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A Wisp of STEAM SUPREME

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In This Issue



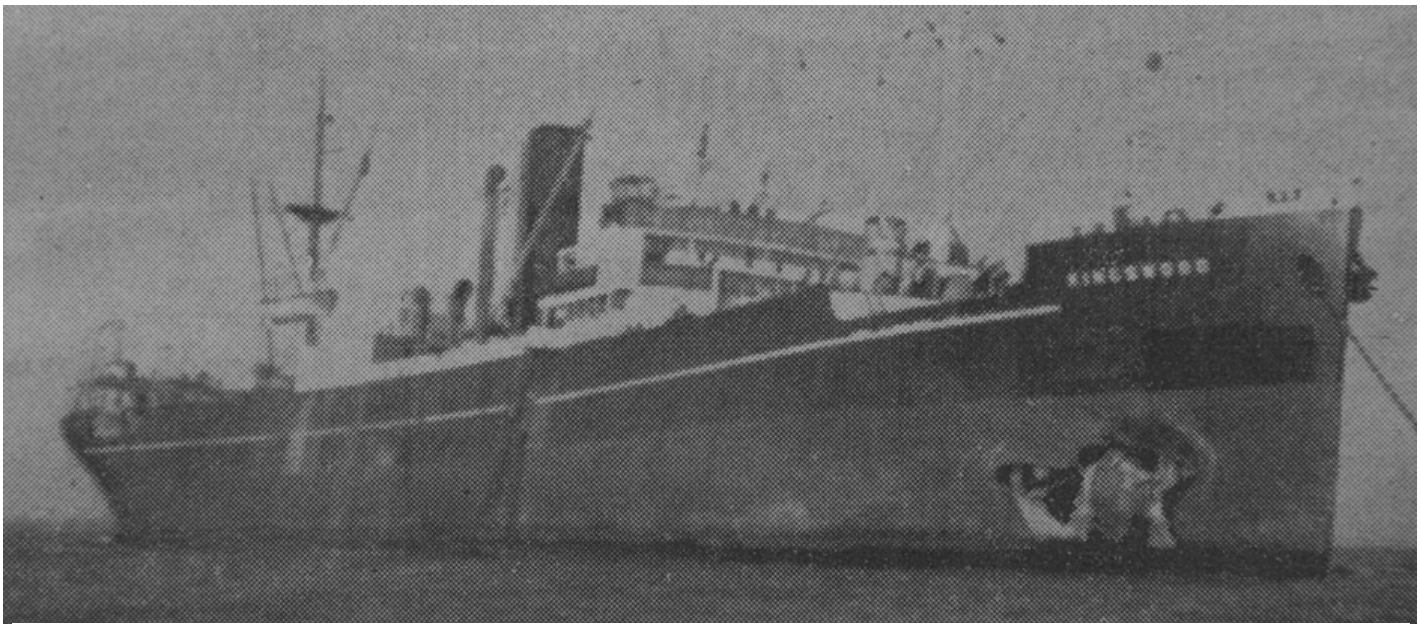
Ships Boiler Explosion



Tractors at Sandstone

Auxiliary Boiler Explosion on Board the *SS Kingswood*

© Rohan Lamb, August 2014



SS Kingswood at its anchorage at Port Pirie with a gaping hole in the starboard bow. (*The News*, 4 January 1937)

Last year the club received the donation of a collection of books from the estate of Ken Dagleish, a former boiler & engine driver instructor at RMIT. Amongst the books were copies of photos showing the damage caused by a boiler explosion on the SS Kingswood. There was no other documentation with the photos so a search on-line found newspaper accounts of the accident in 1937, and a file relating to the enquiry into explosion in the National Archives of Australia. This research revealed the story of an auxiliary boiler about the same size as one of the Lyttelton II's main boilers exploding and ripping its way 50 metres through the ship before coming to rest in the bow just above the water line and leaving a trail of destruction.

