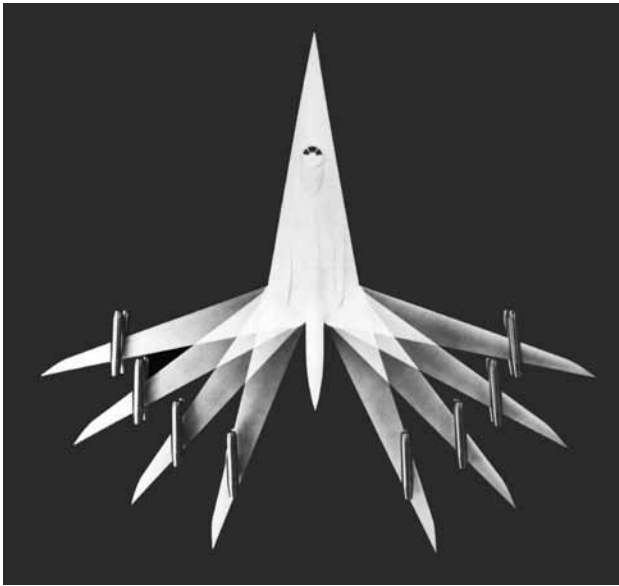




NEWSLETTER SUMMER 2011



BARNES WALLIS MEMORIAL TRUST



Contents

Editorial	2
The Marine Work of Sir Barnes Wallis	3
BWMT Annual Report 2010/11	23
The Airship Guarantee Company and R100	13
Returning to Rilly	18
Royal Society Local Heroes Project	24
Boothferry Golf Club	26
Trustees	28

Editorial

Please accept my apologies for the extended period between this and the previous newsletter; hopefully now I have relinquished my civic duties more time will be available for editing this and the 617 Squadron Aircrew Association newsletters.

This issue includes Professor Richard Morris' 2010 lecture on the marine work of Sir Barnes Wallis and the continuation of Ken Deacon's story of Howden Airship Station and the R100. I have also included an article by the official historian for the 617 Squadron Aircrew Association, Robert Owen about his visit to Rilly la Montagne for the unveiling of a memorial to the aircrew of 9 and 617 Squadrons who died attacking the nearby V1 sites with Tallboy bombs designed by Sir Barnes; with Robert was Wg Cdr John Bell - the bomb-aimer on Bob Knight's crew on the raid of 31 July 1944.

Chris Henderson
Editor

Articles for Publication

Contributions of articles and photographs for the Newsletter will be most welcome. Ideally they should be sent by email in Word format for articles and a common image format such as JPEG (.jpg) for photographs. However, typed articles and original photographs can be accepted and will be scanned and returned to the sender as soon as possible. Please send to chairman@barneswallistrust.org or post to the address on the rear cover.

The views expressed by contributors of articles do not necessarily reflect the views of the Barnes Wallis Memorial Trust.

Coming Soon

Using the "Haynes Manual" approach, Iain Murray describes the technology behind the bouncing bomb as well as the heavily modified Lancasters that were used to deliver the weapons. The book will be available in August 2011.

Dr Iain Murray is a lecturer at the University of Dundee. He is the author of *Bouncing Bomb Man* (Haynes 2009) and was a consultant for the ITV drama series *Foyle's War*, which featured an episode about the bouncing bomb. He lives in Dundee.



The Marine Work of Sir Barnes Wallis

by Iain Murray

(based on presentation at the June 2010 meeting of the Barnes Wallis Memorial Trust)

Although he trained initially as a marine draughtsman, Barnes Wallis is of course best known as an aeronautical engineer. Although he spent more than fifty years working on aircraft and weapons, he did still manage to dip his toe back into water-based projects from time to time. Often these projects were built upon his aeronautical experience - or let him test out aeronautical ideas by getting the Navy to pay for the work!

Trawler Icing Experiments

In 1955, two Hull trawlers Lorella and Roderigo sank off Iceland with all hands. The available evidence pointed to the vessels having experienced heavy icing, leading to them capsizing, although this was disputed as a possible mechanism for the losses. The British Shipbuilding Research Association commissioned a study into the icing phenomenon, and engaged Vickers to assist with this work due to their unique facility - the Stratosphere Chamber. The chamber was constructed in Weybridge after the war for testing the new generation of



The model trawler, close to capsizing, in the Stratosphere Chamber at Weybridge

high-flying aircraft by recreating the conditions in the upper atmosphere. As such, it was a combination of vacuum chamber, freezer and wind tunnel - a vast pressure vessel able to be heated and cooled to recreate a range of conditions. The Vickers works at Barrow was more used to building submarines, but a submarine is just a large pressure vessel, so they got the job of prefabricating the chamber. After transport to Brooklands, it was assembled and then “launched” onto the specially-prepared foundations alongside the clubhouse. As well as its main function of aircraft testing, the chamber was also rented out for testing other military (and civilian) equipment in “the worst weather in the world” which according to the sales pitch “occurs right here at Weybridge”! It was for this reason that the chamber came to be used for the trawler experiments.

A tank about 30 x 20 ft and 5ft deep was constructed on the floor of the chamber, and a detailed 18ft model of a typical trawler constructed (this had been tested for stability at a conventional ship testing facility). Refrigerated air was then circulated round the chamber, and a water spray introduced into the airflow. This was then observed freezing onto the trawler model, eventually building up to the extent that the model capsized - the equivalent of 140 tons of ice on a full-size ship. Full-sized posts and cables were also tested in the chamber, and ice build-up of many tens of pounds-per-foot were recorded over a four hour test, with 1” cables carrying up to 8” of ice. The report describing the research made three primary recommendations:

- trawler designs should be modified to reduce the amount of “top-hamper”, to minimise the amount of surface liable to icing
- improved meteorological information was to be acquired and disseminated to inform captains if conditions conducive to icing were likely to occur
- captains were advised to “withdraw from these conditions as quickly as possible”

