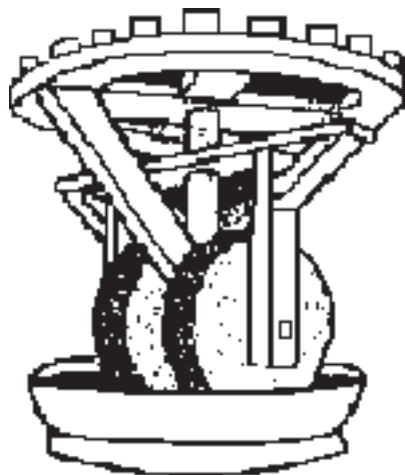


# Touchpaper

The Newsletter of the  
**WALTHAM ABBEY ROYAL GUNPOWDER MILLS  
FRIENDS ASSOCIATION**

[a registered charity No. 1115237]



**SEPTEMBER  
2009**

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PLEASE NOTE: Deadline date for submissions to the  
next issue is 15th November 2009



## *Editorials*

*I will not open with my usual reminder that we need a new editor, I have left that to the chairman in this issue.*

*I would just like to thank everyone who sent in contributions for Touchpaper, there were more than I could fit in and so I have held some back for the next issue ( which will be my last. Sorry I had to get that one in. ).*

*I have been very busy during the summer and so this issue was a bit rushed and has not been proof read, I look forward to being informed of all the errors that you have found.*

*Malcolm Bergh*



## CHAIRMAN'S CHAT

The summer season is going well (note the site closes on 27th September). Visitor numbers are again showing an increase over 2008 but more of course are always welcome. As usual our largest attendance was for the VE Weekend at which Carolyn Grace in her Spitfire was the main attraction on the Bank Holiday Monday May 4th. Also very successful was the Rocket Weekend in July. We produced some new and refurbished exhibits which generated interest among visitors. Children enjoyed firing chemical powered rockets and flying saucers on Queen's Mead. The Weekend highlighted the need for more volunteers to assist when the site is open, particularly on the Rocket Weekend, but also on other popular weekends. Please come if you can.

The full size model of a gunpowder mill is progressing well, although it is unlikely to be open until next season.

Now is the time when we think about new projects for next year so, if you have any suggestions to make, please let me know.

No doubt Malcolm will be repeating his plea for a new editor elsewhere in this issue, so I can only reinforce his request. We really do need someone to take over the editorship. It does not take up a lot of time or work.

John Wright

# Power House Transformed



Before ( Jan 2008 )



After ( August 2009 )

Hill Partnerships Ltd. began renovation work on the Power House in January 2008. As can be seen in the ‘ spot the difference ‘ photos , they have combined the building with the Accumulator Tower via a new glazed office extension. The old site Superintendent’s house , ‘ The Lodge ‘ , has also been refurbished with a large building adjoining to the rest.

Local residents and a group from the Gunpowder Mills site were given the opportunity of a guided tour of the renewed premises and landscaping, and we were impressed with the new lease of life given to the old buildings, and the internal features on three floor levels. ( We hope our free - roaming deer on the site ‘ respect ‘ the new landscaping and plants ! )

**Richard Penfold**

## A Personal Profile.

I hope I don't give offence to the authors but I have found the Personal Profiles printed so far a bit uninteresting. I decided I would write a profile for a real hero, sorry it's not me but one of my former bosses who worked at Waltham Abbey from 1949 until he retired in the seventies; I hope I can do him justice. I refer to Captain James Bell ARIC MC.

Before the start of WW II Jim lived in The Wirral. He worked in the Lever Bros labs at Port Sunlight. Shortly after the outbreak of the war he and any other scientists were co-opted to take on "work of national importance". After a time at a ROF Jim settled down as an explosives expert to one of SOE's training schools in Hertfordshire where he developed techniques for attacking transport systems. In 1944 he received a surprise order, it was get yourself a uniform and report to RAF Ringway for parachute training. The only uniform he could borrow was that of a Major so he thought that would be a good rank to join with. However the powers that be thought that was a bit much so he became Captain J Bell. Ringway used balloons and old Whitley bombers modified by cutting a hole in the floor of the rear fuselage for all their drops. As well as the risks of the parachute not opening or a dodgy landing there was a very high risk of hitting your head on the far side of the hole as you jumped through. This was called "ringing the bell" and left many trainees hanging unconscious in their harness underneath the canopy.

