



SIHG Lecture 10 - 4 March 2008
Mills of the Muslim World
by Michael Harverson
report by Glenys Crocker

The SPAB Mills Section holds a special lecture every other year in memory of Rex Wailes, a distinguished molinologist who played a major role in the Section in the early days, when it was known as the Wind and Watermills Section. 'Mills of the Muslim World' was the title of the 5th Rex Wailes Memorial Lecture, which Michael Harverson gave in 1999. We were fortunate to have him come to tell us about the subject, which has occupied him for many years, from the time he spent living in Iran as a teacher of English early in his career as a language teacher.

Some years ago I went on a very memorable mills tour of Crete with a party that included Michael, and we went exploring both surviving and derelict mills that were typical of a wide area around the Mediterranean and in the Middle and Near East. Much of this area has a Muslim culture now, or did so in the past, but the mills stand in a tradition that goes back well before the spread of Islam in the 7th Century AD. This tradition reached its highest level of sophistication about a thousand years ago, and then remained unchanged until modern times.

Most of Michael's slides, of both wind and watermills, were taken in the areas he had travelled in most, Iran, Afghanistan and Morocco. He also drew on documentary and published sources, particularly for Spain, Turkey and Iraq. As well as mills for grinding corn, he discussed ancient water technology, in particular norias, the great vertical wheels for raising water, for example at Hamas in Syria, and qanats, artificial underground channels that carry water for many miles, coming to the surface at intervals to drive a mill. The water falls down a high drop tower, (see picture on page 1) and is directed by a nozzle on to the blades of a horizontal waterwheel, with direct drive to a single pair of millstones.

Cretan Mill Aquaduct and Drop Tower
 Visit in 1994; Michael Harverson
 is the figure on the right.



We also heard about tide mills and boat mills, animal powered mills, hand mills and several types of windmills, including some of a very different design from the familiar European ones. There were horizontal windmills in Persia in the 9th Century that harnessed a very strong seasonal wind by using tall towers with vertical slits housing a mechanism like tall revolving doors, with direct drive to a pair of stones. Michael showed rows of these structures in Iran and Afghanistan that he had photographed in the 1960s and 1970s.

As well as explaining the various technologies used, Michael told stories of human interest (with a distinct middle-eastern flavour), and this short report of his lecture cannot possibly do justice to either.

Michael's original lecture is published as an A5 booklet, ISBN 1 898856 060, which is available at £5.00 (£7.50 inc p&p) from The Mills Archive, Watlington House, 44 Watlington Street, Reading RG1 4RJ. □

SIHG is a group of the Surrey Archaeological Society, Registered Charity No 272098
 Castle Arch Guildford Surrey GU1 3SX
 Group Patron: David Shepherd OBE, Group President: Prof AG Crocker FSA

Published by the Surrey Industrial History Group and printed
 by Kall-Kwik, 9, Bridge St., Leatherhead KT22 8BL
 © SIHG & contributors 2008 ISSN1355-8188

Contents

- 1 Mills of the Muslim World *by Michael Harverson*
- 3 Diary
Surrey Industrial History Group Officers
- 4 Programme: 33rd Series of SIHG Lectures
- 5 British-Built Aircraft: Volume 3 South East England *by Ron Smith* book review *by Gordon Knowles*
- 5 Surrey's Ancient Stone Mines *by Peter Burgess* book review *by Peter Tarplee*
- 6 Harry Ricardo: The Discovery of 'Octane' in Walton on Thames *by Martin Marriott*
- 7 Leatherhead and Lullingstone *by Peter Tarplee*
- 9 The Pumphouse & Water Supply for Mickleham Downs House near Dorking
by Pam Taylor, Jan Spencer & Bob Bryson
- 8 Industrial Archaeology News No. 144 Spring 2008 *review by Gordon Knowles*

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

***If you have not done so, please renew your SIHG Membership promptly; it is now overdue.
Note that paid-up members will receive a FREE COPY of the SIHG
'25 Years of Conservation Awards' Booklet!***

We are still, at the time of writing, in **urgent** need of a new **Treasurer**.
This is 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.

Launch of Commemorative Booklet

'25 Years of Conservation Awards'

Surrey History Centre, Woking
Thursday 4 September 2008, 1830

Refreshments provided.

