Triple News

50p

Kempton Great Engines Society

Newsletter 51/Spring 2018

Kempton

1928 90 2018

years of the Triples

Steam Museum

When Sir William Prescott, as Chairman of the Metropolitan Water Board, visited the new engine house at Kempton with his wife, Lady Bessie, in 1928, it probably never occurred to him that the Triples would be a major tourist attraction 90 years later.

Thames Water probably didn't envisage it either when they shut down the Triples for the last time 38 years ago. And if it hadn't been for the tenacity and determination of a small group of enthusiasts, who were determined to see the engine house and its unique contents preserved for future generations, we would not now be celebrating the 90th anniversary of Kempton's magnificent steam engines this year.

We hope all our members will join us in wishing our Triples a happy birthday by visiting them in person. Raise a toast to 90 years of industrial history and who knows? With your support, we can look forward to 2028 and the Triples' centenary year.

All hands to the pumps!

Essential maintenance ensures next year's steaming

Although the visitors won't be back until March, there's plenty of work for the volunteers to be getting on with in the engine house.

Take the air pumps on Triple No.6, the working engine. These maintain a vacuum in the condenser and the shaft on one of them has been running out of true, causing rapid wear to the air seal. The only answer is to remove the shaft, machine it and re-assemble it with shims to correct the fault.

Another vital piece of equipment in need of regular service and overhaul is the engine house's modern high-speed centrifugal oil separator. After every steaming weekend, this is used to filter out impurities that can accumulate in the Triple's bearing oil, which is supplied by sponsors Castrol.

Servicing the separator is a specialist job and one we leave to the experts from Alfa Laval Ltd, who built the equipment.

John Barber gets a firm grip on the top section of the air pump shaft on the ram floor of Triple No.6 before removing it for machining and reassembly

Alfa Laval Technical Support Engineer Keith Phillips oversees a trainee while he replaces the bearings and seals on the high-speed centrifugal oil separator

Kempton mourns loss of PAT-man

We are sad to announce the death of Martin Grounds on 24 September last year, just months after his 87th birthday.

Martin first visited Kempton in 2005 after spotting an ad in a local magazine and became a volunteer on the spot. His background as a metallurgist made him an ideal candidate for the museum. During a varied career, he moved from a job as assistant metallurgist at Simms Motor Units Ltd to Kayser Ellison, a manufacturer of special steels, where his interest in steam was kindled by the company's rolling mill, driven by a beam engine with a 40ft flywheel. After Kayser, Martin moved to DYN-Metal as Technical Manager and subsequently transferred to the financial side of the business.

Martin's interests were wide-ranging. He was an Honorary Member of the Thames Sailing Club and a Governor of Hounslow Manor School. He was interested in nature, wildlife and industrial archeology and brought all his skills and experience to Kempton.

He was museum treasurer for a time and thanks to his computing skills, he created the animation of the Triple, still to be seen on a screen near No.7.

Ill health took its toll on the type of work Martin could do but one of his last roles at the museum was PAT testing – a task he took very seriously indeed!

Martin had three children by two marriages and seven grand-children, to all of whom we send our sincere condolences.

Goths invade Kempton for steam punk party

The Triple House hosted a party with a difference when it became the venue for a 'steam punk' wedding – that's Victorian Gothic for those of you not in the know – and the guests were all dressed accordingly.

No expense was spared and the organisers spent a whole day setting up the catering arrangements, professional radio-controlled lighting, disco and live music. Outside was a marquee housing a mobile pub, ready to serve the guests when they arrived aboard a Routemaster double-decker.

A team of museum volunteers fired up the Triple, which was bathed in eerie purple and green lighting, while the revellers danced until past midnight. "They all had such a good time," said volunteer Jerry Scholefield, who took the photos. "In fact, it was difficult to persuade them to leave!"

Steam dates!

March 17-18
April 21-22
May 19-20
June 16-17
September 22-23
October 20-21
November 17-18

For full details, go to www.kemptonsteam.org

How many hard hats does it take to shift a lathe?

