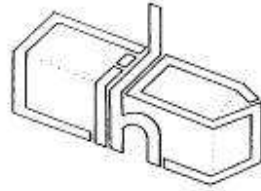


Cumbria Industrial History Society



BULLETIN

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EDITORIAL

Summer is hopefully coming and the Societies activities are starting. There are still plenty of places left for the Spring Conference, if you require a booking form see the Society web site.

Please support the rest of the meetings during the summer there should be something for everyone.

The Mike Davies-Shiels slide collection digitalisation is proceeding rapidly. A lot of the images have now been loaded onto the Cumbria Archive database and they are searchable and viewable on line. The Society can supply low resolution thumb nails of any of the photos free of charge. High resolution files suitable for quality prints will be charged for.

The Society is in the process of getting a new website which will highlight some of the better and more informative of the slides in the near future.

Most of this Bulletin is taken up with the written report by Barrow U3A groups research into Askam brickworks and brick making around Barrow. This follows on from the last November's evening meeting which was excellent and it was thought those members who could not attend should have the advantage of this information. It shows what can be done by a group of enthusiastic researchers.

I do have a number of articles for the next few Bulletins but I am always in need of short filler items and book reviews.

FRONT COVER ASKAM BRICK WORKS (Barrow U3A group)

SOCIETY EVENTS 2014

APRIL CONFERENCE SATURDAY 26TH APRIL 2014

See website for details and booking form.

WORKINGTON'S INDUSTRIAL PAST, SUNDAY 18TH MAY 2014 10.00 AM

The start point is GR NX 984 296. Known locally as the pier end. Its on the south side of the river Derwent. All the walking will be on footpaths and old railways (cycle ways) and possible beach walking. We will use Tesco and Asda parking areas and toilets are not very far away. Restaurants at Morrisons, Tesco, and Asda there is also a McDonalds. A picnic on the beach is nice depending on the weather.

JUNE EVENING MEETING HERON CORN MILL 17TH JUNE 2014 6.30 PM

Meet in Corn mill car park SD 496 799. A tour of the recently refurbished mill and display.

BAUGH FELL AND QUARRIES SUNDAY 20TH JULY 2014 10.00AM

Leader – Kevin Lancaster. Meet at Greenwood Hall, Dowbiggin (SD 6872 9230) at 10am. Weather clothing and stout footwear.

A walk of about 5 or so miles on fell land taking in Wilkin Stile non-lead mine, Dent fault, stone quarries and coal works, seventeen house platforms at Bowscale and mills at Hebblethwaite, lots of pits and two cinder ovens. Lunch at Gill Laid's waterfall.

STAINMORE RAILWAY SATURDAY 23RD AUGUST 2014 10.00AM

Leader – Mark Keefe (Stainmore Railway Trust's archivist) Meet at Kirkby Stephen East station (NY 7618 0668) at 10am. Weather clothing and stout footwear.

Guided walk on the dismantled line past various quarries and former railway infrastructure sites to examine Podgill and Hartley viaducts (Depending on weather and members inclination there would be the opportunity to go further) Back to KSE for a guided tour and tea in the 'buffet'. There is also the possibility of a slide show on the railway.

BROUGHTON AND DUDDON SATURDAY 13TH SEPTEMBER 2014 11 AM.

Meet at Donkey Rocks SD 210 867 for a walk around Duddon Furnace and the industrial sites in Broughton.

AUTUMN CONFERENCE BRAMPTON SATURDAY 18TH OCTOBER 2014

Talks include Brampton businesses and industries, Railways in the area and textile milling.

November Evening meeting Backbarrow Blue works video date and venue to be arranged.

BOOK REVIEW

DEFENCE BY DECEPTION

Colin Dobinson: "Fields of Deception" [Methuen, for English Heritage 2000 & 2013] paperback edition - ISBN 978-0-413-77632-7 price £19.99

As far back as when the Greeks left a wooden horse at the gates of Troy subterfuge has been an accepted military tactic. Even today Trojan Horses cause havoc for unwary computer users.

