133 Years Of The CSR Fleet

To paraphrase "*South Pacific Enterprise*" and the 'Introduction' by Sir Edward Richie Knox, who was chairman when the book was published to mark the centenary of the company, he said of The Colonial Sugar Refining Company Ltd (CSR), that it had been shaped above all by his grandfather Edward Knox and uncle E W Knox, founded unashamedly by capitalist innovation on principles of enterprise and hard work. Consider then, the company established in the 2nd half of the 19th C in the Colony of NSW, setting out to refine sugar that was a staple food at the time**,** in the most efficient, scientific and up to date way, and as history shows, thereby develop the business based on sound management fundamentals.

Led by Edward Knox with his commercial acumen and ability to raise capital, CSR soon set about to build a new refinery to process sugar in the most modern plant it could build at Pyrmont in the late 1870's. The company quickly grew from a refiner of imported raw sugars sourced from the Philippines etc, into an operation that expanded to other new refineries in Melbourne and Auckland NZ, and new sugar mills it built in NSW, Qld. and Fiji.

The company soon found the only way possible to operate these factories spread so widely as they were, was to have a timely shipping service that they had full control over. The story of the early cargo ships of CSR follows. It is interesting in terms of our merchant maritime history when one looks at the early steamers built to CSR specifications in the first 80 odd years **that is the main focus period for this book**. The CSR design was unique. It combined a capacity to carry coal in bulk, raw sugar in bags (later in bulk), general cargo with a heavy lift capability not usually possible on other ships (deck gear included a derrick with capacity for mill rollers up to around 13T, cane locomotives and small ships, carried on deck), molasses tanks, and accommodation for company personnel travelling between Sydney and the mills. Other aspects of the fleet are noteworthy; the first CSR ship, *SS Keera*, was the first iron plated screw steamer built for Australian interests (not CSR), and *SS Rona* was the largest Australian ship operating on the coast when she commenced service in 1919.

Vessels sailed to a demand schedule between ports on the east coast of Australia, Fiji and NZ, determined by the 'sugar season' on the one hand, and the 'slack' regarding equipment and personnel traffic on the other. Though routes and ships changed over time and the fleet was small in number, the company has quietly gone about its shipping business earning respect as an operator for a period that has now passed 133 years; CSR has become Australia's oldest fleet operator of cargo ships at the time of writing in 2006.

1. Background:

My interest came as an engineer in CSR (1959-85) trained in the engineering workshops, then drawing office in HO, refinery and distillery factories in Sydney, and ended in 1981 – 85 when I project managed the construction and establishment of a new shipping terminal in Newcastle for the Tomago Aluminium Smelter.

As an amateur model shipwright, I thought it would be interesting to revisit the easily accessed records on the subject, and this collection of photos and particulars are the result. The operative words are 'revisit the records' and I make no claim to be either expert or a serious maritime historian.

The first places of reference are 'South Pacific Enterprise' (published in 1956), noted above and a more detailed story on shipping in CSR Newsletter No 106 of June 1968. The latter covers the subject perfectly well as an overview, so this article is included verbatim with a few minor edits as Section 2 following. More recent material on the subject includes two papers worth noting

(i) An article submitted by B. (Bruce) A. Wilkinson in 1976 to the quarterly magazine of the Nautical Association of Aust., "The LOG", Vol 9, No 3, pages 67 to 76, titled, "The Principal Ships of …The C.S.R Company" (sic). The late Mr Wilkinson worked at Mort's dock. People who knew him say he wrote about CSR ships (& Burns Philp), concerned the record would otherwise be lost. It lists 21 vessels in date order acquired, that are termed "the well known vessels which have been owned by CSR". A short summary of the ship particulars and life accompanies each vessel listed. 11 of these were not used as ocean going, being river boats used for towage etc.

(ii) The other is a thesis written by David Byrne; It's his dissertation for Master of Letters Degree (submitted in retirement about 10 years ago) titled, *"The Colonial Sugar Refining Company (CSR) and a history of its use of water borne transport, including ocean going vessels, in executing the Company's business including notes on bulk sugar cargos"*. Mr Byrne accessed original records at the ANU, Canberra, in the 'Noel Butlin Archives – CSR Collection', which has become the main archive for CSR material.

Copies of (i) and (ii) are held in the Australian National Maritime Museum Vaughan Evans library in Sydney.

A point to remember about shipping in the early times of CSR, is the undeveloped state of transport infrastructure in the Colony of NSW. Sea travel was the main, if not only, means to transport machinery, coal and sugar, to and from the Northern Rivers, Qld. and Fiji. Shipping was a risk business that required skilled navigation of the rivers and bars, and care in all weathers to avoid the hazards of the coastal runs. An easy to read reference describing some of the background is,

> "North Coast Run, Men & Ships of the NSW North Coast", by Mike Richards, 3nd Ed 1996. Though this little book makes few references to CSR, it tells a clear story about coastal shipping in the early times of the Northern NSW mills. It also gives the particulars for the collier *Platypus* that the Clarence & Richmond River Steam Navigation Co withdrew from regular coal service to Chatsworth mill, that prompted CSR to purchase its first ocean going ship *SS Keera. Platypus* was an iron steamship of 217 tons, 118.9 ft x 23.8 ft x 8 ft, rigged as a 2 masted schooner built in 1864 by A & J Inglis in Glasgow.

2. CSR News Letter No 106, June 1968, pages 21 to 29 inclusive: text reproduced,

"C.S.R. ships and vessels 1873-1968"

Since 1945 the company has had a separate Shipping Department to conduct its business in providing a cargo and passenger service, mostly between Australia and Fiji. The company began in shipping in 1873 to provide for its own needs when they could not be satisfied by other ship owners.

For many years its ships provided a service carrying company materials and products to and from mills and refineries in Australia, Fiji and New Zealand. It extended its activities during World War II, when at the request of the Federal Government; it provided a public service between Australia and Fiji. It continued to operate its shipping business after the war at the request of those who had become accustomed to using it during the war. The Shipping Department now operates on the same lines as any other business.

Before World War II the company's ships were reserved almost entirely for company needs. It was customary for the ships to be laid up, out of commission, for the whole of the slack season.

During the war, ships became scarce and the Federal Government in 1941 asked the company to carry general cargo to Fiji. The company then had *Rona (3)**, *Fiona (4)* and *Tambua*. It agreed to run a regular service to Fiji and to carry defence cargo along the Australian coast.

> * NB: The newsletter incorrectly identified the two *Rona* vessels delivered to CSR as *Rona (2) and (3)*, and the vessel commandeered by the RN as *Rona (1)*. The vessels concerned were actually, in order of date built, H.M. Transport *Ocra* - torpedoed in the North Sea in sight of England and lost on its sea trials in 1915, SS Rona (1) - built in 1918, initially commandeered and identified as H.M. Transport Y2205, before CSR received it in Australia in 1919, and MV Rona (2) - built in 1957. Hence, in the following where *Rona (2)* is quoted, read *SS Rona (1)*, and where *Rona (3)* is quoted, read *MV Rona (2)*.

This shipping business was carried out in the Purchasing Department.

Since it was to enter the "shipping business" the company had to set up a business organization to handle the new type of work, to complement the service department which hitherto had been adequate to look after its ships. It employed a ship's manifest writer and a freighting assessor as a nucleus of the new organization.

The Shipping Department was set up in 1945. It was separate from the Purchasing Department. Mr. L F. Mallam became the 1st Manager of the new department.

One outcome of the new arrangement was that the Shipping Department was required to "stand its own feet " and pay for itself as any other business has to do. It ceased to be purely a service department.

Why the company acquired ships

When the company built Southgate, Darkwater and Chatsworth raw sugar mills on the Northern Rivers of N.S.W., one of the problems of operation was the procurement of coal for the mill furnaces. At first, coal was shipped by the Clarence and Richmond River Steam Navigation Company in the vessel *Platypus*. In 1872 the C. & R.R.S.N. Coy. advised its unwillingness to continue to devote *Platypus* to coal running.

Since the regular supply of fuel for the mills was vital, CSR. began to look around for other means of transporting coal from Newcastle.

