Association for Industrial Archaeology
Annual Conference
Brighton 2015

Industrial Archaeology Tour Notes for Sussex

Compiled and Edited by Robert Taylor

Sussex Industrial Archaeology Society
Welcome to Sussex

We trust you will enjoy the tours which extend across the county from Goodwood in the west to Hastings in the east and north to Gatwick. We have tried to fit as many visits as possible, but as a consequence the timings for all the tours are tight, so please ensure you return to the coach no later than the time stated by the tour leader and note any instructions they or the driver may give.

Most of the places that we visit are either public open spaces or sites, buildings, or structures that are open to the public on a regular basis. Please be aware that all tour members have a responsibility to conduct themselves in a safe and appropriate manner, so do take care when boarding or alighting from vehicles, particularly if crossing in front of or behind the vehicle where one’s view may be obstructed. Similarly care should be exercised when ascending or descending steps or steep slopes and paths that may additionally be slippery when wet.

Where we are visiting a site that is not usually open to the public, further instructions will be provided by the Tour Guide when we get to the site.

Our best wishes for enjoyable time

Committee of the Sussex Industrial Archaeology Society

To assist with identifying the sites while on the bus tours the Field Guide / Gazetteer booklet references are included in the notes for each tour.

Front Cover illustration
Brighton Pavilion

Rear Cover illustrations
Centre:
Ouse Valley Viaduct
Clockwise from top left:
Brighton Station Train Shed
Volks Electric Railway, Brighton
Jill Windmill
Archimedes screw turbine
at Coultershaw

Typeset and design : Martin Snow

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Tour of Brighton

Leaving the university we head east passing on the right the Amex Community Stadium the home of Brighton and Hove Albion Football Club, built in 2011. Extensive views towards Brighton to the south and Lewes to the north can be seen as we head towards the suburb of Woodingdean and over the crossroads down to the village of Rottingdean.

As we enter the village The Elms, the home of Rudyard Kipling, before he moved to Batemans near Burwash, can be glimpsed behind the high wall on the right, just before the pond. On joining the coast road we head up the hill at the top of which is the Beacon Mill W1.7, a black smock mill.

Looking seaward, if the tidal conditions are favourable, will be seen a double line of concrete blocks which carried the tracks of the Brighton and Rottingdean Seashore Electric Railway T3.30 which ran from 1896-1901, the brainchild of electrical pioneer Magnus Volk. Traction current was drawn from an overhead cable. The cars which resembled a cross between a tramcar and a seaside pier were raised on stilt-like legs, attached to four bogies; hence the nickname “Daddy-Long-Legs”. It operated at both high and low tides winter and summer.

In the next valley on the right is St. Dunstan’s Institute for the Blind (now Blind Veterans UK) which was built, in the plan of an airplane in 1937-9 and extended at the southern end in 1975. It is still used for training, holidays and convalescence for blind veterans.

On the hill to the right is the well known Roedean Girls School which opened in 1899. Shortly in the centre of the road is a strange hedgehog like building, one of three pumping stations for the recently built drainage system taking all of Brighton and Hove’s sewage to a plant further east at Peacehaven. To the left can be seen Brighton Marina, the concrete caissons forming the outer arms were constructed between 1975 and 1979.

A surviving gasometer frame U1.5 can be glimpsed to the right; the site was the town’s first gasworks at Black Rock, then outside of the town boundary, the coal was...
landed on the beach to avoid a local coal tax and moved via a tunnel (now lost) to the works.

On the upper seafront road, Marine Parade, is the Regency development of Sussex Square, which was built by Thomas Cubitt to the design of Charles Augustin Busby and his short-term partner Amon Henry Wilds. The facades were complete by 1827, the rest of each building being carried out by individual occupiers. The whole area, known as Kemp Town, was conceived by Thomas Read Kemp as a speculative development.

We now turn off the upper road, down Dukes Mound onto Madeira Drive. The cliff wall on our right was erected in 1830-38, partly built using Ranger’s concrete consisting of hydraulic lime and aggregates mixed with hot or boiling water. Madeira Drive was built in 1872 and became very popular as a promenade, particularly after Madeira Terrace I1.3 was constructed in 1890-97, supported on cast iron columns with latticed arches manufactured by Every’s Phoenix Iron Works of Lewes and is now called the Max Miller Walk. The Madeira Lift that gives access from the lower level up to the Marine Parade was built at the same time. It was originally hydraulic powered.

Running westwards from Black Rock is the Volk’s Electric Railway T3.29. This was also built by Magnus Volk in 1883. It is the oldest operating electric railway in the world; running on a 2ft 8½in gauge track for a distance of 1.1 miles, with the oldest operational carriage dating from 1892.

Near to the line’s Aquarium Station was the site of the Chain Pier, Brighton’s first pier built in 1822/3 to the design of Captain Samuel Brown. It comprised a pier head and three intermediate cast iron towers from which were suspended iron chains and decking. The total length was 1,154 feet. It was destroyed in a storm of 1896. Limited remains of the tower footings can be seen, on the seabed, at favourable tides.

We now pass Brighton Pier, properly known as the Palace Pier L3.3, which was built in 1899, designed by R. St. George Moore and is supported on patent screw piles. We journey along the promenade with its principal hotels; The Grand of 1862, where in 1984 the IRA made an attempt on the life of Margaret Thatcher and her Cabinet, now faithfully restored and extended. Next door is the red brick and terracotta of The Metropole designed by Alfred Waterhouse in 1888.

The sad skeleton of the 1866 West Pier can be seen with its replacement, the 500 feet high tower of the i360 which when complete is planned to have an annular rising observation platform giving spectacular views of the coastal area. It was designed by the architects David Marks and Julia Barfield, who conceived the London Eye.

The fine tall decorative lamp standards U3.2 lining the promenade were erected in 1893 and carried a single arc lamp with luminosity recorded at 1,000 candle power. Their design has an octagonal base, decorated with elaborate foliage ornament and surmounted by a ribbed column. The present twin pendant lanterns and brackets were not added until the mid-1930s. The cast iron ‘birde cage’ bandstand of 1884, now restored is to our left (on the cover of the gazetteer).

