

Left to right: Ian Cottrell and John Stone, volunteers with air pump top cover. Robert Strand speaking at our World Water Film Festival. Richard Albanese and Jasmine Pradissitto, Artist in Residence.

# Hello

#### Hannah Harte, Museum Director

Welcome to Kew News #127. We've had an eventful few months at the Museum so this edition is packed with great engineering stories, great programming stories, and exciting updates from the team.

Firstly, I'd like to say a big thank you to all our staff team. We've been through the mill with a tough restructure. We've been sad to say goodbye to some colleagues and are just starting to reshape with some new faces. All through this uncertain time, everyone has given their all either in hand overs and in working right to the last minute, or by keeping us going when we were down to only four core team. Special thanks to Danielle, Joanna and Richard as well as our brilliant Duty Managers and Volunteers. Overall, things are looking up and the outcome of this will bring vital, specialist marketing and finance expertise in house, with the aim of making us more resilient and proactive.

We've had some great events, with us just completing our fourth monthly Steam Ups. I so enjoy the life and excitement that they breathe into the Museum. But they're not the only way to drum up excitement! On March 9th we were joined by some amazing women to celebrate International Women's Day and, just for one day, we became the London Museum of Women in STEM. We had so much enthusiasm from across the heritage sector, and we'll be back bigger and better next year. Then, just a couple of weeks later, we hosted the World Water Film Festival, who came over from the USA to Europe for the first time to celebrate World Water Day with us. We were so proud to partner with them to bring such a prestigious event to the UK and to support some hugely important and urgent messages about water and the need to care for our natural environment. Many of the films were beautiful, inspiring and informative, and they'll stay with me for a long time.

Then lastly, but definitely not leastly, a big shout out to all our volunteers who are working on projects from upgrading the submersible pump on the Bull engine, inserting new structural girders and pump packing on the Boulton and Watt, to tracking our energy consumption, spring gardening, maintaining our buildings, to providing stellar customer service on our front desk, and feeding into massive funding bids to allow us to keep looking after our site and collections (keep your fingers crossed!). Thank you for all your membership support, new or long-standing, you're all helping to keep the London Museum of Water & Steam strong.



Richard Albanese, Steaming into Sustainability Project Manager

### Repairs, Maintenance and Recommissioning

After the joys of returning to steam over Christmas and the big push beforehand to install our second-hand boiler we have been busy reviewing our working engine collection and planning for maintenance and repairs as needed. It's apparent after several years of shutdown that we have a long list of works to do; some of which were planned for and others which are new. Trying to juggle these against available volunteer labour, funding, and museum opening hours always makes for an interesting life at LMWS!

Some works are nearing completion, others are underway and more are being planned for. We've had a successful drive to increase volunteer numbers to assist with these projects and it's been great welcoming some new faces, especially some younger members to join the team.

#### Boulton & Watt Engine

Over the last year this engine has become erratic in working and difficult to drive. The air pump piston which removes air and water from the condenser has a wooden piston ring, which has become very worn over eight or so years since last fitted and now needs renewal. Leakage past the ring causes a loss of vacuum in the condenser, which makes up much of the driving force that actuates the engine.

Over January we drained the condenser tank, unbolted the top air pump top cover, and lifted the piston up and out. [figures 1, 2, 3] To do this would seem relatively simple, but much of the engines lower valve gear mechanism and floor framing gets in the way and had to be removed too! All of the twelve original square headed top cover bolts have been found to be heavily corroded with damaged threads and these have reached a point where we can no longer rely on them in service safely. We are now making replicas in our own workshop using traditional machine tools to turn, mill, and thread them as required. [figure 4]

In December we noticed an ominous water leak coming via a disused one inch wrought iron pipe buried beneath the flagstone floor running to the engines suction well. The use of this pipe has been lost in the mists of time but it certainly dates from 1900, or before. No longer needed we decided to disconnect it where it joins an ancient 3 inch iron pipe in the condenser tank, this is where our problems began! [figure 5]

The larger pipe forms part of our extensive original basement network of pipes dating back to the 1830's and used to supply our engines with condensing water. They pass through thick walls, have spigot and socketed and flanged joints and hang from vaulted flooded basement chamber ceilings, providing water to most of our site services. Whilst these pipes are in good condition for their age, the area our one inch was joined in was not, having been badly drilled and tapped in 1900, probably by a man using a hand operated drill or even a chisel to make a hole by candlelight!