Surrey History Centre is at 130 Goldsworth Road, Woking GU21 6ND.
Numbers are strictly limited, so if SIHG members wish to attend they must, please, book in advance.

Phone the Secretary Alan Thomas on
01372 720040 or e-mail him at info@sihg.org.uk.

[The Booklet will be issued FREE to ALL SIHG Members.]

SIHG Newsletter No 164 July 2008

DIARY

The 33rd series of Industrial Archaeology Lectures

Held on alternate Tuesdays, 19.30-21.30, from **30 September 2008** at the University of Surrey (Lecture Theatre F).

The complete programme is on page 4.

Enquiries to programme co-ordinator, Bob Bryson, 01483 302389, e-mail meetings@sihg.org.uk.

Details are on www.sihg.org.uk

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

Single lectures at £5, payable on the night, are open to all.

Other IA Organizations - Contacts, Venues & Times

Amberley Working Museum is off the B2139 between Arundel and Storrington, next to Amberley railway station in West Sussex. Free parking.

Crossness Engines, Belvedere Road, Abbey Wood, London SE2. £4 adults. Visits must be booked in advance, Tue or Sun, 0930 - 1530 on 020 8311 3711 (no booking by answerphone). Visits start at 1330. Public steaming days are 1030 - 1630, £5 adults; booking is not required. www.crossness.org.uk.

Docklands History Group, Museum in Docklands, Hertsmore Road, West India Dock, Isle of Dogs, E14 4AL at 1730, £2 non-members.

Greenwich Industrial History Society, The Old Bakehouse, rear of Age Exchange Centre, 11 Blackheath Village, SE3 (opp. Blackheath Station) at 1930.

HIAS (Hampshire Industrial Archaeology Society), Underhill Centre, St John's Road, Hedge End, SO30 4AF at 1945; visitors welcome, free parking.

Kempton Great Engines, 1100 - 1600. Adults £6, OAPs £5, Children (to 16) free. Feltham Hill Road, Hanworth, Middlesex TW13 6XH; 01932 765328, www.kemptonsteam.org.

Kew Bridge Steam Museum, Green Dragon Lane, Brentford, Middx TW8 0EN; open 1100, 0208568 4757, www.kbsm.org.

Lowfield Heath Windmill, Russ Hill, Charlwood. 1400 - 1700. Mike Harrison 01293 862374 or Peter James 01403 272664

Rural Life Centre, Old Kilns Museum, Tilford, Farnham, GU10 2DL, Wed - Sun, 1000 - 1700, £6, over 60s £5, children 5-16, £4, www.rural-life.org.uk.

Upminster Windmill, St Mary's Lane (on A124). 1400 - 1700. 01708 226040, www.upminsterwindmill.co.uk

Advance notice for your diary - Saturday 25 April 2009

SERIAC 2009 - at Winchester Guildhall

hosted by Hampshire Industrial Archaeology Society

The deadline for **submitting copy** for the next Newsletter is **two months time**.
Submissions are accepted in typescript, on a disc, or by email to news@sihg.org.uk.

Anything related to IA will be considered.

Do, please send in reports / photos of holiday visits or thoughts on local, national or international Industrial Archaeology.

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.

This edition of the Surrey Industrial Group Newsletter has been reformatted so that it is more easily read online or printed out as a PDF.

Diary entries have been curtailed to cover SIHG events only.

Other editorial matter is practically as originally published.

Many thanks to all who have sent in contributions.

Website: www.sihg.org.uk

Surrey Industrial History Group Officers

Chairman & Lectures Organiser: **Robert Bryson**, meetings@sihg.org.uk

Secretary: **Alan Thomas**, info@sihg.org.uk

Treasurer: **Robin Turier**

Membership Secretary: **David Evans**, membership@sihg.org.uk

Newsletter Editor: **Jan Spencer**, news@sihg.org.uk

Diary July

27 Sun Rural Life Centre: Rustic Sunday, including **SIHG** exhibits Gantry Crane & Wind Pump.

Diary August

2 Sat Archaeological Training Excavation at Downside Mill, Cobham
 - 10 Sun The Mill of Alexander Raby, Ironmaster ; The dig will be directed by Tony Howe of the Surrey County Archaeological Unit. Beginners/students welcome. For details see www.sihg.org.uk.