The board discussed the possibility of using sailing ships, but no satisfactory arrangement could be made. Finally on 29 October 1872 the board decided to order by telegram from Messrs. F. Parbury & Co, London, "a suitable vessel to carry about 500 tons of coal on a 10 ft. draft, of which 200 tons must be carried on an 8 ft. draft". An estimate of the cost of running such a vessel was examined, which showed a large profit, but the Board was mainly guided in its decision by the refusal of the C. & R.R. Steam N. Coy. to undertake to contract for the conveyance next season of our coal; the high rates charged for and the difficulty of securing sailing vessels except at odd and inconvenient times "

Apparently as a stop gap between the ceasing of the *Platypus* on the coal run and the arrival of the new ship from England, the company purchased *Keera* for £6500. *Keera* had a six months' certificate from the Marine Board. She was a 158 ton vessel and was reputed to be, the first screw steamer to come to Australia.

In a letter to Mr W. H. Poolman, Manager of Chatsworth Mill, 15 April 1873. Mr. E. W. Knox wrote: "We have bought a steam collier called *Keera* here which will carry 250 tons of coal on a light draft so we have now little fear of our stock at the mills running short. We expect delivery in a week or so and will probably send her for the first trip to take the rest of the Macleay (Darkwater Mill) machinery round if the bar gets better."

Keera was an old vessel when the company bought her, and had already earned a redoubtable reputation, as reflected in the following letter Sir Daniel Cooper wrote to Mr. Edward Knox: "I see that you have bought the old *Keera*, which used to be an awful brute in the Wollongong trade, and was then sent and sold at Melbourne, and lay for many years up Saltwater Creek. I hope she may be found useful as beast of burden, but keep her insured."

In 1873 *Keera* was employed in transporting coal to the three mills, and shipping back sugar to Pyrmont refinery *. Costs were less than the freight the company would have had to pay other steamers, but despite the Marine Board certificate, the company was compelled "to renew half her bottom" because insurance companies did not regard her as a good risk.

* NB. Pyrmont refinery did not commence operating until 16 Feb. 1878 so before then it would have been sent to either of CSR's 'Brisbane House' refinery in Chippendale, or their 'Bowden Works' refinery in Liverpool St.

In the early days the company also had a floating dock *Atlas* at Harwood. The dock was used for docking all floating plant at Harwood. Many of the steamers owned by other companies on the Clarence also used it. Company tugs from the Richmond and Tweed were also taken to Harwood for repairs.

Atlas was sunk while being towed by *Fiona (2)* between Brisbane and the Clarence.

The company had hopes of selling *Keera* for a good price when its new ship, *Fiona (1)* arrived, but in the event, there was no market for her, and she was eventually converted into a hulk in 1879 (sic – Sydney register states it was hulked in 1877 and the register then closed).

The company replaced her with the *Terranora*, a schooner rigged paddle steamer, for work on the Tweed River, where Condong Mill was being built. *Terranora* sailed out from England and arrived in 1879.

Mr. W. R. Isaacs, then Manager, Condong Mill, wrote to Mr. E. W. Knox of the imminent arrival of *Terranora* at Condong on 23 June 1879: "*Terranora* has not yet come in. I went down yesterday but saw nothing of her, but think she was in the bay. As the tide was too low to risk my going further than the Light Tower I did not go right down."

He wrote again on 2 July, 1879: "After a good deal of delay at the Clarence again you no doubt are aware the *Terranora* arrived and crossed in safety on Sunday last, since when I have been unable to notify her arrival both lines being out of order."

She was an expensive vessel to run, and could not compete with the steamers then trading on the Northern Rivers. She was notable for her whistle, which later became the whistle at Harwood Mill. *Terranora* was of shallow draft and apparently was used mainly to transport sugar from the Richmond and Tweed rivers to the Clarence for transfer to *Fiona*.

Terranora was sold to a Clarence River priest in 1890 and later became a cable laying vessel in New Zealand.

The first *"Fiona"*

Meanwhile *Fiona (1)* had arrived in 1875. She was of 728 tons and the first of four company ships to bear the name. She went to work on the Clarence River almost immediately.

A report on the operations of the company's sugar mills during the season 1875 included: "On the whole the *Fiona* has done her work well, for even with all the detentions when alterations were being made in the boilers, etc., the freight will not amount to what we should have had to pay other vessels to do the work, and it would have been much less had the channel remained open, for we could then have landed large cargoes without the expense of lighterage, and only sent her to Sydney with sugar every other trip, thus leaving much spare time for other work. I hope that there will be more water on the crossing next season and that we may be able to find some profitable occupation for the steamer until she is again required for our work .."

Fiona (1) had a short life, being wrecked at Seal Rocks, on the N.S.W. coast in January 1882. Her bell finished up in St. Philip's Church, Auburn.

Fiona (2), 817 tons deadweight, was bought in 1883. She made history of a sort by catching a 4302 lb. sunfish in her propeller - the biggest sunfish ever seen at that time.

She was sold in 1908 to W. Collins and Son, Brisbane, and was renamed *Musgrave*. She ran for various owners for another 20 years and eventually was sunk off the coast of Tasmania.

Fiona (3), 7100 tons deadweight, arrived in May 1909. She could carry 1500 tons of molasses in top side tanks. Later another tank was fitted so that she could carry 2500 tons of molasses.

In his book "Raider Wolf - terror of the Tasman"- as condensed in "Readers Digest" February, 1968, Roy Alexander tells of an error of judgment by Captain Karl Nerger, of *Wolf* which resulted in *Fiona* being saved from being sunk and its crew from being taken prisoner:

"On the first day of patrolling the Sydney - Suva track the *Wolf* has a stroke of luck and a mighty bad scare. A sail was sighted at 3 p.m. The raider ordered the stranger to heave about. The boarding party's pinnace had just reached the side of the new prize, an American barque, when a heavy smoke cloud appeared on the skyline. Nerger, immediately suspecting a trap, swung the *Wolf* round and made off at full speed. The boarding party and the barque were left to look after themselves. Nerger kept going all that night with the *Wolf* full out".

"In the meantime, the strange vessel which had jangled the raider's nerves and sent her flying, closed in and passed the American ship, now under the command of the German boarding officer. No signals were exchanged, but those aboard the barque saw a sight that amused everybody except the German officer in charge. On one side was the *Wolf* heavily armed, disappearing in a smoke cloud as she fled from the oncoming vessel; on the other was, the Colonial Sugar Refining Company's old steamer *Fiona*, waddling peacefully on her way between Fiji sugar mills and Sydney's Pyrmont refinery, and not armed with so much as a peashooter."

The company kept *Fiona (3)* until 1933 when she was sold to a foreign buyer and renamed *Johanne Justesen*. She sailed the China Seas and was torpedoed at Cochin during World War II.

The first "Rona" - requisitioned by R.N. (NB. refer correction notes on page 3 of this section)

A vessel named the *Rona* was being built for the company during World War I. However, she was requisitioned by the Royal Navy and taken over on the stocks. She was subsequently torpedoed in the Mediterranean. The Royal Navy replaced her with *Rona (2)* built in 1918. The vessel had an unusual goal-post type foremast, so built that it could be lowered to simulate forward guns.

Rona (2) had a deadweight of 9100 tons - 2000 tons larger than the original *Rona*. She arrived in Sydney in August 1919 and was chartered to take coal from Newcastle for Java ports, and return to Melbourne with a cargo of sugar for Yarraville Refinery. On her next voyage she took coal to Chile and Peru and returned with sugar for Pyrmont Refinery.

Rona (2) was the largest cargo vessel working the Australian coast.

In World War II she played a big part in maintaining a life line of foodstuffs and general merchandise between Australia and the people and forces in Fiji (as did *Fiona* in World War I). She also bore something of a charmed life.

During the early years of the war, when these waters were a hunting ground for enemy submarines and raiders, and generously mined, Rona plodded unaccosted at a steady 9-10 knots to and from Fiji, trailing a dense plume of smoke which was highly discernible by sight or scent from funnel top to a very distant horizon. Rona was at first protected by two Lee Enfield .303 rifles, but later acquired a 3 in. naval gun and a naval crew to operate it, and later an Oerlikon gun and some rockets.

Rona (2) also was used at times to transport phosphate from Nauru.