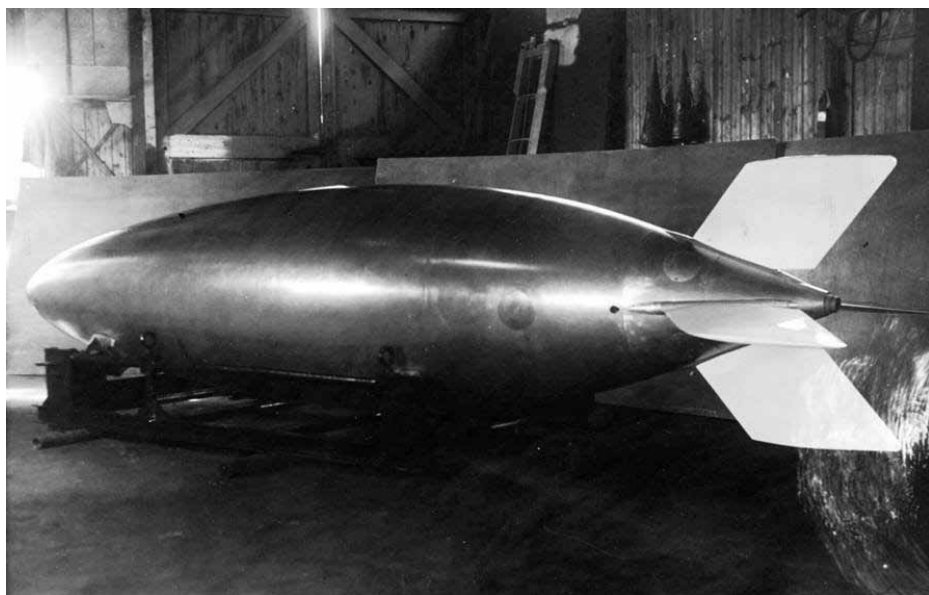
These recommendations were heeded, though not sufficiently quickly to stop a similar incident happening in the winter of 1967-8, leading Wallis to complain that the research had been ignored - and to design a liferaft which would launch itself automatically in the event of the ship sinking!

Building a Better Torpedo

At the same time as the Stratosphere Chamber was under construction, Wallis’s main work was on developing the wing-controlled aerodyne (later to be known as “Wild Goose”), an aircraft with an egg-shaped fuselage controlled only by movement of its two wings. One feature of the WCA was the inclusion of a laminar flow fuselage - this offered the potential to increase aerodynamic efficiency by significantly reducing the drag caused by friction between the

aircraft skin and the air, and research on this phenomenon was being conducted by several aircraft manufacturers and the Royal Aircraft Establishment. Wallis recognised that it would apply equally to a body submerged in water, and so put forward a proposal to the Navy to develop a new torpedo. Around the same weight as the standard 18" torpedo, Wallis's torpedo (code named Heyday) had the potential to travel three times as fast (and hence three times as far) with the same propulsion system. This performance increase certainly made the Navy take notice, and they were not put off by the fact that Heyday would have to be shorter and fatter than existing torpedoes.

It was recognised that scale effects could not be allowed for with laminar flow, so that model tests (which were conducted at the NPL tanks used for the



The full-scale Heyday prototype in its handling cradle at Weymouth

famous "bouncing bomb" tests) would be of limited value - consequently, tests of a full-scale Heyday in the sea would be necessary to prove the principle. Laminar flow relied on the surface layer (the water in contact with the torpedo) not becoming turbulent, so the outer surface had to be very smooth, and the Heyday was manufactured to incredible tolerances - less than 1/1000th of an inch variation for each 3 inches of length.

The Heyday tests, conducted in Weymouth Bay in 1951, showed that laminar flow was difficult to sustain with, at best, less than one third of the length of

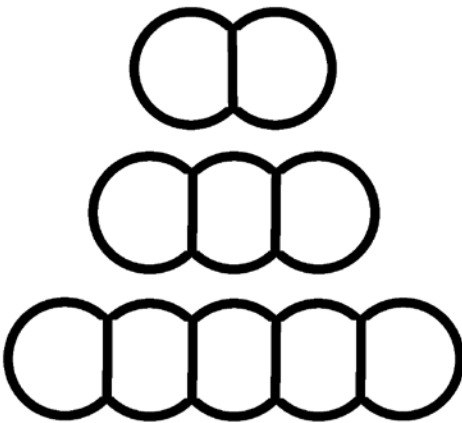
the hull being covered before the surface flow broke up and became turbulent, with the attendant increase in drag. Overall, Heyday would have been slightly faster than a conventional torpedo, but not by a significant margin. Sustaining laminar flow was also found to be impractical by other research, so the idea was ultimately dropped (for both torpedo and aircraft applications).

Submarine Ideas

Although submarines were initially considered to be invulnerable compared to surface vessels, wartime and post-war improvements in the detection and destruction of submerged submarines meant that submarines had to become increasingly stealthy to survive. Hiding underwater could be done most easily by diving deeper, going beneath the thermal layers in the water which reflect sonar, in the same way that aircraft can hide from sight above layers of cloud. If attacked, a submarine was more likely to escape if it was faster, as long as the increase in speed did not generate more noise, hence making the submarine easier to track. A fast (>40kts) deep-diving (>2,000ft) submarine was thus an attractive option - but this required a stronger hull and more powerful engines than in conventional submarines, and in the 1960s, Wallis put forward proposals for both.

The hull of a submarine is essentially a sausage-shaped pressure vessel, and to increase the capacity of such a vessel (to carry more armament, more fuel, or larger machinery), the only options are to lengthen the submarine (which decreases manoeuvrability), or increase the diameter of the hull (which requires the hull to be structurally stronger - and hence thicker and heavier). Wallis proposed increasing the volume, while keeping the diameter the same, by using

multiple overlapping cylinders - at the point of overlap, simple bracing with beams could resist the pressure forces. A hull could thus be constructed as voluminous as required by adding further cylinders (as long as the beam did not become inconveniently large) ... a rather elegant structural solution.