At the boundary between Brighton and Hove is Embassy Court, a block of flats built in 1934-35 to the design of Wells Coates, a fine example of inter-war Modernism in contrast to the Regency (cream) splendour of adjacent Brunswick Town, designed by C. A. Busby between 1825 and 1830. A short distance on is the rather nondescript King Alfred Leisure Centre L4.2 built as swimming baths in 1938-9 but requisitioned by the Navy as HMS King Alfred for training RNVR officers. During the war the Germans claimed to have sunk HMS King Alfred! It was finally opened for business in 1946 but still kept its wartime appellation with permission.

Turning right, Hove Street was the centre of the old village of Hove but of which there are no remains. Our tour continues along the principal commercial area of Hove, Church Road, into Palmeira Square a mid-Victorian development and into Western Road Brighton where much of the northern side was rebuilt during the 1930s. At the eastern end is Churchill Square a 1960s shopping mall. At the next cross roads is the Jubilee Clock Tower of 1888, the time ball remains, but unused - deemed too noisy. North Street was the northern boundary of the old fishing town of Brighthelmstone, with an area known as the hampshires, now the famous Lanes, behind the buildings to the south. We now make a circuit of the Old
Steine which for centuries was an ill drained area where the fishermen dried their nets. It became fashionable in the 18th century with many large houses around the western edge. The central fountain was designed by Amon Henry Wilds, a prominent early architect, in 1846. Continuing northward we pass the Royal Pavilion, the seaside palace of the Prince Regent, later George IV. When George arrived in Brighton in 1789 he rented a farmhouse which over the next 20 years developed into a palace. Designed in an Indian style externally, with a Chinese interior decoration, by architect John Nash, it fell out of favour with Queen Victoria and was purchased in 1855 by the town for £53,000. Behind is the Dome, originally the Royal stables and now a concert hall.

We now make our way to Brighton Railway Station T3.12 (TQ 310 049), where there will be a tour around the station and the opportunity of viewing the superb train shed. The station house was designed by David Mocatta in 1840–41 in an Italianate style and incorporated the head office of the London and Brighton Railway.

An additional roofed platform was added in 1861 on the east side of the station. The present magnificent curving roof was designed by H. E. Wallis with ironwork by the Patent Shaft and Axletree Company of Wednesbury Staffordshire in 1882. At the same time the porte-cochère fronting the station house replaced the colonnade.

We return to the bus at the rear of the station and travel through a recent development on the site of the extensive railway works. At Preston Circus we turn left and we will then travel under the main span of the London Road Viaduct Road with a further view from Beaconsfield Road. The 27 arch brick viaduct T3.14, of 1846 was built to carry the line to Lewes and Hastings.

As we turn pass Preston Circus the Duke of York’s Cinema L1.5 can be seen on the left, it is the oldest working cinema in the UK. Turning right at the next set of traffic signals we approach the tree surrounded ‘Level’ which was used for cricket matches from the mid 18th century. Facing us as we turn left are the Percy and Wagner Almshouses. They were built in 1795 to the memory of Dorothy and Philadelphia Percy and were the first Gothic Revival buildings in Brighton. Lewes Road was a turnpike road from 1770 and is now an uninspiring Victorian development, home in term time to many university students.

Immediately after a one way gyratory system can be seen, on the right, the brick built Brighton Corporation Tramway offices and depot T2.5. Next on the right there are two large factory buildings set back behind the shops in Lewes Road. They were both built by Oppenheimer, the diamond merchant, the south one in 1917 and the northern one in 1918 for the employment of disabled ex-service men.

Travelling north we pass the buildings of Brighton University and the Moulsecoomb estate, begun in 1923, the first council housing in Brighton. This type of housing spread along the road until the 1950s. Passing Stanmer Park note the rather elegant 18th century lodges of Stanmer House, which was built in 1722 to the designs of Nicholas Dubois for Henry Pelham, and is sited about a mile up the drive.
Tour B

Sunday 6th September

Windmills, a retired car from Volk’s Railway
and a Victorian rural village with a unique water supply system

Site conditions

There is a short walk from the car park up a slope to the windmills, which could be muddy if wet.
At the South Downs Heritage Centre there will be a walk through the Garden centre to view the Volk’s Railway Car.
The site is being rebuilt and more detailed information on accessing the storage area will be given at the time.
The visit to Stanmer Village will involve a walk along paths to see the village, horse gin, rural museum and covered well. Access to the rainwater catchment system will involve a 300 yard walk up a tarmac access road and then a 50 yard walk through rough woodland.

Sussex Gazetteer References
W1.5, U2.6

Jack and Jill Windmills

This tour begins with a visit to Jack and Jill Windmills W1.5 situated on the South Downs at Clayton (TQ 303 134). With luck we will have good weather and will be able to appreciate the extensive views across Sussex and Surrey. The two windmills (Jack and Jill) are situated side by side on the top of the Downs.
Jill a post mill, built in 1821 in Brighton and moved to her present site in 1852, is fully restored and will be open for a tour. In the early 1980s members of Sussex Industrial Archaeology Society were instrumental in Jill’s restoration. A new sweep (sail) was constructed last year by volunteers. Work commenced earlier this year on refurbishing two other sweeps. If all goes to plan, Jill will have four sweeps in place at the time of our visit.
Now in private ownership, Jack, the adjacent tower mill from 1866 is being restored externally. Adjacent to Jack’s tower is the roundhouse of Duncton Windmill, dating from 1765.
We have a short break at the South Downs Garden Centre to view Car No. 9 from the Volk’s Electric Railway. It dates from 1898 and was running on Southend Pier for many years. It was acquired by Brighton Corporation shortly after World War II. Volk’s Railway did not run during the war as the beach area was under military control and many defensive barriers were built. As part of the preparations to re-open the railway after the War, the Council restored the seven best cars and bought two 1899 Southend Pier trailer cars from a scrap dealer in Benfleet for £10. They were then motorised by the tramway depot and entered service as cars 8 and 9 in 1950 and 1953. Car 8 used two motors (one for each direction of travel) and car 9 used parts from a milk float (two 67 volt reversing motors in series). A few years ago a manager tried connecting the two car 9 motors in parallel instead of series. Doubling the voltage on the motors resulted in even the slowest speed being terrifyingly fast and was promptly abandoned. After many years of service on the Volk’s Railway it was finally retired from service in the 1990s. The car is in store awaiting the completion of the new South Downs Heritage Centre.