Diary September

4 Thu Surrey Industrial History Group: Launch of Commemorative Booklet
'25 Years of Conservation Awards'
 Surrey History Centre, see notice p 4.

30 Tue **Surrey Industrial History Group** *New Lecture Series*
 A Light to Lighten Our Darkness: The History & Development of Lighthouse Optics
 by *Julia Elton, Past-President Newcomen Society*, see p 2.

Surrey Industrial History Group
The 33rd series of Industrial Archaeology Lectures
 2008 - 2009 PROGRAMME (see also page 3)

2008

30 Sep A Light To Lighten Our Darkness:
 The History & Development of Lighthouse Optics
Julia Elton (Past-President Newcomen Society)

14 Oct Sawmills: A Slice Through Time
Martin Watts (Millwright & Mill Historian)

28 Oct Samuel Cody: Air Pioneer
Peter Reese (Author)

11 Nov Cornwall's Mining Heritage
Dr Peter Stanier (Author & Industrial Archaeologist)

25 Nov Early Wireless
Ken Tythacott (Member British Vintage Wireless Society)

9 Dec Members' Talks

2009

6 Jan Banknote Papermaking at Laverstoke & St Petersburg
Prof. Alan Crocker (President SIHG)

20 Jan Channel Islands Concrete (from WW2 to Today)
Chris Shaw (Consultant)

3 Feb Watches in England (the First Hundred Years (1580 – 1680))
David Thompson (Curator of Horology British Museum)

17 Feb The Early Days of Plastics
Dr John Russell (Vice President Newcomen Society)

3 Mar The Life of Donald Bailey & His Bridge
Pablo Haworth (Surrey & Hants. Canal Society)

British-Built Aircraft: Volume 3 South East England:

Ron Smith

£19.99: Tempus Publishing Ltd. 2004: 224 pp

(Softback): ISBN 0 7524 2993 0

book review by Gordon Knowles

Ron Smith, who works for BAE Systems at Farnborough, has produced a 5 volume work in which he aims to include all aircraft constructed in Britain from 1908 onwards. He makes use of many previously published works, which he duly acknowledges and includes in the detailed bibliography.

The first 50 pages, which are largely repeated in both volumes 1 and 3 and presumably in the others as well, cover the evolution of the industry, through WWI, the inter-war years, WWII and post war. The major part of the book is devoted to a detailed account of each major, and many minor, aircraft manufacturers in the south east. Each county is taken alphabetically in turn, then by location and by manufacturer. It is perhaps an inevitable approach in a work of this nature, and whilst there is a full index, it makes it difficult to easily identify the various sites of a manufacturer. For example, Hawker appears under Brooklands-Weybridge and Dunsfold in Surrey and Langley in Buckinghamshire as well as in Kingston which is in Volume 1, Greater London. But as the author points out there are specialist books on individual firms which combine the various sites in one volume.

It is also frustrating to try to locate a firm as although each county and site is placed alphabetically, and there

is a comprehensive index, there are no obvious indications on individual pages as to county and/or site. This may be down to the publisher rather than the author. My final carp is that whilst chronological lists of each manufacturer's models and types are generally given, and are very useful, they are not in every case fully comprehensive.

Having said all this I was most impressed by the scholarship and range of material included in the book. The illustrations include some well known images, from the Brookland's collection and elsewhere, but also include many that are previously unpublished. Some are from BAE sources not generally available. Also numbers of delightful posters and advertisements are reproduced; many are again new to me.

The author says there are inevitably errors and missing references in a work of this nature, I found none in Volume 3, and only spotted one omission in Volume 1. Croydon, which of course, many of us still regard as being in Surrey during the airport's golden years, does not include the Dingbat. It was built at Croydon in very small numbers with a Carden car engine. However I learned of a number of small manufacturing firms in both volumes that were new to me. I shall have to save up to buy the other 3 volumes.

