



The de Havilland DH 91 Albatross *Fortuna* in front of the control tower at Croydon Airport in 1939, *Aeroplane Monthly* Nov 1984 (Colin Ambrose).



Croydon Aerodrome entrance, 1920. See story on page 10.

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Reports & Notices

Details of meetings are reported in good faith, but information may become out of date. Please check details before attending.

SIHG Visits, Details & Updates at www.sihg.org.uk

Tony Gregory

6 September 1934 - 31 July 2009

We are very sad to report that Tony has passed away.

He has been a committee member and the visits organizer for several years.

A very well attended memorial service was held at St Christopher's Church Haslemere.

Our thoughts are with his wife Celia, who remains a staunch supporter of SIHG.

SIHG Newsletter No 171 September 2009

DIARY

The 34th series of SIHG Industrial Archaeology Lectures

Will be held on alternate Tuesdays, 1930 - 2130, from **29 September 2009**

at the University of Surrey (Lecture Theatre F).

Enquiries to programme co-ordinator, Bob Bryson, meetings@sihg.org.uk. Maps at www.sihg.org.uk

Free parking is available in the evening on the main campus car park.

Members fee £35 for the series. Single lectures at £5, payable on the night, are open to all.

The next Thursday Morning Lecture Series at Leatherhead

starts on 24 September 2009.

Enquiries to programme co-ordinator, Bob Bryson, 01483 302389, email meetings@sihg.org.uk. As seating is strictly limited, enrolment is for a whole course only; casual attendance is not possible.

Open House London Weekend of 19 & 20 September 2009

See www.londonopenhouse.org/ for the full programme.

Advance Notice

Surrey Archaeological Society Research Symposium

Saturday 20 February 2010 at Ashted Peace Memorial Hall

Including contributions from SIHG

Advance Notice

SERIAC 2010

South East Regional Industrial Archaeology Conference

Saturday 24 April 2010 at Chertsey Hall - Organized in 2010 by SIHG!

Other IA Organisations - Venues, Times & Contacts

- Amberley Museum & Heritage Centre:** 1000-1730, next to Amberley railway station, West Sussex, 01798 831370, www.amberleymuseum.co.uk.
- Brooklands Museum:** Brooklands Road, Weybridge, Surrey KT13 0QN
£9.90, conc. £7.70, 01932 857381 ext 221, info@brooklandsmuseum.com.
- Bursledon Brickworks:** Coal Park Lane, Swanwick, Southampton, SO31 7GW, usually open
Thurs 1000-1600, £1.50, child: £0.50, 01489 576248, www.bursledonbrickworks.co.uk.
- Cobham Bus Museum:** London Bus Preservation Trust, Redhill Road, Cobham, Surrey, KT11 1EF, 1000-1700, £5, 2 children free, 01932 868665, www.lbpt.org.
- Crofton Pumping Station:** Crofton, Marlborough, Wiltshire, SN8 3DW,
1030-1700 (closed Wednesdays), 01672 870300, www.croftonbeamengines.org.
- Cuffley Industrial Heritage Society:** Northaw Village Hall, 5 Northaw Road West, Northaw EN6 4NW, at 1930. £3. www.cihs.org.uk.
- Didcot Railway Centre:** Access via Didcot Parkway Station, £7.50, conc. £7.00, www.didcotrailwaycentre.org.uk.
- Docklands History Group:** Museum in Docklands, No 1 Warehouse, West India Quay, Hertsmere Road, London, E14 4AL, at 1730, www.docklandshistorygroup.org.uk.
- Honeywood Museum:** by Carshalton Ponds, Honeywood Walk, Carshalton, Surrey SM5 3NX, 020 8770 4297, www.friendsofhoneywood.co.uk/.
- Kempton Great Engines:** Feltham Hill Road, Hanworth, Middlesex TW13 6XH,
1100-1600, £6, OAPs £5, children free, 01932 765328, www.kemptonsteam.org.
- Kew Bridge Steam Museum:** Green Dragon Lane, Brentford, Middlesex TW8 0EN, 1100-1600, 0208568 4757, www.kbsm.org.
- London Canal Museum:** 12/13 New Wharf Road, N1 9RT, at 1930. £3 (conc. £2), 020 7713 0836, www.canalmuseum.org.uk.
- Railway & Canal Historical Society:** The Rugby Tavern, Rugby Street, London WC1, at 1830. www.rchs.org.uk
- Rural Life Centre:** Old Kilns Museum, Tilford, Farnham, GU10 2DL,
Wed - Sun, 1000-1700, £6, conc. £5, child £4, 01252 795571, www.rural-life.org.uk.
- Newcomen Society London:** Fellows' Room, Science Museum, Exhibition Road, London SW7 2DD at 1745. Guests welcome, admission free.
- Newcomen Society Portsmouth:** Room 0.27, Portland Building, University of Portsmouth, St James Street off Queen Street, Portsea, at 1830. Free parking from 1630, admission free.
- Rotherhithe & Bermondsey Local History Group:** at 1945, guests £1.50.
Time & Talents Centre, Old Mortuary, St Mary Church St, Rotherhithe Village, SE16, www.kingstairs.com/rotherhithe.
- Shere, Gomshall & Peaslake Local History Society:** at 2000, Shere Village Hall. Contact:
Little Hampden, Old Drive, Gomshall, Surrey GU5 9LH, keithchilds1@btinternet.com.
- Streatham Society:** at 2000. 'Woodlawns' 16 Leigham Court Road, Streatham. Info: Brian Bloice, 020 8764 8314, brianbloice@compuserve.com, www.streathamsociety.org.uk.
- Sussex Industrial Archaeology Society:** evening meetings at 1930, AGM at 1400,
West Blatchington Mill Barn, Holmes Avenue, Hove, www.sussexias.co.uk/.
- Twyford Waterworks:** Hazeley Road, Twyford, Hampshire SO21 1QA, 01962 714716, www.twyfordwaterworks.co.uk/.
- Watercress Line (Mid-Hants Railway):** Alresford Station, Alresford, Hants SO24 9JG or
Alton Station, Alton, Hants GU34 2PZ. 01962 733810, www.watercressline.co.uk.
- Westcott Local History Group:** at 1745, Westcott Reading Room. info@westcotthistory.org.uk. Visitors welcome, £1.