By diligent and somewhat costly maintenance, the ship was kept up to classification requirements of both Lloyds and the Navigation Department until she was sold to John Manners and Co. of Hong Kong, in April 1956 for whom she operated as *Sura Breeze* before being scrapped.

Fiona (4), 3500 tons deadweight (2269 gross tons), arrived in Sydney in June 1933. She had a speed of about 11 knots.

During World War II she came into collision with *Cardross* off Sydney Heads during a blackout. *Cardross* sank within a short time, and *Fiona* was badly damaged forward.

For a period during the war she was requisitioned by the Royal Australian Navy and was stationed at Darwin as a store and water ship.

Fiona (4) served the company until sold to Compania Naviera Lanena Ltd., of Hong Kong, in 1958. The buyers agreed to the name *Fiona* being retained for C.S.R.'s possible future use, and changed the vessel's name to *Leona.* As recently as 1964 she brought a molasses cargo into Melbourne.

(in 1940 the company bought *Moamoa* from Burns Philp and Co. for the Northern Rivers trade, and sold her to the U.S. Army in 1942).

The company now has two ships

The company currently owns two vessels -*Tambua* and *Rona (3).*

*Tambua** has a gross tonnage of 3759. She was built as a coal burner by the Caledon. Shipbuilding Co. Ltd., in 1938 She has an overall length of 376 ft., a beam of 50 ft. and a loaded draught of 22 ft. 9 in.

* Whale's tooth: of special significance in Fijian tradition as an object of presentation in many ceremonies.

* NB the principal particulars of the Tambua should read, gross tonnage 3,566 tons, and overall length 360 ft b.p.. Beam and loaded draft were stated correctly.

Originally powered by a steam engine of 1540 D.H.P. (NB should have read 1450 IHP) she maintained an average service speed of a little over 11 knots half a knot better than her originally planned speed. A conversion from coal to oil fuel in 1957 resulted in a more constant source of furnace heating, and a consequently steadier steam pressure, and gave the ship a slightly higher average speed.

Tambua was built as a general-cargo-molasses carrier and was originally used in the Fiji trade to take over general cargo and coal, and to bring back molasses. On the Queensland run she was used for taking general cargo north and bringing back bagged sugar and molasses.

Because of the two banks of four molasses tanks along each side cantilevered below 'tween deck level, *Tambua* is not ideal for carrying bulk sugar. However, she is still a useful vessel, and lifts about 3000 tons of sugar and 2000 tons of molasses from Queensland about every 14 days.

Tambua has had a hard-working, but fairly uneventful existence in her 30 years of service. Early in World War 11 she was requisitioned by the Royal Navy as a water and store ship. She went to Colombo where she remained in harbour for the best part of a year.

Tambua has six berths for passengers.

Rona (3) was built in 1957 for the Fiji run to replace *Rona (2).* She is a motor vessel of 6620 * deadweight tons, an overall length of 390 ft.*, a beam of 54 ft. 8 in., and operates on a loaded draught of 23 ft. 9 in. She is powered by a 3000 B.H.P. diesel engine which produces a service speed of 12 ½ knots. She was built by Hall Russell and Co. Ltd., Aberdeen, Scotland, where she was launched on 5 January 1957. On her delivery voyage she carried a full cargo of sulphate of ammonia from the U.K. for delivery to Fiji ports.

* Should read deadweight 6,600 tons and overall length 365 ft

Rona has proved a very, satisfactory, vessel in the Fiji trade. Equipped with six sets of 5-ton cargo handling derricks and two heavy-lift derricks (one 15-ton and one 25-ton) and electric winches, she is capable of fast loading and discharging of general cargo. She can lift 5100 tons of molasses. A normal loading on the 3½ - 4 week service she provides between Australia and Fiji is in the nature of 3000 tons of general cargo outward, and a full load of molasses and a couple of hundred tons of general cargo on the return trip.

Rona is equipped with modern aids to navigation. including a gyro-compass, radar and echo-sounder, automatic pilot and direction-finding apparatus.

She serves as a weather ship for the Meteorological Bureau, transmitting weather conditions and meteorological data several times daily.

Rona has accommodation for a complement of 43 officers and crew, and four double-berth staterooms for passengers.

She was specially constructed for carrying molasses in bulk. Provision was made for this cargo to he pumped into side tanks fitted with steam heated coils to facilitate discharge.

Passenger accommodation on *Rona* is equivalent to first class on most liners. Charges, however, are on second class basis.

The passenger accommodation is usually "booked out" some time prior to departure from Australia, but because of inability to give a definite sailing date and time, cancellations are generally, heavy. *Rona* is primarily a cargo ship and does not run to a timetable. Passengers must be "on call" at the convenience of the ship and be ready to sail when the ship is ready. Many people are unable to so arrange their travelling schedules. On average about six berths are filled per voyage.

Prospective passengers who seek accommodation on *Rona* are told that because the ship's movements are dictated by the varying needs of C.S.R. business . . . "It is not possible to predict dates or ports of call more than three weeks ahead, and in fact itineraries may be changed during the course of a voyage. Applicants can have their names added to the waiting list, but if definite forward bookings are desired it would be advisable to make use of recognised regular time - table services."

The trip to Viti Levu and back takes about 16-18 days, and the round trip, including Lambasa, about 21 days. C.S.R. staff officers who travel on Rona are given 25 per cent reduction in fares.

Paddle-wheel tug boats

In N.S.W.: The nature of the country in which the company operated in the Northern Rivers dictated that it be equipped with river power - to haul cane barges, raw sugar and supplies. For the purpose it acquired several paddle – wheel tug boats. Some of them were *May - Queen, Darkwater, Iluka, Wollumbin* and *Kyogle.*

Darkwater had too great an appetite for coal, and was laid up at Harwood. The boiler was removed and she was pulled on to the mud flat opposite the mill about 1894.

Iluka worked on the Clarence until dismantled and taken to Sydney. She was bought by a firm at Tea Gardens and the hull fitted with engines and a propeller. In World War II she was bought by the U.S. Army and went to New Guinea.

Wollumbin was bought for work on the Tweed. She arrived about 1882 and towed cane punts to Condong Mill. She later went down to Broadwater (probably early in 1882) when according to a Condong letter of 21 February 1882 she was overhauled "previous to her leaving" and did similar service on the Richmond. She was given a new boiler in 1920, and ran with it for a couple of years before she too was dismantled. The hull was sold to Davis Bros. and Burgess, and used on the Richmond River for collecting pigs.

Kyogle replaced *Wollumbin* on the Tweed but she proved unsuitable for work in the sandy shallow river. She also went to Broadwater where she towed punts until about 1907. She was dismantled and sold to John Kennedy and used to transport metal from his stone crusher at Coraki to various parts of the Richmond River. Finally she was put to rest on the shallow water in Emigrant Creek.

In Fiji: Similar craft were used in Fiji. The best known were *Cakobau* and *Rarawai*.
Cakobau was shipped to Fiji on *Fiona (1)* when she look the first shipload of officers, artificers and material to Fiji in March 1881 to initiate construction of Nausori Mill. *Cakobau* was described by the "Fiji Times- 4 April 1881 as follows: "A splendid little steam launch of the C.S.R.'s called at *Levuka*. It can steam 10 knots with ease".

Another reference on 21 May 1884 refers to *Cakobau's* part in rescuing survivors of the sailing ship which was wrecked at Nasilai off the mouth of the Rewa River.

Harwood Mill apparently had greater need of *Cakobau* than Nausori, for the paddle steamer was towed to Harwood by *Fiona (2)* and she worked there with the Iluka for many years. A mill report on launches in 1914 refers to plans to give *Cakobau* a new hull.

(The first vessel the company operated at *Rarawai* was "a little thing called *Marama* a screw steamer").

Rarawai according to the "Fiji Times", 8 October 1884, was towed from Sydney by *Fiona (2).* It worked first at Nausori, and the Fiji Times- refers to her plying between the Nausori side of the island and Ba.

Rarawai worked mostly at Ba. She was used for towing 80-ton lighters , with sugar from the mill out to cargo ships. She also carried coal and other cargo up to the mill, and made runs to Nausori, Suva and Lambasa.