After further training Jim dropped into the Aosta Valley in northern Italy on the night of 16/17 November 1944. Dropping with him in "Mission Cherokee" were a translator and a W/T operator. The purpose of the mission was to disrupt communications and prevent the Germans from implementing a scorched earth policy. They operated as a military unit, in uniform and not undercover. I will cover the next six months of Jim's life by using that well known PERME practice of cribbing someone else's work. George Evans was a member of X Troop, 4th Durham Survey Regiment, Royal Artillery. He fought in Greece and Crete before being captured at Tobruk in July 1942 and transferred to a POW camp in Italy. When Italy capitulated in 1944 he escaped and joined the partisans, he was waiting for Jim when he dropped into Italy.

I make no apologies for reproducing the part of George's report from October 1944 onward, he was an eyewitness to the events and I was never any good at writing a precis.

An incident George has not described occurred in February/March time 1945. The Germans were so keen to get hold of Jim or any of the others in his team, including George, that they offered thousands of Lira for their betrayal. When that strategy failed they assembled captured partisans and civilian hostages to try to make them or their friends and relatives reveal the team's locations. When this pressure also failed the Germans hanged them in public in the town square; one every morning for a month. To their eternal credit none of them gave the team away. These murders had a profound and long lasting affect on Jim, in his early years at Waltham Abbey he re-lived the horror every year by getting drunk every day throughout the anniversary of the executions. Sometimes we saw him for a hour or so in the morning but he left to get to a pub as they opened at lunchtime.

There were two distinct partisan groupings in Italy, Communist and Christian Democrat, they hated each other almost as much as they hated the Germans. Jim's group were Communists. At the Victory parade in Ivrea he was made a Honorary Life Member of the Italian Communist Party, he regarded this honour from his compatriots just as highly as his MC. When we had to fill in forms for personal vetting he caused a stir by listing his membership of the party. When the war ended Jim was treated like all the other conscripts and had to wait for demob until his number came up. Meanwhile he was given the job of repairing and re-opening the Rhur coalmines working with a mining engineer, George Starr ("Hilaire" who ran the SOE "Wheelwright" group in the south of France). When demobbed late in 1949 he joined ERDE as an EO and was quickly promoted to SEO in the autumn of 1950. I joined him on return from my National Service in October 1950 and we worked together in the pyrotechnic lab until I was moved around 1964. Jim was later promoted to CEO as one of the first batch when that new grade was introduced.

Jim was a great person to work with. He could be trusted, he always made sure that his assistants received due credit for their work and ideas and covered it up if they made a cock up. He also shared out any perks on offer like trips to Schermuly's, Brock's, to a ROF, to town, or a service base. He retired in the seventies and went to live at Ramsey in the Isle of Man, he was allowed to become resident on the island because one (or both) of his parents were Manx. We kept in touch with an annual letter and Christmas card until his death. We received our last Christmas card from Mrs Bell in 2005.

## **George Evans' Story.**

The following is part of George Evans' report starting in October 1944. The full report can be read on [www.raundswarmemorials.org](http://www.raundswarmemorials.org) or [www.bbc.co.uk/ww2peopleswar/stories/41/a2001141.shtml](http://www.bbc.co.uk/ww2peopleswar/stories/41/a2001141.shtml) and is reproduced by kind permission of his widow, Mrs Eileen Evans, and daughters, Mrs Katrina West and Mrs Lorraine Horn who also supplied the photos. The report with more pictures is on display at the Imperial War Museum.

### **8) HELP FROM ABOVE**

August 1944 arrived and contact had been made with the British Government and after much preparation the first drop of arms was received. A massive letter 'H' was arranged, consisting of flammable material, the time was arranged by an announcement on Radio Londra and sure enough the drone of aircraft engines was heard, followed by parachutes laden with mainly Sten guns, ammo and other ancillary articles. Next day, after the activities of the previous night, we retreated up the mountainside to comparative safety and assessed the contents of the airdrop. I had never seen a Sten gun before, but it was elementary and I gave a demonstration of its prowess. Everyone was impressed except for the Germans who must have been surprised by the sudden arrival of the sound of machine gun fire.

Better things were to come and October saw the arrival of Major Alistair Macdonald whom I made contact with. Although he did not disclose his particular mission, he gave me the option of crossing the border or, he said, a mission led by Captain Bell would be arriving and he wished me to stay and join his team.