This is a series to be recommended, it is the most comprehensive record I have yet seen. The author deserves our congratulations for the monumental amount of work that has gone into the series. As *The Aeroplane* says - 'It is a major reference work'. □

Surrey's Ancient Stone Mines by Peter Burgess
204pp, 9"x6", soft back, ISBN 978-0-9556081-1-7,
£12.95. *book review by Peter Tarplee*

Many members will have read East Surrey Underground written by Peter Burgess in 2006 which described various below-ground items of interest in the area. With this new book Peter has concentrated on two areas - Reigate stone quarries and hearthstone mines. He describes the uses of Reigate stone from Roman times and lists many significant structures where the stone has been found or recorded. Although the building stone was used for nearly 2,000 years the hearthstone trade was only active for about 100 years with the last mine in Surrey closing about 50 years ago. (I remember selling hearthstone in a grocer's shop for 1d a lump).

The book is the result of 30 years of study and exploration of underground quarries in the Upper Greensand of East Surrey and provides a chronological look at the industry as well as a site-by-site description of the quarries and mines. It contains an interesting and useful record of a past industry of our county.

Copies of the book may be obtained by post by sending a cheque for £14-20 to Peter Burgess, 8, Trotton Close, Maidenbower, Crawley, RH10 7JP. □



A MELANCHOLY ACCIDENT

Sussex Weekly Advertiser 23 October 1786 page 3

"On Wednesday last a most melancholy accident happened at the iron-works of Alexander Raby esq. at Cobham in Surrey. A carpenter in doing some repairs at the large wheel which worked under the great hammer, was by accident forced under it, and before any assistance could be given him his head was almost wholly scalped, and the bones of his legs and other parts of his body in a great degree laid bare, from the flesh being so shockingly torn and mangled. Fortunately a man was present who drew him from under the wheel in time to save his life, and we are happy to add, that notwithstanding he was a most shocking spectacle to behold, Mr. Hall of Leatherhead who was called to his assistance has given some hopes of his recovery".

The above item was reprinted in the Sussex Industrial Archaeology Society Newsletter of July 1995, p 7. As TE Evans, the SIHG Member who discovered this article, points out, the first 'Factory Act' which might have prevented this accident, was not introduced until 1833. (Those taking part in the Archaeological Training Excavation at Downside Mill, Cobham in August may find this reference of interest.) □

SIHG Members' Talks #5 - 4 December 2007

Harry Ricardo: The Discovery of 'Octane' in Walton on Thames

by Martin Marriott

In the early days of motoring the ignition characteristics of the fuel, motor spirit, were not defined. Motorists and car makers just knew that some stuff worked better than others. The man at the centre of the first explanation of knock quality of petrol was Harry Ricardo who from 1912 to 1919 lived in Walton on Thames in a house called Cherwell in Charlton Avenue, where he conducted his first work on the knock characteristics of fuels in his garden shed.

Harry Ricardo was born in London in 1885 and was educated at Rugby and in 1903 he went up to Cambridge. Here Ricardo worked with Bertram Hopkinson, the Professor of Mechanism and Applied Mechanics, on a research project looking at 'the factors limiting the performance of the internal combustion engine'. They studied knocking in gas and petrol engines. From their findings Hopkins attributed knocking in the petrol engine to the setting up of an explosion wave inside the combustion chamber, which resulted the characteristic high-pitched 'ping'. Since the same phenomena could not be reproduced in the gas engine, he suggested it must be a characteristic of the fuel.

In 1906 Ricardo completed his studies and joined the family civil engineering firm as an inspector of equipment needed for bridge building and in 1912 he moved to Walton and set up in his garden a large portable shed to serve as a workshop and test shop. There he conducted experiments on knocking using a two cylinder two stroke Dolphin marine engine, of his own design, with a detachable combustion chamber. He found that under knocking conditions, that following ignition by the spark plug, the rate of pressure rise was normal until almost the end of the combustion period, then at the last moment it shot up vertically. He concluded that knock in the petrol engine was caused by the spontaneous combustion of a small part of the working fluid due to compression by and radiation from, the rapidly advancing flame front. Whether or not this happen depended the ability of the unburnt fuel to get rid of heat before it spontaneously ignited. He thought this spontaneous ignition temperature might depend on the physical and chemical characteristics of the fuel. At this time benzole, derived from coal manufacture, appeared on the market as an alternative fuel and with this fuel he could get no trace of knock under any conditions.