U3A - University of the Third Age

Friday 20 November 0930 - 1600, at The Menuhin Hall, Stoke d'Abernon

From Mechanical Music to Mechanical Television 150 Years of Entertainment in the Home

Study Day with Ken Tythacott & Jon Weller

Cheque for £10 to 'Surrey U3A Network' to Sheila Hill, sheilahill@hotmail.com.

A special invitation is extended to SIHG Members for this study day; U3A Membership is not necessary.

Brooklands Museum Vimy Day

Saturday 21 November

Opening of new Vimy Exhibition & lectures by Jenny Moseley & Vimy Pilots

£30 including lunch. Vimy Celebration Dinner & Fundraising Auction £50. Lectures + Celebration Dinner £65.

Tickets from Karen McKenna, 01932 857381 ext 241, karenmckenna@brooklandsmuseum.com.

We are still seeking a new Treasurer.

This is a very useful & rewarding role & a relatively light task as SIHG
is part of the Surrey Archaeological Society.

The formal accounts are thus presented by the parent body, not by the SIHG Treasurer.

Diary September

- 24 Thu **Surrey Industrial History Group: Lecture Series at Leatherhead - First Meeting**, see page 3.
- 29 Tue **Surrey Industrial History Group Lecture - First of 34th Series: Searching for Trevithick's London Railway of 1808** by *John Liffin*, Curator of Communications, Science Museum.

Diary October

- 13 Tue **Surrey Industrial History Group Lecture - Second of 34th Series: Kodak & Photography**, by *Tony Earle*, Retired Photographic Scientist.
- 27 Tue **Surrey Industrial History Group Lecture - Third of 34th Series: The Flying Boats of Southampton - Ships of the Sky**, by *Colin van Geffen*, Aviation Artist & Enthusiast.

Diary November

- 10 Tue **Surrey Industrial History Group Lecture - Fourth of 34th Series: The Power & the Glory of Waterwheels**, by *Dr Jeff Hawksley*, Member SPAB Mills Section.
- 24 Tue **Surrey Industrial History Group Lecture - Fifth of 34th Series: Industries of Farnham**, by *Chris Shephard*, Dir Rural Life Centre.

Venues, Times & Contacts are on page 3.

Editorial Note

Many thanks to all who have sent in contributions.
**Copy is needed urgently for the
 November issue of SIHG Newsletter!**

Surrey Industrial History Group Officers

Chairman & SIHG Lectures Organiser: **Robert Bryson**, meetings@sihg.org.uk
 Secretary: **Alan Thomas**, info@sihg.org.uk
 Treasurer: (vacant)
 Membership Secretary: **David Evans**, membership@sihg.org.uk
 Newsletter Editor: **Jan Spencer**, news@sihg.org.uk

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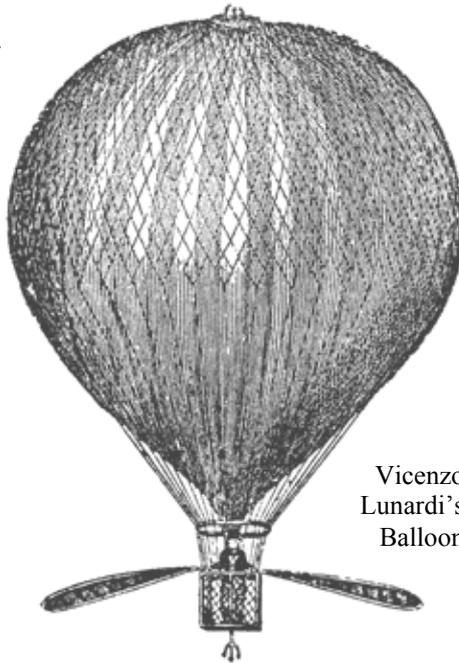
Early Ballooning in Surrey

by Gordon Knowles

The Montgolfier brothers gave the first public demonstration of their hot-air balloon in Paris on 4 June 1783. The first manned balloon ascent took place later the same year when, on 21 November, the Marquis d'Arlandes and Pilatre de Rozier ascended from the Chateau la Meutte in the Bois de Boulogne, Paris. Their flight, in a Mongolfier balloon fuelled by burning straw, carried them 5 miles over Paris and was some 25 minutes in duration. The first balloon ascent in Britain took place on 15 September 1784 when an Italian, Vincenzo Lunardi, took off from the Honourable Artillery grounds at Moorfields in the City of London. James Sadler (1753-1828) became the first British balloonist when on 4 October 1784 he took off from Christ Church Meadow in Oxford, rose to 3,600 feet, and subsequently landed some 6 miles away. Early in 1785 he made a 20 minutes flight from Oxford to Aylesbury in Buckinghamshire.