Captain Bell arrived on the night of 16-17th November with his team of Sgt. Bell (radio operator) and Staff Sgt. Johns. We later recruited Bill Smith (Aussie ex-POW) and Jimmy the Scot (ex-POW), who spoke fluent Italian and with myself this constituted the team. This altered the whole aspect of life for me, because I had a great knowledge of the local countryside and was suddenly kitted out with new battledress, boots etc. which gave me the feeling of at last doing something useful and positive.

Major Macdonald's first task was to organise and distribute the largest arms drop in Italy; this certainly kept our unit very busy for everything would arrive



under the cover of darkness when we felt the tension of waiting for the code-word on Radio Londra. The planes homed in on a signal that came from a small case that Capt. Bell described as his 'Eureka', then it was bedlam trying to get everything away as we had no transport except for the odd mule or two.

In the Aosta valley, north-west of our position, there was an important steel-works. Here it was estimated the Germans had 50,000 tons of steel and 6,000 torpedo bodies (presumed to be for V2's) which they wished to move by rail to Germany to assist their war efforts. Italian partisans had destroyed a railway bridge at Porto San Martino and although German engineers had almost repaired it an alternative route was sought. The railway approaches Ivrea and goes underground; it then resurfaces at the rear of the Hotel Dora to cross the river. Civilian partisans who worked in Ivrea contacted Major Macdonald and volunteered to attack the bridge at this point.

Two Italian partisans 'Noto' and 'Elimiro' were instructed by Capt. Bell on the techniques required. We prepared the charges (my first introduction to Bostick) and on the night of 23rd December 1944 we transported them to the edge of Ivrea. From here Noto and Elmiro took over and by devious means via the cellars of the Hotel Dora they approached the railway. The railway crosses over the river Dora and then goes underground and with Capt. Bell's instructions Noto and Elmiro attached the charges. On Christmas Eve 1944 the bridge was successfully blown up and collapsed into the river Dora. That certainly wished the German troops a 'Very Merry Christmas' for it had caused a major disruption and they had to bring in experts to repair the bridge. It was a serious blow to the enemy who then had to laboriously transport goods from the railway wagons by road to bypass the bridge.

We returned to our base on 24th December and purchased a calf on the way, we slaughtered it and tied it whole to the back of the mule but that was not successful so I cut it in two and the mule was able to carry it. We dined on veal steaks on Christmas Day 1944, which was very enjoyable.

#### 9) SAVED BY A TANK

The blowing up of the bridge in Ivrea was a shock to the Germans but the partisans followed this up by ambushing a patrol of Germans, killing some and wounding others. This really infuriated them and in January they began house-to-house searches, Major Macdonald was caught conferring with colleagues in a café in Serra.

He was captured as they ran out into the snow; luckily the Gestapo took him in for interrogation rather than shoot him on the spot. Major Macdonald managed to escape over the wire around the prison camp and an Italian boy rowed him across a lake right under the noses of German sentries. He then escaped to Switzerland; we did not see him again.



*The bridge at Ivrea blown on 24 December 1944 circa May 1945 after a minimal repair. It has been replaced by a new bridge of similar design.*

The Germans continued the house-to-house searches in Ivrea and the surrounding area, so Capt. Bell decided we would split up to minimise the risk of capture. The Germans in desperation offered increased rewards for the capture of Capt. Bell or any of his band, but to no avail. Staff Sgt. Johns and Bill Smith went into a different area while we remained in the vicinity of Ivrea and waited for things to calm down.

The partisans found a farmhouse away from the town which was isolated and with a clear view of the countryside, but one morning we had information that our house could be under suspicion. We spotted a foot patrol coming our way so we had to decide whether to take them on or make a rapid escape. Luckily the owner of the farmhouse acted quickly and ushered us through the house and into the farmyard, and then guided us down the hillside. The farmer, being an astute type, had concocted his own sewerage system, which consisted of a septic tank covered with slats, which retained solids. On lifting the cover we discovered that one end of the tank was in fact partitioned off and large enough for four of us to stand upright. The farmer then put the planks back and brushed snow over the top. The experience was not particularly enjoyable for it was very cold and we were crammed in with all our gear but we were thankful to emerge some two hours later and return to the warm house.



Portrait taken in Ivrea, back row, George Evans, “Curly”, Jimmy Warren. In front is Staff Sgt. Johns on the left and Jim Bell right.