He talked to a consulting organic chemist Dr Ormandy about his theory of knock and his observation that benzole did not knock. Ormandy was not surprised as benzole consisted of highly stable aromatic hydrocarbons, benzene, toluene and xylene, whereas normal petrol consisted of mixtures of paraffins, naphthenes and aromatics and the paraffin molecules were much less stable. Ricardo tested pure samples of paraffins, naphthenes and aromatics in his Dolphin engine and found, as predicted, that straight chain paraffins were the most likely to knock, naphthenes were less likely to knock and aromatics the least. Thus by 1913 Ricardo had satisfied himself that the incidence of knock was the most important factor limiting the compression ratio and therefore the power output and efficiency of the spark ignition engine, and that it was a phe-

nomenon entirely distinct from pre ignition.

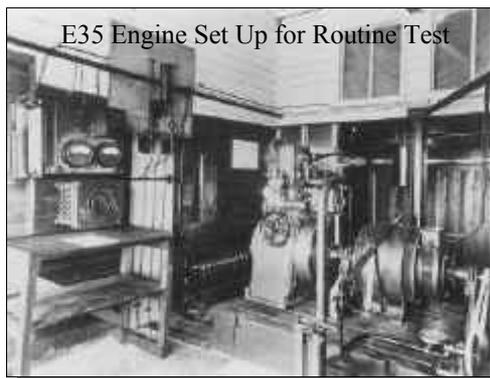
In 1916 the Army had tried out the first experimental tanks using a 105 hp Daimler sleeve valve engine which was the highest powered petrol engine for vehicles then in production. It's power output was barely adequate and it emitted a lot of smoke making the tanks rather too obvious on the battle field. The automobile manufacturers had capacity to construct new engines but not to tackle the design of a new engine and so Ricardo was asked to design a new engine for the tank. His 6 cylinder cross head engine was successfully used not only for tanks during the First World War, but also to provide power for workshops and hospitals. However, the power output of this engine had been limited. Because of the poor fuel, only 45

octane on today's scale, Ricardo had had to limit the compression ratio to 4.3 to 1. He sought to find a better fuel for his tank engine but the committee which allocated fuel to the services told him the best fuels were reserved for aviation and staff cars. He asked to be able to use benzole because, as it was not inclined to detonate, he could use a higher compression ratio and hence get more power and economy from the tank engine. But this request was refused.

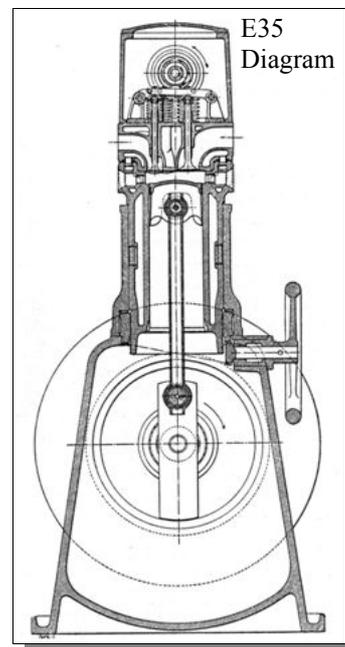
The chairman of the committee Sir Robert Waley-Cohen, Managing Director of the Shell Company was interested in Ricardo's experiments on detonation, and his belief that it was largely a function of the fuel. So Shell provided samples of a wide range of fuels from different crude oils for Ricardo to test. On testing these in his workshop in Walton, one sample stood out far better on detonation than the others, it was a straight run gasoline from an oil field in Borneo. Subsequently this fuel was blended with other components to make an aviation fuel of 65 octane.

At this time Ricardo was still a member of his grandfather's civil engineering firm but on loan to the Ministry of Munitions. In 1917 his grandfather died and he was offered a partnership in the firm. But his dream was to continue with research and development of engines and Ricardo set up his own consulting company 'Engine Patents Ltd'.

With his new company in place he expanded the workshop in Walton and designed and built a new laboratory in Shoreham opened in 1919. To further his research he designed his E-35 Variable Compression Ratio Engine. It was a single cylinder water cooled unit with an overhead camshaft. The cylinder was cast integrally with it's water jacket, the outside of which was machined and slid up a down in a massive guide which was fixed to the crankcase. The lower end of the jacket was treaded externally to carry a large nut which was rotated by a hand wheel to change the compression ratio.