South Downs Heritage Centre

The church was rebuilt in 1838 facing Stanmer House across the green. The village street contains many fine knapped flint and brick houses and cottages. The listed weatherboarded and flint long barn dates from the eighteenth century. Near the pond and church is an ancient well house rebuilt at the same time as the church. It houses a donkey treadmill which is much older, dating back to the 17th Century. The well is 250 feet deep and was dug in the 16th Century. The pond is surrounded by sarsen stones, probably giving the village its name which means stony pool.

In the woods to the north west is a unique Victorian rainwater catchment system U2.6. It is about 230 feet long and 40 feet wide and is now listed grade II. It was built in 1870-5 to the design of Thomas Jones, estate foreman, to supply water for Stanmer House and the estate buildings.

Stanmer Village

The final stop is at Stanmer Park to see the remains of its unique 19th Century rainwater catchment system and tour Stanmer Village, rebuilt as an estate village by the Earl of Chichester (TQ 336 097). The Stanmer Estate covers 5,000 acres of parkland and farms. Stanmer House was built in the 1720s in the Palladian Style.

To the west of the house are the stables, horse gin, for the supply of water, and extensive kitchen garden. A recently reopened rural museum is situated next to the stables, and there is a café in the village open for refreshments.

Visible remains of the Stanmer water catchment system

It is constructed of brick, cement and a mixture of tar and sand and was enlarged to the west in the 1890s. The surface was coated with tar and sand in the 1930s. It was originally surrounded with timber walls carrying a slate roof from which rainwater was channelled down on to the surface of the catcher. There is a gully along one side, an overflow at the north-east corner, and the remains of a filter system to the south-east corner. Water flowed into three deep underground storage tanks said to contain 40,000 gallons each.
Old Shoreham Bridge

We begin with a short walk to the 1782 timber bridge over the River Adur. In 1781 an Act was passed to build a bridge at Old Shoreham to replace the existing ferry. The capital required was raised by tontine, where payments ended on the death of the investor. For this reason subscribers were arranged in three classes according to their age. Units of £100 of stock were offered with the highest rate of return applied to those in the oldest age group (35-57 years) and the lowest to those in the first group (1-17 years). The £5,000 raised financed a wooden bridge of 26 piers and trestles, 500 feet long with a roadway 12 feet wide and approached by a 500 feet causeway on the western bank. Tolls collected were sufficient to pay the stock holders on a regular basis. The bridge was acquired by the London Brighton and South Coast Railway in 1861 when the line to Horsham opened. It remained under railway control with tolls continuing to be collected until December 1970. It had already been replaced by the present high level river crossing. The railway to Horsham closed in March 1966 with a stub to Shoreham Cement Works at Beeding to the north remaining until 1981. The bridge was subsequently deemed unsafe for motor traffic, but was restored and opened to pedestrians in October 2008. Rails, formerly the level crossing, can still be seen embedded in the roadway on the eastern approach to the bridge.

Crossing over the bridge we pass the original buildings on the right, built for Sir Harry Ricardo to accommodate his Bridge Works. His company that has grown to become the international research organisation that it is today.

Shoreham Airport

Following the bridge visit, our coach will drive around the airport boundary to the Art Deco Shoreham Airport Terminal. The airport is regularly used for general aviation with the Terminal Building (now Grade II* listed) in everyday use. Many of the internal features are original, including the ‘streamline’ balcony on the first floor and the window design above the main entrance. The history of the airport is illustrated by the many photographs displayed inside the building. There is also a restaurant where refreshments can be purchased whilst watching light aircraft taking off and landing. A visit to the museum, which tells the history of the airfield, has been arranged.

Shoreham Airport 1936 terminal building

The first flying ground at Shoreham was established by the end of 1910 and many companies and individuals including A. V. Roe, Cedric Lee and the brothers Cecil and Eric Pashley began to establish themselves at the site. On 4th July 1911 Shoreham was the starting point for the first recorded cargo flight when Horatio Barber on his Valkyrie monoplane flew a box of Osram light bulbs to nearby Hove.
During the First World War the Royal Flying Corps Number 3 Reserve Squadron was based at Shoreham. After the war the new Canadian Air force moved from Upper Heyford to Shoreham, where they spent time training and testing some of the 65 captured German aircraft that were stored at the airfield. By December 1921 all activity on the airfield stopped and for the next few years it reverted to grazing land.

Flying returned to Shoreham at the end of 1925 when Cecil Pashley and the Miles brothers formed the Gnat Aero Company, followed by Southern Aircraft Ltd and the Southern Aero Club. Shoreham also hosted many flying meetings and airshows when famous flyers such as Sir Alan Cobham came to town. In 1930 the municipal authorities of Brighton, Hove and Worthing formed a joint committee to establish Shoreham as the municipal airport for the three towns. Construction of the Art Deco Terminal Building began in November 1934, and was officially opened on 13th June 1936. The interior of the building retains many of its original fixtures and fittings.

With the outbreak of the Second World War in 1939 international airline operators moved from London (Croydon) Airport to Shoreham. In 1940 the Royal Air Force took over the airport and, with fighter airfields nearby (such as Tangmere and Westhampnett) the newly formed 277 Air Sea Rescue Squadron was based at Shoreham. After the war, civil flying began again in 1946 and some aircraft manufacture took place on the site until 1970.

Goodwood Motor Circuit

We then head west and after lunch at The Anglesey Arms in Halnaker, we visit the historic Goodwood Motor Circuit and Westhampnett WWII airfield (SU 880 074), with a presentation on the circuit’s motor racing years from 1948-1966 and a tour round the perimeter race track. The circuit was brought back into use in 1998 and now hosts the Goodwood Revival meeting each autumn.