All hands to the lathe! The Colchester Moving Party in perfect harmony

The pukka Colchester Student lathe donated to the museum a few years back by Waldegrave School in Twickenham was being stored until recently in the Gauge House on the waterworks site.

However, Thames Water said they now needed the building for an environmental store (whatever that is!), which prompted us to give the lathe a more permanent home in the engine house.

It proved too big to house on the driving floor so it was decided to lower it into the basement and place it near the oil separator. This area is not only the driest part of the basement, but has three-phase power nearby and can be easily accessed by the crane.

With the lathe wired up and ready to go, it will greatly improve the museum volunteers' metal-working capabilities.

Jerry Scholefield's trailer proves just the job for transporting the lathe

In position in the basement, the top-notch Colchester will have volunteers queing to use it

Triple News looks at how another London steam trust is faring

Dedicated team keeps maritime heritage afloat

We report on the work of the Steam Tug Portwey Trust, whose volunteers are facing similar challenges to Kempton's

Portwey makes for a glorious sight on one of her summer trips up the Thames

Kempton's Triples are not the only steam engines making it to 90. Last year, *Portwey* – one of only two twin-screw, coal-fired steam tugs still operational in the UK – celebrated her 90th birthday and her survival story echoes ours.

Regular visitors to the museum will have no doubt seen Steve Page, Chairman of the Steam Tug Portwey Trust, manning his stand in the Triple House. Like our Triples, *Portwey* came perilously close to being sent to the scrapyard, and it's for that reason Kempton is pleased to support the work of the Trust.

Portwey was launched on 16 August 1927 from Harland & Wolff's yard at Govan on the Clyde. She was built for the Portland and Weymouth Coaling Company to supply water and assist in the coaling of visiting steam ships, plus towing and rescue work. Her powerful pumps were also used in fire-fighting. She put out a fire on a ship loaded with timber and her pumps successfully fought a blaze at the Queen's Hotel in Dartmouth.

During the 1920s and '30s, *Portwey* was often called out in a storm to rescue vessels in trouble in the Channel. During World War II, she was seconded first to the Royal Navy, then to the US Navy, rescuing vessels and crews sunk by enemy action in the Channel.

In 1944, *Portwey* became involved in the preparations for the D-Day landings and she rescued damaged vessels from the disastrous American Slapton Sands exercise in April 1944, which was detected by the Germans and came under attack by their torpedo boats.

The Navy salutes Portwey on 4 August 2017 in tribute to her wartime service

After 1945, *Portwey* returned to civilian life and continued working around the Dart and Brixham, clearing wartime debris from south Devon harbours. In 1952 she was sold to the Falmouth Dock and Engineering Co. for general work, in 1959 she was used by the contractors building the Lizard lifeboat station and, in 1965, she went all the way to Holyhead to work on the building of the car ferry slipway.

Portwey was retired in 1967 after 38 years of continuous operation and would have been scrapped had it not been for Richard Dobson, assistant harbourmaster at Dartmouth, who bought her for £1,285 and took her back to the River Dart. With a small group of friends, he restored *Portwey* and kept her in steam, going to regattas and events until the early 1980s.

In 1982, *Portwey* joined the Maritime Trust collection and moved to London, where she has remained. New volunteers took over, many of whom were staff and students from Hackney College in East London, including the present chief engineer, Chris Nursey. Funding from the Maritime Trust dried up in the 1990s and a trust was formed to continue to preserve *Portwey*.

By this time, the tug needed urgent work and, with the help of an £82,000 grant from the Heritage Lottery Fund, vital repairs were carried out to the hull, funnel and bulwarks. When the Maritime Trust ceased to operate in 1999, the Steam Tug Portwey Trust Ltd was formed.

The struggle to find funding and volunteers to keep *Portwey* afloat is much the same as our experiences here at Kempton. As with all heritage steam projects, the two main challenges are, says Steve Page, money and volunteers. "We received a further small Lottery grant to restore our lifeboat but, otherwise," he says, "we are dependent on the generosity of supporters and volunteers, some of whom have given us thousands of pounds."

