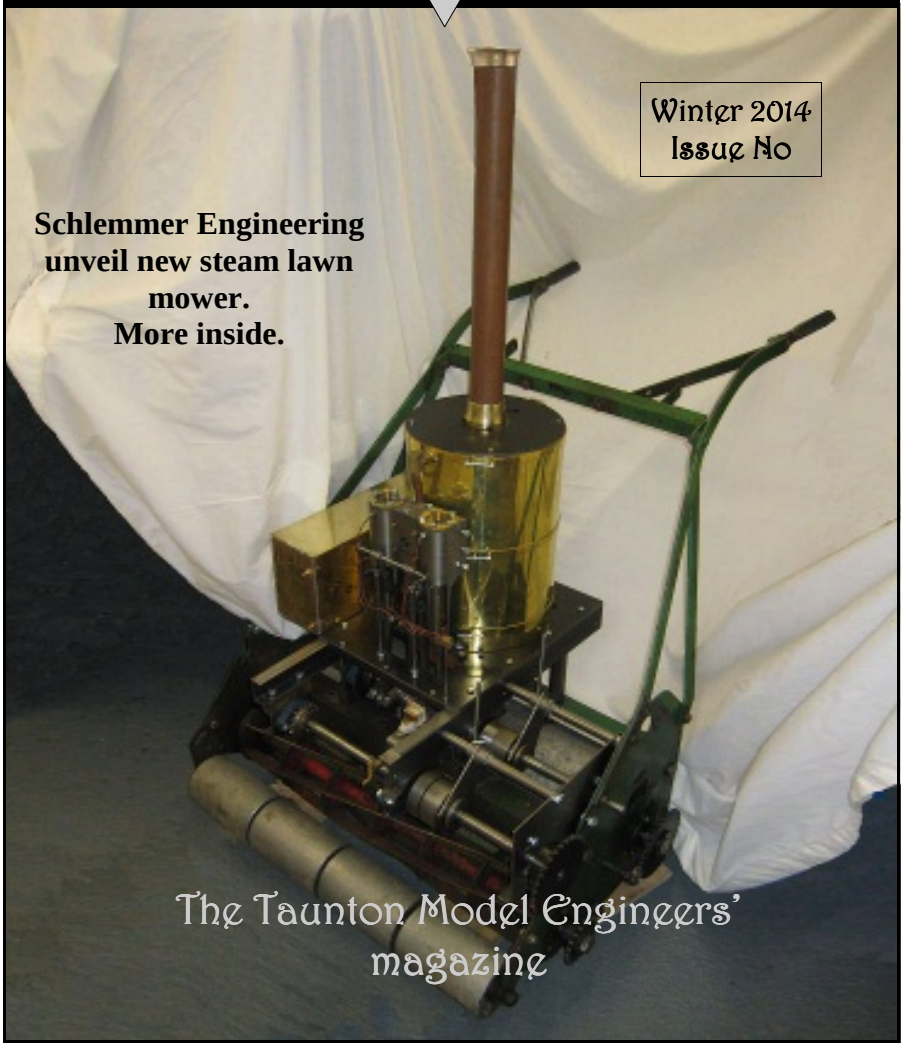
The Oily Rag!



Winter 2014
Issue No

Schlemmer Engineering unveil new steam lawn mower.
More inside.

The Taunton Model Engineers' magazine

Contents

Subscriptions

Ordinary Membership is £30 with a further £5 for spouse or partner.

Junior Membership—£5

Membership Secretary contact details—see inside front cover.
If renewing by post, please enclose S.A.E. for Membership Card

Note Subscriptions are now due.

From the Editor

A poll conducted by the Parish Council showed overwhelming support for our railway at Creech. Despite this the council has not been able to provide us with an acceptable lease. You can read about the chaos in the chairman's report. We seem to have fallen foul of a council where little of the ordinance is properly secured. Under these conditions popular support could be critical.

This means running a regular, reliable and attractive service for passengers, which has not always been possible in the past due to lack of motive power. So I was pleased to hear that the owner of the Hunslet featured on the cover of the last "Oily Rag", Robert Oldfield, has joined the club and that Barry Baxter has acquired a "Stafford". The number of diesel outline locomotives is also increasing with the club's Hymek well on the way to completion and with regular appearances from Tim Himms and his locos. The more activity there is at the track the more interest it will generate and the more difficult the council will find it to remove us whatever the paperwork says.

Not many of us dream of building a full size steam powered machine. This is exactly what Stephen Schlemmer has done and his article on the steam lawn mower is fascinating.

Bob Richards article on the challenges facing Victorian civil engineers building the Severn tunnel is a good read.

The two remaining articles are both personal reminiscences, which seems rather appropriate as we look back over 2014. One by Ray Rolt the other by "Fireman MN retired",

John

Chairman's Notes

By Mike Johns

Regrettably we have not been able to finalise the Creech lease yet. On 9 October our solicitor received a letter dated 26 September from the Parish Council solicitor which set out their views on our remaining concerns and suggesting that these matters should be resolved in correspondence preparatory to finalising the lease. This letter reached us on 13 October and an agreed response drafted by email. However on Sunday 19 October we found the car park locks had been changed and were now key operated although no contact had been made with us as principal leaseholder. After a debate TME now holds keys for out of hours access.

Meantime following a series of telephone conversations with the PC Chairman TME were invited to attend a meeting with their Panel dealing with the lease on 10 November, when Andy Cooke, Dave Wood and myself attended and we agreed the lease amendments required. The PC tabled these for approval at the full Council meeting on 17 November (TME were represented by Andy Cooke, Dave Wood, Tim Griffiths and myself to deal with any queries). Although the amendments were apparently approved the very next item on the PC agenda was a proposal to impose an annual renewal clause in the TME lease in place of the provision for 5 yearly renewal just agreed!