The SIAS President Air Marshall Sir Freddie Sowrey is planning to join the days tour and will describe his experiences as a WWII pilot as the coach makes a circuit of the airfield’s perimeter track. We then walk to the motor circuit buildings where Alan Brewer, the Motor Circuit Manager, will give an illustrated talk on the history of motor racing at Goodwood and the Revival Meeting which is due to take place on the following weekend.

The racing circuit began life as the perimeter track of RAF Westhampnett airfield, which was constructed during WWII as a relief airfield for RAF Tangmere. After the war the land reverted to the Goodwood Estate, with the first motor race taking place on 18th September 1948, organised by the Junior Car Club with Stirling Moss winning the 500cc race (later to become Formula 3).

Goodwood has, over the years, played host to many famous drivers; Mike Hawthorn and Graham Hill had their first single seater races there, Roger Penske visited in 1963, and Jim Clark and Jack Sears competed in 1964. The accident that ended Stirling Moss’s International career happened at St. Mary’s Corner in 1962. Donald Campbell demonstrated his Bluebird CN7 Land Speed Record car at Goodwood in July 1960 and again in July 1962.

As the track would have required modification to cope with the increased speeds of modern racing cars, the last race meeting for over 30 years took place in 1966. The circuit was still used for testing and claimed the life of McLaren’s founder, Bruce McLaren, in an accident on 2nd June 1970.

Today Goodwood Motor Circuit is the only classic circuit in the world to remain entirely in its original form. It was sympathetically restored to enable the inaugural Goodwood Revival Meeting to take place in 1998, and this continues to be held each September.

Poyntz Bridge

We finish the day by visiting the Chichester Canal (SU 860 039), opened 1822, to see Poyntz Swing Bridge. Poyntz Bridge of 1820 is a single-span cast iron swing bridge, 200 yards south of the Canal Basin. It was one of seven identical structures between Chichester and the sea and was named after W. S. Poyntz, a local MP. The ironwork was made by C. and H. Tickell of Southampton and the design maybe by John Rennie, who was the Engineer for the Portsmouth and Arundel Navigation of which Chichester Canal formed part. The superstructure was originally at Hunston but was moved to this site in 1982, where it was restored to working order by the Sussex Industrial Archaeology Society and reopened in 1997.
Shoreham Cement Works
On route we will pass the derelict site of Shoreham Cement Works (TQ 199 086) where it should be possible to pull over to view, please do not leave the coach.

The works were built between 1946 and 1952, then a state of the art plant, but the site has been used for cement production since the 1880s. Although the alignment of the road has been altered (straightened) the works are still bisected with the manufacturing plant to the east comprising clay slurry and chalk mixing tanks, two 351 feet long rotary kilns, and storage silos; the offices and packing plant to the west. Behind the building to the east is the chalk pit, clay slurry being piped into the plant. The closed railway line to Horsham (1861-1966) can still be discerned to the west crossing the river Adur by a now demolished bridge. Coal was delivered to the site by rail, and unloaded by a tippler. Conveyor belts carried material over the main road to storage bunkers from where the coal was later pulverised before being blown into the kilns. The works closed in 1991 and are now in a derelict state with some demolition, notably of the conveyors crossing the road. The former works manager’s house can be seen perched above the road and a terrace of workers housing will come into view north of the works, with the old road fronting them.
**Stopham Bridge**

Approximately one mile after passing through Pulborough can be seen, to the left, the Grade I listed stone bridge T1.1 (TQ 029 184). This is the finest medieval bridge in Sussex and carried traffic over the River Arun and was built in 1423 by the Barttelot family. The centre arch was raised in 1822 to allow passage for high loaded barges to the Wey and Arun Canal and both ends of the bridge were extended in 1865. Note the cutwaters which extend the entire height of the bridge and form recesses for pedestrians. The road now bypasses the old bridge on a new bridge built in 1986.

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**Coultershaw Heritage Site**

This tour begins with a visit to Coultershaw Heritage Site (SU 972 194), U2.2, P3.3, extensively redeveloped in 2014 with restored buildings and new interpretation.

Coultershaw is an important example of 18th century industrialisation in a rural area, which was developed in the mid-18th century by the 3rd Earl of Egremont of Petworth House, which we visit later today. Coultershaw has been the site of several corn mills from before 1086 up to 1973. The site was also on the routes of the Rother Navigation, the Petworth to Chichester Turnpike and the Mid Sussex Railway to Petworth.

In 1782, the 3rd Earl of Egremont installed a Beam Pump alongside the corn mill to provide an extra water supply for Petworth House and Town. The pump is driven by a waterwheel, and pumped water to Petworth, 1½ miles away through a 3in cast iron pipe, which still partially exists. It is a very unusual design, using long beams to transfer the power from the waterwheel to the pump barrels. The pump is believed to be the 1782 original, although the present crankshaft was cast in 1912.

The Rother Navigation was constructed between 1791 and 1794, closing in 1888 after the arrival of the railway. There were eight locks between the River Arun at Stopham and Midhurst, and Coultershaw was the busiest wharf on the Navigation. In 1800 the Petworth to Chichester Turnpike was diverted to cross the River Rother at Coultershaw. There was a Toll House and gate on the north side of the road bridge over the Navigation. The turnpike ceased to be a toll road in 1877. The railway from Pulborough to Petworth was built in 1859, extended to Midhurst and Petersfield in 1866, and closed in 1966. The station is located a quarter of a mile south of Coultershaw.

The recent development of the Coultershaw site began in 1976 when volunteers from the Sussex Industrial Archaeology Society started the restoration of the Beam Pump. After nearly five year’s restoration, and now covered by a timber barn, the pump worked again in 1980. It was officially opened by Lord Egremont on 4th July 1980 and scheduled as an Ancient Monument in the same year. In 2012, with support from the Leconfield Estate, the Coultershaw Trust installed a 15 kilowatt Archimedes screw turbine. It is located in one of the sluices that had once housed a turbine to provide power to the mill. It now generates electricity from a sustainable source.
At Petworth House a guided ‘behind the scenes tour’ has been arranged to see the spectacular icehouse, hydraulic lift, donkey gin powering the wellhead gear and stables. Following the tour lunch will be taken in the restaurant. Petworth House (SU 976 219) has been a family home for over 800 years, becoming a permanent home to the Percy family in the 1500s. In 1682 heiress Elizabeth Percy married Charles Seymour, the 6th Duke of Somerset, and Charles began rebuilding Petworth House in the grand Baroque style we see today, with the parkland being landscaped by ‘Capability’ Brown.