The *SS Kingswood* (yard no.409) was built in 1929 by the Northumberland Shipbuilding Company, Howdon. It was a 5,080 ton single-screw cargo vessel propelled by a single triple expansion engine of 520 nominal horsepower which was augmented by the addition of a low pressure geared turbine in 1931. Steam was supplied by two single-ended main boilers placed athwartship and an auxiliary boiler situated in a recess in the stokehold forward of the main boilers. The engine and boilers were made by North Eastern Marine Engineering Company, Wallsend-on-Tyne.

The ship had left Maputo, Mozambique (at the time it was called Lourenco Marques) on the 5th of December and arrived at Port Dermaine Road at Port Pirie, South Australia on the 26th of December 1936. Here, the vessel remained at anchorage waiting to enter the port to be loaded with zinc concentrates.

During the passage from Maputo the auxiliary boiler was opened up for cleaning, the safety valves overhauled, and the valves reground. Scale was removed from the tube plates and combustion chamber tops. It was filled with sea water and fires lighted on the evening of the 25th December 1936 in preparation for supplying steam while at anchorage for operating the refrigerating machinery, generators, and various pumps. The boiler was under light duty steaming with the fires banked each night, with the exception of the 27th of December when at 9pm it was discovered that a stay tube of the port nest had failed and water had escaped from the boiler. The boiler was under steam at the time with the port fire banked and the starboard fire out. The port fire was immediately drawn, and a stopper fitted in the tube the following morning. The boiler was then put back in commission.

At 7:30am on the 3rd of January 1937 the donkeyman arrived in the stokehold and was instructed to have steam on the auxiliary boiler by 9am. About 8:45am the chief and second engineers were together on the bridge deck when the donkeyman reported to them that there was a pressure of 90 to 100 psi in the auxiliary boiler and the water level was at three-quarters of a glass. Only a few minutes later an explosion occurred with the ship vibrating considerably with smoke and dust escaping from the fidley top and cross bunker hatch. It was not possible to enter the stokehold until the dust cleared. When the crew were able to enter they found the 25 ton auxiliary boiler had exploded and been propelled 160 feet (48.7m) for-

ward through three watertight bulkheads and empty holds before coming to rest in the starboard bow.

Looking in the stokehold and engine room, the crew found a scene of total destruction with the main boilers and triple-expansion engine extensively damaged and unfit for service. The wireless installation was wrecked with the aerial tower broken so radio contact was lost. It was forty minutes after the explosion before contact was made with a passing ship by megaphone to request assistance. It was fortunate that no one was in the stokehold at the time, so the only injuries were minor cuts to some of the crew. The SS Kingswood was towed into Port Pirie harbour on the 5th of January.



Inside the hold of the ship, the auxiliary boiler can be seen embedded in the bow through the hole torn in the bulkhead between the forward holds.

The concussive effects of the explosion on the ship were significant with the port main boiler dislodged by four feet (1220mm) aft, before coming to rest against the high pressure cylinder back column, condenser and bunker end. The starboard boiler moved 5'6" (1680mm) aft and came to rest against the HP forward crank web, and the fan engine.

The triple expansion engine was severely damaged with the cylinders being pushed aft resulting in bending of the connecting rods and the front columns. The cylinder feet, back columns, condenser, exhaust turbine casing were all broken. The engine room was a write off, and there was no possibility of the ship travelling under its own steam. The smokebox doors of the auxiliary boiler were found lodged in the furnace fronts of the main boiler.

The auxiliary boiler was 12' (3657mm) in diameter and 10'6" (3200mm) long (for comparison, the main boilers from the Lyttelton II, are larger in diameter by 7" (178mm) but shorter by 1' (305mm)).