World War I saw deception first practiced to confuse aerial attackers who, at that time, were targeting visually and had minimal navigational aids. In 1916 staff at the naval base at Lowestoft reported that flares lit on a nearby Royal Naval Air Service night landing ground had drawn numerous bombs from a passing Zeppelin. Later that year flares lit on another Norfolk landing ground lured a German airship for long enough for a friendly aircraft to engage it. Although the Admiralty, then responsible for domestic air defence, receive several proposals to develop schemes for decoy lighting little was done. In February 1916 home air defence passed from the Admiralty to the Royal Flying Corps. There is no evidence that the RFC initiated any decoy schemes for their home stations. On the Western Front, however, considerable use was made of false flarepaths and dummy structures to deflect night air attacks, and mock-ups of the very basic airfields were created with tents and derelict aircraft away from the functional bases.

"Fields of Deception" by Colin Dobinson takes these early experiences forward to chart the extensive systems of bombing decoys installed across Britain during the Second World War. As the threat of war grew an Air Raid Precautions Department had been formed in 1935 to study measures that would protect the country against bombing. Civil defence preparations were piecemeal but the need for lighting restrictions in industrial and built up areas and at military installations led to black-out trials in 1936/7. The first trials of a 'baffle lighting' application – to artificially mimic a target to deflect approaching enemy aircraft – was carried out over the Humber in May 1939 with some success. Lack of communication within and between the Services and Departments then mired the entire exercise in a Monty Pythonesque muddle. Salvation came with the appointment in September 1939 of the wonderful Col. John Fisher ('Conky Bill') Turner, a retired Royal Engineer who had risen to be chief engineer to the air force in India and later Director of Works and Buildings at the Air Ministry in London. Since 1931 Turner had presided over the whole of the RAF's unprecedented expansion programme. He was also a qualified pilot and knew the UK airfields from the air as well as on the ground.

Turner was installed in an office at Aerial House on the Strand but for security reasons was never granted any official title. His section, as it built up, was known simply as Colonel Turner's Department. Turner was a man of drive, ready to take initiatives and well able to handle the internal politics of the Air Ministry.

Within weeks Turner had pulled together the several disparate trials for protecting UK airfields and by mid-October 1939 had prepared a specification for day and night decoys. The daylight decoys (later designated 'K' sites) would consist of either a grassed flying field or an area of gorse or heather where tracks could be cut. Each would be equipped with ten dummy aircraft and features like fuel dumps would be created to ape those on the RAF's satellite airfields. The daylight decoys would be sited roughly six miles on the approach side of the 'parent' RAF airfield and would be provided for each airfield east of a line Southampton-Birmingham-Perth. Night decoys ('Q' sites) were simpler affairs with electric lighting replicating the provisions of a genuine airfield, including T wind direction indicators and a set of car headlamps to mimic taxing aircraft. Siting of the lighting decoys was easier as they could be put anywhere irrespective of topography and the lights might even be placed on poles on arable land.

From these abstractions Turner then focussed on the practicalities. Prototypes for several designs of dummy aircraft had already been commissioned and Turner went on a tour to inspect the results. A visit to Shepperton film studios immediately convinced him that the skills and ethic of the film set-designers there were ideally suited to producing the aircraft mock-ups that he required. Of all the trial dummy aircraft Turner inspected the Wellington bomber from Shepperton impressed him most. Soon Norman Loudon, the general manager at Sound City Films, Shepperton was invited to assess a dummy Whiteley produced in Gateshead and a dummy Hurricane built at Hailsham in Sussex. An immediate order for 100 Blenheims and 50 Wellingtons was placed with the Sound City team. Much detailed attention was also given to making the decoy airfields appear as convincing as possible from the air and to ensure their frequent modification so that regular reconnaissance would create an impression of operational activity. Training of personnel to man the decoy units was begun. By April 1940 36 'K' sites had been commissioned and the first 'Q' sites were in position. By mid-June all but three of the 54 planned night decoys were operating.