In 1783, George, the 3rd Earl of Egremont, inherited the estate. He was a collector of British art, and patron to many artists including J.M.W. Turner and John Constable, who called Petworth the ‘house of art’. In 1947 the 3rd Lord Leconfield gave Petworth to the National Trust and his nephew John Wyndham, created 1st Lord Egremont, arranged for the Trust to also receive part of Petworth’s art collection. The current Lord and Lady Egremont continue to live in part of the house.

Petworth House

The Icehouse

Icehouses were a feature of large county estates in the 18th and 19th centuries and were built mainly below ground to increase insulation. Ice was collected from convenient stretches of water during the winter and stacked in the ice house chamber. During the year the ice was used in the kitchens for cooling and preservation. Construction work began on the large Petworth ice house, with a dairy above, on 29th May 1784 and was completed on 25th December that year. The work was carried out by estate workman, required the removal of an old ice house and cost £168 9s 1d. The ice house is constructed in faced brickwork and is a cylindrical pit 24ft 8in diameter with vertical sides between 3ft 3in high and an inverted domed bottom 16ft 1in deep. The icehouse pit is divided into three chambers over which there is a semi-circular brick vault, and each chamber could store about 2,540 cubic feet of ice. The ice house continued in use until the late 19th century.

The dairy above was converted to house a fire appliance - as it was a tight fit between the columns of the portico, guide channels were let in to the paving and small sections of the columns were cut out.
The Well Room and Hydraulic Lift

These are situated in the atmospheric underground service tunnels which would have once been buzzing with servants going to and from the house, Kitchen and servants’ quarters. Household necessities such as food, linen and coal were transported by footmen, housemaids and ‘odd men’ through a tunnel that connected the servants’ quarters to the main house. This separation kept the main house free from cooking smells, noise and the risk of fire.

The well room has a deep well, now covered, at the bottom of which is a 400 foot borehole. Initially water was raised by means of a donkey gin, powering a system of shafts and bevel gears, the circle around which the donkey walked can still be seen. A map apparently survives which shows the route the donkey had to be led to avoid being seen by the family. The donkey and gin were replaced in 1862 by an open crank internal combustion (petrol) engine a very early example of such an engine. It stood on the floor (where the electric motor now is) and a remnant of the exhaust should still be visible protruding from the ceiling. This in turn was replaced by the electric motor fed from the nearby battery house. The drive was by flat belt to a cast iron pulley, which survives, to the wellhead gear. At the end of the passage are double doors behind which is the service lift shaft. Two hydraulic lifts were installed in 1870 by Edward Easton of Southwark Street London and are believed to be the first outside London. They were used for taking coals and visitors’ trunks to their bedrooms. The lift shaft ram with a stop valve or governor at the top remain.

The Stables

The stables were constructed between 1756 and 1760 and display a curious reminder of the Second World War when all place names and direction signs were removed to deny any German invading force vital information. The stables at Petworth House were used as a military depot and two milestones from the Sheet Bridge and Midhurst Turnpike Trust of 1825 were placed there to protect the stonework of the arch leading to the public road from damage that might be inflicted by military vehicles. They were never returned to their original locations in the far west Sussex parishes of Stedham and Rogate. Distances to Brighton Midhurst and Petworth are inscribed on one face and to Winchester and Petersfield on the other.

Weald and Downland Open Air Museum - large artefact store

The final stop on our tour is the large artefacts store of the Weald and Downland Open Air Museum, not normally open to the public. The Museum is the leading museum of historic buildings in England, and it is designated for its outstanding collections of national importance. Currently the Museum has re-erected nearly fifty buildings, and has further ones in store awaiting re-erection.

The Store is filled with racks which include architectural fixtures and fittings, tools for all trades, farming implements, domestic items, lavatory pans, signs, bottles, horse accoutrements, bricks, tiles, pipes and chimney pots – including many in the Fareham style from Hampshire with their characteristic decoration.

Singleton Station

On the return journey we will make a brief stop in the forecourt of Singleton Station. Singleton was the largest station on the London, Brighton and South Coast Railway’s Chichester-Midhurst branch and the most unnecessarily large one on the company’s system. It had four platform faces, two signal boxes, water tower, turntable, horse docks and refreshment rooms, all to serve Goodwood race-goers. The course was three (uphill) miles away! The station was not convenient for the village of Singleton either, and as races were only held one week each year, for the rest of the time the vast station was largely deserted. The impressive buildings were designed by the architect T. H. Myres who designed a total of 18 stations in this style across the London, Brighton and South Coast Railway. The line closed in 1935 having lasted only 53 years. The station is now in private ownership and the track level is now a scrap yard. The goods shed, also by Myres, was recently listed Grade II following an application by the Sussex Industrial Archaeology Society.
The Beehive

Our first visit is to the 1936 Beehive circular airport terminal T4.4 - the first circular airport terminal in the world and now sensitively restored as offices (TQ 286 399).

Gatwick became a licensed aerodrome on 1st August 1930 as the result of two young men, Ronald Waters and John Mockford, deciding to go into the aviation business. They offered flying instruction and a flying club was formed here. The aerodrome changed ownership in May 1932 when it was acquired by the Redwing Aircraft Company but eighteen months later the ownership changed again when it was acquired by a young man, Morris Jackaman, who had a vision of developing it into a passenger airport with scheduled services. The purchase price in 1933 was £13,500.