At the moment *Portwey* enjoys a free berth in London's West India Docks but that could change with the pressure to develop valuable land. "Many of our volunteers are in their 70s and 80s and we really need to attract more young people to learn the skills to maintain and operate historic steam vessels," Steve says.

Portwey's hull will soon need major work and this year she will be dry-docked for another survey. "We would like to service the propellers and stern glands," says chief engineer Chris Nursey, "but the £90,000 price tag is beyond our means. To keep the tug in basic steaming condition will cost us over £15,000 this year, which is most of what we have in the bank."

Portwey is much loved by her loyal team of volunteers and supporters. Like Kempton, the trust offers enthusiasts the chance to spend a day learning how to run and maintain her on steam experience trips, which include time spent in the wheelhouse as well as the engine and boiler rooms.

If you would like to support the Steam Tug Portwey Trust by joining, volunteering, signing up for a steam experience day, booking a Thames trip or simply by making a donation, go to www.stportwey.co.uk or speak to Steve Page next time you see him at Kempton.

Like our Triples, *Portwey* is an irreplaceable part of Britain's dwindling steam heritage and it's down to us to see that she is preserved.

A volunteer carries out repair work to Portwey's hull

Elegant memorials keep Watt's legacy alive

Kempton volunteer ***Stephen Fielding*** *shines a light on four very special lamp standards*

As you enter the Triple House at Kempton, you will see 10 lamps positioned around the gallery. The standards of four of these lamps are strikingly different, predating the engine house by more than 100 years.

These four lamps date back to 1812 and the reign of King George III, long before the days of electricity. A bronze plaque on each tells how the lamp standards were made from the 'parallel motion' taken from the Boulton & Watt engines at Kent Waterworks in Deptford. These engines had very long working lives, pumping before the battle of Waterloo and still working well after the battle of the Somme. For Kempton's Triples to have had as long a working life, they would need to have carried on until 2042!

Watt's moment of pride

The parallel motion is a mechanism on a beam engine that eliminates the need for chains or ropes between the crosshead and beam. The system was invented by James Watt in 1784 when he patented the double-acting steam engine and along with it, the parallel motion. "I am more proud of the parallel motion than of any other mechanical invention I have ever made," Watt stated. The motion overcame the issue of the angular changes between the beam's arcing movement and the linear movement of the piston rod. This innovation further allowed engines to become rotative.

The Kent Waterworks Co., from where the motion links used to make Kempton's lamps came, was established in 1809 to supply water to Deptford, Greenwich and parts of Kent and Surrey. Water was drawn from the River Ravensbourne and supplied a population of around 33,800 people. It was John Rennie, the engineer of London Bridge, who had the idea of using steam engines at Deptford and, in 1811, the task was given to Boulton & Watt.

The first engine – thought to be the first of its kind – was a 55hp rotative-beam pumping engine with a cylinder diameter of 36in and a stroke of 8ft. This became known as No.1 and drove two pump plungers, with two 'Waggon' boilers supplying steam at 2psi. A second identical engine was soon added in 1826, to be known as No.2.

Improvements made in the 1840s and '50s included enlarging the cylinders from 36in to 38in and enhancing the pumps to pump between 175ft and 280ft heads, displacing 1.75 million gallons (8m litres) each, daily. In 1856, a deep well was sunk at the station, relinquishing the Ravensbourne as a source by 1861.

One of the four lamps as you see them today, spread around the 'driving floor' of Kempton's Triple House

Age takes its toll

By the time the Metropolitan Water Board was set up in 1903, the ageing Deptford engines began to suffer mechanical failures. In 1905, engine No.1's main bearing cap bolts sheared off, causing the crankshaft to lift from its bearing, throwing the fly-wheel rim against the engine house wall, breaking both it and the cast-iron crankshaft. The engine was repaired but, in 1920, No.1's pump rod broke causing parallel motion links to become twisted.