In view of this confusion the PC has been advised that TME cannot proceed with the lease until we see the approved minutes of the meeting. Apparently these were not agreed at their December meeting as nothing has appeared on the PC website to date (5 December) so we await events.

We did find out at the PC meeting that they have another Panel

planning future developments in the park. As these seem likely to impact on our activities we have asked for a meeting to discuss what is being considered and how TME might assist. It may be there will be opportunities for joint action to our mutual advantage. We await a response.

I should like to thank the Committee for their support during what has been a difficult year and for the contributions they have made to the club. We have enjoyed an excellent meetings programme this year and that for 2015 looks equally interesting thanks to Tony Gosling and Bill Edmondson. Mike Pinkley has revamped the club website while John Pickering has maintained the high standards the "Oily Rag" enjoys – both represent the public face of the club alongside the teams operating our 2 railways. Thank you all.

The club also owes a debt of gratitude to Bob Bramson. Members will recall his talk on injectors early this year following which TME published his presentation as a booklet for ready reference. This has proved popular and thanks to Bob TME enjoys all the sales income which has more that met the initial costs.

Finally thank you to you, the members. May I wish you all the compliments of the season with the hope that we can continue to enjoy our hobby in our various ways throughout 2015.

News from Creech

By Mike Johns

Having almost completed the 2014 running season we can report a grand total of 1746 passengers carried with the Santa Special day in aid of charity yet to come. Highlights were the 385 carried in one day during the Party in the Park and the block booking of 24 tickets for a larger family party.

Thanks are due to our regular locomotive owners, Allen Wellesley-Miller, Tim Hims, Tony Gosling, John Williams and Tony Newberry for providing the variety that makes our trains attractive to the public. Thanks are also due to Margaret Wellesley-Miller (usually found in the booking office), John Hancock and John Henson for ‘manning’ the station on a regular basis while Tim Griffiths can be found on turntable duty and Fred Stops provides tea and coffee to keep the team going.

The site has been kept presentable thanks to the Thursday gang (Tim Griffiths, Tony Gosling, Mike Pinkney, et al) who regularly checked the track for defects or fallen branches and have kept the grass under control this year as well as renewing some broken fence rails. We await the repairs needed to the park boundary fence which we reported some months ago.

Heavier outdoor work is still being deferred pending resolution of the lease problems. Inside the workshop David Hartland has started machining the steel wheel blanks for the carriage bogies before they are passed to Andy Webb for profiling the flanges. The new cast iron axleboxes have been produced by Tom Dominey and Bob Richards and wait boring for the new bearings. The damaged coach body has been repaired by Mark Hartnell while John Pickering is pressing ahead with the two Hymek locomotives which will soon be ready for painting. He has also produced the control units required for operation in service.

Having fitted an overhead beam earlier in the year David H. has also produced the small trolley needed from which to suspend the 5 cwt. block and tackle which I acquired thanks to the West Somerset Railway Association. Finally mention must be made of Andy Cooke who regularly comes to Creech and can be found turning his hand to many and various tasks including our attempts to keep the place tidy!

Report from Vivary Park

By Diana Fathers

The weather was dull and cold for the Santa Special – not exactly inviting for riding on trains, or for driving them for that matter! Phil Mortimer's "gold" loco was lit up with fairy lights and given the assistance of two reindeer as well as the miniature Santa (this must have been what enabled him to keep going for the whole session!). Chris Warburton with his Maid of Kent looked very festive in his red overalls and Santa hat, and when Chris had to leave, Dave Wood took over with his electric Titan 5 loco. There were plenty of helpers; nearly all the regulars plus a few not-so-regulars, sharing a few jokes and a few mince pies and Barney and Chris's wife Sam kept everyone supplied with hot drinks.

As for customers, there was a steady stream of young and old, happy to ride around, whatever the weather, and their donations were generous with a total of £141 raised for the Children's Hospice South-West.

Thanks to all the drivers, who turn up regularly to ensure there is always a ride available; to all the "heavy gang", who make sure the track is always ready and fit for use, to Station Master John Henson and to all the tea-makers and other helpers who are always happy to lend a hand wherever it's wanted. It's a great team and I'm happy to be a part of it!

A Happy New Year to you all and we look forward to seeing you when we start again on 5th April.

(The following piece did not make it into the last issue but I thought you might find it amusing, ed)

Addendum to Vivary Report.

An air of excitement greeted us on arrival at Vivary one Sunday in July. Firefighters everywhere with their engines and firemen attached to ropes about to rescue someone, or something from the river that flows down past the track attracted a huge crowd of onlookers. Was it a child, and adult or a much-loved pet? Well, not exactly. It was a dragon! Dragons have been put in many places around Somerset for people to find, and one unfortunate creature had been removed from it's plinth by someone and thrown, or dropped in the river. So one fiery monster became one extremely damp squib. It took some considerable time and many attempts to finally get a rope around it and haul it ashore, to a huge round of applause. None the worse for it's experience, the dragon was returned to it's plinth to guard the entrance to the railway and play park once more.

Wanderings of the Nomads.

By John Pickering

I thought it was about time that the membership were brought up to date with the activities of the itinerant band who operate the portable track. This year our first outing was to the WSR. Spring Gala. The weather was far better than last year but there were very few passengers. Our next event was the Stockland village fair. Here things were very different, Bob Richards started the afternoon with his "Sweet Pea" and later I took over with "Salome".

We had a queue of passengers all afternoon and took over £130 which we split between village good causes and club funds.

