Field Trip Report

Saturday 22nd November 2014

Nine members assembled at the Mount Victoria Remembrance Park and then travelled along Darling Causeway down into Hartley Vale by the single lane Hartley Vale Road.

Figure 1. Hartley Vale Retort remnants. photo by Brian Holden

The group parked in the paddock with an obelisk where Brian Holden gave a talk about the industry and rail gauges that ran through the works. Brian's presentation included numerous photos of the shale and candle industries that depended on the shale deposits. Everyone received an A3 map of the Hartley vale site.

Although the shale mineral torbanite (named after the town Torban in Scotland) is a light mineral, it was distilled via retorts in the last century to produce a variety of paraffinic compounds and waxes, industrial oils and compounds. The shale produced a distinctive kerosene smell when burned. The Hartley Vale deposit was the first in situ oil shale to be discovered in Australia in 1824 by a French expedition led Captain Duprey. Hartley Vale deposit was one of the largest and richest deposits in NSW and probably over 250,000 tons of oil shale was extracted. Very little remains today.

We walked along the remnants of the rail line and crossed the ash piles 10m high and up the slope to see the remnants of the rail incline up to Darling Causeway. Numerous shafts were observed - all grated. We tried to find a large adit but the bush had reclaimed much of the site. We arrived at the area where we expected an open cut and we worked out that a dam had been constructed at the site. On returning back to the car park, we passed the remnants of brickworks that held the retorts.

Note: "jet" was reported as being found at Hartley Vale, as most of the oil shale originated from underground mining, no "jet" would be found today.

Figure 2. Lithgow Blast Furnace site - slag pipe remnants.

We travelled to Lithgow for lunch at the Court House Hotel. After, we visited the Lithgow Rescue Station but it was closed, so we then visited the remnants of the Lithgow Blast Furnace. We crawled over the site, collected a few slag specimens and visited the Mining Heritage Centre. A wedding party had booked the entire site so we were limited to seeing the outer hut display of mining history and life like dioramas. The centre was very informative and the guides were knowledgeable about many of the mines, history and stories on display.

Some of the party returned to Sydney leaving five members to continue onto Flat Rock Camping Ground to set up tents alongside the Fish River. We had dinner at the O'Connell Hotel.

Sunday saw us at the Bathurst Fossil and Mineral Museum. The displays showed how Warren Sumerville had accumulated his broad collection. The sulphides, arsenics and silver

displays were extensive. Lunch was enjoyed at the Acropole Restaurant before moving out to Sunny Corner and the Nevada mine area.

We passed the Nevada mine and went into a gossan area of an acid volcanic unit, agglomerates, lapilli and crystal tuffs. The pine trees were mature, 30-40m tall. Pine needles

Figure 4. South of the Nevada mine in search of the gossan belt.

Figure 3. The forest - more pine needles than specimens.

covered the ground and much of the surface was siltstone or claystone. A minor sample of dull green/yellow gossan was found but not much of an area had minerals exposed or visible by scraping the ground surface. The weather was cooling and thunder clouds rolled over so most decided to head home.

Figure 5 Garnet (Andradite $Ca_3Fe_2Si_3O_{12}$.) Size 140mm x 80m x 50mm

Figure 6. Collected by Denis O'Brien

Three members continued to another site and visited the skarn at Diamond Hill in the Lowes Mount State Forest and collected some garnet and calcite specimens. Crystals on a single face measured 6mm - 8mm with most crystals fusing with their neighbours. Many were decomposed and epidote centres were evident when exposed. Some specimens of Andradite *var Melanite* were also found, black in colour, referred to as "titanian andradite" - black Ti-bearing (up to 11.5 mass% TiO_2, usually ~5 or less mass%) variety of Andradite garnet.

Acknowledgements:

Thanks go to Brian Holden for the talk presented on the history of the Hartley Vale Works. Photos for the Photo Gallery and maps for each member of the Hartley Vale Works,

Thanks to Albert Falzon for providing copies of the publication “Layers of Time, The Blue Mountains and their Geology”, “The Geological Map of NSW” and map of the “Hargraves Gold Deposits”.

Thanks to Denis O’Brien for his photos.

Thanks to all who attended.