Lautoka Mill was built in 1902-3 and when the railway line from Rarawai to Lautoka was opened in 1907, *Rarawai* was taken out to sea and sunk in deep water.

The extensible ship's dining table from *Rarawai* is still in use in the Manager's house at Rarawai Mill. The binnacle is now the font in St. John's Church, Rarawai.

Other vessels used in Fiji

Cakobau and *Rarawai* were succeeded by *Rani* and numerous towing launches at Nausori and Lambasa. They were all propeller driven craft powered by steam or internal combustion engines. *Rani* was general work boat for the company. She was based at Lautoka. had a sea-going licence, and transhipped cargo and passengers between Suva or Lautoka and the mills, including Lambasa. The passengers included officers, their wives and children going to and from leave, and Inspectors.

Rani ended her days at Lautoka in 1931. Her anchor now lies beside the notice board for S.P.S.M. and C.S.R. shipping department at Lautoka.

Vessels played an important role in Fiji when all transport between mills was by water. When the King's Road, which circles Viti Levu, was opened in 1934 the need for vessels was considerably reduced.

Lambasa still has a fleet of launches and lighters for loading sugar and molasses and handling inwards cargo. The most notable is *Nanumiau* ("Think of me"). She was transferred from Nausori to Lambasa in 1959 when Nausori was closed down. She tows lighters and punts up and down the Qawa River, and conveys passengers between visiting ships and the company's Malau jetty.

Nanumia was built in 1927 for Mr. G. Johnson, now Managing Director of R.Carpenter and Co. (Fiji) Ltd. In 1928 he won the Suva-Levuka boat race in her.

The company acquired the launch in 1936. She was used mainly by Nausori field officers on the Rewa River, as an escort launch when sugar was being towed from Nausori to be loaded into ships at Suva, and to light the beacons and stand by moored lighters at Laucala Bay.

Nanumiau spent 22 years on the Rewa.

Lambasa also has the useful dredge RALF, named after R. A. L. Farron, a former Fiji Inspector.

New Zealand craft

Before the construction of the bridge across the harbour in Auckland, Chelsea Refinery used many lighters to take refined sugar to Auckland: *Planter, Kotuku, Cooloon, Victoria, Eliza Allen, Mahuta, Haku, Tui, Weka, Kotare* and *Omaki*.

The company's first lighter was *Planter*, built at Chelsea by Charles Bailey in 1883. Capable of carrying 155 tons, she was de-commissioned in 1953 and sold in 1956.

Used first as a steam launch *Kotuku* was converted to a lighter about 1899. Her hull is buried in the reclamations at Chelsea. The Auckland-built steam launch *Mahuta* which replaced *Kotuki* was sold in 1914.

Cooloon and *Victoria* were both built in Australia,

Cooloon was built in 1885 in Sydney as a schooner, and sailed to Auckland in 1902. There she was converted to a lighter and used until condemned in 1939. *Victoria* was built at Port Stephens in 1901 and was rigged as a ketch (fore and aft sails). She sailed to Auckland in 1902 with a cargo of char, and was converted to a lighter in 1903. She was condemned as unseaworthy for sugar cargoes in 1958 and was sold to a Mr. Clifford who towed her to Whangarei to use as a houseboat.

Eliza Allen was used as a lighter for ten years until disposal in 1918.

Five other lighters were built at Chelsea at various stages up until 1944, and were used until 1960. They were: *Haku* (1914), *Tui* (1918), *Weka* (1937), *Kotare* (1941), and *Omaki* (1944). Each was capable of carrying 200 tons of sugar in two holds and ten tons on deck. A characteristic of the lighters was the huge boilers placed midships to provide steam for the winches used to lift the sugar out of the hold.

The lighters were towed by the company's tugs. They were *Bulli* and later *Maro*. *Bulli* was built in Australia in 1939.

Maro was built at Chelsea and came into service in November 1940, the only diesel boat owned by the company in New Zealand. Driven by an eight cylinder Gardner diesel of 130 horsepower she was capable of towing two lighters alongside in fair weather.

Towards the end of its service, the fleet was carrying about 80,000 tons of sugar to Auckland every year. In April 1960 the vessels were laid up and were subsequently sold when it became obvious that trucks could handle deliveries satisfactorily.

Other company vessels

Dyraaba was an iron ship roughly 100 ft. long. She was used at Broadwater as a tug before 1892 (the first reference to her in existing correspondence). She was replaced when the company bought *Captain Tom Fenwick* in 1927 for the 1928 season. Her remains are in the mangroves opposite Broadwater Mill.

The company sold *Captain Tom Fenwick* * in 1959, and replaced her with smaller launches. Later her boiler was removed and she was left at moorings in Ballina where she ultimately sank. She has since been salvaged and refitted as a salvage ship. (* Official records for the vessel identify her as *Captain T. Fenwick:* see page 61)

Leo was built near Ballina about 1879 with two almost identical sister ships one of which *Eva* was owned by the company.

Leo apparently has been towing cane at Broadwater since the mill opened in 1881. She originally was a steamer of about 25 B.H.P. but was converted after World War II to diesel power with a war surplus 60 B.H.P. landing barge engine. She later had two other changes of engines in 1963 and 1965.

Leo also had other work done on her over the years. She is still towing cane with no end to her useful life in sight.

The company now runs a fleet of 11 diesel tugs at Harwood and Broadwater. The vessels include *Wyness* fitted with 150 B.H.P. engine at Broadwater and *Chatsworth* of similar size on the Clarence. Also on the Clarence are five other diesel powered launches - *Ajax, Beardmore, Harwood, Hebe,* and *Wommin. Marama, Yalinbah* and *Gannet* have also operated at Harwood in recent years.

Hebe (1890). *Ajax* (1912), *Beardmore* 1915) and *Marama* (1915) were built on Harwood Island by Mr. J. G. Pashley and Son. In 1928 *Gannet* was purchased from a local shipwright at Maclean and these five steamers operated until 1942 when *Yalinbah* joined the fleet, which as far as is known, came from the Myall Lakes.

In the late 1950s *Marama* was sold and is now used as a houseboat at Palmers Island on the lower Clarence and *Yalinbah* was sold and eventually rotted away at Yamba. The remaining four launches were then fitted with diesel engines.

The launch *Hitherto* was used by the cane inspecting staff for their work when road access to farms was not available. She was bought from a 2nd Engineer who retired from Harwood Mill.

In 1962 and 1965 two new steel hulled launches, *Harwood* and *Chatsworth* were built on the Richmond River for Harwood.

Hitherto was eventually replaced during the war as use of petrol was curtailed. Her replacement is *Platypus* powered by a small Chapman engine.

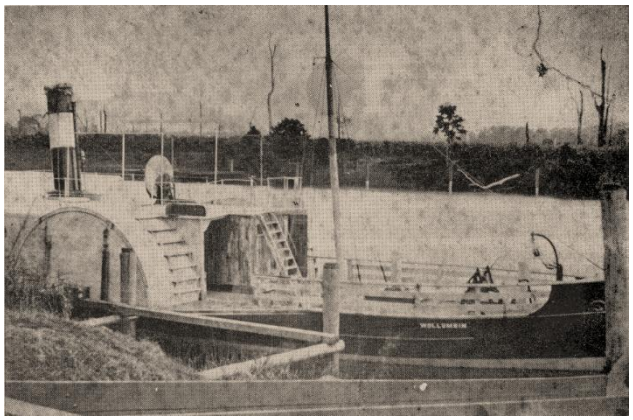
In 1966 *Wommin* was transferred from the Tweed River where she had been operating since 1888. Prior to 1888 *Wommin* had seen service at Newcastle.

Gannet now operates on the Richmond River. As well as the remains of the old *Darkwater* on the bank opposite Harwood Mill the hulk of *Cakobau* was also dragged on to this mud flat.

The Newsletter article also had some images from old photos. SS Fiona (2) and MV Rona (2) are given in Section 3 herein, and the tugs *Rarawai &Wollumbin* are shown below:

Caption Read : This vessel is believed to be *Rarawai*, which was used to haul punts and lighters in Fiji in the 1880's. She was taken out to sea and sunk in 1907

If this photo was at Nausori on the east side of Viti Levu, as the Newsletter states was *Rarawai's* initial location, it indicates the difficulties encountered there in the dry season when the Rewa River had very little water – the tug is shown sitting on its flat bottom unable to operate.