By early 1940 the initial concentration of concern on protecting airfields was extending to aircraft factories and a range of civil targets. Turner was confident that the Sound City technicians were entirely capable of providing mock-ups that could serve as decoys for factory buildings and similar large structures. He ordered the construction of a trial dummy factory north of Banbury. Among the aircraft factories listed for provision of a decoy was Short Brothers seaplane factory at Rochester and this was among six factory decoys completed by late-summer 1940. However, plans to enlarge the Rochester factory were rescinded due to its being within the range of enemy bombers and urgent action was taken to establish the new seaplane factory for Shorts at White Cross Bay on Windermere.

During 1940 a decision was taken that a single unified structure was required to deal with all decoy activities, both civil and military, under a recognised individual – a 'dictator of dummies'. Unsurprisingly, under Turner's leadership a network of defensive decoys was created across much of the UK. Ports and a wide range of military facilities were added to the anticipated targets and, with the beginning of the London blitz, an extra system of fire decoys ('QFs') was devised to distract enemy aircraft if their attacks were extended to other centres of population. In late November of 1940 Coventry suffered its first major bombing raid. This accelerated the creation of a more substantial fire decoy (the 'SF' – known as Starfish) for use in the event of sustained Luftwaffe bombing. Large fires would be lit to draw secondary waves of bombers away from their intended target to reduce casualties and damage.

Dobinson's book contains a great amount of detail of the various decoy arrangements, with drawings, photographs and analyses of their effectiveness. A complete gazetteer of sites is given and a tally of the enemy attacks they attracted. A short final chapter notes the few surviving remains from this unique episode in the history of warfare and the story of our nation.

Decoy sites within Cumbria:

Greystoke Park experimental site for development of 'QF' equipment

Barrow port decoys (4 sites, all 'SF/QL')

Workington port decoys (2 sites, both 'QF/QL')

Ravenglass decoys [? Eskmeals & ROF sites] (one site 'QF/QL', one 'QF')

Broughton Moor RNAD decoys (2 sites, both 'QF')

Carlisle RAF Rockcliffe ('QF')

Army: Aglionby ('QF/QL')

Silloth RAF (2 sites, both 'Q')

PENRITH THROUGH TIME BY Dr. B Lindley & Dr.. J Heyworth Amberley
£14.99

This is the usual photobook with old photographs and the modern day equivalent. Unfortunately most of the photos are of social situations and there are very few pictures of industrial photographs.

FROM CLAY TO SHALE

A research project into the need for bricks and their manufacture in Barrow in Furness and Askam in Furness.

1845-2013

The Background

Thirteen members of the Furness U3A Industrial History Group, during 2012-13, undertook research into the need for housing in a rapidly expanding population in Barrow in Furness from 1845 onwards. Brick manufacture became the focus of our research in Barrow in Furness and later at Askam brickworks. The latter brickworks has been referred to as 'A Museum Piece', has produced bricks continuously since 1900 and is one of the last, if not the last, remaining family owned, coal fired shale brickworks with a fully operational Hoffman type kiln.



In the 1840's Barrow was a village of 325 residents clustered along and close by the Walney Channel. There were 4 jetties from iron ore yards and in 1849, 1,911 ships docked there. About this time in the region of 182,000 tons of local iron ore was produced annually. Initially it was the development of the iron and then the steel industry that brought men, and later their families to Furness eg. miners from Cornwall to extract haematite ore, iron and steel workers from the Midlands and others who wished to be employed in heavy industry. The population rose from 325 in 1845 to 20,000 by 1861. Clearly there was a need for houses, industrial buildings and transport infrastructure. Barrow-in-Furness became known as a 'well planned mid Victorian town' built in brick on the grid system.

A Short History of Brickmaking in Furness

High quality iron ore found locally, made the building of a large iron and steel works a profitable venture, and with suitable land at Hindpool the catalyst was set for other industries to follow. Workers were needed from all over the country to build and operate the plant and machinery, and in turn they required accommodation. Terraced housing, shops, churches and other infrastructure for a growing industrial town were now required plus a large brickmaking capability.