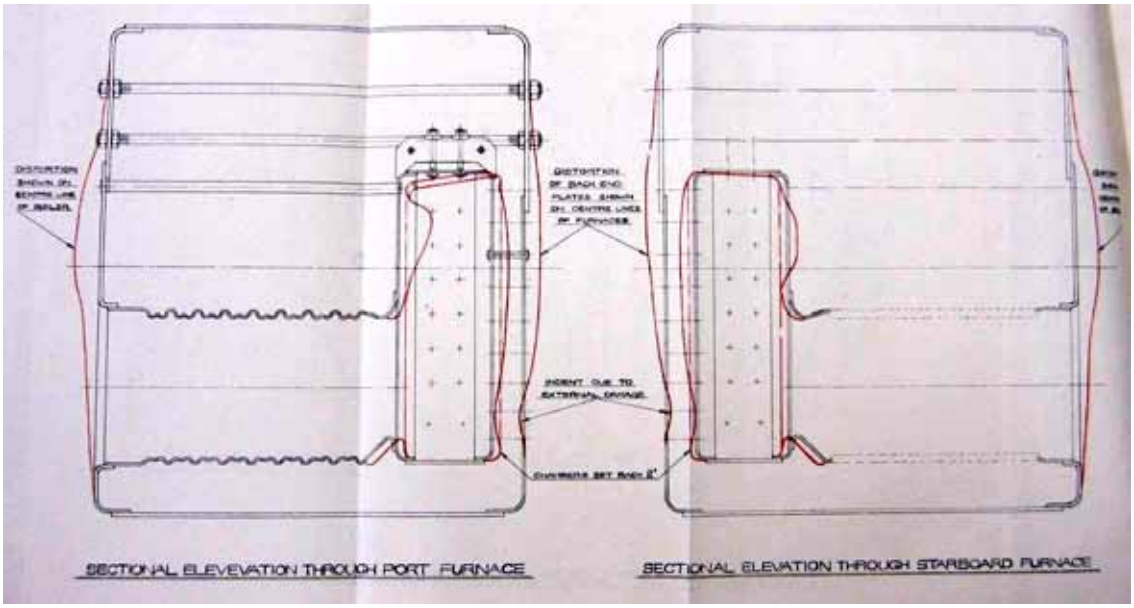
The initial failure leading to the explosion appeared to be the failure of the port back tube plate. However the wasted condition of a number of the stay tubes in the centre of the port nest, and over-pressure in the boiler also contributed to the extent of the failure.

It was concluded that the tube plate was probably overheated over an area covering at least the top two rows of tubes. This resulted in the stay tubes in the top two or three rows of the port tube nest being drawn from the back tube plate due to its distortion by pressure acting on the overheated material. Many of the stay tubes in the centre of the nest were considerably reduced in cross-section due to wastage, so they were unable to hold the additional load when the top rows failed resulting in the complete failure stay tube attachment to the port nest. Many of the tubes were broken at their thin section adjacent to the tubeplate, and the remainder were forced from their threaded holes. The front tubeplate of the port side then bulged outwards as it was no longer supported, and the load was then transferred to the stay tubes of the starboard tube nest. The starboard tube nest then failed in a similar manner with tubes pulled from the back tube plate. The escaping steam propelled the boiler forward through the holds.

The first failure of a stay tube as far as could be ascertained was in March 1935, but failures only occurred in rapid sequence during the last voyage of the vessel. In a



