a blend of herbs, flowers, fruit, resins, etc. The first step is to gather your ingredients, together with jars, lids, mortar, pestle, mixing and measuring spoons. Any guide to incense lists the parts and a part is simply 1 unit of measurement, e.g. a cup or 1tsp.

Start with the essential oils or resins, mashing them up with the mortar and pestle. Or, you could use a blender or coffee grinder. Then add fruit, flowers, dry herbs last. Traditional incense for Beltaine includes:

- Jasmine
- Patchouli
- Frankincense
- Rose
- Peach
- Vanilla
- Ylang ylang

Am Beannachadh Bealltain (The Beltane Blessing)

*Bless, O threefold true and bountiful,
Myself, my spouse, my children.
Bless everything within my dwelling and in my possession,
Bless the kine and crops, the flocks and corn,
From Samhain Eve to Beltane Eve,
With goodly progress and gentle blessing,
From sea to sea, and every river mouth,
From wave to wave, and base of waterfall.*

*Be the Maiden, Mother, and Crone,
Taking possession of all to me belonging.
Be the Horned God, the Wild Spirit of the Forest,
Protecting me in truth and honour.
Satisfy my soul and shield my loved ones,
Blessing everything and everyone,
All my land and my surroundings.
Great gods who create and bring life to all,
I ask for your blessings on this day of fire.*

Beltaine marked the end of winter farming and heralded the start of summer, so that sheep or goats could be moved to upland pastures. Stocks of dried meat from the winter would have been low and the start of May was a chance to use fresh vegetables, oatmeal or cheese. Goat cheese was known to be a traditional food for the mid-European Celts and here is a vegetarian recipe for Beltaine.

Ingredients

12oz field mushrooms
1 garlic clove, chopped
2oz soft goat cheese, cut into 4 circles
2 tbsp fresh parsley, chopped
2 tbsp fresh tarragon, chopped
2 tbsp fresh marjoram, chopped
2 tbsp fresh chives, chopped
Salt and pepper
2 tbsp white wine (optional)

Method

1. Clean and slice mushrooms.
2. Heat 2tbsp oil in a pan
3. Cook garlic, mushrooms and chives on a medium heat until tender, adding salt and pepper.
4. Lift mushrooms out of the pan onto a baking tray in 4 heaps.
5. Put a goat cheese circle in the centre of each.
6. Cook at 200°C until the cheese melts and browns slightly.
7. Wash and dry the herbs and divide into 4 equal portions on plates.
8. Warm the white wine and add any pan juices.
9. Put the mushrooms and cheese onto each plate and pour on the wine.

History: Marion Walker

By Gylden Fellowship

From the mid-16th to the early 18th century, close to 4000 people in Scotland, mostly women, were tried for being a **bana-bhuidseach** (a Gaelic word for witch). There were many witch hunts and trials in Scotland during this time. The Great Scottish Witch Hunt of 1597 is one of the least documented of the five nationwide Scottish witch hunts.

Many of them were conducted by local courts under the supervision of royal commissions, but in contrast to the others, it was not documented by the central authorities and the local records are often missing. It is not known what caused the **Witch Hunt of 1597**, but at the time, Scotland experienced a political conflict between the monarch and the Presbyterian Church, as well as plague and famine. In Edinburgh, a witch trial took place in 1596, when Christian Stewart was accused of having bewitched Patrick Ruthven to death, a case in which the king took a personal interest. Several royal commissions were sent to investigate sorcery in many parts of Scotland. The witch hunts seem to have been most frequent in Fife, Perthshire, Glasgow, Stirlingshire and Aberdeenshire, all between March-October.

The best-known case was that of **The Great Witch of Balwearie** (Margaret Aitken). She was arrested in Fife in April 1597. After having pleaded guilty to witchcraft, likely under torture, she offered to help the royal commission to identify witches in all parts of the country in exchange for her life. During a period of four months, the Aitken commission visited several parts of Scotland and many people were arrested, put on trial and executed after having been pointed out by her. The authorities, including King James VI, saw her as a new super-weapon in the war on witchcraft and terrified Glaswegians were led out in front of Aitken, who claimed she could identify other witches just by looking in their eyes. People were strangled and burned at the stake because of her evidence.

As the witch hunt went on, someone had a bright idea. Take the people Margaret condemned one day and bring them back the next in different clothes and a different order. The great witch turned witch-finder failed to recognise them, condemning and exonerating a different selection. It dawned on the ministers and magistrates that what they really had was a horrifying fraud. On 12 August, the commissions were ordered to end the trials until the claims could be better examined. They'd killed people for nothing and the key ministers ran for cover.