The first balloon ascent in Surrey was made by Sadler on 1 May 1785 from Hurst Park, Molesey. The balloon was fuelled by hydrogen and he was accompanied by William Windham, MP for Norwich. The site near the Thames was then known as Moulsey Hurst. From here Sadler passed over Southwark, Blackheath and Dartford, landing on the Isle of Grain. He had hoped to reach France emulating the flight earlier in the year by Jean-Pierre Blanchard and Dr. John Jeffries. Sadler was appointed Chemist to the newly created Naval Works Department under Sir Samuel Bentham in 1796 although he retained his interest in ballooning, making several further flights.

The second balloon flight in Surrey came a few weeks later when Lunardi took off from St. George's Fields, Southwark, which was then in the county, on the 29th June 1785



Vincenzo Lunardi's Balloon

with Mrs. Letysia Sage, an actress, and Colonel George Biggin, his financial backer, as passengers. The new hydrogen-fuelled balloon landed two hours later on Harrow Common, Mrs Sage becoming the first female balloonist in Britain. By 1802 balloon sites had opened at the Ranleigh Club, west of Barnes Common and in Vauxhall Gardens. More sites were set up in 1838 in Walworth Gardens, in 1850 in Kennington and in 1859 at the Crystal Palace. In the twentieth century there were further sites in Battersea Park in 1903, at Wandsworth Gas Works in

1906, the Roehampton Club in 1914 and at Mitcham Gas Works as late as 1920.

By September 1852 Charles Green had made over 500 ascents, mostly from Vauxhall Gardens, including a flight to Elbern, in Nassau, Germany, a distance of 480 miles, which he made on 7 and 8 November 1836. Vauxhall Gardens were extensive; today the site is covered by St. Peter's Church and the streets adjacent to the Oval cricket ground. The Crystal Palace became an increasingly popular venue; enhanced by the formation of the Aeronautical Society of Great Britain in 1866, whose first Exhibition was held at the Palace on 25 June 1868. In 1859 Coxwell and Glashier had ascended from the Palace shortly after it had been moved from Hyde Park following the Great Exhibition. In 1878 the British Military Balloon Section was formed at Woolwich, transferring to Aldershot in 1890, becoming the Balloon Section of the Royal Engineers.

The years from 1895 to 1914 became the Golden Years of ballooning for sport, culminating in the founding, on 4 September 1901, of the Aero Club of the

(Continued on page 6)

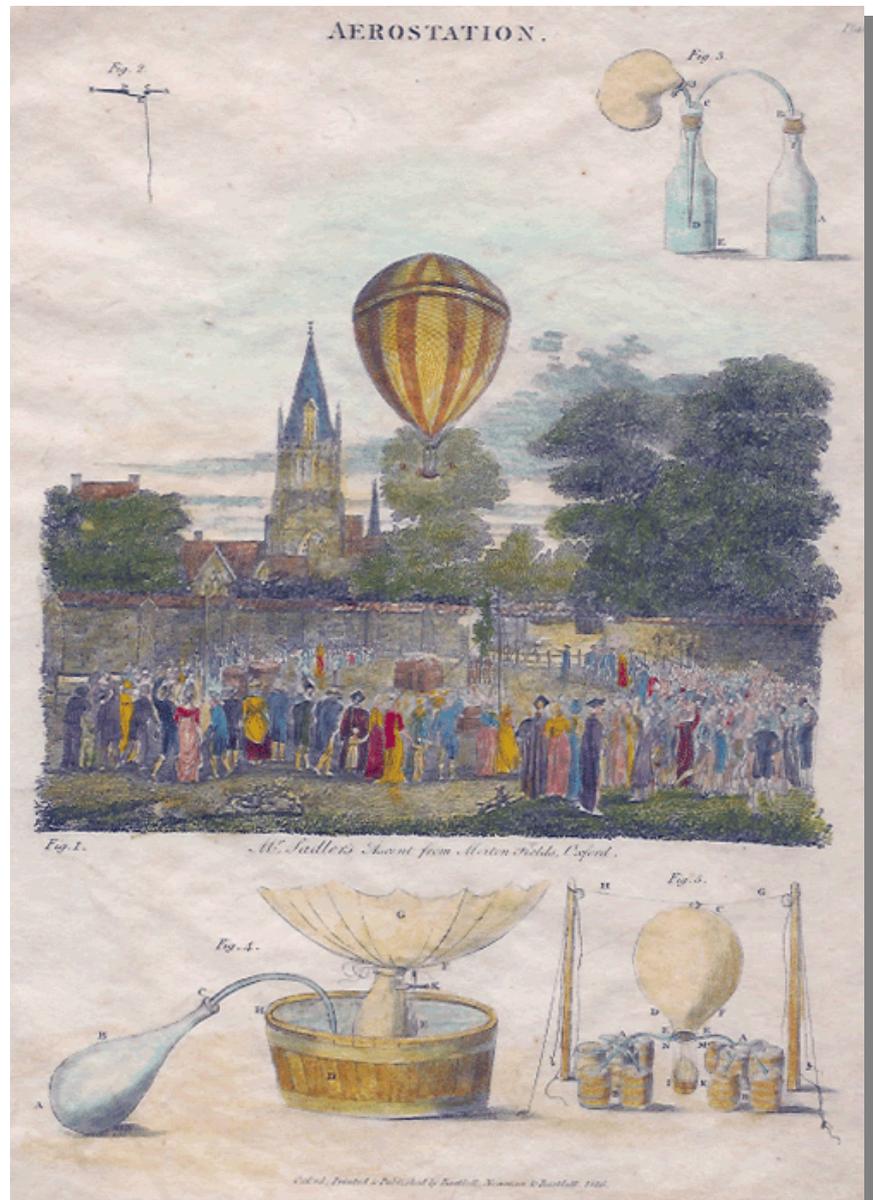
(Continued from page 5)