At the fair I was approached to run at a fun day at the Ferne Animal Sanctuary in aid of their "Digs for Dogs" appeal. Carol and Tim Griffiths joined Bob and I for this day out. Unfortunately we were dogged by mechanical failure, first Bob's "Sweet Pea" split an injector water hose, then my father's recently rebuilt "Polly" lost a grub screw from the left hand side valve gear, so we ended the day using "Salome". Despite time lost changing engines, we still took over £130 all of which we gave to the charity.

Dalwood fair has been on the calendar for several years. This year the location changed and although the chosen spot was good from the point of operation, when the other stands were set up we were virtually hidden. Graham Barford helped out but had few passengers to help. After a very slow start things improved but were never busy.

To try to build good relations with the people of Creech we felt we had to support the "Flower Show". We ran my father's "Polly" all afternoon, with it's new grub screw! Although there were not many passengers it was a very pleasant afternoon in the sun. Diana and Roy Fathers and Simon Gates gave a hand and as a bonus, Chloe won a novelty class in the dog show for--- you guessed it --- riding on the train.

More recently the track was used for the WSR's Autumn gala. On this occasion the "Nomads" were lead by Dave Wood. Unfortunately the numbers of passengers were again very low.

Although I can understand why portable tracks are not as popular with model engineers as they once were they still draw crowds and are fun to operate in small doses. If you would like to be involved next year, please get in touch

The Tickers
(Horological sub group)

By David Spicer

The Harrison project is moving albeit slowly at the moment as we are having a number of special cutters made to get the correct tooth profile for various wheels in the train, There has been so much written on this clock that trying to sort the wheat from the chaff takes some time. One of the problems has been that the clockmakers company records have moved from guildhall to the British Museum, My own workshop is being restored to its former glory and should be able to start making swarf again soon.

A Steam Lawnmower

By Stephen Schlemmer

Most little boys, when they are out and about, inhabit a world of their own. They may imagine they are sailing a ship or flying an aircraft. In my imagination, I was often driving a traction engine. The observant passer-by would have seen me opening the regulator and twirling the steering handle. As I passed through my Meccano years into a career in engineering, I aspired to own a steam engine, but it was never practicable. I had neither the funds nor the space. In my twenties I accepted that a full-size road engine was out of the question, but a miniature never attracted me. What I wanted was something full-sized but small. I had always enjoyed cutting the grass and it came to me one day that a steam lawnmower was the answer. I made some sketches and talked idly about it to friends and there the idea stayed in the back of my mind for 40 years.

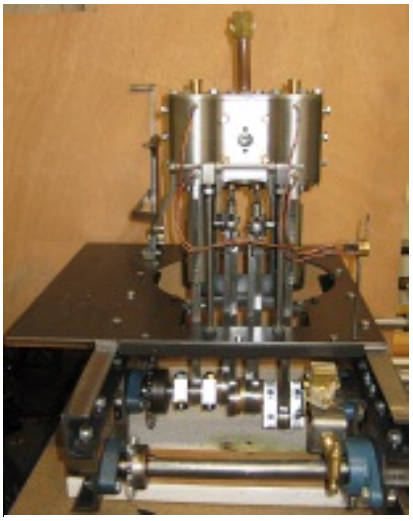
When I retired, I began to think seriously about the steam lawnmower – a full-size machine, with the challenge of building it, plus the continuing pleasure of using it to do a necessary job.

There had been a few steam lawnmowers at the end of the 19th century but they had quickly been surpassed by internal combustion engine machines. And they had all been massive contraptions; I needed something smaller. I sketched various boiler and motion layouts and looked for sources of supply. I've not used machine tools since my apprenticeship 45 years ago and have only hand tools and fitting skills, so I needed all the machined parts as a kit. The most practical layout seemed to be a vertical boiler with vertical cylinders driving a transverse crankshaft.

I bought a 1950s Atco 28inch cylinder mower with a Villiers Mk25 engine, which, when removed, would leave a flat bed on which to mount the steam engine. I did some simple torque tests to assess the torque required to drive the mower and calculated the chain wheel ratios to maintain the necessary roller and cutter speeds. The mower has a trailer roller with seat so that I would have the pleasure of riding on board.

Maxitrak make a model of "Chaloner", a two foot gauge, Welsh quarry engine with just the right arrangement. Their 7 ¼" gauge model is about one third scale with twin cylinders 38mm bore by 60mm stroke, double acting with full Stephenson reversing gear and piston valves. I arranged with Maxitrak to buy a part kit with a slightly larger, copper, 100psi boiler. It has 50 fire tubes over a 230mm diameter grate and, of course, burns coal. The locomotive's front axle became the mower's crankshaft with an eccentric for a mechanical feed pump. The second boiler feed is by a hand pump. The crankshaft drives the mower's roller by chain and a layshaft drives the cutting cylinder by a separate chain; both drives have dog clutches.

There was to be no promised completion date. I realised that it would certainly be more than a year's work but I hoped it wouldn't be the 15 years or more I sometimes read about.



Engine and layshaft assembly

I started by assembling the boiler, lagging and cladding. The motion subframe with cylinders, valve gear, reversing lever and crankshaft were mated to the layshaft and dog clutches. It all ran nicely on compressed air.

Having completed the assembly of the steam parts I turned my attention to the mower. I removed the Villiers engine and prepared the bed of the mower to accept the steam engine sub-assembly. Its rear roller is in three parts with a differential gear; this had been serviced and the roller axle bearings replaced before I bought the mower. One of the cutting cylinder bearings was badly worn and I replaced it. The cross members needed four new holes to accept the steam plant mounting posts. The new drive shaft for the roller needed a generous clearance hole to pass through the left hand side plate just below the handle support. Having mounted the steam plant on the mower, I finished the ash pan.