# Richard's Roundup

This hole had weakened the pipe and when we removed the one inch connection it caused the iron to split. The nightmare of trying to repair this pipe in a confined space cannot be overstated; an extended shutdown of our water supply during opening hours and disturbing adjacent pipe joints, which could lead to far greater leaks.

Luckily Viking Johnson pipe fitting suppliers came to our rescue with the donation for free of a very expensive split iron repair clamp. This we simply bolted around the damaged pipe entombing the damaged section within.

The main condenser water cooling valve had been leaking for some years and this was removed, serviced, and refitted at the same time. Not a drop has leaked out anywhere since! [figures 6, 7, 8]

Above the valve was a very large flag stone floor slab which had cracked into three pieces [figure 9], probably because of careless demolition and removal of the other Boulton & Watt engine which was bizarrely removed for scrap when the Metropolitan Water Board made the site a museum station in 1946. Steel struts added to give support from underneath were found to be in poor condition and original granite edge supports had been damaged so badly as to be ineffective.

We are now in the process fitting a new slab, specially sourced and cut from a quarry in Derbyshire with a new steel section beam to provide support from beneath to it and adjoining original flooring.

Options for the air pump piston ring are also being carefully explored; replacing in wood, bronze, or soft packings as possible options in the hope that we can decrease the need for replacement and prolong the efficient working of the engine and make it easier to operate.



Figures 1 & 2 & 3: air pump dismantling, unbolting air pump top cover, removing air pump piston



Figure 4: Replica bolts for B&W top cover

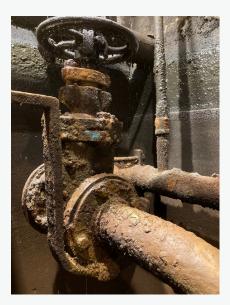


Figure 5: inch water pipe joining 3 inch water pipe and condenser cooling water valve to B&W



Figure 6: Clive Penfold preparing to cut off bolts to condenser cooling water valve to B&W

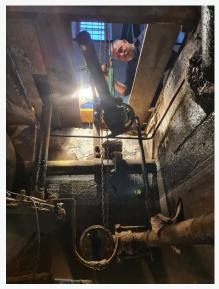


Figure 7: Richard Albanese lifting out condenser cooling water valve from condenser tank on B&W

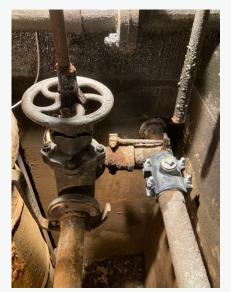


Figure 8: Condenser cooling water valve overhauled and reinstated. fractured 1 inch connection hole entombed under new Viking Johnson repair clamp



Figure 9: Removal of cracked stone floorslab



Figure 10: under bull- start of works in basement pumping out water to Bull



Figure 11: Glen Williams volunteer staff removing rust debris from basement floor of Bull



Figure 12: Glen Williams and Richard Albanese in Bull lower basement

### **Bull Engine**

Over the last few months leakage to the Bull engine main pump gland has been getting worse, meaning it's difficult to keep the engine 'indoors' or at the top of its stroke when running. After two or more years the soft woven packing used to make a watertight seal between the pump plunger and its casing wears away causing leakage, which can quickly accelerate.

To repack the gland, we used high pressure water via mains and electric boosting pump to pressurise the main pump and lift the working parts of the engine up onto heavy wooden support blocks to gain access to the gland ring beneath. Total weight of parts being lifted being 27 tons! Over a day or two the gland ring was lifted and new rings of packing were inserted and then the engine was gently lowered back down using waterpower again.

This maintenance period has given us the opportunity to drain part of the extensive basement to allow for an inspection of water supply pipework, bolts, and fixings to the engine and flooring. We also spent several days repairing the iron access ladder, removing loose scale and rust from iron flooring support girders and off of basement floor, including a full wash down afterwards. [figures 10, 11, 12]

When we restored the engine, we had to install an electric centrifugal pump to provide circulating water as part of the engines main pump and condenser supply. This was rescued second hand from Lotts Road Power Station, a source of free salvaged tools and equipment at the time. Over the years this pump has become more and more noisy, making it hard for our visitors to hear the engine and words of our tour guides and more recently has become difficult to prime ready for use.