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The story of Jim Bell’s wartime exploits will be continued in the December issue of Touchpaper.

**Editor**

# EVENTS PICTURE GALLERY



**6th & 7th June  
Anglo - Zulu War  
Diehard Company**



**13th & 14th June  
Medieval Jousting Event  
Knights of Royal England**



# EVENTS PICTURE GALLERY



## 4th & 5th July Rocket and Space Event



## High Noon at High Down - The Success and End of independent British Satellite Rocketry

*A Waxwing rocket motor is on show in the L157 Rocket Exhibition, seen by visitors to the recent successful Rocket Event. This is a reminder of the relatively brief period when Britain occupied a leading place in the development of the rocket as a satellite launch vehicle.*

*At The Needles in the far west of the Isle of Wight there is a remarkable survival of this era.*

A recent walking holiday on the Isle provided the opportunity to visit The Needles site.

Taking the Coastal Path from the east the route descends from the lonely downs to the Victorian trippers destination of Alum Bay, still prospering on the back of numerous coach parties. Models of lighthouses etc. filled with multi coloured sands from the Alum Bay cliffs occupied many a Victorian and Edwardian mantelpiece and in the 21st. century such simple interests still seem to flourish. It is quite striking to see little people who must come from households filled with battery operated toys of every conceivable description and electronics still apparently happy to fill glass containers with coloured sands and take them up to the ladies at the counter for sealing before bearing them home. Alum Bay gets through about 80 tons of sand a year, but most of this would apparently have been lost to erosion in any case.

The Path ascends out of the Bay on a tarmac road which apparently leads nowhere, but the first clue to a very different place appears in the shape of what appears to have been a military guardhouse, now beginning to disappear in the undergrowth and a National Trust notice which announces that a 20 minute walk along the road will take you to the Old Battery, which overlooks the famous Needles landmark, or is it seamark..

The Trust publish an informative leaflet on the Battery and the other elements on the site ( 1 ) and the bulk of the following comes from this.

The Old Battery was one of the so called Palmerston's Follies, built in the 1860's to protect the Solent and the approaches to Portsmouth from what seems now the far fetched perceived threat of French invasion. By the end of the 19th century it was clear that the useful life of the Old Battery was coming to an end. .

The foundations were being damaged by vibrations from gun firing and the emplacements were not large enough to accommodate the newer Mark IX guns. The Trust have mounted an imaginative exhibition on the Old Battery but our present interest lies more to the north.

It was decided to construct a new battery about 400ft. higher up the down, not surprisingly termed the New Battery. Between 1893 and 1895 three gun emplacements were constructed. Two 9.2 in. guns were emplaced in 1900 with a third being added in 1904. Before WW1 two guns had the new Mark IX barrels installed and 6lb Quick Firing guns were installed. These guns were landed at Colwell Bay about 5 miles away and dragged to the Battery by teams of horses.

After the War the site entered a quiet period, in care and maintenance until 1926 when it was used for TA gunnery competitions. Then in 1939 in WW2 it reverted to its protective role, this time against the possibility of German blockships attempting to block the entrance to the Solent. The Battery did not see any major action but was subject to uncomfortable strafing by German aircraft. The New Battery was listed for disposal in 1952 and the guns destroyed in 1954. And so it might have remained as an isolated and gradually forgotten reminder of what already seems a very distant era. However a very different future in fact awaited.

## HIGH DOWN

The remains of the Battery are evocative but our present interest lies more in a large banner which proclaims Rocket Exhibition.

Totally unexpectedly the path from the Battery takes you round a corner in the chalk to a scene which improbably appears to belong more to the space age.

What you are looking at is a huge natural chalk amphitheatre about 400ft. high in which are the mass concrete remains of the Needles rocket test site, later named High Down.

At the end of WW2 it was evident from German development of the V2 rocket that rocketry had an immense potential both as a military weapon and in a civil role for space exploration etc. and spurred by the growing Cold War situation the superpowers, aided by German scientists and engineers acquired more or less as legitimate war booty embarked on extensive and extremely active programmes of guided weapon and missile R&D and the study, development and manufacture of rocket motors and associated propellant became an important part of the work at various UK Government Technology Establishments, either

already with a long history of propellant specialisation - Waltham Abbey, or built for the purpose – Westcott built 1946 or adapted wartime factories – Summerfield.