Caption Read: *Wollumbin*, a paddle-wheel tug boat used for towing cane punts at Condong Mill in the 1880's

A note on “ ship tonnage ” was included at the end of the Newsletter. It is repeated in Appendix 2 that also explains " Tons Burthen " as was used to describe the capacity of *SS Keera* when first registered in England, 1851.

3. Ocean Going Ships Owned By CSR:

First 99 Years in order of date purchased

3.1 *SS Keera*:

Built in the yard of Thomas Toward, St Peters on the River Tyne, Newcastle-on-Tyne, in 1851. Initial LOA 102 feet, 20.5 ft beam, 113.7 tons burthen. Rebuilt in Dunedin NZ 1868, where she was lengthened 30 ft, after earlier grounding and extensive damage at the 'Buller' river entrance to Westport in 1866. Final LOA 133.1 ft, 20.4 ft breadth to the outside plank, 229 tons gross, 158 tons net, she was a riveted iron auxiliary steam ship with a single screw, 60 HP, rigged as a two masted schooner and remained so throughout her registered sea life

She is believed to be the first iron screw steamer built for Australia, purchased late in her life by CSR in 1873 as their first cargo ship to ensure the supply of coal to Chatsworth Mill. She was capable of carrying 250 tons coal with shallow draft. Replated on two occasions by CSR, finally hulked in 1877 converted to a lighter to move sugar from Chatsworth to Harwood, she had a varied and eventful life in the 20 years prior to CSR, the detail of which is given following.

World Ship Review - Issue 49 - September 2007 (JTR):

AUSTRALIA'S FIRST STEAM
THE SS *KEERA* STORY

Painting by Sydney Maritime Artist Ron Scobie

The *SS Keera* Story

It was said that *Keera* [Official No 31845] was the first iron plated screw propulsion steam ship built for trade in Australia [1] and she is of historical importance in terms of Australia's maritime past. She was built as a sail assisted iron steamer and rigged as a two masted schooner with a standing bowsprit, clipper bow and rounded stern that was a popular ship design at the time.

Keera was not Australia's 'first screw steamer' as such. That place goes to SS *City of Melbourne*, a timber vessel built in Melbourne by J. Kruse as a three masted schooner in 1851. She was initially a steamer but the engine and boiler were later removed.[2] *City of Melbourne* had an 80 hp oscillating steam engine made by John Penn & Sons, that was removed in 1858 and the ship remained converted to pure sail for the rest of her life.

Arguably, *Keera* should be accorded recognition being specifically ordered and built for Australia as a screw steamer, and she remained so throughout her seagoing life.

The building was commissioned by a consortium of nine private investors who intended *Keera* for a regular service between Sydney and Wollongong. They included Henry Gilbert Smith known for his interest in steam as well as the development of Manly, and his nephews Thomas Whistler Smith and Eustace Smith. Together they owned 42% of the ship. Henry appears to have been the main promoter in the acquisition as he is shown as owner in *Lloyd's Register* (1851 and 1852) and he attended the launch.

Henry Gilbert Smith is credited with the introduction of steam navigation to Australia in 1831 when his then Sydney mercantile and importing firm, Smith Bros had a 58 ft paddle steamer ferry PS *Surprise* built by Millard's Slip at Neutral Bay. *Surprise* was to briefly provide a service between Sydney and Parramatta. She had open accommodation and a small 10hp steam engine that Henry may have brought back from England when returning from one of his many trips there, though there is some conjecture that the engine may have been built in Sydney, that has some merit concerning the boiler. The ferry service was not a financial success and *Surprise* was sold to Hobart interests in 1832 [2, 4].

PS *Surprise* was launched on 31st March 1831 and underwent her first steam trial that year. This predated the launch without engines and boiler on 14th November 1831 of PS *William the Fourth* built by Marshal & Lowe on the Williams River, that some authors incorrectly claim to be first (her engines were fitted in Sydney months later). As to being the first, the arrival in Sydney on the night of 13th May 1831 of the British PS *Sophia Jane* was arguably the first visitor but she arrived under sail with paddles stowed and did not raise steam until 11th June 1831.

Keera was built in the yard of Mr Thomas Toward, at St Peters on the River Tyne in the County of Northumberland, England (on the north bank and some five miles east of Newcastle upon Tyne) and launched there in April 1851 [3]. She had a tubular boiler and a 60hp twin cylinder steam engine, built in Newcastle by railway engineers Robert Stephenson & Co., who also supplied marine engines. Little is known of the machinery.

There are few if any extant photographic records to show the deck and rigging for *Keera*, so an artist's picture has been built up from the (two) images discovered and the other material herein.

The Institute of Marine Engineers (Sydney), in a project to mark Australia's 1988 bicentenary, assisted in researching material for a book by the late Mike Richards, *Workhorses in Australian Waters*, that included reference to *Keera* with the sketch below [2] of how they believed she may have looked. Note the tubular (box) boiler that *Keera* was known to have, and a two-cylinder (inverted) "V" engine with its cylinders above the crankshaft.

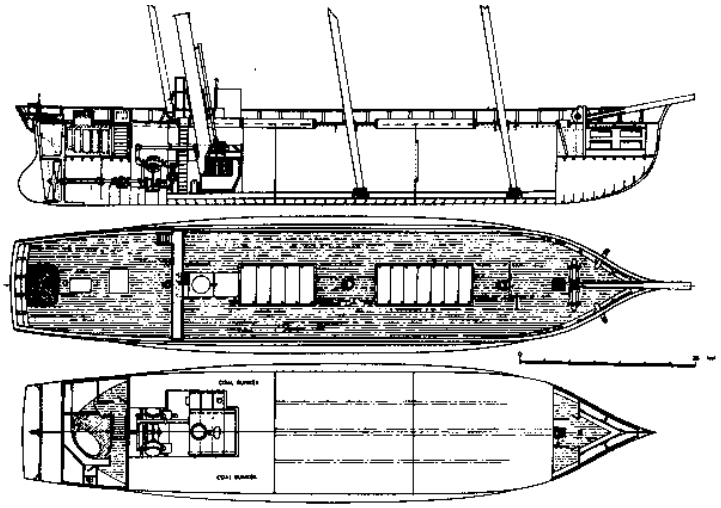
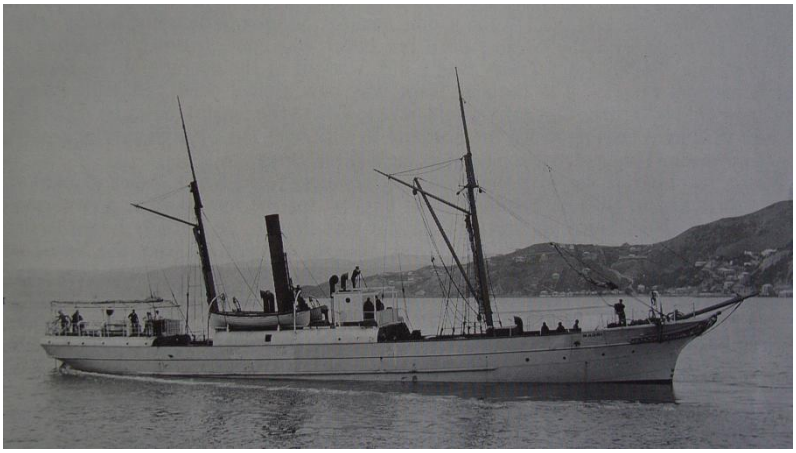


Illustration taken from Workhorses in Australian Waters, *Mike Richards for the Institute of Marine Engineers (Sydney)*

Whereas this diagram shows three masts, a square stern, large coal bunkers, two holds and limited accommodation, *Keera* had only two masts, a round stern and a clipper bow with a more pronounced beak, and it appears from the following, she had a single hold, smaller bunkers and more extensive accommodation.

A close overall visual match to *Keera*, would appear to be the New Zealand steamer SS *Maori* built in 1868 by Blackwood & Gordon at Port Glasgow, 174 tons, dimensions 144 ft x 19.1 ft x 9.2 ft, and acquired by the Harbour Steam Co., of Dunedin in 1869, later sold in 1888 to the Union Company as its first steamer. She is shown pictorially steaming under sail below, and photographed below as she sailed as a steamer only.