At this point, step forward Marion Walker, a local Catholic widow, who was not afraid of the Protestant ministers. She obtained, copied and leaked documents and was not a witch. Her main target was named John Cowper, Margaret Aitken's most zealous promoter. Cowper was a thin-skinned vengeful individual. Marion Walker managed to get her hands on the most incriminating document of all: the final confession of Aitken herself, where she pointed her finger at Cowper and blamed him for all that he had done. The church wanted to hush it up - so Marion circulated it.

Cowper was livid. Thanks to Marion, the confession was passing hand-to-hand, making sure Glaswegians knew exactly who to blame for the deaths of their innocent friends and relatives. To strike back at her, he mobilised his fellow ministers to back him up. The presbytery passed an edict threatening a physical gag for anyone who blamed the ministry of the city for putting to death the persons lately executed for witchcraft. But they didn't gag Marion Walker, because she wasn't blaming anyone. She was simply passing Aitken's confession around the city...not a witch herself, but a defender of wrongly accused women.

Poetry: Lore of attraction

By Nicola Ison

I look at her and can't help myself –
I love you beyond even my own life,
Her beauty leaves me ever speechless.
In reply, I feel her soft breath on my face,
Warm to my senses and always delicate.
She caresses my fingers and bare feet,
Bringing both peace and joy to my heart.
And I love you too, Earthkeeper,
She whispers in my ears and to my eye.
This is how we meet – I slow down,
Until I can find her on another plane –
The one where I see plants growing,
Hear birds singing and watch streams flow.
I'm not going inside myself, oh no –
More likely going outside and aligning,
With her consciousness and protection.
Gaia, you have my love and loyalty,
From long before until forever after,
And still, she smiles down on me.



Shark teeth

By Mark Sharpen

When a building development threatened the remains of a 13th-century coastal fishing site on Santa Catarina Island in southern Brazil in 1996, archaeologists rushed to excavate. They rapidly collected what they could from the Rio do Meio site, namely pottery, tools and animal skeletons. The historical site is now located under a beachfront property, but the artefacts can be seen in the museum at the Federal University of Santa Catarina.

Long before the development, around 750 to 500 years ago, this area was used for fishing by indigenous peoples. Sharks were a key part of their food, including bull sharks and sand tiger sharks. The fishermen would take the shark meat, leaving the heads behind. A student at the Federal University, Guilherme Burg Mayer, studied the remaining shark teeth, because such teeth can yield a lot of data.

In 2023, Burg Mayer and his colleagues compared these excavated teeth to modern shark teeth collected in the same region between 1975-2010. Using a method called **stable isotope analysis**, which gives insights into an animal's diet and environment, the team identified differences between the two sets of teeth that likely reflect how the region's marine ecosystem has changed over the centuries and how sharks have adapted.

Both the shape and chemistry of shark teeth, provided clues about the sharks' diets and rankings as predators by comparing different forms of nitrogen (isotopes). Higher nitrogen isotope values suggest that an animal is feeding higher on the food chain, eating carnivorous or herbivorous prey rather than plants. The research team found that centuries ago, different types of sharks were feeding on animals that occupied the same level of the food web - prey that lived near each other and ate similar things. Ecologists see this type of diet overlap as a good thing, Burg Mayer says, because it points to a more resilient food web where predators have lots of different prey to munch on. If one type of fish disappears, sharks have plenty of others to eat.

In contrast, the diets of Brazil's modern sharks have little overlap. Instead, sharks appear to be either preying on food that attracts little attention from other sharks or eating a more diverse combination of prey from different levels of the food web. A possible explanation for this shift, Burg Mayer says, is that sharks have become less picky as fish species have declined in number, forcing them to prey on new foods. To the researchers, this change signals a less resilient ecosystem.

When the research team focused on the **sand tiger shark**, they found that it has moved up the food chain over time to become one of the ecosystem's top predators. Burg Mayer says modern members of the species are picking their prey from higher on the food chain, because it's become easier; there are fewer sand tiger sharks left to compete for the best food options. Sand tiger sharks have been overfished in Brazil for decades and were categorised as critically endangered in 2018 – fishing for the species was banned at that time.

Mind you, stable isotope analysis can only show that changes have occurred, but not explain why. Overfishing could be responsible for the sharks' changing diets. Also, because sharks lose and regrow their teeth regularly, a single tooth is more like a snapshot covering only a few weeks or months of the animal's life. Regardless, the findings reflect a disturbance in the ecosystem that's worth further investigation, Burg Mayer says. The study also showcases the resilience of sand tiger sharks even under challenging conditions.

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