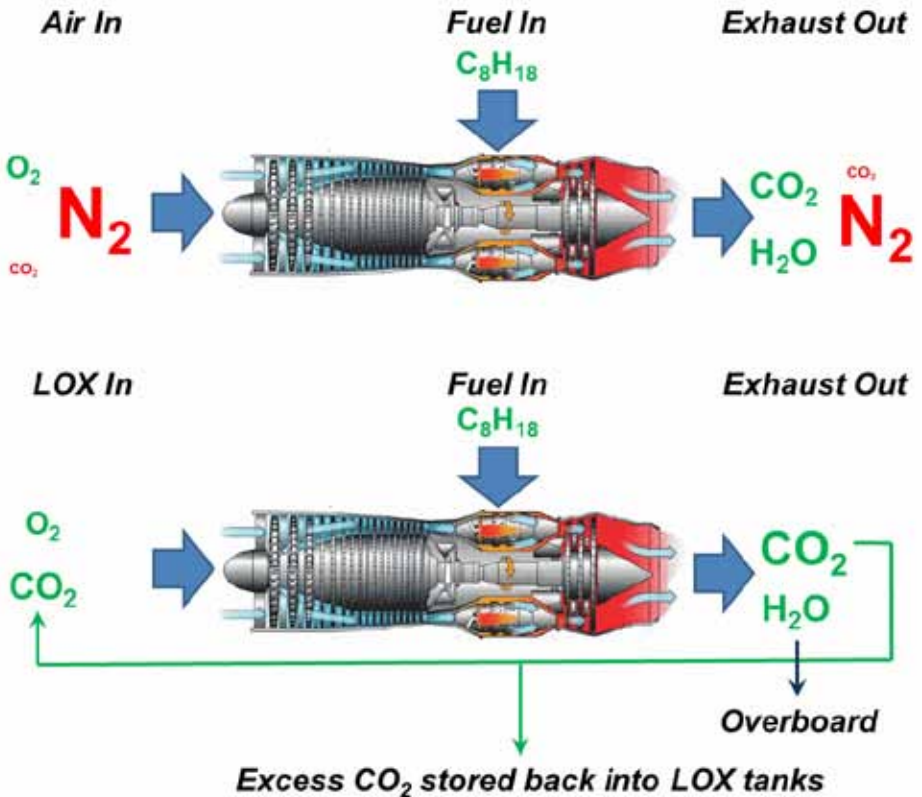


Section of the new Wallis hull form, showing 2, 3 and 5 cylinder variations

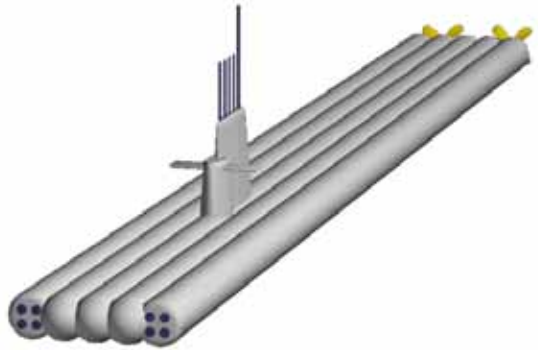
Although nuclear power was being used in submarines by the 1960s, its inherent problems meant that a non-nuclear option offering similar power would still be of interest, and Wallis proposed using gas turbines

(i.e. jet engines). These were being developed at the time for use in surface vessels (and have subsequently been widely adopted in naval ships), but they require a large throughput of air in order to function - something that was not available in a submarine! However, by looking closely at the chemistry and thermodynamics of the gas turbine in detail, Wallis was able to formulate a practical plan for their use underwater.

Conventionally, a gas turbine takes in air and produces work by burning the oxygen in it with fuel. However, oxygen forms only about 20% of air, which is predominantly (about 78%) nitrogen ... although this goes through the engine as part of its mass flow, it is not involved chemically in working of the engine, emerging hotter but otherwise unchanged, along with the combustion products (water and carbon dioxide). Wallis's idea was to operate the turbine on a (largely) closed cycle, replacing the mass of the atmospheric nitrogen with carbon dioxide. The fuel combustion generates carbon dioxide anyway, and the additional carbon dioxide generated would be cooled for storage, the other combustion product (water) being condensed out and pumped overboard. With no



atmospheric oxygen available, liquid oxygen would be used, this being heated on its way to the engine by the combustion gases, which were thus cooled efficiently. The waste liquid carbon dioxide could even be pumped into the tank from which the liquid oxygen was being drawn, as the two have different densities and don't mix. Wallis consulted with his friend R.R. Jamison at Rolls-Royce, who did not see any problems running their engines with liquid oxygen.



Simulation of Wallis's high-pressure submarine hull form; a non-pressurised outer shell would have been added for improved hydrodynamic performance

The thermodynamics seemed to work, and Wallis put this proposal, and that of his new high-pressure hull design, to the Navy in a paper in 1965 - though it was made clear that the two ideas were independent of one another. Their initial reaction was somewhat negative, but although their queries were answered and further correspondence ensued over the next few years, neither idea was adopted (the Navy by then was having to deal with cracking problems in the hulls of the Dreadnought-class submarines). Archive films show that model tests were conducted into launching ballistic missiles horizontally (the Wallis hull design did not offer sufficient height to store them vertically), and archive papers show that the thermodynamics were revisited in the 1980s, but so far neither idea has been adopted.

Wallis also considered the use of his capacious submarines as cargo carriers, offering the ability to submerge beneath the weather, as well as beneath the polar ice cap to exploit the near direct route from the UK to the antipodes via the North Pole - they could also have kept trade routes open more easily in time of conflict. However, even with his new hull design, their cargo capacity would not have been large, so they would not have been efficient compared to surface cargo ships.

Wallis worked the multi-cylinder idea back into some of his later aircraft designs, allow him to construct structurally-efficient square-section fuselages (known in the Wallis family as the "flying shoeboxes"), the curved structural sections concealed within flat outer panels. With the lower pressure now on the outside, the bracing beams could be replaced by lighter tie rods.

Highball - the anti-ship “bouncing bomb”

When Wallis conceived his “bouncing bomb” for attacking the German dams, he realised that it would be equally applicable as an anti-ship weapon, able to skip anti-torpedo nets and sink beneath a target ship before exploding beneath the “soft underbelly” away from the armoured areas of the hull. During a meeting with Leo Lane of the Navy’s DMWD in the summer of 1942, which Lane had called to discuss Wallis’s ideas for a smoke-laying glider, Wallis mentioned his new bombing concept, and Lane was interested immediately. Indeed, Wallis initially received more support from the Navy than from the RAF for his idea, replacing the model dam with a model battleship when the Admiralty came to view his experiments in the model ship tank at Teddington! By early 1943, the concept had matured into two separate weapons - “Upkeep”, a 9,250lb bomb to attack the dams, and “Highball”, a 1,200lb bomb for use against naval targets - which were tested and developed in parallel during the spring of 1943.