I designed sliding supports for the grate so that I would be able to drop the fire into the ash pan. These supports were water-jet cut from 6mm stainless steel to match the stainless steel grate. The new cutting cylinder drive shaft passes neatly below the upper left hand grass box leg, but the boss on the chain wheel was too close to the leg so I modified this, to increase the clearance.

The grass box originally pivoted up and forward to empty and I knew that it would now foul the front of the new motion subframe, so I modified its forward mounting so that it would lift out.

While the parts were all together, I tackled some details, making mounting brackets for the whistle, the feed pump bypass valve and the name plate. I named the mower “NORMAN”, after my father who loved steam and would have been tickled pink by this project; the name plate fits on a bracket on the chimney. I had a builder’s plate made to fit on the side of the water tank.

Now all was ready for painting. I ordered the paint from Craftmaster. The colour scheme is:

hot parts - polished brass or heat resistant Black
chassis - Classic Green
moving parts - either Alfa Red or left unpainted and polished.

The brass and copper parts needed two coats of etch primer, all had one or two coats of primer followed by one or two coats of undercoat and two of topcoat – all with plenty of flatting down between coats. The mower was painted only where I modified it and I aimed for what the preservation movement call ‘working clothes’. It was only after I’d finished painting that I recognised that the new machine was finished in the Meccano colour scheme; red, green, black, gold and silver. I thought it looked very smart.

Now I had to face up to getting it wet, dirty and hot. I first filled the water tank with rainwater stolen from Jane’s water butt, and checked for leaks – all OK; then I used the hand pump in the tank to fill the boiler to half way up the gauge glass – all OK. I soaked charcoal overnight in paraffin and spread it onto the grate with the little firing shovel I’d made; it lit with a satisfying whumph and the tall chimney created a good draught.

I checked the steam oil in the mechanical lubricator driven by the crank pump eccentric and oiled all round. I'd bought a coal supply at Larcombe Coal at Chard Junction who had plenty of the right size, called beans, and was soon able to add coal to the fire, keeping it bright and thin, at 30psi I started to use the steam blower to assist the draught. Almost immediately, the safety valve opened which was quite a shock for a beginner (the working pressure is 100psi). I had a full boiler and a hot fire and the safety valve wouldn't close so I dropped the fire. The sliding grate support bars I'd made worked beautifully, which gave me confidence, and soon the boiler was cooling down.

Raising steam.

I quickly discovered that the safety valve needed setting and so I made a small hand tool for the job. On the next firing I managed to let the fire go out before reaching working pressure. The tall chimney creates a good draught when there's some wind but in still conditions, before the fire gets going, I thought it needed some help so I modified an old fan heater to sit on top of the chimney until the blower could be opened at 30psi. As the pressure on the gauge increased I wound down the safety valve to match until I reached 90psi.

I was now much more comfortable with the heat, and the sounds, and the smell, and the sudden safety valve lifting and knowing what I could touch without gloves. I used the blower at 30psi, oiled all

round and started warming the cylinders at 45psi. At this point there was a leak back of steam through the crank pump bypass into the water tank. The boiler feed water enters the boiler low down at the rear, the last runs of pipe are at boiler pressure, and they heat up by conduction from the boiler clack valve and by radiation from the bottom of the fire. It's easy for steam to form in the pipe and find a way out via joints not fully tight. I made and fitted a small heat shield to protect the pipes from radiation from the fire.

At about 60psi the mower started running both forwards and backwards under control of the regulator and Stephenson reversing gear, the crank pump working to top up the boiler. I'd been advised to run-in the motion before working at load so I engaged only the cutting cylinder drive dog clutch. The engine drove the cutting cylinder and no eccentrics or bearings felt warm to the touch.

The plan for the next few firings was to have some longer runs learning how to manage the fire, running against the cutting cylinder load and then, on blocks, running against the roller drive load. Then I'd see how the mower pulled herself before seeing if she would pull me as well. You see, now she had a life of her own, despite having a male name, like many ships, she was definitely female.

There were also lots of little jobs to keep me happy, including: shortening some fixings; cleaning and polishing; making some oak hand grips for the handle bars; making a wooden, on-board coal bunker; painting a red line at 100psi on the pressure gauge. As I have concentrated on achieving a working mower, there will always be possible improvements such as: chain tensioners; chain guards; new grass box; more suitable seat on the roller trailer - plenty to keep me interested and busy.

During firing I managed to let the fire go out a number of times. I learnt that I needed to be more daring with the quantity of charcoal and light the charcoal on a thin bed of small coal.

This had the benefit of raising 30psi without using the electric blower. At 30psi the steam blower can take over. I also discovered that I had not been opening the regulator fully. Over a number of steamings I gradually increased the load.

In due course “NORMAN” drove the cutting cylinder; herself, pedestrian controlled, on the drive; drove herself with the cutting cylinder engaged; and finally cut grass, pedestrian controlled. The old mower’s cutting cylinder is a bit battered and has some tight spots against the fixed blade. This generates peak loads and it’s at these points that the motion stops when pressure drops.

However, at this point, although the grass was too soft for the full outfit, “NORMAN” towed the trailer with me in the seat, around the drive. What a sense of achievement that was. On the next steaming, I was cutting grass, pedestrian controlled, when the whistle valve stuck open. Naturally, it is good steam mower practice to sound the

Chief Engineer and some of the staff at Schlemmer Engineering.

whistle when starting off and when turning at the end of each cut. I dropped the fire. I was amazed how loud, and how long, that whistle blew before pressure dropped too low.

I found that the annular seat for the valve spring was so narrow that the end of the spring had worked into the bore and failed to close the valve. Maxitrak happily replaced the valve. The new one, has the same exterior dimensions but much improved details including a bigger lever, pin and ball and much better spring and seat.