United Kingdom by Frank Hedges Butler and the Hon. Charles Rolls. The first meeting organised by the new Club was held on 31 May 1902 at the polo ground of the Ranleigh Club at Barn Elms, Barnes Common, when the inaugural race was won by Hedges Butler with a flight to Ongar in Essex. The Ranleigh Club was the base for ballooning until January 1908, when it moved to the Hurlingham Club in Fulham on the north bank of the Thames.

The Short brothers, Horace, Eustace and Oswald, bought a second-hand coal gas Spencer balloon for £30, Eustace and Oswald teaching themselves to fly it. They set up business in 1903 to build balloons under the arches of the London, Brighton and South Coast Railway next to Battersea gas works. Coal gas had less lifting capacity than hydrogen, but was much cheaper and easier to obtain. They successfully built a 33,000 cubic feet capacity balloon and by 1905 had obtained orders from The Royal Aero Club, the Indian Army and the Royal Navy as well as from private customers such as the Hon. CS Rolls. The Wright brothers visited in May 1908 and signed an agreement for Shorts to build six Wright Flyers under the arches at Battersea. For a brief period, balloon, glider and limited aircraft construction was carried on side by side until Shorts realised the need for more space and moved to Leysdown on the Isle of Sheppey where they set up the world's first aircraft production line.

On 18 November 1908 a new distance record was established with a flight from Crystal Palace to Matte Derevni in New Alexandrovsk, in Russia; 1,117 miles in 36 hours. This

remarkable flight was made by AE Gaudron, Capt. EA Maitland and Major CC Turner in a large balloon of 108,000 cubic feet appropriately named 'Mammoth'. The outbreak of war in August 1914 effectively brought to an end the pleasures of free ballooning, although a few ascents were made in the early twenties. Today the hot-air balloon, fuelled by Calor gas, has returned to the skies over Surrey, in spite of being restricted by the problems of air traffic control and getting caught in the air lanes to Heathrow and Gatwick as well as other minor airfields. □



James Sadler's Balloon over Oxford.

Who Invented the Aeroplane?

by Alan Thomas

Posed as a *Quite Interesting*

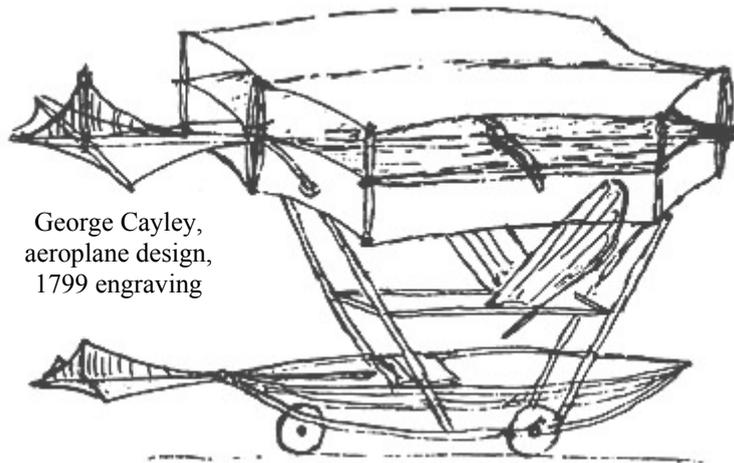
Question, the panel would most likely answer: 'The Wright Brothers'. They were of course the first to demonstrate a fully controllable, powered flying machine; but as far as the aerodynamics were concerned, their work was anticipated (with some deficiencies)

in the late 18th and early 19th centuries by Sir George Cayley, a baronet with an estate in Yorkshire. As Newton said, 'if I have seen further than most men, it is by standing on the shoulders of giants' - and in aviation, the principal giant, as it were, was Cayley.

Cayley (1773-1857) was an unusual man. Although a substantial landowner with all the appropriate duties and life-style, he was to an extent an outsider. He was a Unitarian, and thus disqualified from attending university. He was educated at home by two tutors, both Nonconformists, who instructed him in science and mathematics. If he had followed the conventional 'Eton and Christchurch' route, he would have had no scientific education. As it was, he developed a great interest in scientific and engineering matters, including, from 1796, aeronautics - but of course he had to manage his estates as well.