The primary target for Highball was the German battleship Tirpitz, which was lying in the Norwegian fjords, poised to strike at convoys heading to Russia; she had already been attacked several times without success. Although Reculver in Kent was the main site for both Upkeep and Highball testing, a realistic training location for Highball drops (to simulate the high terrain around the fjords) was also sought - and found at Loch Striven. This was located just off the Firth of Clyde, but the area was sparsely populated and was already in use as a secret test site for submarines. A French WWI battleship Courbet was retired from its role as an AA platform in Portsmouth, and towed to the loch to act as a target. Nets were slung beneath the ship to catch the hits and near misses for examination ... although they caught fewer than was hoped!

During 1943 and 1944 (when the Courbet was replaced by HMS Malaya), many weapon test drops and squadron training drops were made on the loch (and it is footage of these drops which is famously seen in “The Dam Busters” movie). During the research for my book “Bouncing-Bomb Man” I realised that, as more than 120 drops had been made in the loch (possibly more than 200) and that not all were recovered, there was a reasonable chance that a good number might still be in the loch. These were candidates for recovery as no complete examples of Highball exist in museums. I managed to interest the Archaeological Divers Association in the project, but lack of funds initially prevented any progress being made - before a useful coincidence came to our aid. Due to the economic downturn, the Maersk shipping line had laid-up several of its container ships, and reached an agreement with Clydeport in 2009 to “park” them in Loch Striven (the local residents were none too pleased with this, and when this became apparent, Maersk made great efforts to assuage

their impact). Early in 2010, the BBC used the anchored ships as a filming set for their children's adventure series "Mission: 2110", and Maersk decided to donate the fee for this to local charities, via a public online vote. By this rather fortuitous route, the Highball project was awarded £1,200 at a ceremony on board the Maersk Beaumont - enough for a preliminary survey dive mission!

As an overture to this survey, plans were made for a single dive in the loch in May 2010, to examine the shore and bottom conditions. The day before this dive, I received a telephone call from a local fisherman (who had seen the press coverage of the Maersk ceremony), and he confirmed that there were still Highballs in the loch ... as he dredged them up in his nets from time to time! As a result, we were able to meet with him on the day of the test dive, although we did not find anything (other than quite favourable diving conditions)!

The preliminary survey diving took place in July, initially dropping onto interesting targets found using the fishing vessel's sonar, but unfortunately these turned out to be rocks! The second day was washed out by poor weather (unusual for Scotland in summer!), and the third day found more rocks. For the fourth day, a loan of a Remotely Operated Vehicle had been arranged, and this allowed quicker reconnaissance of more sonar targets, though these also turned



A Highball resting on the bottom of Loch Striven
(image courtesy Underwater Science Ltd.)

out to be rocks! In the afternoon, however, the ROV came across a length of very substantial anchor chain on the sea floor, and it was guided along this, past some more rocks, until it found a very substantial anchor. Backtracking along the chain (which was lying in a straight line), the ROV passed more rocks ... and then the observers realised that this rock was actually a Highball! Even before the ROV was brought to a halt, another Highball was spotted ... and over the next few minutes at least six were found in close proximity. Later that afternoon, and again on the next (and final) day of the dive, the divers went down to film the Highballs from close quarters (they are all known to be inert-filled test specimens - no live bombs were dropped in the loch).

The successful location of the Highballs has unfortunately been tempered by legal considerations ... although a lone Highball could legally be recovered, the presence of the anchor makes the whole area legally a “wreck” site, and this means that the situation for recovery is more complex. Firstly, a full survey of the whole area needs to be conducted (it is hoped that this will happen in summer 2011, subject to funds), and once this is completed, permission may be obtained from the appropriate authorities to recover one or more of the Highballs (most of which look to be in excellent condition) for museum display.

Although less famous than its “dam busting” cousin, the story of Highball is a fascinating one, and it is a worthwhile one to present to the public via a recovered example of this other “bouncing bomb”.

Iain Murray

Barnes Wallis Memorial Trust Annual Report

27th May 2010 – 24th May 2011

The year started with our Annual Public Meeting at Howden School of Technology College, the theme of the meeting was the Maritime Connection. The speakers were Robert Owen, Dr Mary Stopes-Roe, Dr Iain Murray and Professor Richard Morris.

This year the BWMT annual award held at the above school was judged by Sir Barnes’ daughter, Mary Stopes-Roe with two new judges, Barry Low from Beverley and Gerry Carroll, chairman of the Trust. The winner was Steven Perfect, who designed a clamp which is used for servicing bicycles.

We now have the exhibition story boards stored locally and a lot of interest has been shown by museums in the area; Sewerby Hall will be interested in 2013, Newark Air Museum and museums in the Hull area are hopefully future prospects.

Renaissance Yorkshire (RY) is now acting as our intermediary between BWMT and the Yorkshire Air Museum (YAM) to try and bring to a close the dispute regarding the artefacts belonging to the trust still held by them; trustee Richard Morris is the single contact between RY & YAM, and has done a brilliant job bringing it altogether

Our first two years at MOSI come to an end at the end of June. I have discussed the future with the curator, and they are happy for us to continue storing our artefacts but they will need half the storage area as they themselves are short of space.

Two of our trustees, Peter Rix and Chris Henderson continue to give talks on the life and work of Sir Barnes Wallis. Venues have included Bedford Museum and Royal Aeronautical Donations from these events are our only source of income at present.

On behalf of the Trust I would like to thank Howden School for the continued use of their hall for our annual lecture. I would also like to thank Mr and Mrs Neild for all their efforts keeping us fed and watered

Next year 2012 is the 125th anniversary of the birth of Sir Barnes Wallis, so we will be looking at ways to celebrate this occasion.