Maori *sailing under a light brig rig, from* The Line that Dared,
edited by G McLauchlan,



SS Maori *from* The Southern Octopus – the rise of a shipping empire *by G M*^{c}*Lean*

Compared with *Maori* above, the accommodation structure for *Keera* continued elevated from the engine room. The mainmast was placed in-between, and it probably had no cargo derrick aft since there was a slightly raised quarterdeck, nor was there a welldeck as shown for *Maori.* An artist's impression for *Keera* is thus concluded based on the above and following material.

The first certificate of registration for *Keera* was No 24/1851 issued in the Port of Newcastle upon Tyne, on 5th June 1851, the master being recorded as Alfred M Sainthill.

She sailed from Southampton and the Isle of Wight on 18th August 1851. Aboard were a few passengers and a cargo of 70 tons of heavy goods including anchors, chain and other hardware. She sailed under canvas only to Australia, taking 137 days (often done with delivery voyages). The long voyage was due to her light steamer rig and heavy weather that took her to latitude 40° south via St Paul Island in the Indian Ocean and south of Van Diemen's Land (now Tasmania) [1]. The *Shipping Gazette & Sydney General Trade List* for Saturday 10th January 1852 notes her arrival at Phoenix Wharf Darling Harbour on 3rd January 1852, where she remained seven weeks for refitting.

Keera was next registered in Sydney [5] on 1st May 1852, with the following shown on certificate No 49/1852 by the surveying officer with his hand written entries in italics. There were slight differences compared with the Port of Newcastle register:

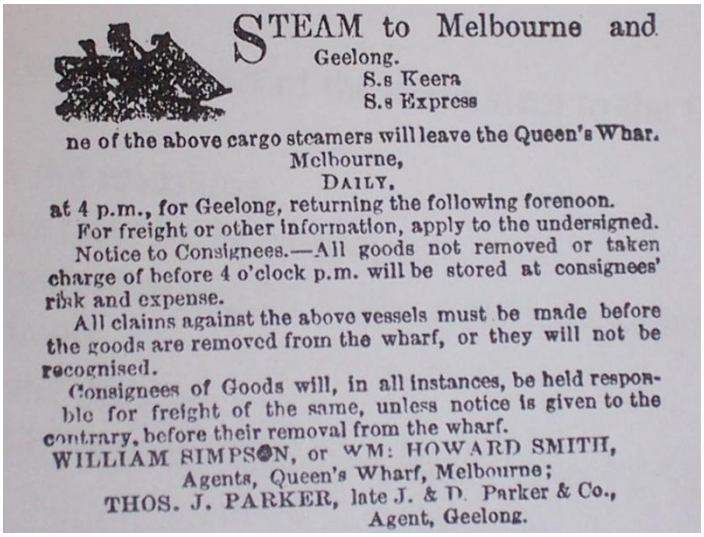
> Burthen *113.7* Tons,
> *One and a poop* Deck,
> *2* Masts,
> Length from inner part of the Main Stem to the fore part of the Stern Post aloft is *102.1 ft* (Ref [1] states the LOA was 106 ft and keel length was 96 ft)
> Breadth in midships *20.5 ft*,
> Depth in hold at midships *10.4 ft*,
> *schooner* Rigged, *standing* Bowsprit, *round* Stern, *clench* (ie clinker) Built, *no* Galleries, *a scroll figure* Head, and that the Framework *and Plating* is of *Iron* and she is a *Steamer propelled by a Screw with an Engine Room twenty two feet six tenths in length and fifty five two tenths Tons*

The 'Subscribing Owners' were three Sydney merchants, Thomas W Smith (9/64ths) Colin Croft (8/64ths) & Thomas Taylor (5/64ths). The 'Other Owners' were William Manning Esq of Sydney (5/64ths), two Sydney merchants, Eustas Smith (4/64ths) and Henry Smith (14/64ths), and three persons described as 'gentlemen', Edye Manning from Devonshire, England (9/64ths), Richard Corrand of London (4/64ths) and John Kimpson of Herefordshire, England (6/64ths).

Soon after the arrival and registration in Sydney, the register shows the ship sold (64/64ths) to James Cowie, another 'gentleman', being the Chairman of the Geelong Steam Navigation Company, by way of a bill of sale dated 6th November 1852 and the register updated 23rd November 1852. The registry subsequently transferred to Geelong (No 5/1853) and later to Melbourne (25/1864).

It has been suggested the ship proved difficult to operate into and out of Wollongong harbour (Belmore Basin) which is probably true as it is exposed, there is no turning basin at the berth, and *Keera*'s length would have made manoeuvring difficult. An equally plausible reason for the sale is these first owners took an opportunity to recover their investment and perhaps make some profit, since they were primarily merchants and investors. They did not set out to develop a shipping line as such.

The Geelong Steam Navigation Company had the vessel from late 1852 perhaps until at least 1860 when she sailed a regular steam packet service between Geelong and Queen's Wharf Melbourne, sometimes three days each week. An advertisement on the front page of *The Geelong Advertiser* of 22nd June 1860 is shown below.



STEAM to Melbourne and Geelong.

S.s Keera
S.s Express

ne of the above cargo steamers will leave the Queen's Whar. Melbourne,
DAILY,
at 4 p.m., for Geelong, returning the following forenoon.

For freight or other information, apply to the undersigned.

Notice to Consignees.—All goods not removed or taken charge of before 4 o'clock p.m. will be stored at consignees' risk and expense.

All claims against the above vessels must be made before the goods are removed from the wharf, or they will not be recognised.

Consignees of Goods will, in all instances, be held responsible for freight of the same, unless notice is given to the contrary, before their removal from the wharf.

WILLIAM SIMPSON, or WM. HOWARD SMITH,
Agents, Queen's Wharf, Melbourne;
THOS. J. PARKER, late J. & D. Parker & Co.,
Agent, Geelong.

The 22nd June 1860 advertisement,
Ships in Corio Bay, *by Jack Loney*

The second ship, SS *Express*, in the above advertisement, was owned by Captain William Howard Smith whose name appears at the bottom as agent for *Keera*. Captain Smith was to found the fleet/enterprise [6] of the same name that spanned a period of 146 years. His ship *Express* competed with *Keera* but this did not appear to faze him as he received the agents' return on their efforts as his competitor.

The Melbourne register shows a succession of ownership changes, mainly from the sale of shares held by individuals, however the ship was later owned by the Gippsland Steam Navigation Company who used it for a regular run between Melbourne and Port Albert (that is services to Gippsland Lakes, Sale and Bairnsdale) as shown in the last Melbourne register (No 25/1864). Comments recorded in 1873 company files, made to the Colonial Sugar Refining Co. Ltd's., General Manager, Edward Knox by Sir Daniel Cooper, a co-director, confirm *Keera* had also been laid up in Salt Water Creek, Melbourne, sometime during her Victorian life.

New Zealand records show *Keera* to have been in the Otago Province area of the South Island of New Zealand in early 1866, including a reference to the issue of an Engineer's Certificate to a William Melville for *Keera* on 14th February 1866. The ship remained on the Melbourne register at this time as it "*closed on the 25th April 1867 following the ship being wrecked on the north west coast of the South Island of New Zealand, 2nd November 1866* ". The wreck was reported in 1867 to the New Zealand House of Representatives [7], in accordance with NZ practice. The journal records the Court of Enquiry found it occurred for "*want of a signal station and a lack of judgement on the part of the captain, and the location as Buller*". Buller Bay is close to Westport near Cape Foulwind, and *Keera* might have been headed there to off load passengers and general cargo or take on a load of coal and or timber.

NZ Timeline Updated 2010:

The NZ web site "Past Papers" [http://pastpapers.natlib.gov.nz] has been expanded since 2007 when I first wrote about Keera. The site enables extensive searching of references to the activities of *Keera* in NZ as reported by the regional papers of the times, ie the Grey River Argus (GRA), the West Coast Times (WST) & the Otago Witness (OW). These papers reported regularly on the period 1866 – 1868 when *Keera* was engaged in the 'West Coast trade', her grounding at the entry to the Buller in Nov 1866 and subsequent repair at Port Chalmers Mar 1867 then return to this 'West Coast' trade, her 30 ft lengthening at Pelichet Bay Dunedin Nov 1868, and subsequent transfer to the 'Lyttelton trade', etc., are paraphrased following.