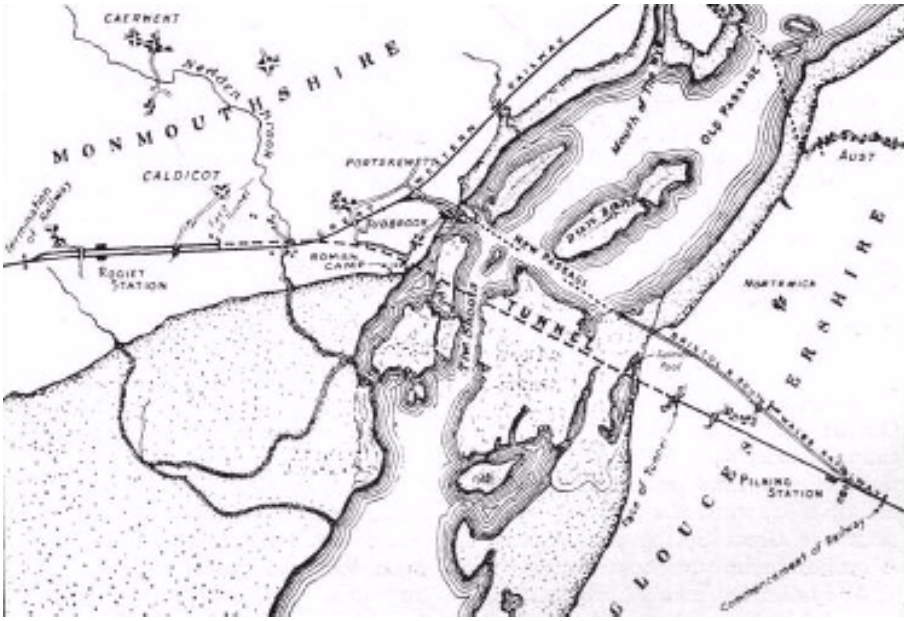
During these steamings, I'd found it difficult to maintain a good fire and working pressure for more than a few minutes. The fire quickly burned too hot and thin or else I added too much coal and pressure dropped. As soon as pressure dropped the motion stopped at a high point on the cutting cylinder. I attended a number of steam rallies and TME events during the season and talked to drivers of miniature traction engines and locomotives. They seemed to use larger coal and had good advice on where to put it on the grate. I bought some larger coal from Larcombes. I'm removing the high spots on the cutting cylinder.

"NORMAN" has now passed her first annual boiler inspection and a winter of maintenance and further, detailed improvements awaits.

Severn Tunnel Story

By Bob Richards

The story of the Severn tunnel, the longest tunnel in Britain and the longest underwater tunnel in the world until recently, is a dramatic story of labour, peril and perseverance of which todays passengers through the tunnel have but little knowledge. The Engineer in charge was Mr Charles Richardson with Sir John Hawkshaw the consulting engineer.



Map of the tunnel showing the old Bristol and South Wales Union Railway ferry.

Work began in March 1873 when a shaft of 15feet diameter was sunk at Sudbrook, on the Monmouthshire side, within 100yds of the remains of the Roman camp which had guarded a ferry on the roman route between the capital of Brittannia Secunda–Caerlon-headquarters of the Augustan Legion at Bath.

During the sinking of the Sudbrook shaft, two springs of fresh water were encountered and dealt with by a Cornish beam engine. The bottom of the shaft was reached and a 7ft. heading, following the axis of the tunnel in a south–easterly direction, was begun in December 1874. This work went on until in August 1877, 4800ft. had been driven under the river bed through sandstone, in which copious fresh-water springs were met which necessitated the digging of a second vertical shaft at Sudbrook for use as a sump and pumping shaft.

By October 1879, four shafts on the Monmouthshire side and one on the Gloustershire side had been provided, from four of them 7ft. tunnel headings had been driven. The heading from the first shaft at Sudbrook had advanced for nearly two miles, and that from sea wall shaft, on the English side to an under-river point 130yds from the Sudbrook heading, and then a catastrophe occurred! On the night of the 16th October 1879, a tremendous underground spring of fresh water burst through into the workings in such, terrific volume that it defied all efforts to dam it back.

Its pressure was enormous. The great pumps were overwhelmed and in a few hours the water was 150ft. deep in the Sudbrook shaft. This was the engineer's first acquaintance with the Great Spring, the continued persistence of which has, to this day, required the use of high-powered pumping plant to keep the tunnel dry. (The quantity of water removed was between 16 million and 25 million gallons per day).

All the fresh water comes from the river Neddern, the waters of which join the river Severn nearby. After the breakthrough the river ran dry for approx. 5 miles. The river flows through a marshy area under which is a layer of limestone dipping towards the Severn Estuary; when this limestone barrier had been partially pierced by the heading, the working face became too thin to resist the pressure of the water any longer. This disaster caused a temporary loss of seven year's work.

The water from the Great Spring was eventually shut out by the use of two heavy oak shields made to fit the entrances to the headings on either side of the first Sudbrook shaft. Three more pumps were necessary to get the water under control.

An Emergency headwall containing an iron door and 2 pipes had been built in the heading and the screwing down of stop-cocks in the pipes would have shut of the 9,000ft heading beyond,

thus impounding the water within. Unfortunately, however, the headwall door had been left open when the Great spring was tapped and the panic-stricken workmen fled for safety.