The trust is continuing to be financially sound but with the low interest rates they are almost static, previous high interest rates used to give a boost.

We had the sad loss of Tom Jamison, one of our longest serving trustees. Tom is sadly missed.

We have had an excellent exhibition at Beverley, and we have erected interpretation boards on the site of the Howden Airship Station and have on exhibition on the site at the Boothferry Golf Club. The library at Howden now has a permanent exhibition on Sir Barnes Wallis' life at Howden. Tentative links have been established with Beverley Grammar School and Market Weighton School with an exhibition at the latter. We are also in contact with the Airship Heritage Trust.

In addition to all these activities, which are part of the Trust's mission, we have had to spend considerable time and effort on the ongoing saga with the Yorkshire Air Museum, and with the need to move material to MOSI.

Gerry Carroll

The Airship Guarantee Company and the R100

By Ken Deacon (edited by Chris Henderson)

In 1919 Alcock and Brown made the first non-stop one way crossing of the Atlantic by air in a converted Vickers Vimy bomber aircraft. It was followed a few weeks later by the airship R-34's flight from East Fortune, in Scotland to New York and back. For the powers to be at the time the airship was the only means of providing long distance travel.

In 1923 Vickers Ltd put forward a proposal to the Conservative Government, of the day that, they would build and operate six airships on the Empire routes. Before this proposal could be agreed and signed the Labour Government came to power and the proposal was stopped.

The new Prime Minister, Ramsey McDonald, appointed a Cabinet committee to investigate the whole airship matter and decide a course of action. The result of the investigation was, rather than put the whole airship industry in the hands of private enterprise, the State, in the form of the Air Ministry, which had personnel who had been involved with the R38/ZR2 and considered that no one knew more about airship design than they did, would build an airship, to be called the R101 at the Royal Airship Works at Cardington in Bedfordshire. In parallel, the Airship Guarantee Company Ltd, a subsidiary of Vickers Ltd would build another airship, the R100 to the same contract specifications.

The Airship Guarantee Company sought a suitable site for the R100 construction and decided to build the R100 at Howden. Vickers brought back Barnes Wallis who had been working abroad to head the design team, because of his success with the R80.

Nevil Shute Norway (better known as Nevil Shute the famous author) was employed as the Chief Calculator; he had the daunting task of checking the stress loading on the framework of the airship, something that had not been correctly addressed on the R38/ZR2, and was to be repeated on the R101.

In 1924 the Airship Guarantee Company sent a working party to Howden to put the now derelict airship station back into service. The massive shed still stood surrounded by debris of the wartime blimp sheds. The owners had abandoned it in the face of falling scrap metal prices. The door clearance of 130ft. (40 meters) had to be increased by 10ft to accommodate the R100.

Once more Howden was back on the map. The town's fortunes took an upward turn as a large labour force, mainly recruited locally (60% of the labour on airship construction was female) was needed not only to rebuild and run the



Howden Construction Sheds

station, but to construct a giant airship, which was to measure 709 feet (216 meters) in length, nearly as long as the ocean-going liners of the day, 130 feet (40 meters) in diameter, 5,000,000 cubic foot displacement and powered by six Rolls-Royce engines, producing 4,200hp.

The wages being paid at the time were £4 a week for a foreman such as Mr B Nichols, while a worker such as Harry Wilson from Goole would collect approximately £2.15 shillings (£2.75) for a 47 hour, six day week. A weekly rail ticket for the return trip from Hull to North Howden station on the London North-Eastern Railway was 10 shillings.

Over the following six years the two airships took shape. In Nevil Shute's book, 'Slide Rule', he describes how the rivalry between the two teams building the R100 and R101, meant there was no exchange of information, leaving each team to solve their own problems. With the result that the R101's team, which had the greater resources, tended to build in equipment which was not really essential and led to the airship being a lot heavier than the R100. One example of this was the R101 carried a spare engine, only to be used in the docking action that occupied only a few minutes at the end of each flight.

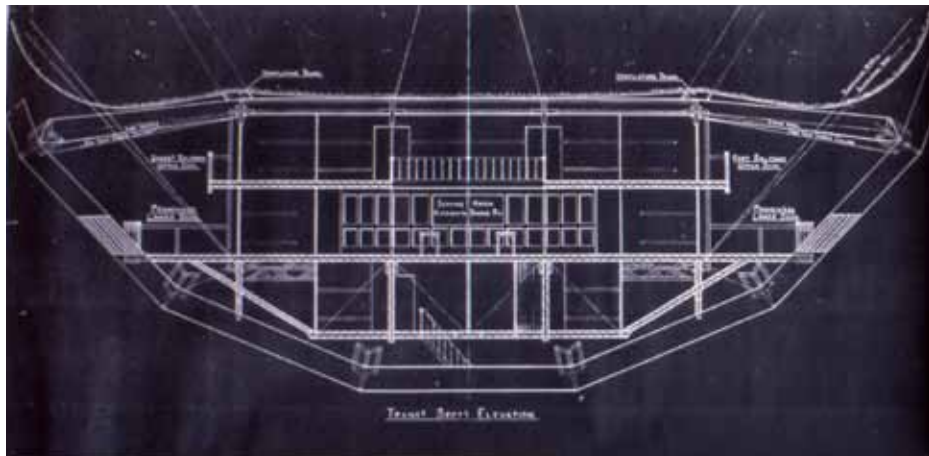


Nevil Shute Norway
in 1949

The rivalry between the two teams continued, being fed, by the knowledge that only one team would survive, that would be the team who produced the best airship.

Most of the press coverage of the day was about the R101, but in 1928 more than fifty MPs, businessmen and Government Officials were treated to a tea party in the passenger compartment of the unfinished R100, the waitresses being recruited from the fabric shop.

The R100 passenger accommodation consisted of an section situated mounted inside the hull, some 180 ft. from the bow.. The accommodation consisted of three floors: two floors for the passengers, and the third and lower floor which



Cross section of the R100's passenger and crew area

housed the crew.

Cooking facilities were available in an electric kitchen. Passenger comfort was rated between Pullman and ocean-going liner, with two and four berths cabins. Transparent panels in the side of the ship provided light and a view of



The Dining Room of the R100 with balcony and cabins above

the ground below, and the promenades provided enough space to hold a small dance.