E35 Engine Set Up for Routine Test

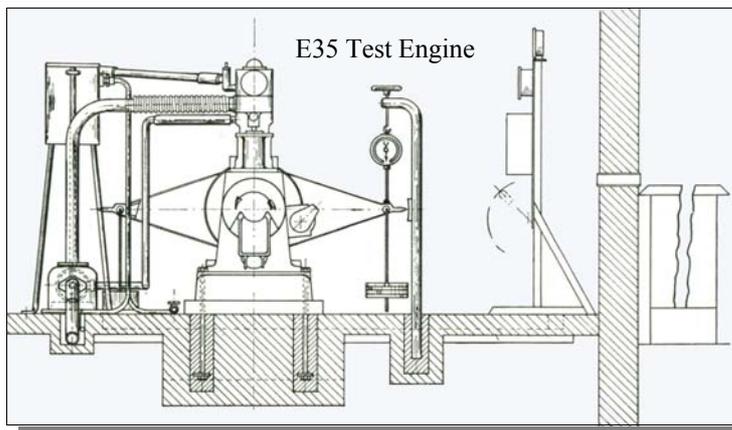


E35 Diagram

Shell had prepared samples of a wide range of volatile fuels. These fuels all gave the same power output in a Ricardo's variable compression engine but were significantly different in their tendency to detonate. Of the pure substances which are found in petrol he found that the paraffin, normal heptane was the worst and the aromatic, toluene, was the best from a detonation point of view.

Initially Ricardo considered to express the tendency to knock of a fuel in terms of the highest compression ratio at which it could be used in his E35 engine but he realised that different engines with larger or smaller cylinders or different combustion chamber shapes would not necessarily behave the same. So he decided to express it in terms of the proportion of toluene added to heptane needed to match any given sample of fuel. This was called the "Toluene Number" which was accepted by the Ministry and the trade as a figure of merit of any fuel for petrol engines. Later iso octane was used in place of toluene and the number renamed the 'Octane Number'.

There is one final link with Surrey in the Ricardo octane story and this relates to the flight of Alcock and Brown across the Atlantic in a Vickers Vimy bomber. They used a



special high energy fuel, based on Ricardo's work, which gave 12 to 15% better fuel economy than standard fuels. When they landed there was scarcely enough fuel left in their tanks for a further mile of flight.

So next time you fill up with 95 octane euro premium petrol, remember, the concept of 'octane' started in a garden shed in Walton on Thames. ☐

Leatherhead and Lullingstone

by Peter Tarplee

Following the recent television series 'Save Lullingstone Castle' my wife and I decided to visit Lullingstone Castle to see both the house occupied by Guy and Sarah Hart Dyke and the World Garden of Plants, which has been constructed by their son Tom.

Most people think of Lullingstone as the home of the Lullingstone Silk Farm, which, as many of you will know, was started by Zöe Lady Hart Dyke when they lived in Leatherhead. Zöe was the mother of Guy Hart Dyke who told me of his upbringing in the house called Wilderness in Tyrrells Wood when he went to school at Downsend School and his sister attended Parson's Mead.

It was while Lady Zöe was living at Leatherhead that she seriously started her silkworm operation although she had been dabbling with silkworms since her school days. Whilst at Leatherhead Lady Zöe travelled up to the Natural History Museum daily for a month in order to copy out in longhand the only textbook the museum had on the science of sericulture (this was before the days of photocopiers). She kept her first worms in the attic of Wilderness and when she needed to stifle the cocoons she did them in her kitchen oven. However, this was not approved of by her cook - especially in view of the smell. As Zöe enlarged her silk operation in 1933 she moved the worms to Lullingstone (her husband's family home) while still living at Leatherhead and carrying out the reeling in the garage of Wilderness. There was still the problem of stifling the cocoons and Zöe spent a morning wearing down her baker in Leatherhead persuading him to let her put the cocoons in his oven after he had baked Leatherhead's bread. She then borrowed a lorry from Eynsford in which she drove the cocoons to the Leatherhead bakery from Kent. The operation took about six hours after which the baker was afraid that his customers would find out what had been in his bread oven. Apparently the secret remained until Lady Zöe published her book 'So Spins the Silkworm' in 1949.