The Furness Railway was initially established in the locality in the 1840's and as it developed the means was there to bring workers here in their thousands, and after 1857 building began in earnest. During the next thirteen years up to 1870, much of the terraced housing in Hindpool was built, including St. James Church and of course the steel works itself which needed numerous workshops, outbuildings and offices. The docks were constructed, together with its own infrastructure plus buildings such as the huge

Walmsley and Smith cornmill.

At the time of writing this article it is not certain who the main brickmaking businesses were during the 1860's, but The North Lancashire Patent Machine Brick and Tile Works Limited, incorporated in 1862, moved to the Hindpool site soon after. Brickmaking would continue under various owners there until 1967 when the Furness Brick and Tile Company Limited, sold this site to ASDA and concentrated making bricks from shale, rather than clay, at its Askam brickworks. The demise of the common clay brick was due to the use of breezeblocks, far cheaper to produce and faster to use to complete a building.

Another large brickmaking enterprise which took over the above site was Woodhouse Son and Andrews, operating between 1870 and 1882, then Caruthers and Co. from 1882 to 1885, followed by R.F. Matthews and Co. who worked the site before Furness Brick and Tile took over in 1899.

The other main brick maker, builder and timber merchant during the 1860's and beyond was William Gradwell. His company built most of the terraced properties in Hindpool and elsewhere, including St. James Church, Duke of Edinburgh hotel and many imposing buildings in the town. His two main works were on the corner of Hindpool Road and North Road, now the site of Hollywood Park, known as Hindpool Brickworks and Sawmills, and secondly, Dalton Road Brickworks, situated close to Thwaite Street and running parallel with Rawlinson Street as far as Cavendish Street. This site also included a sawmill as timber was a large part of the Gradwell empire. Exact dates for these two sites are unknown and further research is needed.

William Gradwell's company produced many millions of bricks, and as well as being a building contractor, and supplying other builders with bricks, he supplied all the timber products for the buildings themselves. The other companies mentioned above were primarily brick producers, supplying the numerous local builders in the town and the surrounding district.

Ulverston Brickmaking Company was operating between 1874 and 1877, and Gradwell was also connected with it as well as the Barrow Brick Company Limited from 1873 to 1875. Gradwell took over this company. The Brick Business Books, which show quantities of bricks produced between 1871 and 1885, are in the possession of the Collinge family, of Furness Brick and Tile, and list the many builders and brickmakers operating at that time, but it is impossible to determine who were making bricks and who were the customers, ie. builders. The books were intended to register the amount of clay or sand taken from the ground and list the royalties which were due, but they also indicate the numbers of bricks produced.

Financial History

The Collinge Family

The business is currently owned by the three Collinge brothers, Roger, Richard and John, with Roger acting as Company Secretary and Richard as Managing Director. They are the third generation to sit on the Board. We were very fortunate to be provided with copies of the published accounts of the business from its formation through to 1980.

The Early Days 1898-1904

The company was incorporated in August 1898, purchasing the freehold of existing brickworks located at Ormsgill and Hindpool in Barrow in Furness for £17,500. Over the next couple of years improvements were made at both sites. In December 1899, the company's four directors, R.F. Matthew (Brick Manufacturer), Henry Mellon (Mining Engineer), John Field (Builder) and George Heath (Brewer) established a separate business Askam Brick Co Ltd to operate the brickworks at Askam which Henry Mellon had already begun to construct. The company was partly financed by FBT. Local shale beds were purchased. Brick making at Askam commenced in December 1900.

In May 1902 the two companies were combined when FBT purchased the shares of Askam Brick Co for £5,403 financing this by issuing more ordinary shares. By 1901 FBT was booming, enabling it to pay a 20% dividend to ordinary shareholders. High profits and dividends were maintained for the next three years.

Prosperity 1905-22

Sustained profitability meant that dividends could be paid every year averaging 14%, with peak levels of 20% in 1913-15 and 1920. Net profit peaked at £9400 in 1921. By 1912 all the loans taken out to establish the business had been repaid.

Depression and Recovery 1923-39

The slump in the national economy led to a decline in building and therefore demand for bricks resulting in a loss being made for the first time in 1923. But demand picked up by the mid 1920s so that profits averaged around £3600 between 1925-33. To bolster demand and diversify the business, the company went into property development and profits allowed a record dividend of 25% to be paid in the years 1935-38.