It was Morris Jackaman who subsequently conceived a circular design as being the answer to improved airport layout. His idea, which he patented, was that there would be covered telescopic gangways which would radiate outwards from the terminal building to the steps of the waiting aircraft. The architects were three young men Frank Hoar, Bill Lovett and Alan Marlow who had formed a partnership. Construction began in August 1935, and a company, Airports Ltd was formed to manage the airport. Access was important and Jackaman who had been joined by the aviation pioneer Marcel Desoutter, persuaded the Southern Railway to build an airport station which would be connected by a subway to the terminal building. The first service was to Paris on Sunday 17th May 1936 by the newly formed British Airways Ltd which had been persuaded to transfer its services from a not very accessible airport in Essex.

The early development at Gatwick was difficult with the only airline moving out after the airport became water-logged in 1937 but fortunately companies involved in defence work later moved here. During the Second World War the airport was requisitioned for the RAF which used it mainly for Army Co-operation work. Civil Aviation returned after the war but the future was not bright until it was decided to develop the airport as a bad weather...
airport alternative to Heathrow. For the first time concrete runways were built and new terminal buildings were constructed over half a mile to the north of the site of the old Gatwick Racecourse station. The redevelopment of 1958 effectively cut off the Beehive from the new airport but it continued to be used as offices for airport related activities including BEA Helicopters. After major restoration and refurbishment, it became the headquarters of GB Airways from 2000 until 2007 when the airline was closed down. It is still owned by the airline’s owner, the Bland Group of Gibraltar, and is managed as offices by Orega which markets it as a flagship business centre. The ‘Beehive’ was the world’s first fully integrated airport building with railway access on a main line. It is considered internationally by architectural and airport historians as a very important example of early innovative airport terminal design. It was listed Grade II in 1996 which happened to be sixty years after its opening.

Ouse Valley Viaduct

We then drive south along some country roads to Haywards Heath and the Bluebell Railway. Soon after leaving Gatwick, we will pass the Ouse Valley Viaduct at Balcombe T3.15 (TQ 323 279) on the London-Brighton main railway line. The viaduct was designed by the engineer for the London to Brighton railway, John Urpeth Rastrick, together with the line’s architect, David Mocatta, who was a pupil of John Soane. It is the most spectacular engineering feature on the Brighton main line. Built in 1841, the viaduct is 1,475 feet long and 96 feet high, supported by 37 semi-circular arches, each of 30 feet, surmounted by Caen stone balustrades. Each pier is pierced with an opening, with semi-circular soffits and inverts, to reduce the number of bricks required and reduce the ground bearing pressure. At each end are four pavilions, also of Caen stone. The viaduct cost £38,500 to build and the 11 million bricks used were either burnt in clamps along the line where clay deposits occurred or were transported from brickfields at Piddinghoe near Newhaven up the Ouse Navigation through Lewes to the nearby terminus at Upper Rylands Bridge P5.7. The structure is a Grade II listed building and was restored in 1996-98, using real (rather than reconstructed) Caen stone with grants from the Railway Heritage Trust and English Heritage.

The Bluebell Railway T3.18, T3.19, T3.20

Following a buffet lunch at Sheffield Park Station (TQ 404 237), we spend the afternoon on the Bluebell Railway – the first UK standard gauge preservation railway – which has a comprehensive collection of locomotives and carriages. There are 33 steam locomotives of various sizes in the collection, which began with just two small engines in 1960. The carriage collection is equally comprehensive and has won many awards for the standard of restoration. We start with a tour of the Engine Sheds and Atlantic Loco Project - a ‘new-build’ project recreating a 1911 period steam locomotive Beachy Head for use on the Bluebell. We will be able to view the current stage of the reconstruction where the main chassis is now complete and work continues on the boiler with a view to finishing and steaming the locomotive in about three year’s time. We then go by coach to Horsted Keynes Station for a tour of the carriage repair works. We continue by train from Horsted Keynes along the newly extended line through the re-excavated Imberhorne cutting and over the Imberhorne viaduct to East Grinstead (TQ 388 382). We return from East Grinstead to Sheffield Park, with afternoon cream tea served on the train.

The Bluebell Railway was part of the London, Brighton and South Coast Railway’s Lewes to East Grinstead line which opened in 1882, closed in 1955, reopened 1956 and then closed again in 1958. The preservation of the line began in 1960 as a pioneer 5 mile steam railway extended over the years in stages to reach East Grinstead to link up with the main railway network in 2013. The last stage to East Grinstead was complex and costly as Imberhorne cutting had been used as a landfill tip - 135,000 tons of rubbish had to be removed at a cost of £8 million to enable the track to be re-laid. All the stations on the line were designed by the architect T. H. Myres and three survive in preservation by the Bluebell Railway, namely Sheffield Park, Horsted Keynes and Kingscote. The Bluebell Railway’s station at East Grinstead is a new build, but it has a certain T. H. Myres flavour.
Brede Water Pumping Station

We begin with a visit to Brede Water Pumping station, near Hastings **U2.10** (TQ 814 178) which has two large triple expansion engines, together with a large collection of smaller engines and artefacts related to the water industry. Tea and coffee will be available during the visit. The pumping station was built in 1903 to supply water from new wells to Hastings. It originally housed two 410 h.p. triple expansion steam pumping engines built by Tangye’s of Birmingham in 1904, one of which survives. This engine was restored to its original colours for its centenary. In 1939 a second pump house was built for a Worthington Simpson triple expansion engine, number 5058, installed in 1941. It is the last of its type supplied by Worthington Simpson of Newark and its 420 h.p. was capable of pumping 3.5 million gallons per day to the Fairlight and Baldslow service reservoirs north of Hastings. In 1964 the boilers were removed and the pumps and engines mothballed. Sadly in the early 1980s the impressive tall chimney was demolished. However in 1987 the complex was listed Grade II and restoration began, and it is now managed by the Brede Steam Engine Society. Both remaining engines are now capable of being demonstrated using compressed air and the space where the boilers were now exhibits water heritage pumping machinery.

There is a range of water artefacts from Folkestone and Dover Water Services displayed in the old boiler house. This includes the first triple expansion horizontal steam pumping engine made by Simpsons in 1889. Also on view are a wide range of other pumps and equipment, including recording instruments.