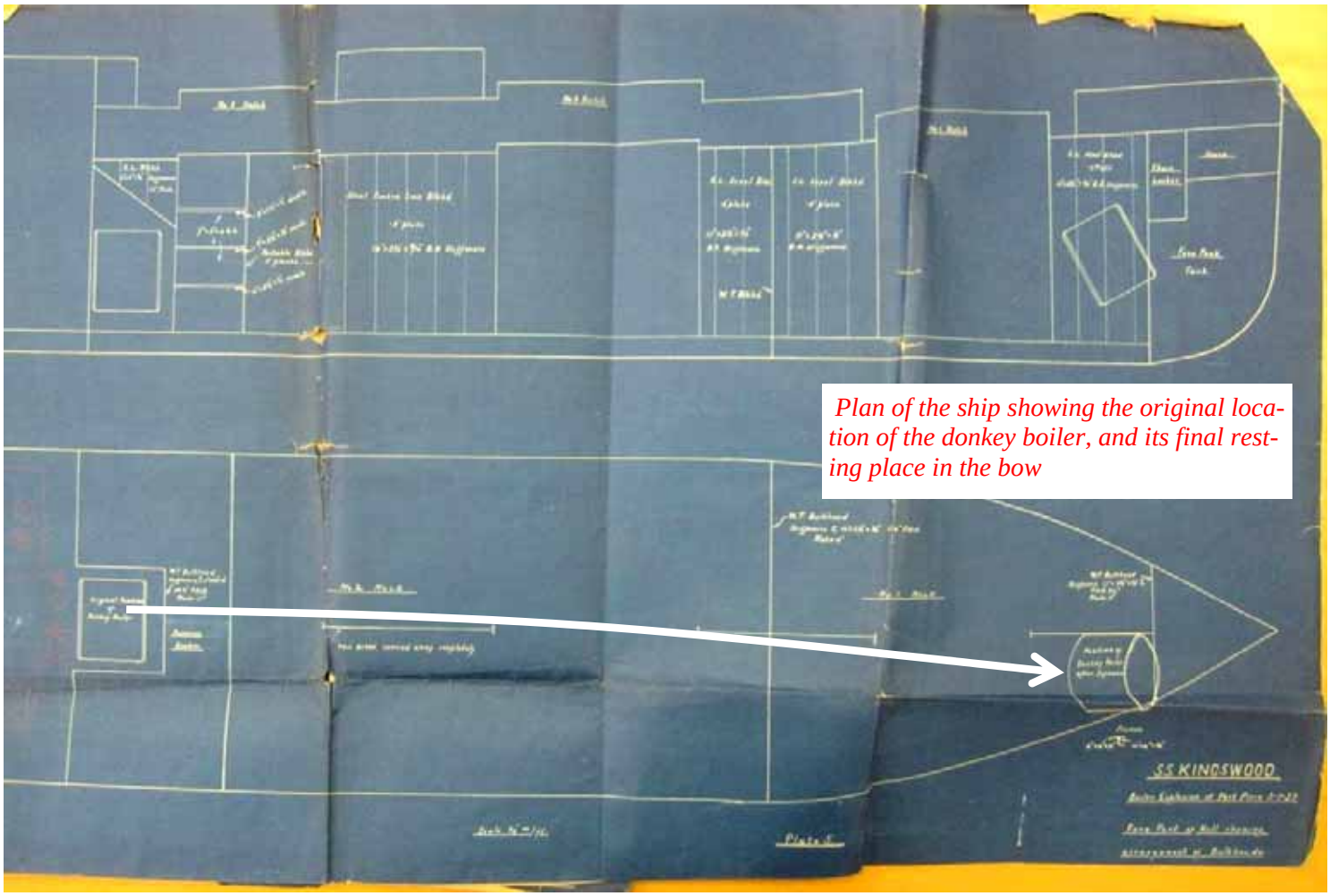
View looking aft showing damage to the front of the main boilers, the foreground area being the space previously occupied by the auxiliary boiler



Drawing showing the extensive distortion of the furnaces and front and back plates of the donkey boiler

letter from the Chief Engineer to the owners written from Durban on the 6th of November he advised that the stay tubes required renewal and that seven had stoppers fitted. This was followed by a further report on the 2nd of December from Maputo that four more stay tubes had burst. The Superintendent Engineer to the Owners acted on this information and had arranged for renewal of the tubes upon the ship returning to England, but in hindsight, this was too late.

The raising of steam that morning for 40 to 100 psi was largely by the fire in the port furnace, and this accounted for the severe distortion of the port combustion chamber top and back tubeplate. This area overheated due to a shortness of water, but it was reported by the donkeyman that the water level was three-quarters of a glass. The feed check valves and blow down valves on the boiler were all found in the closed position indicating that water could not have leaked from the boiler. The water level gauge however was not checked by the donkeyman at 7am, or later either but despite the increase in pressure the water level was reported to be the same. This lead to the conclusion the water gauge was defec-



Plan of the ship showing the original location of the donkey boiler, and its final resting place in the bow



View of the boiler where it came to rest in the starboard bow with bulkhead plates and stiffeners wrapped around it.

tive. It was not possible to examine this after the explosion as the entire water gauge column was lost in the explosion. After servicing the boiler while at sea no test of safety valves after reassembly was done. It was not certain therefore that they were in working order, and only parts of them were recovered.