Figure 13: bull engine Glen Williams and Richard Albanese installing JST submersible pump to Bull



Clive Penfold and Tim Wellburn on pump gland repacking the Bull Engine



Richard Albanese, Martin Frank and Glen Williams looking up from Bull upper basement

A few weeks ago, we were very kindly donated a new submersible pump by JST Pumps Limited in Kent which we installed and tested as a replacement a few days before our March Steam Up. Sadly, its flow capacity couldn't quite reach the amount of water and height needed to be pumped and we were unable to run the engine that weekend as planned. [figure 13]

However not all is lost, the pump can be repurposed elsewhere on site and by the time you read this a shiny new super silent submersible pump will have been installed as a replacement. Details and story to follow soon!

### Waddon Engine

After laying up during the pandemic it's clear that this engine needs some maintenance too, namely to the 33 individual oilers which adorn the many moving parts. These exquisite and important devices consist of a glass reservoir with finely controllable needle valve, which allows drops of oil to flow to the engine bearings and linkages.

After several years an accumulation of oil sludge in the bottom restricts or stops the flow meaning each needs to be stripped down, degreased, and cleaned. [figures 14, 15, 16] It's a great opportunity to give them a good polish up so that they sparkle and look their best when back on the engine. Three of our new younger volunteers have been busy with this and are over halfway through, including gaining experience on using a lathe to hold parts being polished. [figures 17, 18, 19] The barring engine steam piston rod and valve rod glands have also been repacked and we are trying to give the engine a good clean up as we go around.



Figure 14: dismantled and refurbished oiler to Waddon engine



Figure 15: Waddon lubricator parts being cleaned up



Figure 16: refurbished and polished lubricators ready to refit on Waddon engine

# Richard's Roundup



Figure 17: Saeid Ashrafi volunteer cleaning lubricator parts for Waddon



Figure 18: Joe Ellis using lathe to clean lubricator parts for Waddon engine



Figure 19: Logan Rosa cleaning and polishing lubricators for Waddon engine

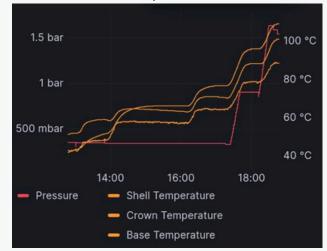
### Beel Boiler

Since Christmas and initial boiler commissioning, we have had Atlas Boiler Company return to complete burner combustion settings so that our boiler is working at maximum efficiency in relation to gas consumption and heat given off. We are very pleased with the increased performance which should lower our energy costs more.

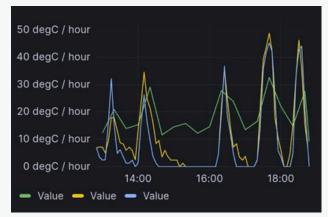
Additional sensors have also been added inhouse to the boiler so that more data can be logged and we can improve operational efficiency further. It's still early days in terms of steam ups and evaluation but we should be able to publish some data in Kew News soon.

Milin Patel, our wonderful volunteer water sommelier, who delights the public with water taste testing challenges has, through his day job, managed to get for us brand new boiler water treatment and softening plants. These vital pieces of equipment are being donated via him and the parent company and will save us many thousands of pounds. Again, more details to follow soon!

#### Pressure and Temperature



#### Temperature Change



# Richard's Roundup

#### Alistair

Our little Diesel locomotive hasn't been well recently having suffered a leaking cylinder head gasket and sticky starter motor. These have since been fixed by our talented Thursday volunteer team and the loco is back in service much to the delight of our younger visitors.

### Splashzone

Our younger visitors also love our Splashzone water fun exhibits, which they abuse regularly by putting stones and gravel into pipes and parts they shouldn't. All good learning experiences no doubt, but an occasional headache in terms of maintenance! Glen has been busy dismantling blocked pipes and removing verdigris and limescale to get them working again at their best.

### Sustainable Steam

This project is gathering momentum and we are starting to make some good connections with outside groups and organisations in terms of furthering our knowledge and exploring options for the future. Volunteer recruitment is also starting to help us become more sustainable longer term, following the pandemic.

We've already successfully installed a new steam boiler plant, which has made a significant impact on reducing our gas consumption, but we are now looking ahead to potentially trialling new and untested technology in the form of 'green steam'. This is produced as an exothermic reaction by combining hydrogen and oxygen gas within an enclosed pressure vessel or boiler to make superheated steam. The gases are generated by electrolysis, and assuming the electricity used comes from renewable sources, then there are zero emissions. The water condensed from the steam is continuously reused to re-manufacture the gases. As a technology this is not a new process as it's been used for space rocket propulsion for many years, but it's only now that its potential as a green energy source has been developed for small scale industry and transport applications. It has the potential to be truly carbon neutral.