Cayley undertook both theoretical and practical work in aeronautics from the age of 23 until his last surviving contribution to aeronautics in 1855. He died at the age of 83 in 1857. He was the first to fly a model glider, in 1804, which had stability in roll, pitch and yaw and both horizontal and vertical tail surfaces. His studies and experimental results were written up in his own journals and occasionally in articles in what stood for the technical press of the time. Notably, in 1809 (six years before Waterloo) he wrote an article in three parts which was published in *A Journal of Natural Philosophy, Chemistry and the Arts* (W Nicholson, London) in 1809/10. The year 2009 is therefore the 200th anniversary of this seminal work. This set out, correctly, the basic aerodynamics of the fixed-wing aeroplane; although as the terminology of aerodynamics had not been defined at that time, the arguments are not always easy to follow and may not have been fully appreciated by other workers in the 19th century, particularly as the illustrations were not graphic enough.

Later workers in the 19th century tended to disregard this paper, either because they did not



George Cayley,
aeroplane design,
1799 engraving

know of it or because they thought they knew better - notably perhaps Otto Lilienthal (the inventor of the hang glider) in the 1890s. The Aeronautical Society of Great Britain (founded 1866) (later the Royal Aeronautical Society) paid Cayley no attention until in 1876 they published an abridged version

of the 1809/10 paper.

Cayley's later work, when published at all, could only be found in (to us) obscure periodicals of small circulation and some of his notebooks were not discovered until 1961. However, the early work was known to the Wright brothers; Wilbur stated in 1909 that 'About 100 years ago an Englishman, Sir George Cayley, carried the science of flying to a point which it had never reached before and which it scarcely reached again during the last century'. We may conclude that the 1809/10 articles were known to them, perhaps not in the original form but as republished in the *Aeronautical Annual* at Boston in 1895.

Although the basic features of an aeroplane, that is three-axis stability, had been defined, Cayley did not see the importance of control in all these axes. He provided the elevator (in modern terminology) for pitch control and stability and a rudder for yaw control and stability. He assumed that the latter control could be used to alter the aeroplane's course. Although some experiments with models were tried, it was apparently not observed that use of the rudder alone causes side-slip (as in the case of a hovercraft). He sought to design an aircraft which had natural stability, one which did not need continual control movements to fly a steady path (which was just as well, because the pilot would be required to propel the aircraft by actuating flappers through a system of hand-operated levers). Dihedral, or pendulum stability, was used to give stability in roll. Cayley eventually had his famous 'coachman carrier' flown in 1853 for a few hundred feet in a straight line, but this was probably not known to the Wright brothers.

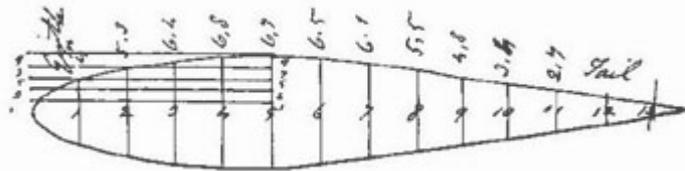
The Wright brothers proceeded by correct scientific method, that is literature search, hypothesis, experiment and theory. As bicycle mechanics they were familiar with the problem of control of an unstable machine, which quickly becomes instinctive, and believed that an aeroplane without natural stability could be similarly controlled by the

(Continued on page 8)

(Continued from page 7)

pilot (although he would be working in six degrees of freedom). Their designs had no dihedral to give roll stability - rather the reverse and the elevator gave control but was not set to give natural stability. Their great invention was their system of roll control, in which the wings were warped in opposite directions, one up and one down, to turn the aeroplane. In their 1902 glider, there was initially no yaw control - no fin or rudder - but they soon found that turns could not be made without the addition and use of a rudder as well, in a co-ordinated fashion. It was coupled to the roll control, so that its operation was automatic, calling for no additional action by the pilot, and turns could be made without side-slip. It was on this glider that on 20 September 1902 that full three-axis control was first demonstrated and that date should be regarded of as equal importance to that of the first powered flight on 17 December 1903.

Having developed a full control system, the next step was to add an engine and propeller and an airframe capable of lifting the extra weight. The brothers attempted to buy an engine, but one could not be found in time or at an affordable price. So they made their own - a very simple, even crude, machine, but just powerful enough to get the airframe and pilot off the ground. The great problem that had to be solved was to design an efficient propeller. They searched for papers covering the necessary theory, but found none, and they had to develop their own, regarding the blades as wings moving in spiral paths. It is notable also that they used two propellers turning in opposite directions and they did not therefore have to cope with gyroscopic effects, which gave pilots of the early single engine/propeller aircraft great problems.



George Cayley, airfoil design, 1804

Having no natural stability, the pilot of a Wright Flyer had to adjust the controls continually, like riding a bicycle. This made these aeroplanes very manoeuvrable, compared with rival designs of the early 1900s; however they were difficult and relatively dangerous to fly. Designers in Europe developed inherently stable machines, which did

not require such continuous control, but they were much less manoeuvrable because the pilot had to fight the natural stability. This could be disastrous, as in some of the reconnaissance aeroplanes of WWI which became known as 'flying coffins' (one of which, the DH4, was made under licence by the Wright company). It was not until the 1970s that inherently unstable aeroplanes began to be developed, using computers and 'fly by wire' systems to give stability and great manoeuvrability.