In the opinion of the inspector, this was considered a unique explosion due to the amount of distortion which occurred in the boiler, and was without precedence which he attributed to severe overpressure of the boiler. The donkeyman left the ship in Australia before the investigation started and therefore was not available to provide evidence.

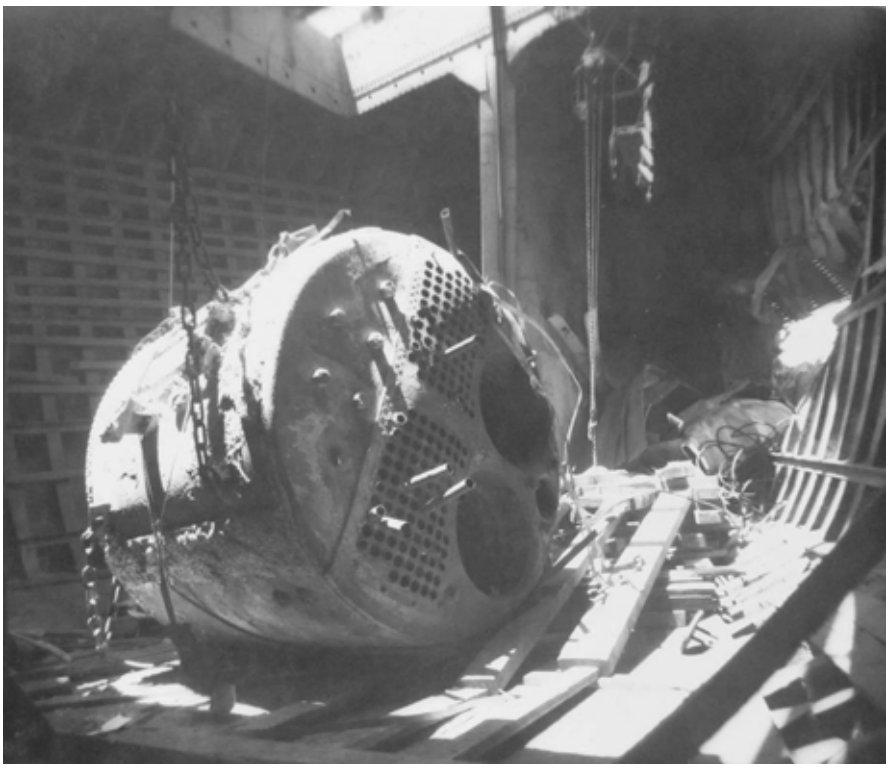
The owners decided to repair the ship back in England. The hull was patched, the main boilers secured, and another donkey boiler installed to provide steam for the steering gear while being towed. The SS Kingswood sailed for England on the 27th April 1937, towed by one of the largest tugs in the world, the Ganges from Holland. The tug developed 1,200 horsepower and took five months to tow the ship at an average speed of four knots on the 12,000 mile (19,310 km) journey, and docked at South Shields, Durham on the 14th of September 1937 (*Age*, 16 September 1937, p.8, *Adelaide Advertiser*, 22 April 1937, p.20). It was the longest single tow on record at the time (*Adelaide Advertiser*, 11 February 1938, p.24).

Back in England, the ship was in dry dock for three months while the North Eastern Marine Engineering Company fitted a new triple expansion engine, and John Readhead & Sons Ltd. repaired the hull. The ship was returned to service in 1938 (*Adelaide Advertiser*, 11 February 1938, p.24).

As a postscript to the story, on the 17th of December 1943 the SS Kingswood was hit by one of two torpedos fired by the German U-boat U-515 southwest of Kotonu, Dahomey in the Bight of Benin off Africa and was sunk. The 48 crew members survived, landing near Dahomey on the 19th December 1943 (*SS Kingswood, A Survival History*, http://www.sixtant.net/2011).