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**Tour F**

**Tuesday 8th September**

**East Sussex; Water pumping, motoring heritage, De La Warr Pavilion, Bexhill and Hastings**

**Site conditions**

*At Brede there is a short walk to the engine house from the coach park. There are a number of flights of stone steps with handrails inside the building.*

*For the Bexhill visits, there will be a short walk to the museum and De La Warr Pavilion on pavements and good paths. Both buildings have lifts for access to upper and lower floors.*

*At Hastings the Museum is housed in an old church and the Cliff Lift has steps to the ticket office.*

**Sussex Gazetteer References**

U2.10, M1.7, L2.2, T3.33, M1.8
Bexhill Museum

Then on to Bexhill, which was the birthplace of British Motor Racing, for a visit to Bexhill Museum M1.7 (TQ 737 071). The museum was set up in 1914 by local people with an interest in natural history, archaeology and ethnography. It now gives an insight into the history of Bexhill, its famous residents and visitors and the historic milestones that have made Bexhill internationally famous.

The 7th Earl De La Warr started the development of Bexhill-on-Sea from a rural village to a fashionable resort in 1883. His son, the 8th Earl De La Warr, secured the town’s place in history by hosting Britain’s first automobile races on 19th May 1902. The event was organised by the Automobile Club of Great Britain and Ireland and attracted thousands of visitors. The races were held on Bexhill’s unique seafront ‘bicycle boulevard,’ with more than 200 vehicles entered, all racing at speeds in excess of 50 miles per hour. The speed limit at the time was only a mere 12 miles per hour, so it’s fair to say that the racing was rather exciting. Despite opposition, motor races continued including a Concours d’Elegance or car show in 1934, which two years later, was held in the newly opened De La Warr Pavilion. Jubilee Speed Trials were put on in 1954 to celebrate Bexhill’s motoring heritage and for the first time the focus was on historic rather than contemporary vehicles. The tradition was revived in 1990 with the first Bexhill 100 Festival of Motoring.

The Museum’s curator Julian Porter will be giving a brief talk on the towns motoring heritage. During our visit we will see three vehicles representing different eras and technology: a reproduction 1902 Serpollet ‘Easter Egg’, steam car, winner of the first Bexhill motor race, a 1958 Mk III Elva sports racing car and the 1993 world record breaker Volta electric car. The Elva car was built by Frank Nichols who was born in Bexhill in 1920. He opened a small garage in Pevensey in the late 1940s and later set up a garage in London Road, Bexhill, where he produced the first Elva car. Elva Cars moved to Rye in 1961 and ceased production in 1969.

De La Warr Pavilion

Following a fish’n chip lunch at Di Paolo’s restaurant on the seafront, we have a guided walk through the Iconic Grade I listed 1930s Art Deco De La Warr Pavilion L2.2 designed by the architects Erich Mendelsohn and Serge Chermayeff. It was constructed in 1935 and underwent a major restoration in 2004.

In May 1935, as the Earl De La Warr laid the plaque that can still be seen in the floor of the Pavilion’s foyer, he set out his vision for: ‘A modernist building of world renown that will become a crucible for creating a new model of cultural provision in an English seaside town which is going to lead to the growth, prosperity and the greater culture of our town’.

The new seafront building, the De La Warr Pavilion, was the result of an architectural competition for a building which would include an entertainment hall to seat at least 1,500 people, a 200-seat restaurant and a reading room. The competition attracted over 230 entrants, and was won by Erich Mendelsohn and Serge Chermayeff, who were leading figures in the Modern Movement. Amongst the building’s most innovative features was its use of a welded steel frame construction, pioneered by structural engineer Felix Samuely. Construction began in January 1935 and it was opened on 12th December of the same year by the Duke and Duchess of York (later King George VI and Queen Elizabeth).

During World War II, the De La Warr Pavilion was used by the military and after the War, management of the Pavilion was taken over by Bexhill Corporation (which later became Rother District Council). Over the years changes were made to the building, many of which were inconsistent with the original design, and a lack of maintenance caused the building to decay.

In 1986, the De La Warr Pavilion was granted a Grade I listed Building status, and in 2002 the Heritage Lottery Fund and the Arts Council granted £6 million to restore the building and turn it into a contemporary arts centre. The ownership of the buildings was transferred from Rother District Council to the De La Warr Pavilion Charitable Trust, and after extensive restoration work it reopened as a contemporary arts centre.
Hastings

The final part of the day is spent in the historic Rock-a-Nore area of Hastings (TQ 827 094) to visit the Fishermen’s Museum and see one of the unique Hastings black net huts and the beach-launched fishing fleet, or alternatively a ride on the East Cliff Lift.

Hastings has over a thousand years of maritime history. The name of the shingle beach, the Stade, dates from before the 1066 battle of Hastings and means ‘landing place’. Following the building of the 1887 groyne at Rock-a-Nore and the 1896 incomplete harbour arm, the shingle stopped moving east and the Stade grew in size. Today it is home to Britain’s biggest fleet of beach-launched fishing boats. After each trip the boats are hauled out of the sea, therefore they cannot be more than ten metres long and can only fish in local waters. Each vessel has a shed containing an engine and winch, operated by a ‘boy ashore’ to haul in the boats and tractors help push the craft into the sea, especially when the tide is low.

The tall black net shops are used to store nets and other fishing gear. With a design dating back to the reign of Queen Elizabeth I, they are 2 to 3 storeys high, weatherboarded with pitched roofs. Each storey is rented by a fisherman, with access to the upper floors by ladders clamped to the walls.

Rock-a-Nore is an urban area of Hastings, East Sussex stretching from the Old Town area along Rock-a-Nore Road between the cliffs and the beach called The Stade, with its net shops. Its name was officially adopted in 1859 and derives from a former building ‘lyinge to the Mayne Rock against the north’.

East Cliff Lift

The Hastings Fishermen’s Museum M1.8 is located inside a church built on the Stade in 1852, which fell out of use after the Second World War. In 1956 local people concerned about preserving the maritime history of Hastings took over the old Fishermen’s Church. Today it contains one of the last of the luggers (sailing fishing boats), the Enterprise, together with many models, photographs, paintings, nets, ropes and a wide variety of other fishing artefacts.