It was decided to close this headwall door and the job called for a competent diver with plenty of pluck and a cool head. A diver named Alexander Lambert (From the divers news letter) filled the bill, and in his first attempt he moved along a flooded heading for nearly 1000ft. He was completely alone, groping cautiously along in the inky blackness of an underground passage filled from floor to roof with water. He had to manoeuvre his way past masses of rocks, tools and upturned trollies left by the miners in their hurried escape. He got to within 70ft. of the headwall door but, despite every effort, he could not drag the many hundreds of feet of air supply any further; so he had to return to the shaft.

Lieutenant Fleuss, RN. had just invented a diving suit, the first re-breather suit, where the diver carried a cylinder of compressed oxygen and breathed into a bag, which contained a chemical to, absorb the carbon dioxide. This dispensed entirely with the air hose; Fleuss was invited down from London, but failed in an attempt to go up the headwall through excusable inexperience and nervousness? Once again diver Lambert was called in and, after accustoming himself to the new apparatus reached the headwall and removed a pair of tram rails which were jammed in the door, which he closed before returning to the surface in fear of his oxygen supply running out. Two days later he again descended and closed the valves, as he believed, staying under the water for 1hr. 20 min. much to the relief of the main contractor Thomas Walker.

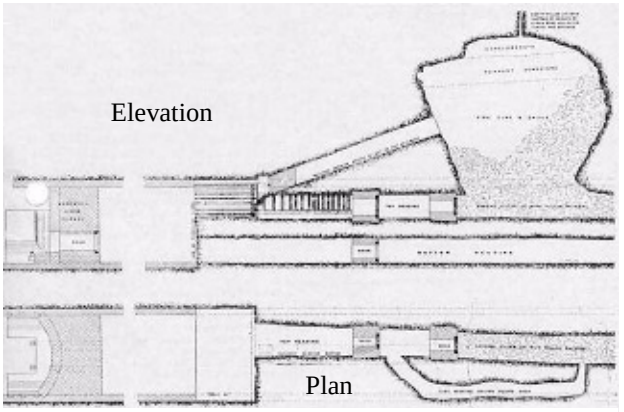
To the intense disappointment of everyone, however, his heroic efforts did not bring about any great acceleration in lowering the water level. A perverse twist of fate ordained that the valves he thought he was closing had a left hand thread, and he had opened it to the full!

This would have been discovered the following day, when the water-level had been lowered by 184ft. in Sudbrook pump-shaft and the door in its side was opened to reveal only 3ft. of water in the heading, but further pump troubles occurred and it was not until nearly a month later that the Foreman of the pumps was able to walk up the heading to the headwall and find the true cause of the trouble. He promptly closed the valve and slowed down the pumps. A fortnight later the doors through the headwall in the northwest heading were opened; at its far end a quantity of rock debris, which had been forced into the tunnel when the Great Spring broke in, was discovered. So another 8ft. thick headwall was built at a point 370ft from the first at Sudbrook shaft.

When the wall was completed on 4th Jan 1881, the workings were shut off entirely from the waters of the Great Spring. As a safety precaution, inner head walls were built at the rear of each of the other two, but the four plugs only “held” the traffic pressure of the Great Spring for two years, during which the general construction of the tunnel proceeded. Additional shafts were sunk, the pumping equipment augmented, and the 7ft headways enlarged to full tunnel dimensions; compressed air drills were brought into use to speed up the excavations.

When it was decided to concrete the river bottom at the Salmon pool, in April 1881, further trouble was experienced. At this point the river is only 3ft deep at low water. To locate the leak men joined hands and waded through the pool. A man disappearing through the hole where the water was finding its way into the tunnel brought their search to an abrupt end. His comrades pulled the man out and the bed of the pool was then covered with a vast quantity of clay.

The following year, although electric lighting was then still in its infancy, it was installed together with a telephone line, throughout the tunnel.



Sudbrook Cavity and headings

By May 1883 it became necessary to tackle the portion through the sealed up area where the waters of the Great Spring were imprisoned, but owing to the great pressure behind the headwall door it was impossible to open it. Another bottom heading was therefore driven below the original 7ft. heading from Sudbrook shaft to a point beyond the headwall; a hole was driven in the upper heading to allow the water to flow along the lower heading to the pump-shaft at Sudbrook. The 7ft heading was then restored and re-timbered and another headwall built immediately below it as a precaution against the tapping of further accumulations of water.

Then on the 10th October 1883, when everything was going favourably, water broke in from the bottom face of the lower heading in greater volume than ever. It flowed down the workings in a 16ft-wide river, poured down into the sump with deafening roar, and completely overwhelmed the pumps again. The doors in the 7ft. headwall and in the rising heading above it were promptly closed, but it was impossible to get near to the headwall in the lower heading, where the impetus of the water swept everything irresistibly before it. All this water was clear and fresh, and was entering the workings at 27,000 gallons per min.

The pumps gradually held it at 132 ft. from the surface. It was considered that the influx was from some underground reservoir which must become exhausted sooner or later.

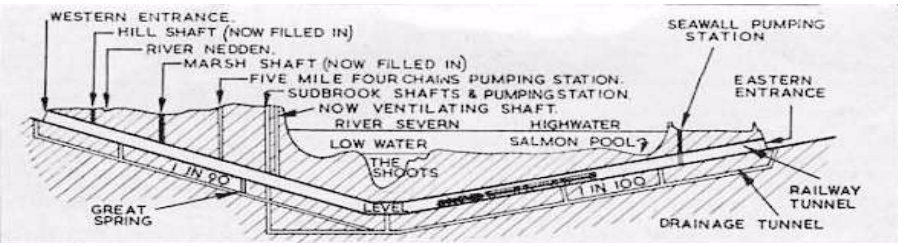
In fact, after 2 days of raising 11,000 gallons per min., the water was lowered a further 13ft. Diver Lambert was again called upon and he went down the lower heading to the door in the headwall and closed it. By November 3rd. the pumps had entirely cleared the workings southeast of the Great Spring, which was held back again by the other headwalls. But while all this inflow was at its worst, the largest pumps broke down and in a few hours the workings were temporarily flooded.