From 1956 to 1971 the High Down Facilities functioned as a Government rocket test centre. The following is a brief synopsis.

The first main impetus for British rocket development was military in the shape of the intercontinental medium range ballistic missile Blue Streak, main contractor De Havilland Propellers, engines Rolls Royce, guidance systems Sperry Gyroscopes, with research and test firing at Spadeadam in Cumbria. At Spadeadam British Oxygen Corporation also participated. The procedure involved static test firing at Spadeadam and assuming this was satisfactory transport to the range at the Weapons Research Establishment at Woomera Australia for actual test launch.

The design of Blue Streak's warhead was the separate responsibility of the Atomic Weapons Research Establishment. For this a smaller rocket was required to act as a warhead model vehicle to test the effect of re-entry to the earth's atmosphere and for this in conjunction with the Royal Aircraft Establishment ( RAE ) in 1955 a design and development contract was awarded to Saunders Roe at East Cowes on the Isle of Wight, the rocket being named Black Knight.

For this a firing test site was required and the Needles New Battery was an excellent possibility – on the Isle, natural bowl shape providing security and deflection of noise, gases etc. out to sea, substantial facilities, including underground surviving from WW2. ample scope for further development. The procedure was again to proof fire tethered static rockets and then transport to Woomera for test launch. The New Battery project, built by Saunders Roe, was termed High Down, with above ground facilities consisting of two test stands with tall gantries an observation blockhouse between them and aluminium clad buildings and the facility must have presented an awesome space age spectacle in an already impressive natural setting. Saunders Roe built a duplicate of High Down at Woomera.

Black Knight was initially a single stage rocket propelled by four Gamma 201 engines liquid powered by kerosene fuel and high test peroxide ( HTP ) oxidant, engines built by Bristol Siddeley Engines at Ansty. The Black Knight was a success on its first launch on 7th. September 1958 at Woomera and it generated intense interest in the USA. Later with the US supplying



equipment Black Knight was developed into two stage with greater re-entry speed and in all 22 Black Knights were successfully launched.

In the meantime the RAE had been investigating the possibility of satellite launching and consideration was given to either using Black Knight direct or developing a rocket utilising its technology. The latter was decided and the name Black Arrow given to the project. This was a three stage rocket. The first stage was powered again by liquid HTP / Kerosene engines, this time 8 Rolls Royce Gamma 2, the second by 2 Gamma 2 and the third stage by a solid propellant Waxwing motor developed at Westcott. [ The propellant was a high performance plastic propellant developed at ERDE Waltham Abbey, also used in a number of military systems and in all of the British civil sounding rockets ]

After tethered test firing at High Down as with Black Knight Black Arrow was taken to Woomera for launch testing. The results were :

July 1969 First launch, without satellite. Code R0. Malfunction after reaching Stage 2 – destroyed remotely by ground control.

Second launch, without satellite. Code R1. Stage 2 fuel pressure malfunction – destroyed by ground control.

September 1970. Third launch, with satellite. Code R2. All three stages completed successfully, but payload equipment malfunction – destroyed by ground control.

### **Jubilation**

28th. October 1971. Fourth launch, with satellite Prospero. Code R3. Total success. Prospero began sending data back to earth.

In a rich piece of historical connection Prospero had been developed by the firm Marconi. Marconi was the wireless pioneer and in 1897, helped by the postmaster of local Totland Mr. Garlick, he had made wireless experiments at nearby Alum Bay and in 1899 Marconi successfully contacted The Needles from 70 miles out on the ship ‘St. Paul’.

### **Despair**

Unbelievably within a few days of the Prospero launch the UK Government cancelled the programme and with it the opportunity to establish a British satellite launcher industry.

Doubtless at the time plausible reasons for the decision were advanced – did they need the money for Concord ?, but there had been an excellent working spirit at High Down producing successful results and it was a sad day for British science and technology when it terminated.

## **The Aftermath**

It appears from a 1971 sales brochure that for a time after the cancellation the British Hovercraft Corporation leased High Down from the MoD and endeavoured to market it as a commercial test centre. However they must have pulled out as in 1975 the National Trust purchased The Needles headland with all its facilities with funds from the Enterprise Neptune campaign and in 2003 commenced work on establishing a rocket exhibition in the underground rooms and magazines of the New Battery.