World War Two and its aftermath 1940-8

During the early war years sales and profits held up reasonably well, but from 1943 - 1948 losses were incurred each year, reflecting the dramatic slump in sales. Total losses of over £12,000 were incurred and dividend payments ceased from 1943 onwards. Modernisation of the works at Askam and Hindpool was undertaken after the war, which was the first major capital investment since 1920.

Post War Prosperity 1949-65

The modernised production facilities allowed FBT to take advantage of the increased demand for bricks in the 1950s and early 1960s. Dividend payments were resumed in 1950 and by 1953 the company was debt free and paying dividends of 10%, the peak level achieved in the post war period.

Retrenchment and Modernisation 1966-1980

Losses on brickmaking in the late 1960s led to closure of the Hindpool works leaving only Askam still producing bricks. However, major investment was undertaken in the 1970s to secure the future of the Askam works by improving efficiency. Much of the funding for this came from the sale of the Hindpool site. 1980 saw profits reach an all

time high of £16,433 allowing a large bank overdraft to be paid off.

Transport

By siting their brickworks at Askam, the directors of the Furness Brick and Tile Co. Ltd. were able to take advantage of the well established Furness Railway to transport their heavy loads of bricks to prospective customers. Until 1953 the works used a siding with access to the Furness line at the north side of the works. In that year the siding was altered to give access to the south instead. The siding was closed before 1956.

Everything is now transported by road.

Initially shale for the Askam bricks came from local workings at the more northern end of Spring Wood, later from areas nearer to and then directly behind Park Farm. Items for a tramway to transport the shale to the works required purchases recorded in the Company Minute Book:

October 1899 £246.13s.2d for rails;

November 1900 £52.10s for wagons from A Koppel

January 1900 £425 for engine from T Mitchell & Sons:

March 1900 £8.0s.5d for sleepers .

The Directors Rough Minutes Book has an entry dated **28th September 1900** of an agreement with Dalton Urban District Council for the tramway to cross Park Road.

The shale is now obtained by excavating an area near Greenscoe Quarry (Cragg Wood) and transported to the works by road.

Geology

The locally born geologist John Bolton published his book Geological fragments of Furness and Cartmel in 1869. This described and recorded the volcanic origin of Greenscoe and High Haulme but did not mention the presence of the shale, which is now understood to be derived from mudstones of the Skiddaw group. Shale makes very strong bricks – much stronger and longer lasting than clay.

There are large deposits of shale in the area, which are quarried bi-annually and can be stacked just outside the brickworks as it is not affected by the weather. As soon as it enters the brickmaking process the shale must be thoroughly crushed and small amounts of water added before being pressed into brick moulds.

Brickmaking...Machines and Processes

Before the 1879 invention of the steam shovel all material for brickmaking would be dug by hand. This would be transported by horse and cart and wheel-barrow to the works.

Clay would be mixed to an even consistency in a pug mill by horse and roller, rotating around a central pole. A proportion of water would be added depending on the dryness or hardness of the clay.

Before mechanisation bricks were made in single wooden mould boxes, or in sets of 6, by a brick moulder and his assistants, working for 12 to 14 hrs. to produce between 3 and 5 thousand bricks per day. The 'off-bearer' would remove them from the mould and transport them to a level bed of sand to dry outdoors or in sheds. During this, 'edgers' using 'clappers' would turn and straighten them.

Shale used by the Askam Brick Company since 1900 has to be crushed by heavy steel rollers into powder in a pan. This drops and is then fed into the worm-screw mixing box

where a small proportion of water is added to make it mouldable.