The R100 was nicked-named the ‘The Cupid Airship’ because 20 workers were married to local girls during the construction.

In the early hours of the 16th, December 1929, Nevil Shute set off from his lodgings in Hailgate, Howden, to make his way to the airship station. The country roads around the town were choked with coaches transporting the 500-army personnel, who would provide the ground handling party, needed to walk the giant airship from the shed, ready for its first flight.

The troops came from Beverley, Pontefract and the Lancaster Regiment from York. By 7.15am. the crew were on-board and the R100 took to the skies.



R100's Electric Galley



After completing a few circuits of Howden and being satisfied that all was well, the airship headed for York. Following a few circuits of the Minister and York itself, the airship set course for its future base at Cardington in Bedfordshire. After completing its flying trials the R100 made a successful proving flight to Canada and back to Cardington.

Meanwhile the R101, had flown first in October 1929, but the design team were forced to carry out many modifications, mainly to try and reduce the weight of the airship. Possibly prompted by the success of the R100's uneventful flight to Canada it was decided the R101 would fly to India, carrying Lord Thompson, the then Secretary for Air, even though the airship had by no means completed enough trial flights, which seemed to have been apparent to all but the Air Ministry.

The R101 set off from Cardington on October 4th. 1930, ignoring the poor weather forecast, it flew into a mini storm and crashed near Beauvais in Northern France. All but six were killed from the fifty-four souls on board, Lord Thompson being one of those killed. As a result of the loss of the R101 all airship production in Britain was stopped.

The R100 never flew again and was eventually sold for less than £500. Its girders were steamrollered and sold for scrap. All future money and technology



The Wreckage of the R101

was transferred to the design and development of the aeroplane. Once again the Howden Air Station was left to run down and the town's fortunes with it. The town still survives, but the airship station is no more.

Ken Deacon

Returning to Rilly

On 31 July 1944 the Squadron despatched sixteen Lancasters, each carrying a Tallboy, to attack a railway tunnel south of Reims being used as a storage depot for V-1 flying bombs and which had been attacked a fortnight earlier by US 8th Air Force B-24 Liberators.

The Squadron were to bomb at the head of some 80 other aircraft from No. 5 Group. The Tallboys would be aimed to seal both ends of the tunnel, whilst the main force aircraft were to drop delay action 1,000 and 500 pounders to disrupt access to the tunnel and hamper repair and recovery work. There had been some consternation at briefing when it was revealed that the Squadron would be bombing from a lower level than the main force aircraft, but it was calculated that they would be clear as bombs from the higher force fell through the Squadron's bombing height.

Unfortunately timings went awry and both main force and the Squadron arrived over target at the same time. Flt Lt Bill Reid VC had just released his Tallboy and was holding the aircraft on course to obtain his aiming point photograph when the aircraft shuddered twice as it was hit by two bombs falling from the force above. One bomb fell through the fuselage by the mid upper turret, severing the controls, the other detaching a port engine. Realising their predicament Bill gave the order to bail out and after seeing three of his crew descend into the nose, and receiving no reply from his gunners, sought to get out himself. With movement restricted by the increasing violent gyrations of the aircraft he tried unsuccessfully to exit via the cockpit side window, then, remembering the dinghy exit in the roof, reached up and turned the jettison handle. As he did so, he found himself falling through space, surrounded by parts of his disintegrating Lancaster.

Deploying his chute, he landed in a tree, but despite an injured hand and leg he set off in an attempt to clear the target area as soon as possible, but to no avail. After travelling for a mile or so he was captured by German troops, who took him to a nearby flak battery. On the way they passed the shattered tail section of his aircraft. Reid asked to inspect it and was horrified to discover the body of the mid upper gunner slumped near the door. The rear turret had broken off and lay wrecked a few hundred yards away, the dead gunner was still inside. Shortly after his arrival at the flak battery the Germans brought in his Wireless Operator, David Luker. Although it was not known at the time, the remaining crew had all been killed. The Germans recovered three bodies and buried them in Clichy Cemetery, Paris, but the body of F/Sgt Donald Stewart,

the Flight Engineer was only discovered a week later and interred in the local cemetery at Germaine.

Two aircraft were lost during the operation, the second, a Lancaster from No. 9 Sqn being hit by flak and crashing locally with the loss of all its crew, who were also interred in Clichy.

Sixty five years later, inspired by members of a local aviation group, the inhabitants of Rilly la Montagne, took the decision to commemorate the attacks and remember those who had lost their lives during this operation with the erection of a memorial stone in Rilly's Place de la Gare, a short distance from the northern tunnel entrance. John Bell, who had flown as Bob Knights' bomb aimer on the operation and myself were invited to attend the dedication ceremony on June 3 and assist the mayor of Rilly in the unveiling of the memorial.

Travelling out on Friday June 12 and crossing the Channel via Le Shuttle we had a pleasant journey through the Pas de Calais and Picardy to Reims where we were met by Olivier Housseaux, who took us to meet another of the group, Joachim Lelongt, an instructor with the French Air Force who, along with his parents, were to provide us with accommodation and hospitality for the weekend.

Friday evening was spent on a "familiarisation" session, meeting other members of the group and travelling some 5 miles south to Rilly la Montagne, a delightful flower bedecked village in the champagne producing region, adjacent to the tunnel. Here we were shown the tunnel's northern entrance and watched the setting up of a commemorative exhibition in the local "village hall", a modern, stylish concrete and glass building adjacent to the village's imposing war memorial. The exhibition comprised photographs of some of the Squadron's wartime personnel and aircraft together with various artefacts including fragments from one of the Tallboys dropped during the attack, mounted on a metal framework and with a replica tail unit, creating in effect a scaled down replica of the weapon. The team were delighted when John pointed out that one of the photographs showed his own aircraft, DV385, KC-A, "Thumper Mk III". More telling were photographs of the damage inflicted on the village – although our hosts were quick to point out that the majority of this was caused by an earlier attack on the tunnel by the US 8th Air Force, and not by Bomber Command – a fact borne out by study of post-raid intelligence reports. Despite the physical damage to property, human casualties were minimal, most of the population having taken shelter in the limestone caves beneath their homes, normally used for making and storing the local product. Despite our curiosity,

we were not allowed to see the memorial, being deliberately kept well away in order to preserve an element of surprise for the following day.