Overall The Needles area is a feast for all interested in industrial archaeology and the history of coastal defence and rocket technology and the National Trust and its volunteers are to be congratulated on their endeavour to preserve and present this important piece of the nation's heritage - and on what other Trust site on a very windy day do you have to 'phone first to see if it is open !

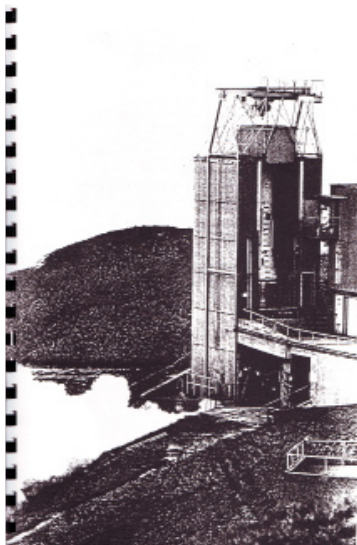
**Prospero was the only British satellite to be launched from a British rocket. However this is not quite the end of the story. For even as we write up in space Prospero still orbits the earth passing overhead twice a day and is likely to for some long time to come – a silent symbol of what might have been.**

( 1 ) *The Needles New Battery For your Eyes only* The National Trust

*High Down falls 'within living memory ' and it is possible that some readers have recollections ,information, comment / opinion, did Britain attempt too much?, either with reference to the whole project or specifically to Waxwing. If so, e mail or letter to the Editor will be welcome for inclusion in the Archive. Ed.*

Les Tucker

# High Down Images



**Rocket test firing at High Down  
in 1960's.**

**Wasc 2022**



**Wasc 2022**



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## TOUCH BYTES

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### Ian Wallace



Colleagues will be pleased to know that Ian Wallace has risen to ever greater heights in academia. Currently the Head of the Applied Science, Security and Resilience Department at Shrivenham, he has been named as the new Head of Cranfield Defence and Security, taking over his new appointment in October 2009. The Royal Military College of Science at Shrivenham used to be wholly owned and run by the MOD, but now

academic provision is delivered through a partnering agreement between MOD and Cranfield University, and Ian's new appointment is essentially what used to be the Principal of the Royal Military College of Science, a two star or Chief Scientific Officer appointment. Colleagues will recall that Ian's early research at Waltham Abbey was in the chemical kinetics of combustion and with the decomposition of explosives, and he has a continuing professional interest in explosives safety. After leaving Waltham Abbey he worked as an equipment project manager in the MOD(PE) and as an IT Director. He was Scientific Advisor to Chief Inspector Naval Ordnance before becoming Vice President of the Ordnance Board and Director Safety Policy in the PE, taking that role over from Geoff Hooper in 1997. In that appointment he helped develop new safety management arrangements for the MoD following the 1997 Strategic Defence Review. He was then responsible for implementing those arrangements for explosives safety, becoming the first Director of the Defence Ordnance Safety Group and Chief Inspector of Explosives in 2000. Ian came to Shrivenham in 2001 and for the past eight years he has been head of several Cranfield Academic departments.

In his current role as Head of the Department of Applied Science, Security and Resilience at Cranfield University Professor Wallace combines his key skills as a specialist in the field of explosives science, technology and safety with his administrative, general and programme management expertise in running successful educational and research programmes. Upon news of his new appointment Ian said “I’m both excited and a little apprehensive about the future. Cranfield Defence and Security has got fantastic people and facilities, and we can make a real difference in making the UK and the world more secure through our teaching, research and consultancy”. We wish him all the very best in his new incarnation.

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## Short-listed for Essex Tourism Awards 2009

The Royal Gunpowder Mills is delighted with the announcement of the finalists that will go through to the very first Essex Tourism awards in September 2009.

It is one of three attractions short-listed in the ‘Best small Essex attraction’ category and Mr Len Stuart, one of the Friends and a dedicated volunteer is also short-listed for the ‘outstanding customer service award’.

These nominations reflect the hard work and commitment of all the staff and volunteers in developing the visitor attraction over the last eight years. Lisa Bone, Strategic Tourism Manager for Essex County Council commented: ‘The awards will help to encourage outstanding quality and reward those businesses who are passionate about the county and its tourism.’