The 1852 American Ver Valen was the first steam driven brickmaking machine invented and imported here and Australia. When these or similar machines were introduced to Manchester in 1861, a few months later many were blown up by the labourers fearing loss of employment ! Clay would be pressed into moulds or extruded through dies and the protruding ribbon sliced into even length pieces by cross cutting wires or blades. A Bennett Sayer 1960 extruder is still operational at Askam alongside the press moulders. The current two James Mitchell pressed brick machines, working at 2000 lbs per square inch, can each make 50 bricks per minute, dark grey at this stage. They then drop onto a conveyor belt and pass down to men preparing the stacks, each of about 400. If they are required to be textured, at the intermediate position on the belt, they can be coated with dry particles of shale or grit. Spaces are left between all bricks to allow even firing. Some stacks are built curved on one side to fit the arch curvature of the kilns. They are then moved into the kilns by fork lift truck.

40 tons of Shotton coal from Co. Durham are currently delivered by road weekly and conveyed to the top floor above the kilns to dry on the hot surfaces. It is hand fed down feed tubes to the two or three kilns forward of the main fired kiln to warm them up preceding main firing. The main kiln is fired to maximum temperature by pulverised coal which is blown down into the kiln by 8 or more hoses radiating like octopus legs from the electric pulverising machine above. This machine is affectionally known as the 'Octopus'.

Making bricks in a Hoffman type kiln

The Hoffman type kiln at Askam brickworks comprises 20 back to back chambers – 10 on each side of the long building. Chambers 1 and 20 and 10 and 11 are open plan at the ends ie. having no permanent back. The back is rebuilt by hand, with its necessary trace holes, of the same 'green' (uncooked) bricks that are loaded into the chamber for firing. They become part of the end product with the back being replaced upon each firing.

KILN SIZE Approx. 9.7m deep, 2.5m high, 4.5m across the floor

TRACE HOLES These are in the arch walls like narrow doorways- approx 0.5m high x 0.25m wide. There are 7 on each side, equally spaced, interconnecting every chamber. Before loading these are temporarily sealed with thin card supported by thin wood batons. The card falls out and burns out during firing allowing air and transfer of heat forward from one chamber to the next.

FEED TUBES Each chamber has 28 feed tubes leading down into it from the floor above, each capped with a steel lid. These enable small coal or powdered coal to be fed into the chamber. When cool, electric lights can be lowered down them to assist unloading.

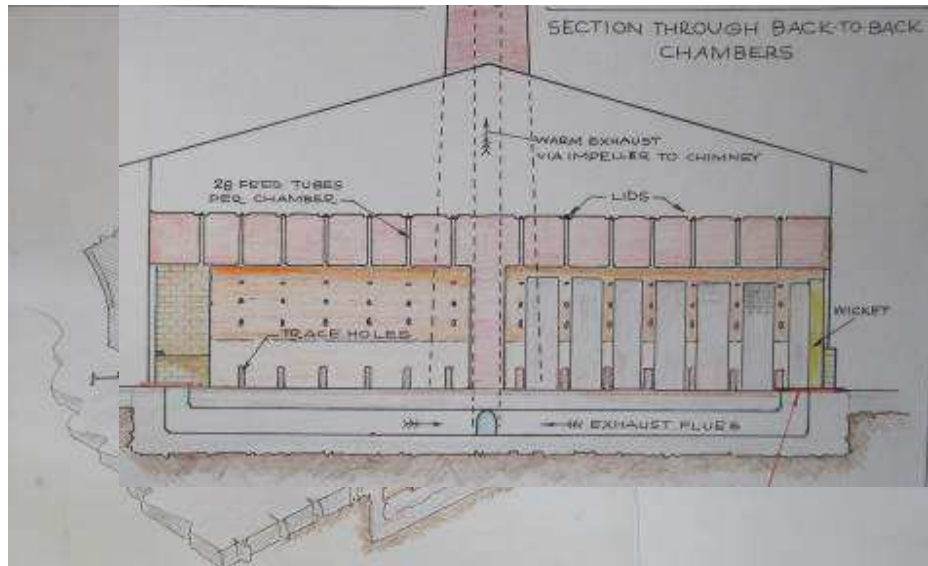
DAMPERS Every chamber has a steel plate damper at floor level accessible from outside. When opened exhaust from firing is sucked out into the under- floor flues which leads to the impeller and chimney.