Guy Hart Dyke told me that when his mother moved the silkworms to Lullingstone she took over a large part of the house in which to keep them and he remembers that the noise was tremendous when they were all eating their mulberry leaves.

The silkworms left Lullingstone in 1956 after the marriage between Lady Zöe Hart Dyke and her husband had been dissolved. She took them to Ayot St Lawrence where she settled. When she died in 1975 the worms were taken to Sherborne in Dorset where they were bought by Robert Gooden who operated them with his butterfly farm at Over Compton as the Worldlife and Lullingstone Silk Farm. After the Gooden family had lived at Compton House for 270 years Robert moved to Lower Penquite House near Liskeard in Cornwall three or four years ago taking his butterflies and silkworms with him.

Recently they moved to southern France with the butterflies but I have not been able to confirm the whereabouts of the Lullingstone silkworms.

The gowns for the coronation of George VI for Queen Elizabeth and the Duchesses of Gloucester and Kent were made from Lullingstone silk. During World War II the silk was used for making parachutes and later it was used for the wedding dresses for Princess Elizabeth and Princess Diana.

I thought that those of you who may have seen the television series, or indeed may have visited Lullingstone, would like to know the connection between Leatherhead and Lullingstone. I have been unable to find which baker she persuaded to help her and if anyone does know I should be interested. The house in Tyrrells Wood is still there more or less as it was when the Hart Dykes lived in it; after they left it was re-named Marlborough and is now known as Beeches.

Further information may be obtained from:

So Spins the Silkworm by Zöe Lady Hart Dyke (1949)
An Englishman's Home by Tom Hart Dyke (2007) ☐

**Industrial Archaeology News No. 144
Spring 2008**

review by Gordon Knowles

This issue contains a major article on a Surrey site, a WWII air raid shelter at a school in Redhill, which will be reported on a future Newsletter.

'Philadelphia, Workshop of the World ?' by Roger Holden is based on his visit to the 36th Annual Conference of the American Society for Archaeology. He was the sole British representative there in 2007. The city had many small manufacturing industries at the beginning of the 20th c, as well as giants such as the Baldwin locomotive works. The city was noted for textiles, knitted fabrics, carpets and lace among others products, virtually all of which have disappeared since 1970. The booming 'Center City' commercial and tourist area is now bordered by vast acres of industrial dereliction. Roger describes the visits held during the conference, including museums, bridges, a refinery, textiles, beer & metals. The conference papers were presented from 7.30 am, 'one sometimes gets the impression that sleep is an unknown concept in America!'

Julie Parker writes on 'Excavations at a Gateshead iron works' describing the site of William Hawks & Co. established in 1747, expanding rapidly in the early 1800s and closing suddenly in 1889. The site was subsequently used by a gear works, the Baltic Flour Mills and a power station during the 20th c. These buildings were all demolished between 1973 and 1984 and the Ingersoll Rand building was then constructed on the site. This was itself demolished in 2006. Recent Archaeological excavations

have revealed several phases of construction including some from the first buildings on the site. These included a revetment wall for a flue and chimneys, and walls of a large sandstone structure with rectangular slots, presumably supporting machinery.

South Eastern news includes details of the rediscovery of Magnus Volk's dynamo. This was made for him by Siemens for his Electric Railway at Brighton in 1883 and after that closed it had various homes at the Brighton College of Technology and latterly at the Engineerium. When that was facing closure a few years ago many of its artefacts were put up for sale, but the dynamo was not among these. It 'just disappeared' and recently it turned out that it had 'been reclaimed by the University' and was recently discovered there lying in a corridor awaiting disposal as scrap. It is now in safe storage and there are plans to open a Volks Museum where it will be on display.

There is news of the opening of the new Science Museum Library at Wroughton near Swindon. It contains 42,000 items, including most of the material moved from the Imperial College site in London and unlike that will be open to the public as well as to bona fide researchers. The collection includes over 6,000 items pre 1800, and contains books, personal papers, plans, drawings, photographs, trade literature etc. and should prove a boon for scholars, There is much more space than was available in London, it just means further for us in Surrey to travel, but at least there is plenty of car parking space ! □

The Pumphouse & Water Supply for Mickleham Downs House near Dorking



The Crankshaft (top)
The Bevel Gears (above)
see next page.