In February, Hannah the Museum Director and I were able to see the test plant fired up at the 'Steamology' development laboratory in Somerset. It was incredible to see large volumes of steam being created from nothing within a four second timeframe! Steamology want to partner with us to model and then develop a working full sized plant which can be set up at the Museum to act as a demonstration piece for investors, industry, and government professionals. The challenge being to power most or all our engines and cope with the heavy steam loads, particularly on start up that some of our engines create. We will effectively help replicate steam usage scenarios as found typically in industry.

Jasmine Pradissitto has joined us to act as our 'artist in residence' and she will design, make, interpret, and display some wonderful pieces, which will bring together the heritage of our museum and its collections to the wider story of the climate emergency and the challenges we must face. See page 10 to find out more.

We have started to actively recruit new volunteers to join our technical and estate maintenance teams, after several years of not having staff available to help coordinate or train them when needed. It's been really encouraging in that five of these recruits are below the age of 28 with two at 15 and 16 and still at school. We desperately need younger people to take an interest in heritage if sites like ours are to survive!

We've given and or attended several talks and presentations where the climate emergency, becoming carbon neutral, and museums and heritage have come together. Something which the government and National Heritage Lottery Fund are keen for us to do. In January the Association of British Transport and Engineering Museums held an event on decarbonising museums related to transport, land, sea, and air at the London Transport Museum Depot at Acton, which lead to lively and thought provoking discussions, after which the delegates came here to LMWS where we were able to show and explain first hand our ideas and newly installed boiler plant. We did similar in November for a decarbonising museums conference held in Coventry where we are helping to represent stationary steam engine museums in the UK and we gave a related speech to the Royal College of Science Association Alumni dinner event in March.

We are currently applying for two significant grant applications to help repair, improve and consolidate our Boulton & Watt and 90 and 100 inch engines and houses, the latter of which has suffered greatly due to failing render, roof timbers and lead gutters in last three years, causing a big spike in winter humidity with significant water damage internally. If successful we hope to install energy efficient background heating which will allow us to finally control heat and humidity and provide better conservation care.

We have resurrected 'ALPHA' – the Association of London Pumping Heritage Attractions which though set up twenty or more years ago had become dormant in the internet age. This London group allows the steam museums at Crossness, Kempton Park, Markfield Road, LMWS, and Walthamstow Pumphouse to come together to share ideas, knowledge, technical support and even volunteers. [figure 20] It creates a single voice representing our rather unique collection of sites which can be used to help us obtain grants together and influence policy makers where needed. We held our first meeting at Walthamstow in April and already have a list of good ideas to help including shared marketing and promotion.



Figure 20: Sewage Steam Engine at Walthamstow Pumphouse Museum

# "Introducing: Jasmine Pradissitto" Artist in Residence

Dr. Jasmine Pradissitto FRSA, FLIS, a Londonbased artist, academic, and speaker, is thrilled to announce her appointment as the inaugural 'Artist in Residence' at The London Museum of Water & Steam. This collaboration marks a significant milestone as Jasmine works towards her first solo museum show scheduled for 2025. An award-winning London-based artist, she is an academic and speaker who has a Ph.D. in physics from UCL and has studied art at Goldsmiths and London Metropolitan University.

A 'Renaissance Woman' and polymath, her critical practice encompasses painting, sculpture, technology, nature, and an unwavering commitment to exploring the intersections of art and science.





Figure 1. 2021'Rewilding' pollution absorbing Noxorb, wood from a forest fire and grasses

For over two decades, she has been a global advocate for integrating the arts 'A' into STEM education, championing the pivotal role of creativity in fostering innovative ways of becoming better future ancestors.

Over the past eight years, she has been pioneering the sculptural use of a ceramic material capable of absorbing the harmful gases created as by-products of combustion, and as a result, has installed two public art projects in London at The Horniman Museum Gardens (2022 Museum of the Year and DEFRA prize 2021 for Bees) and Camden People's Theatre with Euston Town, a Mayor of London environmental initiative (PEA AWARD 2021).