CHIMNEY 40m high emitting heat 50-100⁰C, steam and a little smoke, being

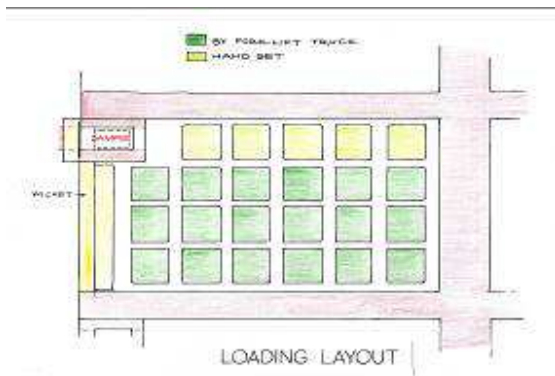
controlled by its own damper and impeller (fan that draws).

WICKET

This is the name given to the 0.5m thick front wall sealing the chamber after loading. It is made of heat resisting blocks, old bricks and finally screeded with slurry from the brick pressing machine waste.



LOADING Each chamber is loaded high with 23 stacks of bricks, amounting to 20,000. Gaps are left in line with the trace holes to allow the transfer of ventilation and heat forward. It takes about 4.5 weeks for a chamber to cool to 40-50 degrees to enable unloading. It is reloaded as soon as possible in order to prevent over cooling. It takes 3.5 weeks to restore if allowed to go cold.