Saturday dawned bright and sunny and we were taken to the village of Germaine, a short distance from the tunnel's southern entrance. Here we were joined by the mayor, Mme Corinne Demotier and other inhabitants of this small commune in the local cemetery where, after a brief and moving service, John and I laid a wreath on the grave of Donald Stewart, after which a trumpeter played "God Save the Queen". We then made our way with the entire entourage to La Mairie where we were entertained to champagne and speeches, during which a former mayor of the commune presented a portable oxygen bottle salvaged from the remains of Bill Reid's Lancaster. In subsequent conversations with the villagers we learned much about Germaine's wartime history, older residents recalling the period 1939-40, in particular the reaction of many members of the British Expeditionary Force whose arrival in France brought them into contact with the delights of French wine for the first time! More poignant were accounts of the village during the First World War, when, like Reims (which was reduced to rubble by German bombardment), it became caught in the middle between opposing French and German advances.

After an excellent lunch – and yet more champagne – we were taken back to Rilly for the dedication of the Memorial. Arriving in the square the town band was assembling and whilst John was being interviewed by the editor of the local newspaper the local population began to congregate for the event. As the appointed hour arrived we were taken over for our first glimpse of the memorial – at present shrouded in an RAF ensign. After introductions to the Mayor of Rilly and various other officials we positioned ourselves appropriately either side of the memorial. The band struck up and a number of proclamations were made, after which John and I were invited to join the mayor and reveal the monument.



The Rilly la Montagne memorial

The memorial comprises a slab of polished black marble, inscribed with a coloured Squadron crest, and bearing the inscription:

On 17 and 31 July 1944, the tunnel at Rilly la Montagne a storage depot for German V-1 flying bombs, was the target for Allied bombers. On 31 July RAF Bomber Command mounted an attack by 97 Lancaster bombers, amongst them 16 Lancasters of No. 617 Squadron each carrying a 6 tonnes Tallboy earthquake bomb.

2 Lancasters failed to return from this mission:

ME557 – 617 Sqn and LM453 – 9 Sqn

“In memory of these two crews who died for our freedom”

Beneath this is an applied metal relief showing a representation of the tunnel entrance, being broken by a Tallboy. The stone is approached by a short path, into which have been set railway lines leading to the memorial, with “sleepers” represented by inset pebbles.

As the ensign was removed the audience applauded and the band struck up the “Marseillaise”, whilst an aerial tribute was made by the appearance of a Tiger Moth that continued to circle the village for the remainder of proceedings. John and I laid a wreath on behalf of the Association, to be joined by others from Rilly and Germaine. The mayor of Rilly then gave a speech recalling the courage of the crews and the sacrifice they had made. Having been briefed the night before, and asked if we would contribute to the proceedings, I had prepared a suitable oration, which had been refined from my very rusty ‘O’ level French into a more refined work by Olivier. Nevertheless, it was perhaps fortuitous that the Tiger Moth’s Gypsy Major engine did much to conceal the inadequacies of accent and pronunciation as I echoed the mayor’s sentiments and emphasised the importance of the lessons of history. A further declaration by a member of the aviation group was followed by a stirring speech by the local Member of Parliament (they always have to have the last word!) before we were asked to pose for numerous photographs before the appreciative audience.

After our fifteen minutes of fame we were led up across a footbridge, providing an excellent view of the tunnel, to join the band who were to lead us together with other French veterans in a ceremonial march back through the houses to the exhibition hall, where yet again more champagne awaited our arrival.

Inside the exhibition hall villagers, both young and old, surrounded us, seeking signatures for their commemorative programmes. A number of

the older residents recalled the events of July 1944, including Jean Bernard Quicheron, a young boy at the time, who is today a translator for the EC, and whose skills were invaluable in interpreting and facilitating many an interesting conversation. Several had brought along souvenirs of that time, including a pocket diary recording the effects of the bombing, photographs of the damage, and even a large piece of black camouflaged aircraft skin from Bill Reid's aircraft.

The following day we returned to Rilly for a closer inspection of the tunnel and the memorial. Courtesy of a local forest warden we were able to enter the woodland surrounding the tunnel where our hosts took us to see what has become known locally as "Le six tonne" – a perfect example of a Tallboy crater, part water filled, but still clearly recognisable. Heading south again towards Germaine, we visited the southern tunnel entrance and descended into the cutting, where the scar of a second Tallboy impact could still be clearly seen on the opposite slope. Above the entrance we were shown two excavated depressions, now reclaimed by nature, that once contained light flak guns for the tunnel's defence.

Lunch was taken at the home of Jean-Marie Chappelleut, a local aviation historian, who invited us to view his collection. Having already seen a few small fragments of aircraft in the kitchen we imagined further similar small items but were totally unprepared for what was to follow. Leading us through a doorway into one of several side buildings we entered a veritable Aladdin's cave of material – including a complete nose art panel from a B-26 Marauder, the mainwheel from a B-17, Lancaster undercarriage struts, box after box of other Lancaster components, all bearing testimony to an aircraft's catastrophic end during the notorious attack on Mailly le Camp in May 1944. The Luftwaffe was well represented too – a complete bomb rack and fairing from a Ju 88, and the engine and propeller from a Messerschmitt 109. An airborne supply container, complete with its parachute lay near to a group of French Army saddlebags from a horse drawn artillery unit that had been decimated by Stukas only a mile or so up the road in May 1940. It was an incredible collection, which continued to unfold as we were taken upstairs and into another building.

After lunch we set off for the Group's public museum at Vraux. Housed in farm buildings in the centre of the village this tells the story of the nearby airfield which was originally occupied by the French Air Force pre-war, then handed over to the Advanced Air Striking force of the RAF, with Fairey Battles, Bristol Blenheims and Hawker Hurricanes. After destroying many of these on the ground the Luftwaffe was in occupation until the airfield was liberated for use by the American Air Force in late 1944. Photographic exhibits

are supplemented by salvaged and preserved artefacts together with aircraft components. However, as with Jean-Marie's collection, a surprise awaited us as we were led through to another room with the comment, "And in here is the Stirling...."