1. The 'West Coast' is one of the administrative regions of NZ, located on the west coast of the South Isl. It is remote and sparsely populated, made up of the three districts of Buller, Grey and Westland where the principal towns are Westport, Greymouth and Hokitika. The region was divided between Nelson Province and Canterbury Province from 1853, however in 1873 the Canterbury portion of the region formed its own Westland Province, which was maintained until the abolition of the provincial system in 1876. The region has a very high rainfall due to prevailing north westerly winds and the Southern Alps. The Tasman Sea there is well known to be very rough and 4 meter swells are common.

   The West Coast was only occasionally visited by early Europeans until the discovery of gold near the Taramakau River in 1864. By the end of that year there were an estimated 1800 prospectors on the West Coast, many of them around the Hokitika area, which in 1866 became briefly the most populous settlement in New Zealand. Following pounamu (greenstone) and gold, the next mineral to make the West Coast valuable was coal. Discovered near the Buller River in the mid 1840s, mining began in earnest during the 1860's and by the 1880's coal had become the region's main industry with mines throughout the northern half of the region, especially around Westport.

2. *Keera* had been considered for NZ well before her actual arrival. The Southland Times in Invercargill ran an article in the issue dated 15 May 1863 stating she was intended for the trade between Invercargill and Dunedin.

It appears this did not eventuate however in a later issue the names of "Carey and Gilles, agents, Invercargill" are noted that suggests they had knowledge of the ship.

Thus, rechecking 'Transactions subsequent to the Melbourne Register 25/1864' shows the Gippsland SNC^{o} as owner, sold all 64 shares in *Keera* to J R Carey and B E Gilles in a transaction dated 2 Oct 1865 then the Gippsland SNC^{o} appears to have financed the sale by way of 3 mortgages over the ship in an entry dated 5 Oct 1865 (these were subsequently discharged by 31 August 1866). Accordingly, Carey & Gilles became owners progressively from 5 October 1865 and they relocated her to the NZ West Coast trade soon after (OW 23 Dec 1865).

There are many references in the aforementioned newspapers to *Keera's* activities (ie her movements between Dunedin, Greymouth, Hokitika and Buller [Westport] where she carried passengers and general cargo on a regular basis).

There were few if any roads connecting these towns, so inhabitants relied on shipping. The sea distance between Dunedin and Buller is about 570 NM and sailing would have taken around 3 days at *Keera's* speed averaging say 8 knots in good conditions. Entry to each of these ports required her to cross a bar and she was often delayed by tide and sea conditions. The round trip would thus take a week or more subject to conditions (which resulted in many ships being lost, including the year of 1866).

Further, *Keera's* depth of hold was approximately 10 ft and she drew something less fully loaded. The tide range along the coastline of these west coast rivers is around 11 ft and low water falls to around 2 ft, so negotiating the conditions at a bar in a single screw steamer demanded experienced seamanship, good judgement and constant vigilance. Entry to these ports was a risk that was ever present.

3. *Keera* had left Hokitika for Buller via Greymouth 31 October 1866 [WCT 10 Nov 1866 quoting Mr Gilles who was aboard]. She intended stopping at Pakihi to drop passengers and cargo but abandoned this due to heavy seas. She continued on to Buller arriving at 1.30 pm on **2nd of November 1866**. She waited until 2 pm before attempting to enter the river so as to have sufficient water on the rising tide. There was no signal station at Buller.

   She ran in, staying to the south and grounded on a spit close to the channel. A pilot then boarded her and she soon refloated but when reversing off the bank her wheel chains parted. These were rejoined and Gilles claimed there was a misunderstanding with the pilot about the direction of the channel and she was mistakenly sent aground onto the north spit. She remained there fast for a day, then refloated on a high tide but rapidly took in water (4 feet in flowed to the hold) so she was warped up the beach to safety where she remained and was partially dismantled later.

As noted, the Court of Enquiry found the cause to be "the lack of a signal station and an error of judgement on the part of the Captain (Joyce)". Considering the previous statement attributed to Gilles, the finding appears to be a little harsh on Capt Joyce ! [Ref. AJHR 1867, Section E6 page 21]

A survey/inspection described by the other owner (Capt) Carey said, the damage to *Keera* was not terminal and they were hopeful she would be able to return to the Dunedin trade [WCT 16 Nov 1866]. Getting *Keera* off the spit (said to be 500 yards wide) however proved to be a difficult and costly task; the owners subsequently tried to auction her where she lay [GRA 22 Nov 1866] but this failed.

4. *Keera* was eventually recovered mid to late Jan 1867 as reported in the Westport Times 5th Jan 1867. The ingenuity shown in achieving the recovery is worth repeating the newspaper article here,

The SS Keera is progressing towards the river at a very fair rate, and is now on the bank and out of danger from tides or weather. At the time of commencing operations she had thirty tons of sand which had to be cleared out, and she had to be lifted by the stern full six feet before getting on the ways. ***It is estimated that the gross weight of the craft as she then lay was three hundred tons****, no bad lift at starting. As we have previously stated, considerable difficulties were encountered at the outset of the undertaking but these have been surmounted, and rather over 150 feet has been traversed on the way to relaunch. About another hundred feet, or rather less, has to be gone over, when the vessel will be slewed to the river, and be put in just astern of the wreck of the Eclipse. Unless something unexpected occurs to prevent it, the Keera will be by the river side in a fortnight. She will then be refitted, as far as her engines go, thoroughly, and will be patched up in the hull, so as to enable her to make the trip to Dunedin. Mr. Akerley is superintending the launch, and is un-mitting (sic) in his exertions, as well as showing himself thoroughly capable of carrying out the task he has undertaken.*

Westport Times 5 Jan 1867

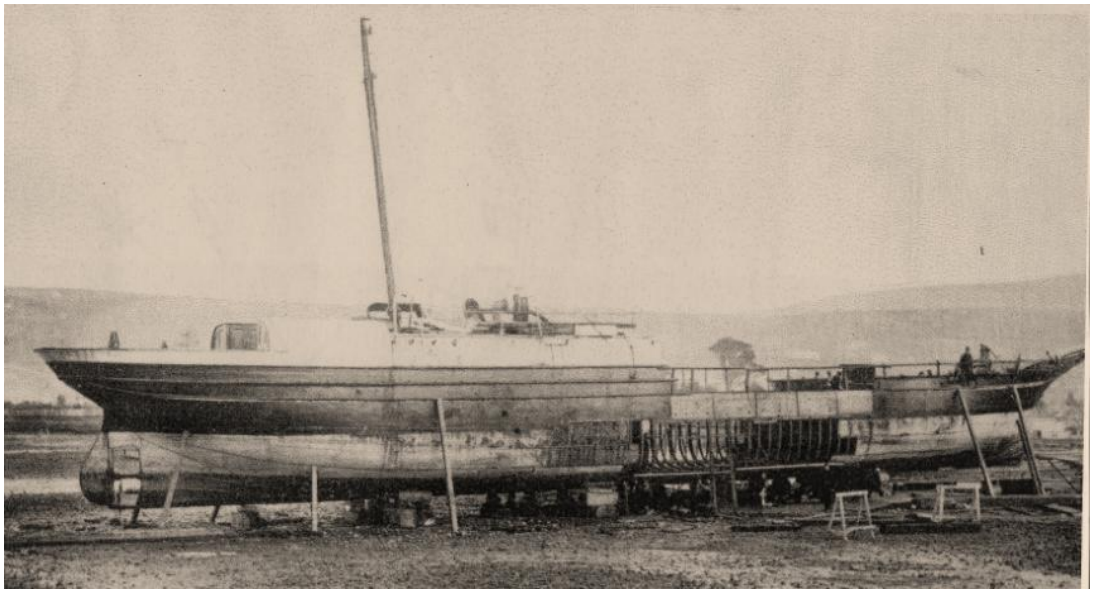
The 100 ton steamer Lioness, that also serviced the West Coast trade, was used to bring hydraulic equipment to lift and move *Keera* up onto and along the ways to her final relaunch. She was made water tight and subsequently sailed the 570 NM under her own steam to Port Chalmers via Lyttelton (in port there for 5 hours on the 25th Jan 1867 as reported by the Southland Times 28th Jan 1867). *Keera* was then extensively repaired at M^{c}Kinnon & Murray Port Chalmers slip [GRA 5 Mar 1867 repeated a Daily News report dated 27 Feb 1867]. The final repair included 4 new plates with extensive re-riveting, 36 ft of the keel reshod, the stern frame strengthened, a new rudder and 3 blade propeller, the propeller shaft relined plus new thrust brasses, and engine pistons and valves refaced etc. The work was said to have been supervised by a Mr Hamilton who was responsible for recovering her from the beach at Buller.