Len Stuart, over the last 5 years, has consistently shown dedication and commitment to the operation and development of the rocket exhibition and regularly acts as a steward talking to the public and sharing with visitors his knowledge and enthusiasm about the artefacts on display. Time and time again he receives thanks and praise from the visitors for his friendly approach and for making their visit so interesting. He also has attended the UK Space Conference 2009 at Charterhouse School, Surrey and Excursion exhibition at Alexandra Palace to positively promote Waltham Abbey, as well as the Royal Gunpowder Mills.

## H10 - 50 years ago – Tony Barratt

50 years ago in September 1959 I left school and started my 40 years Civil Service career in building H10. There have already been articles from several of the numerous inmates of this relatively small building as over the years it was occupied by many different sections and scores of staff.



I joined the Combustion Section, headed by Jack Powling and was shown the ropes in the leaky Bay 1 at the east end by Bill Smith.

I also moved temporarily into the same digs as Bill as Personnel had forgotten to tell me I had got the job until a week before I started and had not arranged

any accommodation (which was also part of their remit). The photograph shows Bill in Bay 1 next to the only desk for 3 scientific staff. In this picture there is electrical equipment without a back and a blow torch used for glass blowing. When Bill had moved into H10 in 1954 facilities were very basic - there was a chemical toilet and a urinal draining directly into the canal.

Combustion Section pushed forward the boundaries of science using, as was the norm in those days, rather Heath Robinson apparatus. I remember using an hydraulic press to form AP powder into sticks then drilling holes for fuse wires to enable burning rates to be measured in a fuel gas. Initial tests, in the lab fume cupboard, were with coal gas in a glass tube covered with metal gauze. Excess gas was burnt on the gauze and to prevent a flash back we would blow out flame with a fire extinguisher! Burning rates were measured in high pressure mixtures of carbon monoxide and hydrogen in a strand burner. We mixed these gases in a cylinder inside the strand burner enclosure, which was in the north east bay in building H16. In other experiments in H16 we were literally working in the dark. I assisted new arrival Tony Davies measuring flame temperatures. This was done by matching the sodium emission lines in a flame with those from a calibrated lamp - it was not always easy to keep awake on a warm afternoon.

Back in H10 there was an unpleasant incident with a full Winchester (2.5 Litres) of concentrated ammonia. When I removed the stopper half the contents hit the roof, it did a good job of stripping the paint off the bench and cupboards!

After one year another new entrant, Peter Hart, took my place. I was transferred to the Combustion Section, taking over the Closed Vessel apparatus from Geoff Colley, but that is another story.....

### **Last of the Summer Wine**

Still going strong ! Most of the original members are still alive , and although there have been changes by some moving away , the number at meetings is always about a dozen or so.

Our best wishes go to John and Enid Williams , now in Ross - on - Wye , Norman 'Ozzy' Blay , John Hicks , Gordon Bromberger , Bob and Margaret Brown in Faversham , Alan and Majorie Short who are still in Waltham Abbey , but too busy on Fridays to attend . We sometimes see Dennis Mansell but Jean keeps him busy .

Sheila Cooke and Jean Church have become have become regular attendees and we usually expect Jock McDougal , Geoff and Pam Colley , Ron Treadgold , John Vernon , Dave Manners , Len Stuart and sometimes John Wright and Brian and Daphne Clements.

Ron Treadgold is the oldest by a short head on Jock McDougal . We think that the oldest surviving ex - employee is John Gooding who has rejoined the friends ( but can't get to LSW meetings ). Hot contenders for this role include Stan Wills ( Waltham Cross ) , Vic Clifford ( Northampton ) and Eric Baker ( Haverhill ) who says he just feels old ; That's just the non - bionic parts . Incidentally , is Gordon Palmer still alive ?

At the other end of the scale , Tim Douglas has retired to Salisbury but sometimes meets up with the Waltham Abbey Badminton Club's fishing section for a worm - drowning session at Fishers Green ! Nothing has been heard of that other young retiree , Ike ( Jammy Dodger ) Eickoff who promised faithfully that he would write and let us know what was happening in the far west ( perhaps something for the Christmas Edition ).

In the list of LSW members I forgot to include Margaret Lee , your hard working editor Malcolm Bergh and me. **B. C. Howard**

P.S. The Christmas LSW party exceeded 20 last year, so book early as the pub kitchen can only cater for 22.

**ROYAL**  
**GUNPOWDER**  
**MILLS**  
WALTHAM ABBEY

‘TOUCHPAPER’©

Published by RGM(WA) Friends Association