The next door Shipwreck Museum relates the stories of local historic shipwrecks stretching from the Goodwin Sands in Kent to Pevensey Bay in Sussex. Hastings’ most famous shipwreck, the 18th century Amsterdam sank into the sands of St Leonards after beaching during a bad storm and its remains can be seen at the lowest tides.

Free admission if time permits.

The East Cliff lift T3.33 (TQ 827 095) was one the last water balance cliff railways in England until its electrification in 1974. Built in 1900-3 to a 5ft gauge, it is one of the steepest, running in a cutting in the cliff face. It has a gradient of 1:1.28, and is 267ft long. Hastings Corporation owned a refuse destructor at nearby Rock-a-Nore which was used to provide the steam power for pumping sea water to a reservoir, the water being used for street cleaning and sewer flushing. Because of the availability of this cheap power source it was decided to use the water balance system to power the lifts. The two cars were connected by a steel cable around a pulley at the top of the incline. Each car had a 600 gallon water tank on the underside which was filled from a standpipe when the car was at the top whilst the tank on the lower one was emptied, hence the heavier car descending would pull the lower car up. There were tail ropes fitted to each car to ensure that the weight of the ropes was equal each side irrespective of the position of the cars. At the bottom the water was emptied out of the tank and pumped back to the top for re-use, being stored in two 1,200 gallon tanks in the towers of the mock castle serving as an upper entrance.
Volks Electric Railway

The Volks Railway T3.29 was the first public electric railway in the world. A 2 foot gauge demonstration line of ¼ mile in length was opened on 4 August 1883 by Magnus Volk. The following year the gauge was changed to 2ft 8½in and the line was extended along the seafront to Banjo Groyne, with a further extension to the east in 1901.

Magnus Volk, the son of a German clockmaker, was born in Western Road, Brighton on 19th October 1851. He was apprenticed to a scientific instrument maker but returned to help his mother run the family business after his father died. His interest in science and engineering enabled him to be the first person in Brighton with a house fitted with electric light, and helped him get a contract to provide the Royal Pavilion with incandescent electric lighting. In 1883 he opened a 2 ft. gauge electric railway for a quarter of a mile on the Brighton seashore from the Aquarium to the Chain Pier. Power was provided by a 2 h.p. Otto gas engine driving a Siemens D5 50 volt DC generator. The small electric car was fitted with a 1½ h.p. motor giving a top speed of about 6 mph.

With an increase in gauge to 2ft 8½in the railway was extended eastwards from the Aquarium to the Banjo Groyne for a total of 1,400 yards, and one of the seafront arches at Paston Place was rented to provide workshop and power facilities. This consisted of an Otto 12 h.p. gas engine powering a Siemens D2 dynamo at 160 r.p.m., giving an output 160 volts at 40 amps. A station was provided adjacent to the Banjo Groyne, and a loop complete with halt was provided halfway along the track for cars to pass. The new line opened on April 14th 1884, and then a summer service operated until 1940 when the threat of invasion closed the railway for the duration of the Second World War.

During the War, the ownership of the railway passed to Brighton Corporation and, in 1947, the mainline was rebuilt using 50 lb rail for the running line and 25 lb rail mounted on insulators for the third rail. Although a winter service was tried, only a summer service was successful. In 1962, the cars were repainted in a new brown and yellow livery with VR and the Brighton crest. In 1983 the Centenary of the line was celebrated with Conrad Volk, Magnus’s youngest son, driving the special train. The railway continues to be operated by the City of Brighton and Hove, with support from ‘The Volk’s Electric Railway Association’ (VERA).

The railway will be providing a two carriage set for our ride along the seafront which will be followed by a visit and tour to the main storage depot and workshops. (TQ 325 035).
Amberley Museum and Heritage Centre

Following the morning visit the bus will go to the Amberley Museum and Heritage Centre M1.3, which was founded in 1979 to preserve the industrial history of the South East (TQ 028 119). There will be a short introductory talk at the start of our visit, and there is a restaurant where lunch may be purchased.

The 36 acre museum site is housed in former chalk pits, and there are a number of kilns and buildings which reflect this significant industry. Of particular importance are the De Witt kilns E6, erected in 1905 and consisting of 18 chambers fired in rotation. The original design was not a success and by 1910 a series of conventional bottle kilns had been inserted into the structure.

There are a wide variety of other exhibits reflecting the industrial history of the south east, including:

- Milne Electrical Collection, one of the major electrical collections in Britain, it concentrates on technical developments in the south east, backed up by a wealth of written material, company records and library.
- BT’s Connected Earth exhibition outlines the history of the British telephone system and telecommunications from early telephony up to the present day.
- The Printing collection, which is regularly demonstrated, includes a significant collection of printing machinery from the hand operated Columbian Eagle press of the Victorian era to the offset-litho machines of the recent past.
- Narrow gauge railways were used extensively in quarries, engineering works, military facilities and construction sites. Although the collection includes some passenger stock, it concentrates on the stock used for freight and mineral workings which is not preserved elsewhere. The collection is of national significance with many of the items being originally used by companies based in the south east.
- The Paviors’ Museum of Roads and Roadmaking covers the technology and development of road surfaces and the road system; an essential part of the history of road transport. Part of the structure is a former Tanyard building from Horsham.
- The Omnibus Collection aims to show the development of the motor bus in the South East, concentrating on the period up to the 1940s. The collection is supported by an extensive archive recording the history of Southdown Motor Services. 2015 is the centenary of the formation of Southdown.
- Radio, Television and Communications collections includes the development of an industry that has a major influence on our lives today. The collection includes examples of early radio and television equipment, many of which are shown in working order. It is one of the most significant collections of this material in the country.

After the final visit to Amberley Museum the coach will return to Brighton Station and the University. Or alternatively members may use the trains from Amberley Station (next to the entrance of museum) which serve London Victoria, Portsmouth and the south coast.

The train times from Amberley:

To Gatwick Airport and London Victoria:
14.17, 15.17, 16.17, 17.17

To Bognor Regis - change at Barnham for Portsmouth or Southampton:
14.57, 15.57, 16.57, 17.57