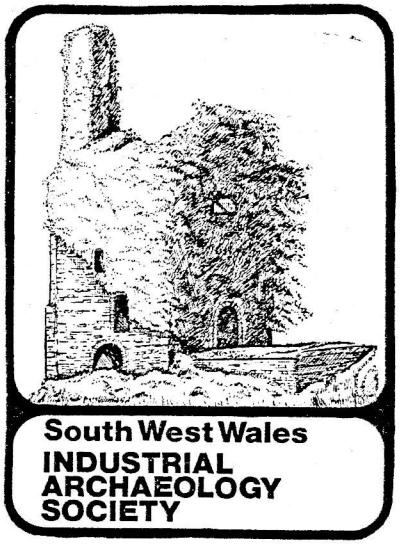

SOUTH WEST WALES INDUSTRIAL ARCHAEOLOGY SOCIETY

NEWSLETTER CYLCHLYTHYR

CYMDEITHAS ARCHAEOLEG DIWYDIANNOL DE ORLLEWIN CYMRU

No. 17: November 1977
Editorial Committee: F.G.Cowley, P.R.Reynolds, W.I.Roberts
Price to non-members: 10p.

FORTHCOMING EVENTS

24 November

Gwyn Walters, M.Sc., National Library of Wales
'The mapping of South Wales before the Ordnance Survey'
(To be held in association with the Extra-Mural Department.
Admission: 20p.)

8 December

Tony Evans
'The decline of the tinplate industry in South Wales between the wars'
Admission free.

Both meetings will be held in the Royal Institution of South Wales (Swansea Museum) and will commence at 7 p.m.

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Scott's Pit. Days on which the dig will continue are:

19 November 10 December 20 January

Work starts at 9.30 a.m. See page 5 for a progress report and details on how to find the site.

ARE YOU SUPPORTING YOUR SOCIETY ?

We have to ask this question because your Committee members were recently embarassed by the very poor attendance at an evening meeting of the Society. We would like you to help us prevent a repetition of the situation.

Dr Alan Griffin was invited to speak on the industrial archaeology of coal mining because it was directly related to the Society's work at Scott's Pit and because it forms an important part of local history. No-one had spoken on this aspect of the subject before, and it was one which, it was felt, would have a wide general appeal. Because it was an expensive lecture to arrange the Extra-Mural Studies Department of the University College agreed to support it as part of the joint programme, and one of the members of the S.W.W.I.A.S. provided overnight accomodation to avoid hotel costs.

However, despite the publicity leaflets produced by the Department of Extra-Mural Studies and circulated to all members by the S.W.W.I.A.S., only ten members turned up to hear this fascinating talk. Can you imagine how embarassing and disappointing this is to members of the Committee who have gone to the trouble of organising the event, and how the speaker must feel when he has made a round trip of over 200 miles, part of it in fog, and taking two days ?

We are going to try harder - by more publicity - but, please, we need your support. It is your society, after all.

ALL DONE BY BLOWING

Wind-powered land transport in South Wales and elsewhere

It was probably the Jesuit priest, Fr. Juan Gonzales de Mendoza who first introduced to Europe the Chinese idea of a landship. This was a wheeled carriage with a sail which depended on the wind to drive it. According to Robert Parke's English translation of Mendoza's Historie of the great and mightie kingdome of China published in 1588, the Chinese

> have amongst them many coches and wagons that goe with sailes, and made with such industrie and policie that they do gouerne that with great ease: this is crediblie informed by many that have seene it.

The idea aroused considerable interest in Europe, and in about 1600 or 1602 the Dutch scientist, Simon Stevinus, constructed a landship large enough to carry 28 people. It was given a run on the sea shore and is said to have covered about fifty miles in two hours. The event was recorded by the artist De Gheyn, and his print depicting the occasion still survives.

The landship made its appearance in literature too. In Paradise Lost (III, 437-439), John Milton writes of

> the barren plains
> Of Sericana where Chineses drive
> With sails and wind their cany waggons light.