Following their first flight, for two years or so, the brothers refused to demonstrate their Flyer because they wished to protect their patent rights. A US patent was granted in 1906, after which they were more forthcoming, and many demonstrations were given; but they refused to participate in the air races of the time, nor in the cross-channel event in competition with Blériot. Some further development took place, notably of the Model B, which had the elevator mounted aft with the rudder and wheeled landing gear. Further development, into the type of aeroplane seen in WWI, took place mainly in Europe and the US lost the lead in aircraft development for about 20 years.

The Wright brothers' achievement was to demonstrate that flying machines were practical; once they showed that, and how it was done, anyone could do it. This pattern of progress can be seen in other fields in aviation in the development of the first jet engines by Whittle and Ohain. Detailed designs may differ greatly, but they all owe their genesis to

Corrections & Clarifications

Some Members will have received a double helping of the inside pages in July - our apologies (but they could become collectors' items)!

The deadline for **submitting copy** for the next Newsletter is
10 November 2009.

Submissions are accepted in typescript, on a disc, or by e-mail to news@sihg.org.uk. Anything related to IA will be considered.

*Priority will be given to Surrey-based or topical articles.
Contributions will be published as soon as space is available.*

*Readers are advised that the views of contributors
are not necessarily the views of SIHG.*

Website: www.sihg.org.uk

Industrial Archaeology News No 150, Autumn 2009

review by Gordon Knowles

Stephen Hughes of the Welsh Royal Commission writes that the *Pontcysyllte Aqueduct and Canal*, 11 miles (18 kilometres) long, was inscribed a World Heritage site at the meeting of the UNESCO World Heritage Committee in Seville in June. This followed six years of preparatory work, the main presentation to the committee being made by Stephen himself. He describes the tortuous proceedings, conducted in both English and French which culminated in success after almost three days debate.

The *Fe09 Footprints of Industry* conference held at Ironbridge in June is reported by Marilyn Palmer. This was celebrating the 300th anniversary of the first successful use of coke to smelt iron. Some 40 speakers contributed wide ranging papers over three days to make this a successful event. Papers were given on the historical, technical and social aspects and the event was co-ordinated by the Ironbridge Institute, supported by the AIA, the Newcomen Society, the Historical Metallurgy Society and the Society for Post-Medieval Archaeology.

Mark Sissons describes the May *East Midlands Industrial Archaeology Conference (EMIAC)* at which the main topic was Longdendale Water which is to the east of Manchester ending in the Woodhead Pass over the Pennines. A series of reservoirs were constructed between 1854 and 1877; these were described during the day's lectures which culminated in a visit to the Glossop area, the abandoned railway and the reservoirs.

Alan Thomas, SIHG Secretary, who is also the *South East Regional Correspondent*, reports on the 100th anniversary commemorations of Louis Bleriot's successful flight across the English Channel on 25 July

1909 which were held in Dover on 25 and 26 July, including the successful crossing by an original and by replicas of Bleriot's monoplane. He also reports the flight of the Vickers Vimy (see the last issue of our Newsletter), work on the extension to the Bluebell Railway towards East Grinstead and the opening in May of the waterway under Loxwood High Street on the Wey & Arun Canal. He also notes that the Basingstoke Canal Authority was obliged to close the Deepcut flight of locks because of structural problems. No date for re-opening has been announced as funds are tight; meanwhile the rest of the canal remains open.

Other news he reports includes a note that work on restoring the original boilers is progressing at the Twyford waterworks near Winchester. When complete the Hawthorn Davey triple-expansion engine may be brought back into steam, this would be an important project for most preserved engines do not use their original boilers. Following closure of the Sittingbourne and Kemsley light railway in 2007, one of the oldest pre-stressed concrete structures in the country now faces demolition. This is a 118 span, one kilometre long, viaduct built in the 1920s and efforts are being made to have it listed and to save the site being turned into another shopping centre. Alan also reports on the move of the Thames Ditton Statue Foundry Gantry crane from the Rural Life Centre at Tilford to a private collection in Manningtree, Essex. This severs SIHG's involvement with the crane after many years.

There is also a report on the SERIAC meeting in Winchester which was fully reported in the last issue of the SIHG Newsletter. □

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International Journal for the History of Engineering & Technology Formerly Transactions of the Newcomen Society

New Evidence Supporting Wolverhampton as the Location of the First Working Newcomen Engine Suhail Rana
A Confirmation of the Location of the 1712 'Dudley Castle' Newcomen Engine at Coneegree, Tipton

JH Andrew and JS Allen

A Light to Lighten our Darkness: Lighthouse Optics and the Later Development of Fresnel's Revolutionary
Refracting Lens 1780-1900 Julia Elton

Christopher Colles: America's First Steam-engine Builder Alan M Levitt

The Material Culture of British Pharmaceutical Laboratories in the Golden Age of Drug Discovery (c. 1935-75)
Viviane Quirke

Rhys Jenkins (1859-1953) Links in the Life of an Engineering Historian Ray Smith and Stephen K Jones

Reviews

Thomas McErlean and Norman Crothers. *Harnessing the Tides - The Early Medieval Tide Mills at Nendrum*
Monastery, Strangford Lough (Philip T Donald)

Tony Vernon, *Yorkshire Engine Company: Sheffield's Locomotive Manufacturer* (George Carpenter)

Stan Basnett, *Trains of the Isle of Man - The Ailsa Years* (Paul Dunkerley)

Bill Fairney, *The Knife and Fork Man: The Life and work of Charles Benjamin Redrup* (Clive Ellam)

Colin Bowden, *The end of a revolution: the last days of stationary steam* (Mike Chrimes)

Anthony S Travis, *On chariots with horses of fire and iron: the excursionists and the narrow gauge railroad from*
Jaffa to Jerusalem (Mike Chrimes)

Sir Bernard Crossland and John S Moore ed., *The lives of great engineers of Ulster. Vol 3* (Sue Hots) □

Croydon Airport 1920 to 1959

by Gordon Knowles

The end of this month, 30 September 2009, is the 50th anniversary of the closing of Britain's first international airport.