The loops were straightened and two new cast-iron spacers were cast from the originals to retain the shape and design. Engine No.2 was luckier and escaped with just a small fire that burned off the wooden cladding, later replaced with steel.

In March 1921, load on the Boulton & Watt engines was lightened by the addition of two surplus Worthington triple-expansion engines relocated from Molesey. The old Watt engines ran for just eight hours a day until they were finally retired in May 1925.

By the time they were decommissioned, they had racked up well over 100 years' service, spanning the reigns of six monarchs and 26 prime ministers. The MWB Kent district engineer reckoned that even after a century's service, they were not yet worn out.

The MWB considered preserving one of the engines for posterity. The parallel motions were removed and relocated to the new engine house at Kempton, although records relating to this are scarce. The engines themselves, minus certain parts, lay dormant in Deptford until World War II.

War seals their fate

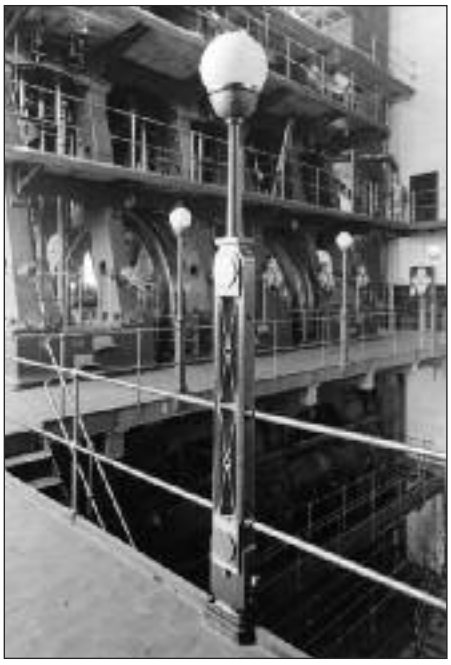
In January 1941, *The Engineer* magazine headlined the fact that the MWB had decided to donate some historic engines to the scrap iron campaign. In spite of calls for the 1812 engine to be preserved, work was already too far advanced to save either engine, although some parts had been removed, including the parallel motion. The MWB sold the engines for £225 to scrap merchants George Cohen Sons & Co. The *Financial Times* of October 1941 recorded how the MWB's total iron donation could produce the equivalent of 280 heavy infantry tanks.

Fitting legacy

In 1932, Deptford was remodelled and a new engine house identical to Kempton's Triple House was built to house a Hathorn, Davey & Co. triple known as the James Engine. The building still survives but, sadly, the triple was replaced in the 1950s with an electric pump.

With this in mind, it seems fitting that the four lamps at Kempton stand in silent tribute to some of the longest-serving engines in London. Let us hope they continue to stand there for many years to come.

The parallel motion can be clearly seen here on No.1 with the beam of No.2 in the background (1924)



One of the four lamps made from a Boulton & Watt parallel motion photographed in January 1929

Engine No.2, showing the controls and crank on the driving level, taken in 1924 just before its retirement

Walton hides triple secret

Kempton's engines are not the only Triples in the area, as ***Stephen Fielding*** *reveals*

Walton Water Treatment Works is a modern and strategically important site, providing fresh water to huge swathes of south and south-east London, yet its history goes back to the turn of the last century.

I was lucky enough to be shown around by site engineer Allan Mabb, who has worked for Thames Water for 30 years. Our tour began in the 1911 engine house that was once home to four Thames Ironworks triple-expansion steam engines. Built in West Ham, they each drove a Gwynnes Invincible centrifugal pump at 120rpm, generating 327 water horsepower.

These pumps lifted 30 million gallons (136m litres) of raw water daily from the Thames to a head of 52ft into the Knight and Bessborough reservoirs. They were named after Sir Henry Knight and Lord Bessborough, board members of the Southwark & Vauxhall Water Co. The reservoirs cover 125 acres and hold 1.2 billion gallons (5.5b litres).