Photo Gallery

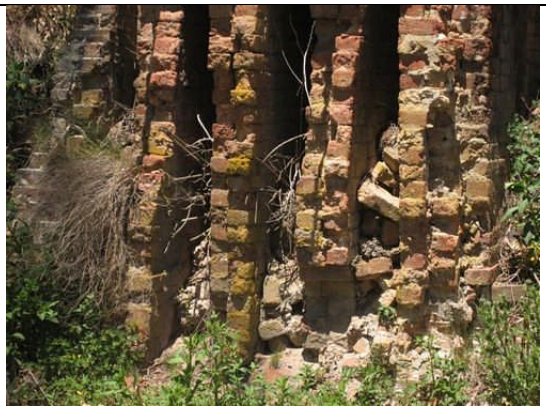


Figure 7 Hartley Vale remnant brick structure

Figure 8 Hartley Vale track between the ash mounds and retorts. Bucket full of torbanite.

Figure 9 members at the Lithgow Blast Furnace

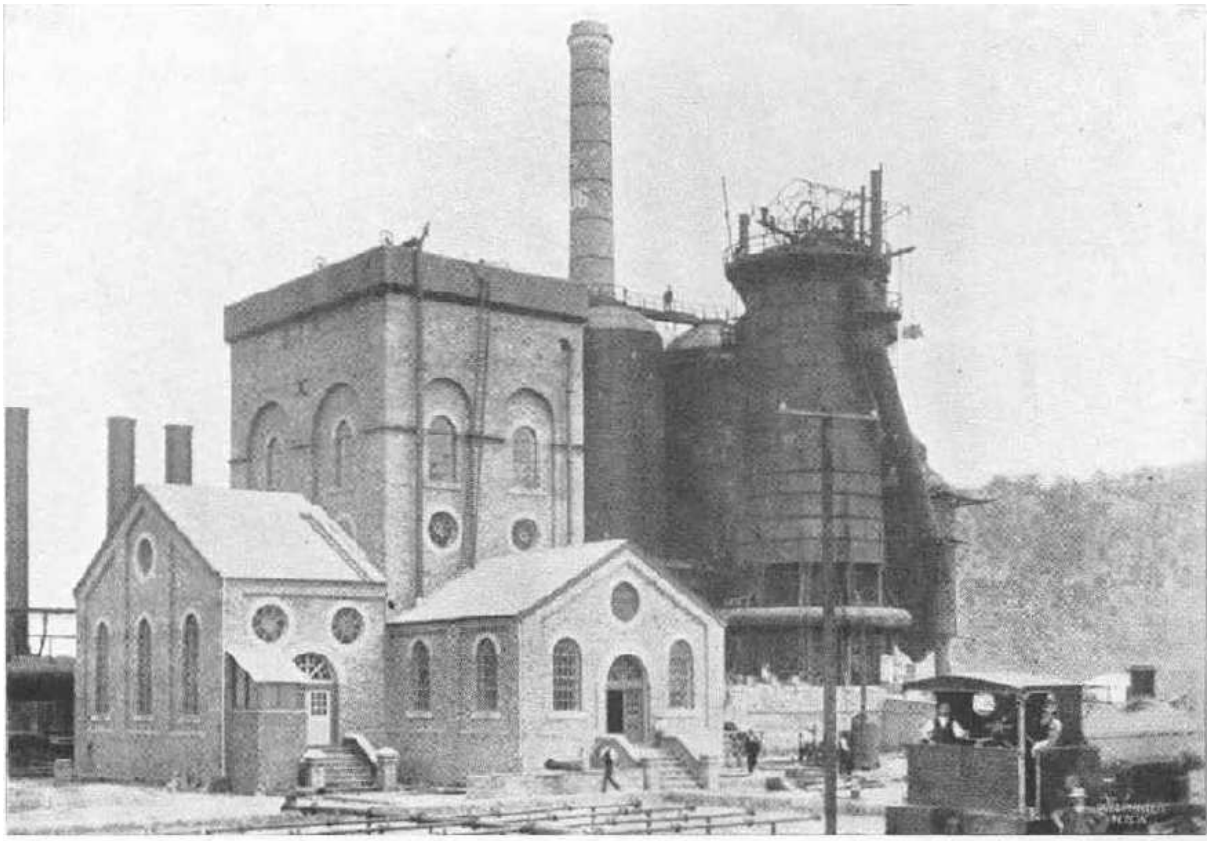
Figure 10 History

Figure 11 Lithgow Rescue Station display underground rolling stock

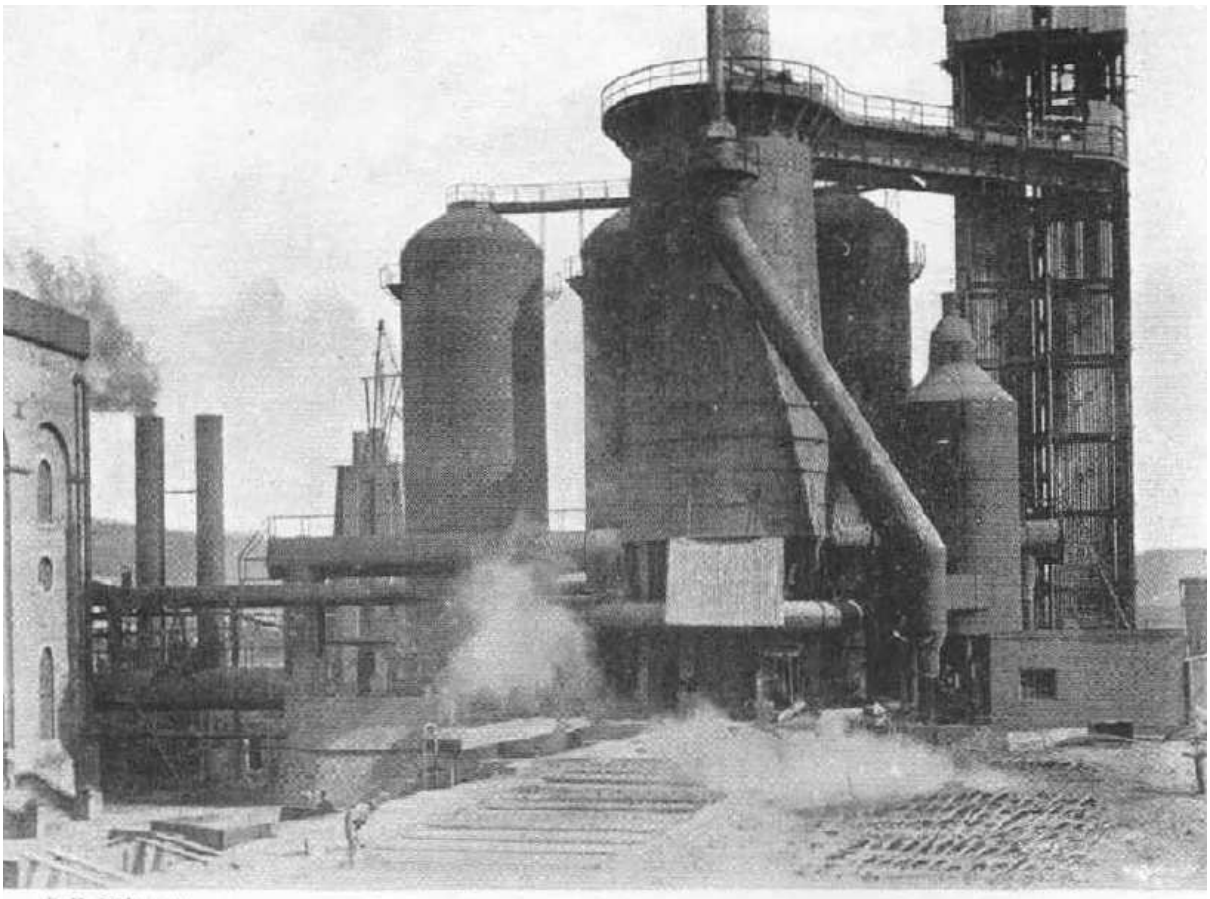
Figure 12 Lithgow Blast Furnace ("hot house")

Figure 13 Lithgow State Mine Heritage Centre with head frame and outer display building.

Figure 14 Lithgow State Mine head frame of State Mines



SANDFORD LIMITED IRON BLAST FURNACE, LITHGOW VALLEY.



G. H. Blakemore.

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Hartley Vale Works map overlaid on Google Earth

The Lithgow Blast Furnace

a. **Air Intake Tunnel** - the tunnel, constructed in 1923, providing air for the Parsons Turbine blowers and Thomson Blowing Engine.

b. **Ferrant Engine House** - housed a steam electric power generator set, it was constructed in 1914.

c. **Cooling Pond** - a reservoir of water for the boilers and to cool the blast furnace, the pond was constructed in 1907.

d. **Water Return Channel** - returned water from the furnace back to the pond.

e. **Rail siding No.l** - the line, constructed in 1907, was altered when the site was expanded.