His knowledge is presumably derived from Parke's translation of Mendoza. Some modern critics believe that Milton really doubted the veracity of the Jesuit writer.

The next appearance of the landship brings us a lot nearer home, and, for perhaps the first time, is a serious attempt at providing cheap, efficient transport. In 1697 or 1698 William Waller, Steward of the Mines to a company known as the Mine Adventurers of England, visited Neath where Sir Humphrey Mackworth was energetically exploiting the coal reserves. He was highly impressed with what he saw, and in the Epistle Dedicatory of his book An essay on the value of the mines late of Sir Carberry Price (1698) he wrote of Mackworth's

> new sailing-waggons, for the cheap carriage of his coal to the water-side, whereby one horse does the work of ten at all times; but when any wind is blowing (which is seldom wanting near the sea) one man and a small sail does the work of twenty... And, I believe, he is the first gentleman, in this part of the world, that hath set up sailing engines on land, driven by the wind, not for any curiosity, or vain applause, but for real profit...

Mackworth's waggons were really wind-assisted, rather than totally dependent on the wind. They were used on the waggonway system linking his mines to the shipping places. It was, of course, essential for the landship, if it was to have any hope of catching on, that the way should be absolutely smooth and regular, even though the Chinese do not appear to have used any specially prepared surface.

Over a century later, and just a few miles away, another attempt at harnessing wind power for land transport was made. The Cambrian (18 April 1807) reported that

> An experiment of a novel kind was made on the Oystermouth Tramroad yesterday, to ascertain the practicability of a carriage proceeding to the Mumbles without horse, by the aid of the wind alone. Some Jolly Sons of Neptune rigged a wagon with a long sail, and the wind blowing strong and fair as could be wished, set out from our quay, and after clearing the houses dropped anchor at the end of the tramroad in less than three quarters of an hour, having come a distance of about $4\frac{1}{2}$ miles.

This gives the sailors an average speed of somewhat over 6 m.p.h. compared to Stevinus's 25 m.p.h. However, for a wagon with cast-iron wheels on a cast-iron tramroad, the performance sounds plausible.

Nearly thirty years later a similar experiment was carried out at Llanelli on the railway from Llanelli Dock to Dafen belonging to the Llanelly Dock & Railway Co. Again The Cambrian tells the story. In its issue for 15 November 1834 the following paragraph appears:-

> Novel Railway Trip. On Friday the 7th inst., a coal waggon was rigged with a mast and sail by Capt. Hurst of the Emperor Alexander and was placed on the Llangennech Coal Company Railway at Llanelly Dock. The wind blowing strong in the direction of the railway, the waggon was put in motion and proceeded to St. David's Pit, actually going up the inclined plane, which is half a mile long. The whole distance is nearly three miles and was performed in 7 minutes and a half, which is somewhere about 25 miles per hour. On a subsequent occasion when the wind was blowing against the side of the waggon, it was propelled at the rate of nine or ten miles an hour.

A speed of 25 m.p.h. seems rather exaggerated for an up-hill run, even though it is matched by Stevinus's speed. Incidentally the word "novel" used in the reports of both the Oystermouth and the Llanelli trips is hardly apt in view of the long history of the idea.

What is really interesting about all these reports, and what this little note does not attempt to answer, is what, if any, was the influence of one experiment on another. Had Stevinus read Mendoza's Historie: did Mackworth get his ideas from Paradise Lost; had the "Jolly Sons of Neptune" at Oystermouth heard of Mackworth's earlier experiments at Neath; and had Captain Hurst any connection with the episode on the Mumbles Railway? It would be fascinating if it were to prove possible to link all these events to one another, but perhaps that would be to expect too much. After all, the idea of harnessing wind power for land transport is fairly obvious to a community familiar with sailing ships, and the notion might well have occurred independently to the people involved in all these different enterprises.

F.G.C. P.R.R.

WHO'S HUGHES ?