Reference

Report of Preliminary Enquiry (no.3300). Explosion from the Auxiliary Boiler on board the SS Kingswood, ON 160723, 12 April 1938 (National Archives of Australia, MP121/1, M37/543/185).





Close up view of the hole in the bow with the auxiliary boiler lodged in the hole.

The auxiliary boiler after being pulled out of the bow of the ship. Note the bulged boiler plates in the tube nest area and dislodged tubes.



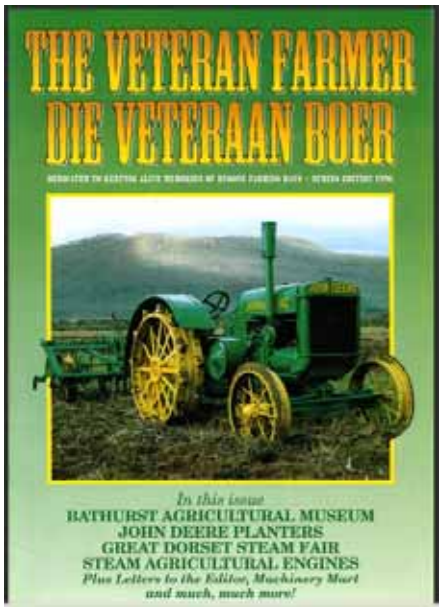
Rare Marshall MP 6 tractor

Wilfred Mole's love of machinery can be traced to his childhood days growing up on his families farm in South Africa and indeed he still has some of his fathers machinery from those days . While today he may be a business man his love is still with the land with a Modern large scale farm at Sandstone in South Africa and an Organic farm in England , that supplies amongst others Prince Charles . He even had a stint as a farmer in Wagga Wagga Australia.

It is therefore no surprise that tractors formed the nucleus of the collection that has become the Sandstone Heritage trust based in South Africa although of course now it's focus has shifted to 2 ft gauge steam railways.

Veteran Farm Publication

The extent of his passion for agricultural heritage can be judged from his publication of the South African magazine " The Veteran Farmer / Dei Veteraan Boer " from 1995 for about 5 years before it became integrated in the Sandstone Heritage Trust web site. The principle Editor was Chris Wilson who incidentally has had a long time association with Sandstone's tractors managing the collection and doing many of the restorations particularly on his favourite make John Deere . Chris is still Sandstone's Tractor Specialist and once again is calling for volunteers to help drive the tractors at the 2015 show. - *see web site*

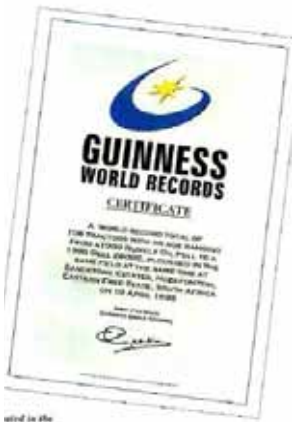


Right *Although Wilf's publication had a strong tractor component it was really far more diverse also covering amongst other things crop growing over the years farm building techniques and hand tools .*

Working Tractors

Sandstones real claim to fame on the world tractor scene has to be initiating the Guinness Book of World Records record series to have the largest number of vintage tractors ploughing in a paddock at the same time . Wilf got the idea for these workings after becoming disillusioned with the South African vintage tractor scene where the norm had become to display pristine restored tractors, while the owners spent the time in the beer tent. Never was a tractor seen to move, let alone work, until pack-up time when they would be winched onto a trailer and carted home . Prizes would be awarded to the tractor that looked the best in the judges eyes with no regard to how it looked when it came out of the factory or whether it was actually capable of doing a days work . With this sort of competition he reasoned there can only be 1 winner and by definition everyone else who exhibited must be a loser so went home disgruntled. The solution was a working event, where each tractor was encouraged to pull a ground-engaging implement over a prescribed distance. Thus in April 1999, Sandstone played host to the "Great One Hundred Working". This was a three-day celebration of agricultural heritage culminated in South Africa being

awarded the inaugural Guinness World Record for 106 tractors all working at the same time . Not to be outdone the Australians had a go at Yass in 2001 and managed a new record of 299 tractors . South Africa retaliated in April 2002 with the " Great 400 Working " which exceeded expectations when some 700 tractors turned up and returned the record to Sandstone. Subsequently the record has been broken a number of times in various countries around the world with Wilf achieving his objective of getting rid of the show ponies and getting tractors out at work in the dust.