# "Introducing: Jasmine Pradissitto" Artist in Residence

'Attention, in an age of constant distraction, is a rare form of generosity. Yet by being able to pay better attention and find awe once again, even in the simplest of things, not only do we take better care of ourselves, but also of each other and our natural world. Both science and art, which were only separated relatively recently in human history, illicit the same attention, awe, and wonder that drove The Industrial Revolution. Yet, despite our brilliance, unless we can learn from the transgressions of the past, we will only repeat them in the future. But there is hope in stories.



Figure 2. and 3. 'Be like Water' large scale watercolour and plant print and render of possible large scale hangings in the Museum .

By creating a body of site-specific works for the museum, I invite audiences to join me in rediscovering the beauty and complexity of our industrial heritage, while envisioning a future where art, 'machine', and nature converge to inspire profound societal and environmental transformation.'

JASMINE PRADISSITTO

# "STEAM Explorer"

Danielle Holmes, Engagement and Interpretation Officer

STEAM Explorer is a free water engineering course supported by the Worshipful Company of Water Conservators. The course is offered three times over the year in Spring (April), Summer (July), and Autumn (October).

April was the first of these three courses, 8 explorers participated. On the first sessions they were taught about the history of London's Water Supply and the importance this site had in this history. The second session had the explorers ferried around the site by Richard Albanese with a focus on the engineering history here, they also got to go into many background areas that are never or rarely seen by the public. The last session of STEAM Explorers was on the Steam Up weekend and they supported steaming the boiler and running some of the engines.





Programs like STEAM Explorers are so important because heritage sites need young people investing time and interest in them. Without this investment, we cannot continue under the same operating model heading into future. From this first STEAM Explorer course we have retained 5-6 youth who plan to volunteer with the museum, as well as one who is already registered as a volunteer and is working with the Thursday engineering team on cleaning the Waddon's lubricators (see page 7).

A big thank you to Sara Holmes at Wisterium for their excellent work on the new STEAM Explorer logo, they went above and beyond and donated extra designing time to ensure it fit the ask perfectly. As well a thank you to Harry and his team at Pronto Direct. They were a massive help in getting the boiler suits and hats printed, as well as giving the museum a charitable discount to ensure we stayed on budget.

If you know someone who would like to become an explorer, please email **learning@waterandsteam.org.uk** to join the mailing list for Summer and Autumn date announcements. You can also head to waterandsteam.org.uk/STEAM-explorer for more information.

## A very warm welcome to our new volunteers

- Angus Lei, FoH and Tour
- Manivalli Sribalan, FoH
- Joe Ellis, Engineering
- Logan Rosa, Engineering
- Clive Bradley, Maintenance
- Martin Walshe, FoH and Maintenance

- Saeid Ashrafi, Engineering
- Kai Swann, Engineering
- Henry Toute, Engineering
- Julian Tankin, Engineering

Interested in Volunteering? Email volunteers@waterandsteam.org.uk to get started.

# Goodbye and Thank You!

#### Jade Husseyin, Volunteer Coordinator

After 20 months at the London Museum of Water and Steam it is time to say goodbye and it has been an experience! I came here in August 2022 with NO museum experience, I was studying for my Classics Masters and was desperate to see if the museum life was for me. I had my interview on zoom with Liz Power during the hottest day of the year, I had four fans on and looked like I was doing 90's pop video!

I got lost on my first day and was very embarrassed when I saw the standpipe tower behind me.

That day was whirlwind, summer holiday programming was on and all I had to do was set up my email, walk around the museum and find lunch. Everyone was so welcoming and passionate about the site. Within my first six weeks, I had cleaned the splash zone, starred in an Instagram video promoting our nomination at the Family-Friendly Museum Award, helped in a puppet show and been duty manager. It was an intense experience as there was so much to learn, but I felt like a core part of the team.

The best thing about working for a small independent museum is seeing how much effect you have in your role, and I have had so much freedom within my role. From creating my own recruitment process to promoting the museum at volunteer and heritage fairs, I feel I got to embody my role and I have loved every moment of it.

Everyone has a favourite engine and mine will always be the ninety inch, as I studied Charles Dickens journalism for my degree. But I hold a special place for the water wheel as well, as everyone knows I run out every time it was moving! There have been so many wonderful moments while working here including, winning the Christmas quiz two years running, being part of a Steam-Up event, running a bubble disco, but overall, it would have to be the friendships I have made here.

So, as I say goodbye, I cannot wait to see what the museum does next and you have converting a Classics student into a Victorian enthusiast!