To add to all the tunnel-flooding troubles, on the night of October 17 1883 in complete darkness, a great tidal wave swept up the Severn estuary, pouring over the seawalls and low lying land as far as the tunnel shaft on the marsh, where it extinguished the fires of the pumping engines and thundered down the 100ft. shaft, imprisoning all but two of the 83 men working in the tunnel. In the tunnel the water rose to within 8ft. of the roof, and a small boat was lowered, end on, to rescue the men. They were brought back to the surface the following morning.

So bad was the tidal flooding that the long, deep cutting on the Welsh side of the tunnel was filled and at that date 18th. October 1883 the tunnel works were in a worse plight than at any time since the Great Sprig broke though. Huge quantities of massive timbers from the store yards floated away, never to be seen again and the workmen's cottages were flooded out.

By the end of 1883, 3774yds. of full-sized tunnel had been completed, of which 3179yds. had been arched. The open approach cuttings of one mile on the English side and the one and three quarter miles on the Welsh side were well under way. The Great Spring had been shut off, but the completely incalculable problems it presented were far from solved. More pumps were needed and that meant new engine houses, work which occupied many months.

The pumps cleared the remaining water from the tunnel and it was possible to walk the whole length of the tunnel 4 miles 628yds. On April 18 1885, the last length of brickwork in the 20ft high 26ft. wide tunnel was keyed into place; five months later Sir Daniel Gooch with a party of friends travelled through the tunnel from Severn tunnel junction to the Gloustershire side and back



A section of the tunnel.

At the time of completing the tunnel the main pumping station was at Sudbrook, where five engines were at work; they were called on to raise massive amount of water every day. The other pumping station at the sea wall had 2 engines which dealt with the water, at the welsh side. The max amount of water pumped in one-day 36,556,218gal. Their minimum record 13,374,332 gal. The tunnel was open for passenger traffic 1st Dec 1886 and to goods traffic 1st September 1886.

(Drawings by courtesy of British rail.)

A 'fridge' too far?

by Ray Rolt

Back in the early 50s, there was not the availability of Electrical Goods that there is today and these were expensive. My brother used to buy Newnes "Practical Mechanics", which showed you how to build your own refrigerator!

Always open to a challenge, he decided to do so, and I helped him. We commandeered an old wooden ‘clothes horse’, which had been made redundant by one of those clothes dryers that could be pulled up to the ceiling using two pulleys and ropes, fortunately the house that we rented had high ceilings! This was used to make a robust frame for the outer casing, with the voids infilled with 3” (75 mm.) cork slabs where the cabinet was. The fridge cabinet was formed out of thick galvanised sheet, as was the outer casing. The cabinet was finished inside with several coats of White enamel paint and the evaporator / ice box fitted. A heavy insulated door was made to seal the cabinet, complete with a proper ‘chrome’ fridge door handle.

After all the copper pipework had been done, a pump and electric motor and cooler fitted, and all necessary control gear, it was charged with ‘gas’ by a refrigerator specialist. This ‘marvel’ of ingenuity was positioned in the Parlour and switched on! To our surprise and relief it actually worked! Not only that but it performed without fault for over a year, then disaster!

We had a cat and a dog as household pets, the dog being a black and white “Cocker Spaniel”. One night, Norman and I were woken up by our father. He had heard ‘Banty’ the dog whimpering. We all went downstairs to investigate and, when we opened the door to the Parlour, were engulfed in thick, acrid smoke! The poor dog was lying on the floor with his nose tight to the gap under the door. We somehow managed to cut off the electric supply to the fridge and rescued the dog. Later we managed to open the window and back door to clear the smoke. Yes the cat was alright, it must have been in another part of the house! If it hadn’t been for the dog, things might have been more serious!

The cause of the smoke was the failure of the ‘stator’ on the electric motor, which gives a ’boost’ to overcome the resistance caused by the pump.

The result was that the motor stalled and overheated, the windings became red hot and burnt off the insulation, which caused the smoke. The motor was duly replaced and the fridge gave good service until replaced several years later! The good news is that the dog was non the worse for his experience. You hear of canaries being used to give warning of dangerous gases in mines, but not dogs giving warning of fridge failure!!

My brother's primary interest was in aircraft. As a result, he made several models. The first was called the 'Flying Orange Box', which was a glider painted orange, hence the name. This had a fuselage made of balsa wood sheet which was of rectangular section.

An interesting design feature was a vertical rectangular frame inside the fuselage at the centre of gravity with a central pivot secured to the fuselage. This had a lead weight at the bottom to give a gimbal action and the frame was linked by wires to the tailplane. I can't remember now whether the whole tailplane pivoted or it was fitted with elevators. With the nose slightly weighted, when the glider was launched it would go into a shallow dive and gain speed. The elevators would change the trim and bring up the nose causing the glider to go into a shallow climb. As it lost speed, the whole process would be repeated. The idea was to extend the length of glide before the glider finally landed. From what I can remember, I think that it flew quite well.

The wings were removable and of the usual rib construction with tissue paper skin, coated with dope, and were of about 3'-6" (1050 mm.) wingspan.

His next project was a powered model aircraft, built to a published design, possibly based on a "Miles Magister" light aircraft. By this time, it was possible to buy a "Frog" two-stroke model aircraft engine with a plastic propeller, which performed well, and this was used as the power unit.

The duration of flight was controlled by the amount of fuel put in. This was a mixture of special two-stroke oil with paraffin and ether, which features in the next model! Though it performed quite well, it suffered from a common problem, the heavy landing! The advent of radio control many years later finally solved the problem .