Above *Robin Gibb on the Minneapolis Moline manoeuvring a trailer load of sunflowers after the word went around " everything must be pulling something "*

The present record was set in Cooley, Ireland on Sunday 5 August 2007 when over 4000 vintage tractors were working in one field at the same time which led to the comment " this is unlikely to be beaten." How right can you be ? Someone at Sandstone lamented to me the Irish spoilt it for everyone, they did not adhere to the Vintage spirit and dragged along all the middle aged tractors that was still in service around the country to make up the numbers thus sadly putting an end to the event.

Back to the Collection

The extent of the collection is not completely apparent but at Sandstone there are 3 large closed sheds which according to the web site house at least 350 restored tractors.



One of the 3 sheds housing restored tractors at Sandstone .

John Deeres are in the majority and indeed most of the modern farm machinery is also John Deere .



. **Right** *Modern farm JD*

International Harvester is also well represented while Field Marshall are a favourite at Sandstone with at least a dozen while there are a similar number of Lanz Bulldogs , while both are single cylinder 2 strokes the German product is not liked as much .

Exotic Tractors

Wilf's most treasured is a Marshall MP6 a powerful tractor of much more up to date design made principally for export .



Above *MP Marshall also see opening photo of this story)*

During development the MP 6 was designated the Series 5 Field Marshall but being a completely new design now using a modern 70 hp in line 6 cylinder Leyland UEA 360 engine I guess they wanted to dissociate it from the clunky old single cylinder so it was renamed Marshall MP6 . With only 197 made between 1956 and 1961 and almost all of them

exported they are now considered an exotic tractor and worth a small fortune. I do not know the background of Sandstones tractor but from 1915 the British firm of Marshall, sons & Co , Gainsborough had a strong agent in Bloemfontein , the Free State's capital city , who used the local agricultural shows to demonstrate and exhibit the latest in farm machinery . This would have included tractors from the early 1930's with the introduction of Marshall 15/30 model .



Below *Another tractor that could be considered exotic is this German Allgaier Diesel featuring the Porsche System . Although better known for cars Porsche offered a range of quality tractors as indeed did Lamborghini .*

Ground Breaking Tractors

With the discovery of diamonds and gold in Southern Africa the British invaded the country at the start of the last century slaughtering large numbers of white African farmers and their families. The area around Sandstone was one of the hot spots of this Anglo—Boer war and even today it is still in their minds with comments such as " I *(the Australians)* was on the wrong side " . Anyway the upshot was the establishing of large farms and the need for tractors capable of working large paddocks . With very little available from England attention turned to the large prairie tractors of the US . Fairbanks Morse was one such manufacture and although they only produced a small number of these prairie tractors up until 1914 the first tractor in the Orange Free State was a F M. It was a screen cooled 7 tonne lumbering monster towing a brace of wagons for 320 km across country from the rail head . At river crossings and heavy sand the wagons had to be unhooked while the tractor crossed by itself then hauled the wagons through with a long wire rope . These tractors played an important part in opening up farming land in South Africa. Not surprisingly Sandstone has a number of this type of machine.



Above Sandstones most impressive tractor , just compare its size to the John Deere belted up to start it . Aptly named "The Big 4 " this Emerson-Brantingham has a 60 hp four cylinder engine , 8 ft 3 inch high wheels and weights 22,000 lbs . It can pull a 10 bottom plough at 2 mph .