In a lecture given on 14 October 1976 Professor Emeritus E.G.Bowen mentioned one John Hughes of Dowlais who went and founded an iron works in Russia, yet another of the band of Welsh global venturers whose mastery of their trade and absolute confidence took them to many parts of the world.

Although documentation on John Hughes is sparse in South Wales, an article in the Journal of the Iron and Steel Institute (no.11, 1889) throws a little more light on the Russian works. It states:-

> RUSSIAN IRONWORKS. Professor Time, of the St. Petersburg Mining Institute, has prepared an elaborate report on the present condition of the metallurgical and minig industries of the Don coalfield. This has been translated from the Russian by Mr. G. Kamensky.
>
> The author first describes the oldest of the South Russian ironworks - those of Mr. Hughes. They are typical English works, with two blast furnaces. It is now proposed to build a third, capable of yielding 160 tons per day. The life of the old coke furnaces having a yield of 25 to 30 tons per day often exceeded nine years, or about 110,000 tons during the whole period. Under present conditions at Hughes' works a furnace is capable of yielding 100,000 tons during its four years' life. Mr. Hughes is of the opinion that a shorter life with a corresponding increase in production is still more profitable, and that 150,000 tons of iron may be smelted in two or three years with great advantage.
>
> The Hughes works possess both a puddling and a stell-making department. The former consists of eight open-hearth furnaces and a three-high rolling mill. The yearly production of rails is nearly 30,000 tons. The open-hearth process takes twelve hours. The furnace charge is composed of 10 tons of pig iron, 5 tons scrap iron, ½ ton spiegeleisen, and a small quantity of Krivoregsky iron ore. The metal is run into a cast iron mould. The ingots have a section of 14 inches square at the wide end, and 12 inches at the narrow end. Their weight varies from 1 ton to 1 1/3 ton. Each ingot makes four rails. One ton of rails requires the consumption of ½ ton

(P.T.O.)

of coal in the open-hearth furnaces, and 3/4 ton for reheating and working the rolling mills.

The number of men employed at the works and in the mines is 4,000. The amount paid in wages varies from £15,000 to £18,000 per month. The production of the Hughes ironworks during the year 1888 amounted to 53,704 tons of pig iron, 26,877 tons of steel rails, 4,224 tons of chairs, fish plates, &c., and 4,750 tons of manufactured iron. Of coal, 263,730 tons were raised, and 67,708 tons of coke were produced.

If anyone has any more information regarding Hughes, I would be pleased to hear from them.

Jim Lerwell

(Dr Fred Cowley draws our attention to a brief article on Hughes in the Dictionary of Welsh Biography. He was born at Dowlais in 1814, and eventually became General Manager of the Millwall Docks Ironworks in London. While he was there the Russians invited him to establish an iron and steel works in their country. The site he chose was in the Donetz basin, a lonely spot, but convenient for iron-ore mines and ports. The New Russia Co. was founded in 1869, and before long the large town of Yuzofka (Hughesoffka) was established. The early workers came from South Wales and elsewhere. Hughes died in 1889, and his company was nationalised at the Revolution. Hughesoffka became Stalino, and subsequently Donetsk. Ed.)

SOCIETY EXCURSIONS, 1977

The first field day of the summer was a visit to Cardiff on June 25th to visit the new Industrial and Maritime Museum of Wales. The bulk of the exhibits are engines indoors, and outside there are a number of railway relics. A common reaction among members was that they suffered from not having sufficiently informative placards. In the afternoon some of the party took to the shops, whilst the more hard-bitten IA enthusiasts followed a trail along the Glamorganshire Canal, provided by the kindness of Richard Keen.

The usual SWWIAS weather - rain, cloud and wind - prevailed on July 23rd when we visited Llandybie where our guides were the late Bryn Thomas and the Revd. Gomer Roberts. We started at Cil-yr-ychen limekilns, built in 1856-57 by the church architect, R.K. Penson. From there we continued to the Pentregwenlais kilns which impressed us by their great depth and bulk: they are built of stone, rendered in concrete and dated 1903. The final visit was to Tirydail tinplate works at Ammanford. The building is on a grand scale and reminiscent of chapel architecture. It is now deserted apart from a small car-breaking firm at one end.