Expecting to see perhaps a few components and photographs of an aircraft that in theory is all but extinct, we were astounded to see some 30 feet of Stirling fuselage, from mainplane trailing edge to leading edge of tailplane. Although sectioned into three and with the floor removed by a farmer who had used it to house various animals and farm machinery, it still retains its camouflage, code letters, D-Day striping and serial number – confirming its identity as an aircraft that had belly landed whilst on an SOE supply mission in September 1944. A truly remarkable exhibit.

All too soon the weekend was over and it was time to say our farewells, feeling that we had known our hosts for a far greater time, such was their exceedingly generous hospitality and warmth. We left Reims reflecting on the knowledge that even after 65 years the Squadron's, and indeed the RAF's contribution toward the liberation of France is still very much recognised and commemorated.

Rob Owen



Wg Cdr John Bell (left) and Robert Owen (centre) at the Rilly la Montagne memorial

Royal Society Local Heroes Project

In the previous newsletter we reported plans for an exhibition about the life and work of Barnes Wallis that we were putting together in conjunction with the East Ridings Museum Service as part of the Royal Society's Local Heroes Project. The project turned out to be a great success. We produced some 21 A1 size display boards, all professionally designed and produced, to form the core of the exhibition. The exhibition was first shown in Goole Museum in December 2009/January 2010. This marked the 80th anniversary of the first flight of the R100 from Howden, where it was built, on 16th December 1929. Goole is only a few miles from Howden. The exhibition was then shown in the Treasure House in Beverley in July/August 2010. This marked the 80th Anniversary of the R100s flight to Canada and back in July/August 1930. Both exhibitions were extremely successful with both museums reporting visitor levels of nearly double their usual levels. At each place we also arranged a series of lunchtime talks and these too proved to be very popular and resulted in requests to give the talks to local groups. In addition we received some cash donations from visitors and the two museums sold some books etc on our behalf.

At one of the planning meetings in arranging the exhibitions we were due to discuss publicity material. Purely by chance we had been contacted just prior to this by a local artist, Gary Saunt, who lives in Beverley. Gary offered his services to produce the artwork for the publicity material and we also used his skills to help with some of the boards. Particularly dramatic was the panorama he produced of the Moehne Dam being attacked at night. Gary also produced a picture of the 6 engined Victory bomber that Barnes Wallis conceived to carry the 10 ton bombs that were his first solution on how to beach the dams.



Vickers Victory Bomber by Gary Saunt

Gary's skills were a great help and we are very grateful to him for his assistance.



Exhibition Artwork by Gary Saunt

Part of the arrangements for the whole project was that after the two exhibitions were over all the boards would become the property of the Trust with the intention that we would seek opportunities to show the boards elsewhere. We have already loaned them to a local school for a few months and discussions are taking place with other museums for future temporary exhibitions.

For many years the Trust has wished to have a display in Howden Library and at Boothferry Golf Club – which occupies the site of Howden Airship station. We used copies of some of the Local Heroes project boards to form an exhibition in the Golf Club and this is open to the public. Similarly copies of a few of the boards are now on public display in Howden Library. The Library also has A3 size copies of all the boards for reference and

these too are available for members of the public to refer to.

Coincidentally soon after the exhibition in Goole the curator there was approached by the curator at Bedford Museum for help. Bedford museum were planning a big exhibition to mark the 80th anniversary of the crash of the R101 in October 1930 and wanted to include something about the R100 as well. The Goole curator referred the Bedford curator to us and we were pleased to help. We also gave a couple of lunchtime talks in Bedford as part of their exhibition. This contact would not have come about if it was not for our initiative in the Local Heroes Project.

In summary our involvement in the Royal Society's Local Heroes Project has been a great success in helping us spread the word about the life and work of Sir Barnes Wallis.

Peter Rix

Boothferry Golf Club

On Tuesday 3rd. August 2010 we finally managed to have the unveiling ceremony for two interpretation boards at the Boothferry Golf Club.

Thanks are due to David Patrick for installing the boards, and to Charlotte Hursey for producing a press release that I was able to send to numerous papers, and also to BBC TV, which brought the Howden Civic Society, the Barnes Wallis Memorial Trust and the Boothferry Golf Course a great deal of publicity.

The two boards are placed at the Boothferry Golf Course by the kind permission and co-operation of the owner Chris Mowthorpe. One tells the story of the Royal Naval Airship Station that was there in World War 1. The second tells the story of the Barnes Wallis designed R.100 airship which was built there in 1925-29. These two boards are between the car park and the entrance to the clubhouse.



The cost of the boards was covered by the grants left to the Howden Civic Society and the Sir Barnes Wallis Memorial Trust by the late Mr and Mrs Tom Asquith. Inside the club house there is a small exhibition of nine boards paid for by the BWMT, which tells more of the Wallis family involvement with Howden and the airships. People are able to visit the Golf Club and see the boards without having to be members of the Club. Also they are able to get refreshments.



Dr Mary Stopes-Roe with Ken Deacon viewing the boards

In the Howden library there are six more boards, also paid for by the BWMT. Many visitors to the town who wish to know more about the R.100 and where it was made are now directed to the Golf Club.

Because Mary Stopes-Roe, Barnes Wallis' daughter does not live nearby, I was asked by the TV to go to the Golf club and be filmed and interviewed about the boards the day before, and at 8.30 on the Tuesday morning I was interviewed by Radio Humberside. The actual unveiling ceremony went off very well; Mary Stopes-Roe unveiled the Barnes Wallis Memorial Trust board, and Mrs Sue Chapman, Chair of the Howden Civic Society unveiled the Howden Civic Society board. Because of the publicity we had many people who belong to both organizations, including Gerry Carroll (chairman of the Barnes Wallis Memorial Trust) and press reporters and photographers in attendance.

In Howden town centre notices on the Shire Hall notice board, and in Candy-Andy's shop window invite visitors to the town to visit the exhibition.

Ken Deacon

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