Future Projects

Of course any collection will have it's projects in waiting . Sandstone is no exception but the Trust is very mindful that in Africa anything left sitting around does not last very long so needs to be preserved . Warwick





Above *Large open sided sheds within the farm compound protect dozens of future projects from metal thieves and the weather .*

Left *Waiting it's turn Sandstones pre 1915 Fairbanks Morse Prairie tractor . Many small bits are missing including piston and conrod but it has stood up to the weather well . They also have the remains of a second one*



A New Traction Engine at the Club

A Traction engine kit , but to some it may look like a 3D jigsaw puzzle , arrived at the club the other evening . Actually it is the carcasses of 2 Fowler 6nhp compound engines acquired from the Colac area by Tim Collard. The intention was for it to be put in the treasures but this will have to wait until the ground out there firms up. Between the 2 engines and the bits he has at home Tim pretty much has all he needs to make a good engine given time .

Above *The Morris's help Tim and Sam unload the traction engine parts*

Below *Tim and young son Hamish were down at the week end working out a plan of attack .*



Mini Mac

Our little MacDonald footpath roller has been languishing for many years virtually a cripple with clutch troubles . It has a clutch on either end of the gearbox input shaft , Forward and reverse gears are in mess all the time with the direction of motion controlled by which ever clutch is engaged . *(Who said duel clutch transmissions are new)* Obviously the clutches must work in unison otherwise you will get both gears at once or none . This is what had been happening despite many attempts to synchronize the adjustment with it eventually dawning something more serious must be out of order . The impending railway realignment was the catalyst to fix it properly as it was found very useful on the initial track construction . With a bit of a lull before track construction starts the railway team have got stuck into the repairs

Below *Dave Rochester and Frank Hedges pondering the gearbox . The clutch shaft bearings had indeed had it .*



Pressing Repairs

Again Ray Bedford has taken the opportunity to get stuck into another long standing project our 50 ton hydraulic press . Originally from Swinburne Tech it was in good order but came without a press table which made it pretty useless . Ray put forward a plan to make up a table but in times when we have to be careful with money some eyes viewed the cost with dismay . This was were Paul McMillan stepped forward and offered to have his engineering works make one for us .

Paul delivered the finished article last Thursday and what a superb job exceeding all expectations of what we could have done ourselves.



Above *Ray Bedford and Paul McMillan admire the new press table at their feet with the press's frame behind them*

It just shows if you are prepared to give it a go help often comes from unexpected quarters—Thanks Paul and his men.

Working Bee

The working Bee was great success and it was good to see many of our recent members turn up and enthusiastically pitch in to the various tasks .

The Morris heavy machinery was well utilized , after being loaded up with bitumen chippings the Euclid was used to move the ploughing engine into bay 4 before filling in pot holes and adding a bit more fill to smooth the surface around the turntable rails .



Below *With plenty of ballast aboard the Euclid easily moves the ploughing engine across to bay 4 after the chimney is removed*

One of the biggest tasks was sorting out the material from behind bay 4 into 2 piles , one for scrap and the other useful material or parts of machines that are ear marked for restoration . This went more smoothly than expected and generally consensus on what was to go or stay was reached easily but the job is not over . We now have 2 piles in an awkward position on the arena that need to go, one in a scrap bin and the other back out of sight .

Another job well done was cleaning up the rubble pile by the stone crusher . This was very unsightly and one of the first things to hit visitors in the eye as they come in the front gate . Useful bricks were stacked in the treasures , broken ones corralled by the crusher and rubble carted away to a soft spot



Above *This scene no longer greets visitors*



A team attacked the wood heap sawing and stacking up more firewood while another attended to various dead trees and branches around the site.

Above *John Mills on the bench*

In all a great effort , people are obviously still prepared to chip in if something useful is organized for them to do ,

thanks .

Fairy & Gnome Festival

Rotary fund raising event to benefit Monash community groups The public come dressed up as Fairies and Gnomes with Entry $5 per adult $10 per family . Activities such as prizes for best costume , face painting and an animal farm will be free . Only charges will be food and train rides .

This event will be held on Sunday 16th November . The steam and diesel museum to be running with our costs being covered by the organizers while we get to keep the train takings .