In contrast, the weather on August 27th was ideal when we visited the site of the lead mines at Rhandirmwyn. Our guide was Michael Evans, and access to the site was kindly granted by Messrs. Economic Forestry. The principal mine was Nantmwyn which may have been first worked in the 17th century, and where continuous operations lasted until 1900, with further, short-lived attempts until 1932. On site, the most impressive relic is the Angred Shaft engine house with its circular stone chimney capped with bricks. Slightly lower down are the remains of a ferro-concrete mill of the 1925-32 period. The centre of operations in the 18th centurt was the Upper Boat Level. The adit is still visible, but the other remains are confusing and led to a good deal of inconclusive discussion among members of the party.

The final outing of the season was on October 8th. Under the leadership of Richard Keen a full bus-load set off to visit sites of IA interest in Pembrokeshire (as was). The little harbour of Porthgain was the first port of call, where we inspected the harbour of 1902-04, built to carry away slate, brick and crushed stone. Also to be seen were the hoppers for loading the stone onto the ships, the quarries and their associated buildings, the beacons on either side of the harbour mouth, and the track of the railways which linked the quarries to the harbour. From Porthgain we continued to Rosebush in the Preseli Hills where a slate quarry worked until World War I. On the lowest level are to be seen the ruins of the slate-dressing shop and a locomtive shed. Above these, the galleries rise up, cut into the side of the hill in the traditional manner. One of them was blocked off to make a small reservoir: this, and the remains of a rusty iron pipe descending towards the workshops suggest a former turbine. Not far away is the quarrymen's village of Rosebush, with the famous blue-painted, corrugated iron Precely Hotel erected by the North Pembrokeshire & Fishguard Railway Company to develop the area's tourist potential.

P.R.R.

FURTHER PROGRESS AT SCOTT'S PIT

The archaeological dig on this site has now been going on for a year, and the small band of enthusiastic members involved are to be congratulated on the amount of fill material that they have moved and on the number of finds revealed. The team (see below) have dug about one day a month in sun and rain, with local children making twice the work by pushing in the sides of the holes in between digs. Of course, a colliery site is both dusty and dirty, but it also presents the hazard of having stone and timber work removed and put down the shaft, and this has meant that structures have had to be measured and plotted as soon as they have been revealed and decisions made where to dig next.

Vandals have recently painted on the engine house, removed finds and broken part of the capping stone, leaving the shaft partially open and a potential danger to children. Fencing and barbed-wire which we put up have been removed. However, these are the sort of problems faced by the amateur archaeologist in any urban area, and they are giving us good experience.

A tentative interpretation of the information revealed from the work on site about the operation and construction of the colliery suggests that it may be of considerable historical importance as a surviving example of a fairly advanced undertaking for the early 19th century. In brief, what we have learnt so far is:-

1. The construction of Scott's Tramroad and the sinking of the pit took place probably about 1819. Mining ceased in about 1840, and certainly by 1846. However, the coal slag tip appears to be larger than would normally have been expected after just 20 years working. Certain featuresof the colliery, including the tunnels and the engine base, and the stout construction of the engine house make it appear an advanced design and a significant investment in the local coal industry.
2. The pumping house probably contained an engine with a vertical 40" cylinder driving a 33' beam linked to the pump rods. This size of cylinder was about average for a coal pit at the time. It would probably have been a single-acting, compound engine, and it does not seem to have driven the winding drum.
3. The winding engine appears to have been located at right angles to the pumping engine house and at an unusually large distance of 40' from the shaft.
4. Scott's Pit was probably a single shaft pit, divided by timber boards, or "brattices" to assist ventilation.
5. Surface furnace ventilation appears to have been used with a fire in a stone building at the end of a tunnel, but at present this appears to enter the shaft on the downcast side, not on the upcast.
6. The line of Scott's Tramroad has been traced up to the pit and two of the tram-plates likely to have been used have been found, one of which is in very good condition and of an unusual design.