The Customs Airport for London was created on 29 March 1920 from two WWI military airfields, Beddington and Waddon. There had been much discussion in Whitehall as to whether Hounslow or Beddington (with Waddon) should be designated. It was eventually decided that it would be better to have the new aerodrome to the south of London, rather than to the north, as it would save time and fuel by not having to fly around the capital; it was thought too dangerous to fly over London. In fact the first civil flight took place as early as December 1919 from the General Headquarters of the Royal Air Force in the Pas de Calais to Beddington carrying civil servants who made the trip from RAF HQ to the Air Ministry in the Strand in an hour and a quarter.

The first arrivals and departure facilities and the customs office were in wooden huts converted from the WWI buildings. A controversial operation was the opening of a crossing on Plough Lane enabling aircraft to be moved from the west side to the new facilities on the east side. Originally it was proposed to name the new airport London Terminal Aerodrome, Wallington, but the local councils could not agree as to which should have the honour so the new airport was named Croydon. The first airlines to operate from Croydon were Instone Air Lines and Air Transport and Travel (AT&T), joined soon afterwards by Daimler Airways and Handley Page Transport. One of the most famous of the early aircraft to fly from Croydon was the 10 seat Vickers Vimy Commercial *City of London* of Instone.

Soon continental companies initiated flights to and from Croydon to Europe. Two French companies, Compagnie des Messageries Aeriennes (C.M.A.) and the Compagnies des Grands Express Aeriens (C.G.E.A.), flying 5 seater Spad S.33s and 12 passenger Farman Goliaths respectively, flew to Paris Le Bourget. The companies soon merged into Air Union and subsequently became Air France. S.N.T.A. flew to Brussels, merging with S.A.B.E.N.A. in 1923, the same year that a Berlin-London air route was started by DLH. All these foreign companies were subsidised from the outset by their governments, this caused severe problems for the British companies, so much so that AT&T had folded before the end of 1920.

The Hambling Committee recommended to the Government that all the British companies should be merged and that a subsidy would be paid to the new body for ten years, by which time it was assumed that it would be in profit. Thus on 1 April 1924 Imperial Airways was created. Perhaps the best remembered aeroplane of the twenties and thirties was the Handley Page HP42 biplane flown by Imperial; it was slow, stately but utterly safe. But probably the most significant aeroplane of the period was the pioneering Douglas DC2 and its successor the DC3, favoured by a number of continental airlines. It was a sleek monoplane, much faster and was the precursor of all subsequent piston engined airliners.

A new modern terminal was completed alongside the Purley Way in 1928 together with a new hotel and hangers. Croydon was the start, and/or finish, of many record breaking flights. The most popular flier with the public was

undoubtedly Amy Johnson; her epic solo flight to Darwin, Australia, in 1930 made her a household name. She was the first woman to make the solo flight.

When war broke out in September 1939 all civilian flying ceased and the aircraft were flown to Bristol, the RAF had arrived on 25 August when the site became RAF Croydon, a fighter station. Hawker Hurricanes were the most numerous aircraft at Croydon during the war but other types also flew from there. On 1 August 1944 the formal transfer to the Director of Civil Aviation took place, but the RAF stayed on site until April 1945, by then there had been resumption of transport flying, both military and civil. In fact it was not until June 1946 that RAF Croydon was officially closed. Semi-military passenger flights were started to Prague and Berlin-Warsaw, the latter soon transferring to Blackbushe. No 110 Wing of RAF Transport Command moved in 1946 to Northolt forming the hub of British European Airways (BEA); this was virtually the end of scheduled services from Croydon. New aircraft were heavier than pre-war models, needing concrete runways and longer take off runs. Croydon's grass runways were deemed inadequate. So scheduled civil flying under BEA transferred to Northolt and then to the new Heathrow, muddy paths, tents and all.

It was disputed at the time that Croydon, in spite of being in a heavily built up area, was no longer suitable for civil flying. Many were of the opinion that it could continue with smaller companies flying smaller aircraft. The complexities of Air Traffic Control in the south east were other factors which weighed against Croydon continuing. So it was that on 30 September 1959 the last commercial flight left Croydon, a de Havilland Heron of Morton Air Services piloted by the aptly named Capt. Geoffrey Last. A vociferous and prolonged campaign to keep Croydon open was to no avail.