A Frog 50 of the period.

I had been given a ‘Mamod’ stationary steam engine and we decided to make a model cabin cruiser out of balsa wood, using it as power unit. By making a long tiller with the pivot for the rudder at the centre, with fishing line attached to both end of this and to both ends of a length of wood held in the hand, we had an effective means of steering.

Anxious to do a static test , we filled an old galvanised iron bath tub with water and placed the boat into it. A problem! We did not have any methylated spirits. Not to worry, said my brother, we will use some of the ether used for the “Frog” engine. Wrong! With a much lower ‘flash point’ and invisible flame, there was a ‘whoomp’ and my brother nearly lost his eyebrows! Fortunately no serious harm was done.

The boat itself performed quite well and we used to take it to the local canal to run it. Thanks to the rudder control, we could set it going and steer it into the middle and walk alongside it. It could be brought back to the bank at will.

My brother’s last and most ambitious project was to build a full size aircraft!! He obtained the drawings for a small single engined design and got as far as making the skeletal frame for the tail fin.

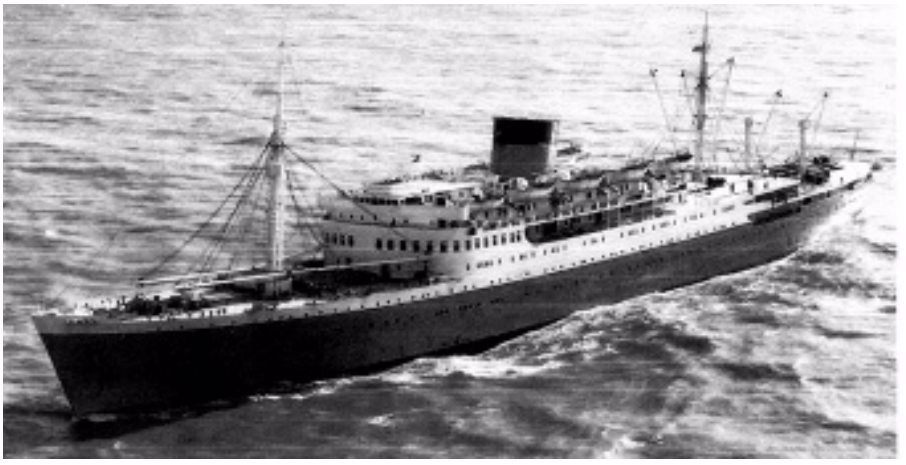
It must have been about this time that he met my sister-in-law and it did not progress any further!! Probably just as well as our back garden would have been too small for take off!!!

Of SHIPS AND THINGS.

By FIREMAN MN retired.

The “Paraguay Star” got into London and we paid off on the 22nd June but I stayed on board as it was due to go for a refit and there was a lot of stores to clear and the four generators to strip down before moving off. This was to be a towing job as the ship would be dead, the job lasted 2 weeks and then I went home.

I soon started to get itchy feet doing nothing so I went up to the docks to see what was about. The “Kenya Castle” was finishing loading so I went aboard to check it out and I signed on as a main greaser, she was sailing the next day so it was a quick dash home to get my gear and say goodbye.



RMS Kenya Castle.

The Union Castle ships were mostly fast passenger liners and mail carriers. It was the companies boast that the town's people of Southampton set their clocks by the mail ship setting sail dead on 4pm every Thursday.

Back to the "Kenya Castle" she was a twin screw steam turbine driven ship of 17,000 tons with a speed of 17 Knots.

The first port of call was Gibraltar, this was mainly passengers on and off plus the mail and general supplies. Interesting little snippet, Gibraltar was known as R.A.F. Lipton, for alongside the airbase was a small Liptons supermarket with the name on the roof 4ft high so it showed up very well from the air.

Two days from Gib we got to Genoa were a great fuss was made of loading sports cars for Cape Town. After Genoa, down the Italian coast through the straights of Massina and then on to Port Said. We did not dock at Port Said but anchored off, all unloading and passenger movements being by lighter and barge.

As we entered the canal I was amazed to see about 20 ships all sunken with just the superstructure and the masts showing above the water, this was Nasser's blockade at the time of the Suez Crises, but a few had been dragged aside to allow ships to pass again. The actual canal is about 100 miles long.

After the port of Suez it is about 1,000 miles down to the Red Sea to Aden where we took on the bulk of our fuel oil. Bunkering finished, off again to Mombasa about 1600 miles, on the way we crossed the Equator with the usual business of King Neptune clambering over the ships side to frighten the life out of the more gullible of the passengers.

After Mombasa came Da es Salaam which was the Capital of Tanganyika and then Beira and Lourenco Marques both in

Mozambique which was the old Portuguese East Africa.
Still heading south through the Indian Ocean we arrived at Durban then East London and Port Elizabeth and finally Cape Town. This was the time when apartheid was in its Hay Day and this is only my personal view, what a terrible thing it was. Blacks only buses or white buses towing an open trailer with no seats. White shops and cinemas and the same for Blacks, segregated schools and pavements had a white line painted down the centre, with the blacks to walk on the roadside. The violence and cruelty had to be seen to be believed, people back in the U.K. just hadn't a clue.

Built on the same style as the famous Raffles Hotel in Singapore was a place called Delmonico's with the whole of the ground floor being a huge bar and dance floor. This is where the "White Supremacy" crowd came to let their hair down, get roaring drunk and behave in a thoroughly obnoxious manner which to me just went to show how sad their lives really were.

Clublec 2014

Phil Mortimer starts the defence of his title

Mark Sweet behind his Princess Marina.

Mark takes the 3.5” trophy

Phil was again the overall winner