In future we will be looking for evidence to provide answers to the following questions:-

1. Was there a separate airshaft, as shown on the 1875 6" O.S. map?
2. What type of boiler was used in the engine house? Was it an old 'haystack' type?
3. Where did the water for the boiler come from? Where did the water pumped from the pit bottom go to?
4. What type of head frame was installed for the winding gear?
5. Were there guide rails in the shaft for an early cage?
6. How did the furnace ventilation system actually function?
7. Is there any evidence on the pumping house floor to suggest how it worked?
8. Where exactly did Scott's Tramroad end, and how were the trams loaded?

We appear to be very close now to revealing all the evidence which the site has to offer, and therefore, it is hoped, to finding the answers to the above questions, which will help to place the pit in its historical perspective. The dig and associated research has certainly produced interesting evidence which, when properly assessed, might make Scott's Pit an important example of the development of mining engineering and techniques.

Dr Alan Griffin, an expert in mining history and methods, who recently addressed the Society, finds the site sufficiently interesting to consider assisting in the investigation, probably next Spring. Richard Keen, of the National Museum of Wales, has also offered to help in the interpretation of the site.

Future digging will consist of revealing as much as possible before going back and uncovering the walls and tunnels previously revealed which will then be photographed for inclusion in the draft report. I am still confident that we will reach this stage by the Spring. This draft report will then be circulated by the Society to specialists in mining history, to the NMW and other interested parties. They will be invited to make comments for possible inclusion in the final, amended report. This will appeal mainly to the serious industrial archaeologist, so there is likely to be a popular edition as well, similar to the trails the Society has produced.

It is hoped eventually to leave Scott's Pit so that it looks attractive and can readily be understood by the public who will have access to it. Presentation may be similar to other well established ecclesiastical and domestic remains.

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Can you assist in the dig? A few hours a month is all that is required and your help could enable us to speed up the rate of progress considerably. The next digs:-

Saturdays 19th November 10th December 20th January

Scott's Pit is opposite the entrance to Heol Las Park, near the M4 at Birchgrove. Coming from Morriston, turn left at Llansamlet lights, and take the first right after passing under the motorway.

The Team	Jim Lerwell	Pauline James	Peter Wakelin	Owen Thomas
	Paul Reynolds	Alun Richards	Colin Williams	Cliff Alden
	Fred Cowley	Idris Roberts	Hayden Holloway	John Howard
	Barry Fagg (Leader)			

B.C.Fagg

REVIEW

Ian L. WRIGHT. Canals in Wales (D.Bradford Barton, St. Aubyn's Road, Truro. £3-95.)

Canals in Wales is primarily a book of new and historical photographs based on the collection of Ian Wright, a Northampton teacher originating from Barry. Each of the 125 photographs has an extended caption which gives some information on the individual subject and on the canal with which it is connected. The book is set out with a chapter on each canal. It has a definite bias towards the Glamorganshire Canal, on which Ian Wright's own collection is based, and unfortunately leaves out a few canals of local interest such as the Llansamlet and the Penclawdd. It would also appear that the author has attempted to fill out the book with some (rather unnecessary) portraits and illustrations of street nameplates and company letterheads. Many of the photographs are previously unpublished and are of sujects which can no longer be seen. The reproductions are generally excellent, and it is easy to pick out details of personal interest.

Canals in Wales should definitely not be bought as a textbook as it is not intended as one. The short histories and captions in the book cannot be taken, by any means, as definitive, and there are several small mistakes. The two maps of the Welsh canals are poor and, although they suffice, could have been greatly improved by the use of finer line. I recommend the book for its photographs which should be of great interest to any South Wales transport historian, but I think that it should be bought as such and not as a serious introduction to, or synopsis of, canals in Wales.

Peter A.Wakelin.

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