For many years the site languished; the booking hall becoming a carpet warehouse and a petrol station was erected in the forecourt. But with the combined efforts of the Croydon Airport Society, an eventually enlightened local council and a far-sighted developer, the 1928 buildings were restored during the 1990s and brought back into use. The booking hall is as it was, now with some displays and model aircraft suspended from the ceiling, commercial units have been created from the admin offices and the Rayon d'Or restaurant renewed, linked to the refurbished hotel. (The Rayon d'Or is named after the de luxe catering service operated by Air France to Paris). The flourishing Airport Society now has an excellent museum, expanding all the time, in the old control tower and a major photo and text archive in the old gate house. The museum is usually open one Sunday a month and by special arrangement for parties, and the archive is accessible by genuine researchers.

There is a DH Heron on a plinth outside in the markings of the Morton Air Services aircraft. There has been only one flying event since closure. I recall attending the meeting in 1988 when a number of mainly DH light aircraft flew using what remained of the old grass airfield not taken over by housing. The streets of the estate are named after Croydon personalities of its heyday. I wonder how many of the youngsters living there today have any idea of the history of the site they are living on. □

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review by Gordon Knowles

Professor Marilyn Palmer (co-editor 1984-2001) and Dr David Gwyn, the editor since 2001, jointly write that the Review has been continuously published since 1984 and that now all earlier issues are available online to AIA members and institutional subscribers, including a facility to search for articles under topic headings.

The 2008 Rolt Memorial Lecture was given by Wayne D Cocroft, Senior Archaeological Investigator with English Heritage, and was intriguingly titled

'Dan Dare's Lair' – The Industrial Archaeology of Britain's Post-war Technological Renaissance. The lecture followed the theme of last year's conference seminar on 'Modern Military Matters' and noted that modern military sites have much in common with large industrial sites. They employed many hundreds of people, incorporated complex technologies and were creators of new landscapes and communities. Cocroft explored the places created and used to develop and manufacture many of the products that have been portrayed as representing the rebirth of post-war Britain as a major industrial power. Many of the new industries were based on technology developed during the Second World War, including radar, jet and rocket engines, and military and civil atomic power. Politically, the World Wars had left a legacy of heavy government involvement in scientific research establishments and the state as the main customer for their products. In the post-war decades this relationship was strengthened as the development of high-tech weaponry was seen as one means of countering the growing threat from the Soviet Union and her allies.

Warehouses, Wharves and Transport Infrastructure in Manchester during the Industrial Revolution: The Rochdale Canal Company's Piccadilly Basin, 1792-1856; is a joint article by Peter Maw, Terry Wyke and Alan Kidd, who are all from the Centre for Regional History at Manchester Metropolitan University. They suggest that Manchester, given its importance to British industrialisation, offers a useful platform to refine our understanding of inland navigation in the 18th and 19th centuries, complementing recent industrial archaeological research. The Rochdale Canal, completed in 1804, was one of four major canals that served Manchester in the early 19th century, affording the town greatly improved access to Eastern England and its commercial ports. The article analyses the establishment of the Piccadilly basin from 1792-1856, a period when the company built eight multi-storeyed warehouses and laid out 25 wharves to facilitate its trade. Comparison is drawn between the basin's economic functions and other Manchester canal basins.

Excavations at Lochrin Distillery, Edinburgh is by Richard Heawood who works for Historic Scotland and describes excavations made in 2005 by Abercorn

Archaeology. The distillery was founded by John Haig around 1780, at a time when the scale of Scottish distilleries was increasing dramatically and distilling was, briefly, the most significant industry in Scotland. Frequent increases in excise duty meant that they were challenging times and Lochrin, like other distilleries, was mothballed and re-opened several times before finally closing in 1848. By the end of the century all trace had been swept away. The excavations made in 2005 were undertaken prior to re-development of the site when six still bases were recorded, these were considered to have been from three different phases of construction, together with the footings of a worm tub and a large basement structure. The excavations have clarified the evolution of the distillery, confirming that large lowland distilleries of the period were dynamic enterprises, frequently adapted in the light of challenges facing the industry.

A Fading Memory: the North Yorkshire Coastal Alum Industry in the Light of Recent Analytical Field Survey by English Heritage is by Marcus Jecock, a landscape archaeologist with English Heritage. For over 250 years from 1604, the North York Moors were the centre of the English alum industry, the principal use of which was as a mordant to fix the colour of dyed woollen cloth. It was made by quarrying, burning and steeping huge quantities of shale to produce an impure solution of aluminium sulphate; then, at alum houses, the liquor was concentrated by boiling and an alkali added to form alum. The North Yorkshire quarries exploited both inland and coastal shale deposits, but the most successful quarry/alum house complexes were situated on, or near, the coast. Even when working the latter had to contend with periodic landslips and cliff falls; with closure, they now form a diminishing archaeological resource slowly sliding into the sea. The paper reviews the present understanding of the industrial process in the light of a recent analytical survey undertaken by English Heritage of four hitherto poorly recorded works, three of which are coastal. In so doing, it highlights the disproportionate loss of certain classes of features at the coastal sites and advocates the need to do more to compare the latter to their inland counterparts, to place the industry in its wider British and European context and to examine it from an economic as well as a technological perspective.

In 'Shorter Notices' the SIHG publication "25 Years of Conservation Awards 1983-2007" is reviewed and is gratifyingly highly recommended by the reviewer 'IW', whose personal favourite site is Chatley Heath Semaphore Tower, but he/she commends the wide range of our awards from nationally famous locations such as Brooklands and the Basingstoke Canal to less celebrated individual initiatives like the garden full of stationary engines and the collection of over 100 historic bicycles. □