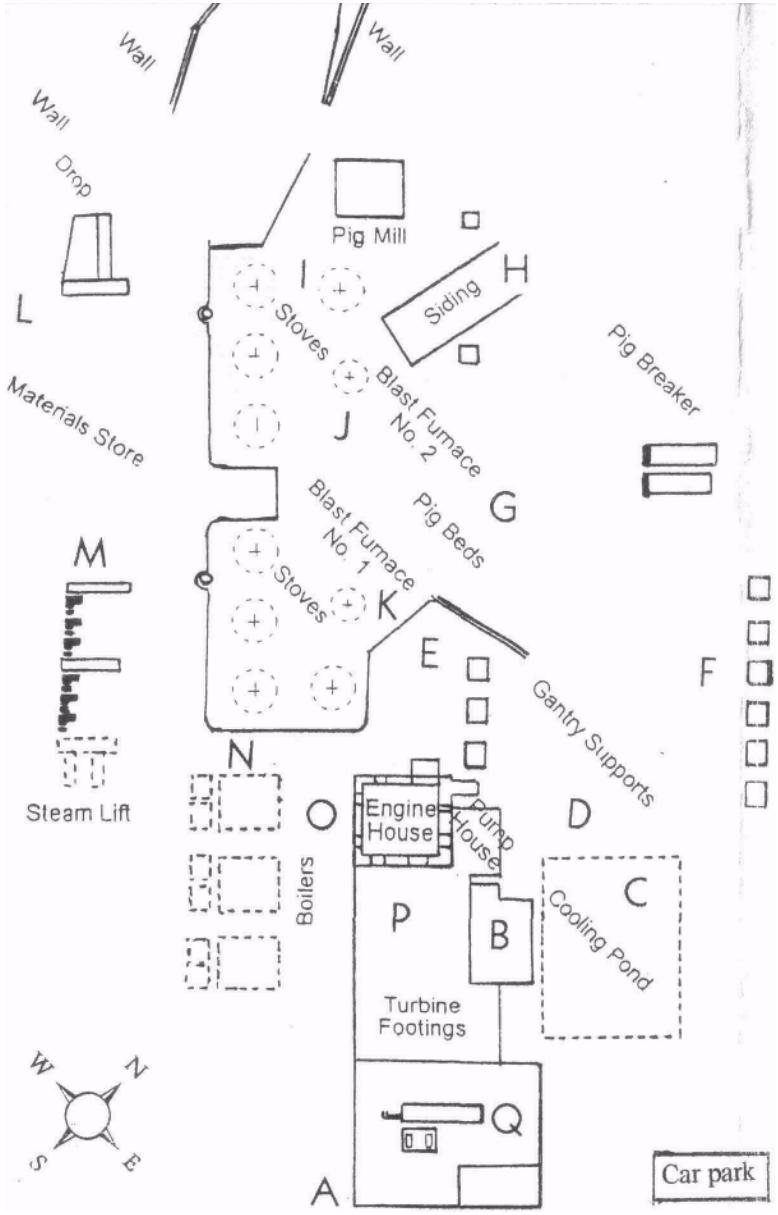
f. **Gantry Supports** - held in place the crane that lifted the pig iron combs to the pig breaker. The crane was erected in 1918.

g. **Pig Beds** - molten ore was tapped from the furnace and stored in the mould.

h. **Rail Siding 2** - built in 1913 the rail serviced the 2nd furnace. It carried molted slag to the dump and liquid iron to the steelworks.

i. **Cowper Stoves** - filled with firebricks, the stoves were used to preheat air from the blowing engines before it went to the furnace.

j. **Blast Furnace 2** - built in 1913.



Map of the Blast Furnace

k. **Blast Furnace 1** - built in 1907, the furnace was 23 metres high

1. **Travelling Crane Walls** - an electric driven crane, running along the wall maintained raw material stockpiles.

m. **Material Storage Bins** - this area could store up to 50000 tonnes of iron ore, limestone and coke.

n. **Boiler House** - This building housed 10 Babcock and Wilcox boilers which were fired by waste gas.

o. **Davy Engine House** - containing the Davy air blower and producing 15000 cubic feet of air per minute. It was installed in 1906 and weighed 120 tonnes.

p. **Parsons turbines** - Varying in capability from 20000 to 40000 cubic feet per minute the 3 air blowing engines were installed as the Blast Furnace was expanded.

q. **Thomson Blowing Engine** - An air blowing engine producing 45000 cubic feet of air per minute at 25 psi. Installed in 1923, the engine weighed 400 tonnes.

Extract from Lithgow Tourism brochure.