SIHG Recording of
 Endangered Industrial Archaeology
**The Pumphouse & Water Supply
 for Mickleham Downs House
 near Dorking**

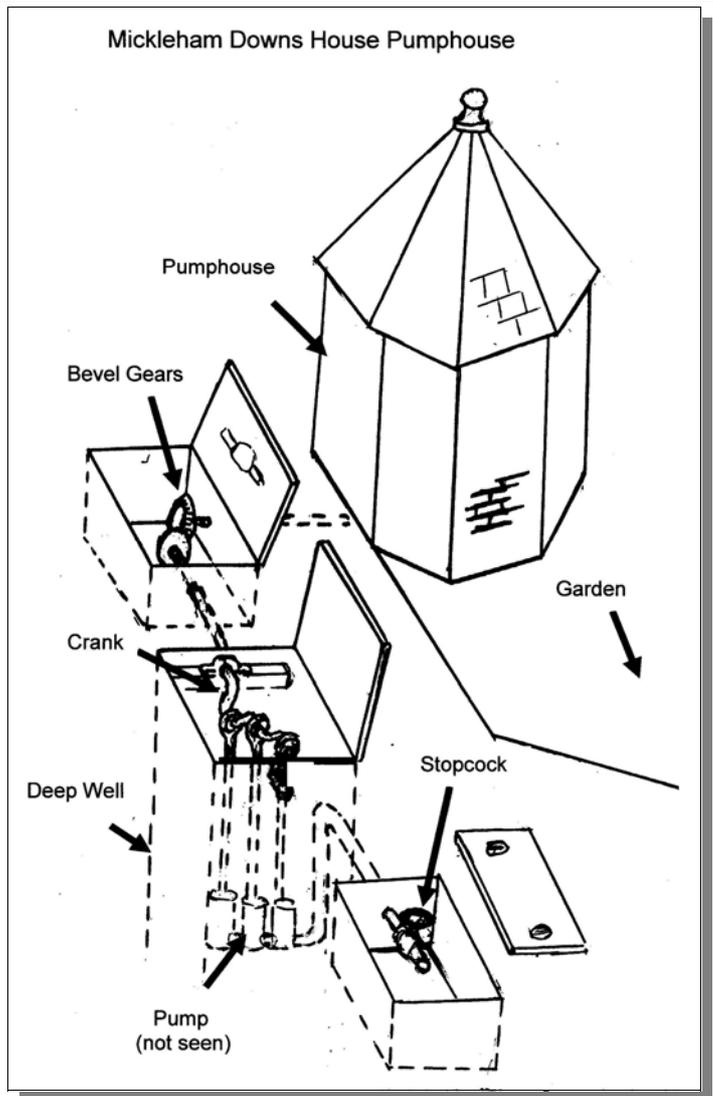
by Pam Taylor, Jan Spencer & Bob Bryson

In April 2008 a small group of SIHG members was invited to record the pumphouse as it was threatened with demolition, along with the adjacent dwellings. They form a harmonious group formed from the stables of the long-demolished Mickleham Downs House, which is set in countryside on the Cherkley estate, owned at one time by Lord Beaverbrook. We surveyed the building, which no longer has an engine installed, and peered down manhole covers at the gear-wheels and connecting rods which remained at the top of the well-shaft. The site was relatively close to the house that it would have supplied and this may account for the attractive octagonal design of the pumphouse. Inside the building are the remains of the engine seating, plumber blocks for line shafting and the original door.

The name cast on one of the manhole covers was S. Owens & Co., Engineers, London, which company is known to have made pumps. We thought that the actual pumps, which we could not see, would be mounted down below in the well and assumed that the system worked as shown in the following sketch. A similar triple pump can be seen at The Rural Life Centre, although this pump is close-coupled to the crank. What type of engine was employed to drive the pump remains a mystery; possibly it was an early oil or gas engine.

Further research was carried out to find any information about the house, one reference was to the fact that it housed the Charing Cross branch of The Sun Insurance Office from 1939-1947. Apparently photos of the staff at the house are contained in an album held by the City of Westminster Archives Centre. A newspaper article in The Advertiser gave several pictures of 'the mansion' but these, frustratingly, did not show the pumphouse. See our photos on page 8.

If any readers can provide any further details of this installation, please contact the authors of this article. □



One of the plumber blocks