All but one of the engines were scrapped in 1975, leaving Unit No.4, which had one last hurrah in the very hot summer of 1976 when it was brought out of retirement to provide extra water desperately needed to fill the reservoirs. Electric vertical spindle pumps have now taken over the duties of the old engines.

While admiring the surviving engine, Allan told me that Thames Ironworks formed its own works football team, which later became West Ham United. 'Hammers' fans will know the chant 'Come on you Irons!'.

Of the four triples installed at Walton in 1911, only engine No.4 survives – the others were scrapped in 1975

Modern methods

Today, water is still drawn from the same channel under the floor, fed from the Walton intake 400 yards away. This consists of three 12ft wide by 12ft deep channels controlled by individual steel sluice gates regulating the flow of water from the Thames into the aqueduct. Normally, around 150 million gallons (680m litres) passes through the sluices daily into the pump wells and is then lifted into the reservoirs, where it settles until it passes via gravity through the treatment process. However, during the floods of 2012, one of the sluice gates jammed open, causing 50 million gallons (227m litres) of water to surge in, flooding the pump houses and knocking the site offline.

Originally, the first part of the treatment process involved sand filter beds but, for the past five years, the majority of the beds have been drained and filled with banks of photo-voltaic panels, capable of providing 1.8MW of solar power for the electric pumps, supplementing the total power consumption of around 4.8MW. Converting the beds reduced the total output by about 7.7 million gallons (35m litres) a day.

The water first undergoes ozone treatment by passing oxygen (O_3) through it. The water then enters the 'CoCoDaff' tanks (counter-current dissolved air flotation and filtration system) where ferric sulphate is bubbled through from the bottom. A brown foam of impurities forms on the surface and, once a reasonable layer has formed, a crossflow of water on the surface pushes the foam into a side channel where it is taken away. The cloudy water underneath is then filtered through carbon (anthracite) and sand filters to the Granular Activated Carbon (GAC), comprising a 15in-thick sponge that will absorb any herbicides and pesticides. After the GAC process, the water is then disinfected and passed into the contact tank – the final stage of the process. This underground tank is adjacent to the pump house and its U shape encourages the water to flow from one end to the other while being dosed with sodium hypochlorite.

Fifteen scientists monitor water quality. One of the worst bugs is *Cryptosporidium*, which can be found in the Thames and, if ingested, can affect the digestive and respiratory systems leading to nausea. While chemical processes such as chlorine are powerless against it, sand filters have been shown to stop it.

Echoes of Kempton

Once treatment is complete, the water is ready for distribution. In the old days, this was done by a Hathorn Davey triple known as No.6. This engine was slightly smaller than the ones at Kempton and only two years older, being inaugurated in July 1926 by the then Minister of Health, Neville Chamberlain, and the newly elected Chairman of the Metropolitan Water Board, Sir William Prescott.

To supplement the triple, steam turbines were installed on the basement floor in a similar configuration to Kempton. In fact, at a glance, the set-up was almost identical and this can be attributed to Henry Stilgoe, the chief engineer responsible for both sites. Unlike Kempton's, however, these machines did not escape the scrap man and were removed in the late 1970s.

The work of these steam engines is now performed by electricity, with Units 12-14 delivering water at 300ft head to Chessington and Units 15-18 sending water 15 miles to Honor Oak at 180ft head. Combined, they pump 22-24 million gallons (100m-110m litres) of fresh water daily to the metropolis.

My thanks to Walton site manager Vincent Jones and engineer Michael Watt for organising my visit and special thanks to site engineer Allan Mabb for a very enjoyable and informative tour. SF

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The Trust's aims
1. To restore to steam one of the two historic triple-expansion engines at Kempton Park Pumping Station for Thames Water.
2. To operate the restored engine for public viewing on selected weekends every year.

Data Protection
Society members should be aware that information on membership and renewal forms is held on record for use by the officers of the Society and Trust only.