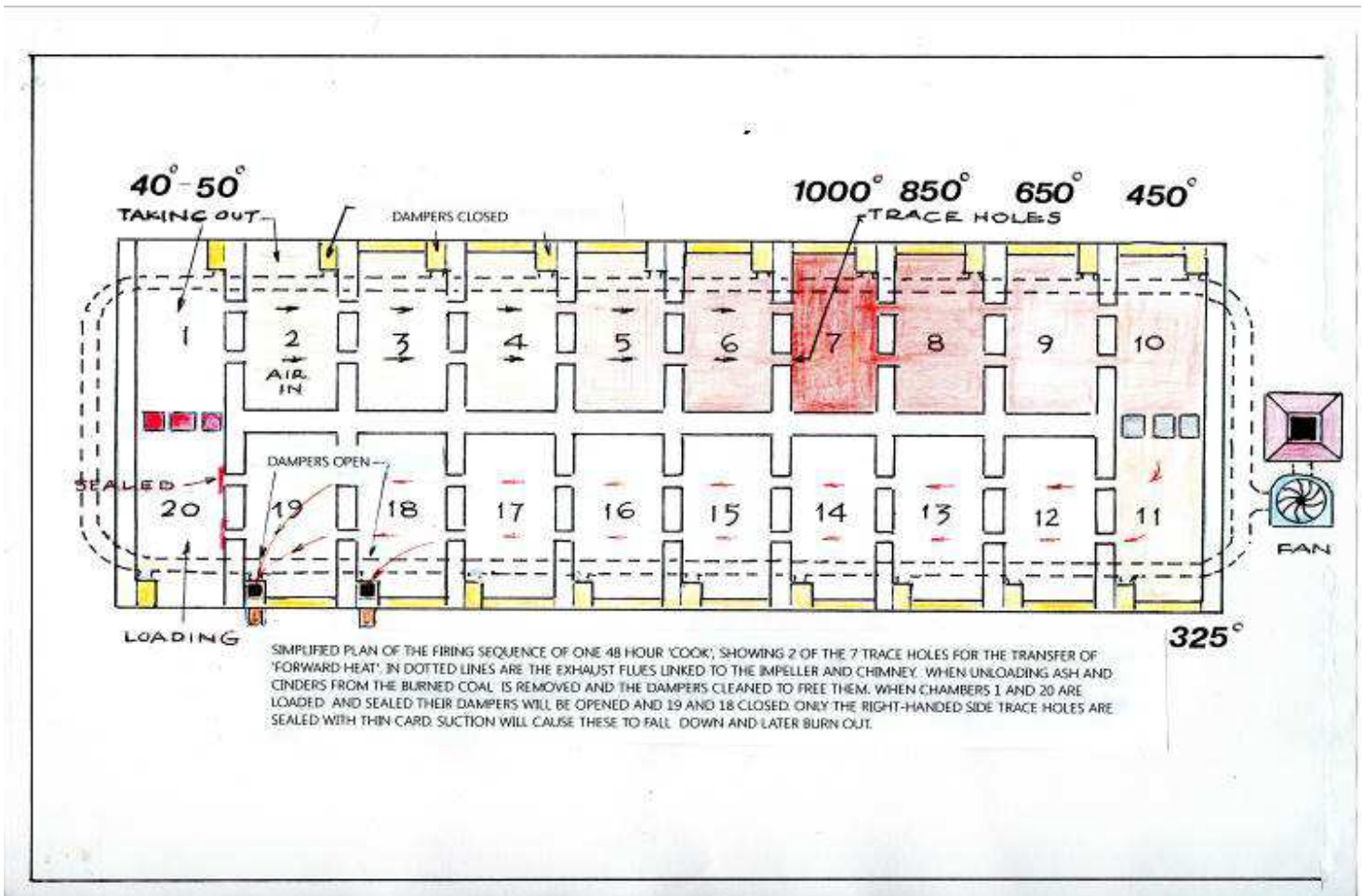
TEMPERATURES

Chambers are continuously monitored in the control room. Thermo couples are set into the top of the feed tubes. Firing is between 1000-1040°C depending on the final colour and hardness required.

FIRING

This is achieved by burning small coal to preheat the next 3 or 4 chambers after the main fired chamber (MFC). The main chamber, already pre heated, is fired by the OCTOPUS blowing air and fine dust of pulverised coal down the feed tubes – one OCTOPUS is employed for 20 hours of 'cooking' and a second is added for the remaining 20 hours. Coal combusts spontaneously between 450/500°C and is ignited from the trace holes of the MFC.

The whole process from firing to unloading can take 5 weeks, a minimum of 4, determined by production rates and outside temperatures.



KEY FACTS

Currently 6000 tons of shale are mined twice a year

3 tons of shale make 1000 bricks

Wastage factor of spoilt bricks is 10% but many are reusable or recycled

Production 2013 was about 4,000,000 recession curtailed demand. It should improve in Spring/Summer 2014

Askam brickworks produces many specialist and decorative bricks for heritage buildings etc. To achieve this they have a large variety of moulds and can vary the temperature when firing or add compounds of elements such as manganese to change the hardness or colour of the bricks. Various methods such as 'tumbling' are used to provide texture to the fired brick to make them match old buildings undergoing restoration.



Specialist bricks.



The “Octopus” -note 2 in use



Coal drying on the floor (above the kiln)



Extracting the shale 2013



Locomotive taking Locomotive taking shale from behind Park Farm to the Brickworks

Environmental aspects

Since the 1970's shale has been extracted from Cragg Wood which is an ancient and environmentally rich area with indigenous trees such as oak, ash, hazel, alder and hawthorn. It is also rich with an abundance of flora & fauna. Badgers have been known to live there for countless years & deer too, also game birds. The Shale quarry, like all quarries, has destroyed the natural environment as work has progressed.

There are very strict, numerous and complicated regulations from the Department of Environment to ensure the restoration of the site. The Planning Officer monitors the progress of restoration throughout at regular intervals. In particular the regulations state that the overburden, which is what is left after the top soil, sub soil and shale has been extracted, has to be restored within a season of its disturbance. It has to be reseeded with grass, indigenous wild flowers & trees. It is monitored regularly by the Planning Officer in order to ensure that weeds and other invasive plants do not interfere with the regeneration. It is a very costly procedure and regulations state that a fund has to be established before quarrying begins to ensure its implementation for the benefit of the environment and humans. Askam brickworks received permission in 2013 to continue to extract shale for a further 15 years.

The Furness u3a Team working on this project are indebted for the help of many people but in particular wish to thank the Barrow in Furness Archive Department and Roger, Richard and Nick Collinge.



HERON CORN MILL from the MDS collection taken in July 1988 and site of the June evening visit.

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