#### Amy Dobson, Engagement Coordinator (Community and Families)

When I joined the museum at the beginning of last year, I had no idea what I was getting myself into! I've learned so much, had some wonderful experiences, and worked with a fantastic team, volunteers, members and visitors. Two particular achievements stand out for me as highlights over the last year – my role in getting the museum back in steam, and working alongside Danielle on the museum's urgent funding appeal.

We worked really hard together to set up and share the appeal throughout our community and beyond, and also to get the exciting news out about returning to steam! We took risks, and we were pretty ambitious but hitting each fundraising milestone was a huge relief and an even bigger success to meet our target and help ensure the survival of LMWS for many years to come.

It's been very hard to leave Kew (especially after I just got my very own boiler suit), but I'll be back to visit regularly. There's no place quite like it. For now, I'm settling into my new life in Scotland with my wife and keeping busy with house renovations! The Thursday team will be glad to hear that my boiler suit is now suitably "mucky" and covered in paint. Looking forward to returning to LMWS soon, this time as a visitor!

# LMWS Past Events

## International Women's Day - London Museum of Women in STEM 9th March 2024

#### **Amy Dobson**

International Women's Day is celebrated globally on the 8th March every year, and this year we wanted to celebrate and promote women working within the STEM sector (science, technology, engineering and mathematics). We planned a "takeover" day on Saturday 9 March and invited lots of guests and organisations to take part.



Staff from Kew Gardens taught us how to make herbarium specimens, our artist in residence Jasmine Pradissitto taught people how to create our very own cyanotype using valves, cogs and other engine parts found around the workshop. We also had fun with Jasmine creating giant spirographs down in the Waterworks Gallery. We had guests from the National Physics Laboratory and Worley, both running experiments tables, and software engineers from Google teaching people how to code a musical!

Dr Jinx St Leger, a senior Engineer from Cambridge Museum of Technology (Cheddars Lane Pumping Station) delivered the most popular activity of the day; an engineering challenge where girls had to build a structure out of paper, and then weight test it with tins of Heinz beans! The record for the day was 22 tins!

The day was a great success, and one that we hope to run again next year. A huge thanks goes out to all who took part and helped out, including Our Barn who loaned us 10 laptops for our coding workshops.

### World Water Film Festival 22nd and 23rd March 2024

#### **Amy Dobson**

At the end of 2023, we were introduced to Robert Strand, the director of the World Water Film Festival through the museum's Water Ambassador Milin Patel.

The World Water Film Festival was founded in 2022 in New York by Strand who is an environmental advocate and filmmaker. It's a non-profit film festival for filmmakers and storytellers from all over the world that offers a platform to highlight human-water relationship issues and concerns beyond its entertainment and informative value.

> ARBAGE WASTE KILLS ALL FISI LEFT IS TO FISH THE GARBAGI

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After a very exciting and optimistic meeting, we were offered the opportunity to be the first European venue to screen the film festival. An ambitious target was then set for organising our very first film festival at the museum on World Water Day – an exclusive members screening on March 22 and a general visitor event on March 23.

We were also honoured and delighted to welcome Robert Strand to London for the events. We had fantastic support from Brad Taylor and his sons who supplied and set up all of the AV equipment, and also from Rob Casey who very kindly gave Robert Strand a private tour of the site.

We screened films in four spaces – the Waterworks Gallery, the Steam Hall, the Babcock Room and the 90 Inch Engine House and showed films from all over the world. Another successful event in the museum calendar, and one to build on again for next year!

Our museum cat Piper celebrated her 2nd birthday on 18th April with a packet of dreamies and a belly scratch.

# Upcoming Events



Great for everyone!

#### Stirling Engines at the Museum Sunday 12 May

Did you know the original Stirling engine was invented by Robert Stirling in 1816 and used in the late 1800's to pump water?

The Stirling Engine Society are at the London Museum of Water & Steam on Sunday 12 May! Come marvel at a toy fairground driven by a modern Stirling Engine, toy Stirling Engines invented in the 1860s, and speak to the engineers who built the engines about how they work and why they are so cool! Book tickets on our website.

#### Water Wonders Monday 27 - Friday 31 May

The London Museum of Water & Steam presents 'Water Wonders' for May Half Term. Join us for a week of fun to celebrate the wonders of water through a history tour, a cyanotype workshop, and some water fun in the Splash Zone!

More information on the website's What's On page.





More info at waterandsteam.org.uk

Tours 🔴 Workshops 📥 Crafts

For a full list of upcoming events, please visit:

https://waterandsteam.org.uk/events



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# Upcoming Events









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