She was refloated at the Port Chalmers slip late Feb.1867 and towed to Pelichet Bay jetty Dunedin for further refitting and painting to then be returned to the West Coast trade.

5. *Keera* was aground again in late October 1867, this time at Greymouth where on an ebbing tide she either ran out of channel due to a failure to keep the beacons in line or she did not follow the semaphore instructions from the signal station [GRA 24 Oct 1867]. Luckily she was refloated undamaged next tide, but it shows how difficult it was to bring ships in to port on these west coast rivers.

   As noted, the tide range along this coast ranges from around 2.3 m to a peak of 3.7 m, which combined with big swells and or big seas, and bars and channels that forever changed, all made for very difficult conditions for a single screw ship. The tide ranges here are some 0.7 to 1.3 m greater that on the east coast, as at say Dunedin.

6. In August 1868, a 3 month contract was placed with Kincaid M^{c}Queen & C^{o} in Dunedin to lengthen *Keera* some 30 ft amidships and to carry out a further (major) refit [OW 8 Aug 1868]. It was said to be the first time a ship was lengthened this way in NZ. She was stripped before the handover, explaining the absence of standing rigging in the photo below (dated about 15 August 1868) at the beach beside the Pelichet Bay jetty where the work was done.



Lengthening Keera - Otago Settlers Museum Collection

Report of a "Supposed Earthquake Wave" [OW 22 Aug 1868] makes an interesting claim "that *Keera* was moved up the beach to safety *in the matter of a few hours*", when the effects (of the tsunami originating from Chile) were being noticed in the Otago Harbour;

The claim the ship was moved is questionable given, (i) her mass (estimated at 300 tons when she was moved at Buller !), (ii) the packed (aligned) blocks under the keel with supporting props, (iii) the very short time claimed, and,

It took some time to relaunch *Keera* after this rebuild. 'Screws' (sic) were used to move her down the beach, and when this failed, pontoons were strapped to the stern to increase her buoyancy thus allowing her to refloat 9 Nov 1868 [GRA 5 & 10 Nov 1868].

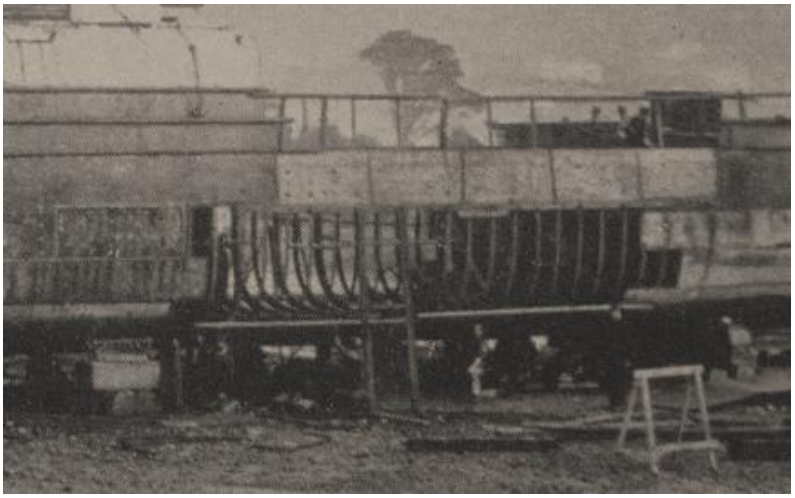
Successful sea trials were carried out on the Otago Harbour reported in detail [OW 5 Dec 1868]. *Keera* was subsequently placed in the 'Lyttelton trade'.

Footnote:

The Auckland **"New Zealander" of 29 Dec 1852 quoted from the Melbourne Argus** that ran a story that discussed the profits being made by importing steamers from the UK then selling them in Australia - a practice that was developing despite the high operating costs of steamers that achieved only a modest time advantage for the passage out c/w sail. An example given was the recent sale of *Keera* that had been built at a cost of about £6000 then sold for £10500 soon after arrival. It supports the contention that Henry Gilbert Smith & his co owners sold *Keera* primarily motivated by profit rather than an apparent difficulty with the ship berthing at Belmore Basin.

Continuing the Keera story from page 20,

When she was salvaged and taken to Dunedin, she was re-registered there on 9th July 1867 (Port of Dunedin No 6/1867) in the joint owner names of Alfred William Gillies, shipowner of Hokitika and John Randal Carey, also of Hokitika. It is therefore clear this pair were responsible for the 'Buller' salvage and the later contract to lengthen and rebuild her with the Dunedin firm of Kincaid M^{c}Queen & Co.



Cropped From The Port of Otago, *by A.H. M^{c}Lintock*

The 1868 photo[8] at the Pelichet Bay Jetty shows progress with the new cogged ribs, the clinker strakes of riveted iron plates (five plates approximately 6 ft x 4 ft x ⅜" thick to each strake) and access to strengthen the bottom and extend the cargo hold by some 30 feet.

Dunedin was a new settlement and Kincaid M^{c}Queen & Co had just started their Union foundry when they contracted to rebuild the ship that included casting a new propeller, probably done to better suit the longer hull. This firm of engineers became known for constructing dredgers used in Otago harbour and builders of mining equipment for the gold industry. The timber deck and interior cabin were replaced by a Mr Andrew Melville of Port Chalmers as reported in *The Otago Witness* on 24th October, 1868 thus:

> **" *The old favourite steamer* Keera*, has for some time past been in the hands of busy workers in iron and wood, and there is little doubt that when ready for sea, she will not only sustain her well won reputation, but will be a credit to her owners, to the Province she sails from, to the place where the improvements in her were made, and to those engaged in the work. She has been lengthened 30 ft, an entirely new section having been added to her. Her boiler has been thoroughly repaired, a new bottom upon a new and improved principle having been fixed. All this is being done by Messrs Kincaid & McLean, and so expeditious have they been that they will be able to complete the work in very much less than the contract time. They have also cast for her a new propeller and her engines are in their hands. Most of the work on board has been done under the superintendence of Mr O'Connel, the foreman to Messrs Kincaid & McLean, and the manner in which the whole is executed is the best testimony that could be given to the success of local industries. The contract for the woodwork was accepted by Mr Andrew Melville of Port Chalmers and he has already laid the decks for caulking which will be done during the first spell of fine weather. He is also proceeding expeditiously with the interior fittings, the putting up of a new paul bitt and the rest of the work.*"**

Following the rebuild, the Dunedin register was altered, No 13/1868 dated 4th December 1868, to show the new dimensions. *Keera* remained in New Zealand another four years as a cargo and passenger steamer with a number of ownership changes including one to The Bank of New South Wales as a mortgagee for 50%. The registry also changed to the Port of Auckland, No 28/1872, dated 20th December 1872. *Keera* sailed from Auckland soon after on 23rd January 1873 and returned to Australia.

The Sydney register reopened on 4th February 1873, No 15/1873, in the name of Henry Alfred Coffee (Shipbroker of Melbourne) as the sole owner then transferred to Alfred William Gilles on 27th March 1873 (that is the joint owner who had salvaged and rebuilt her as noted earlier, but now being of Sydney). The Sydney register details show the changes made in the Dunedin rebuild,

Single deck, two masts, schooner rigged, round stern, clench build, scroll head, iron frame,
229.68 tons grt less allowance for engines of 71.59 tons = 158.09 tons net,
133.1 ft long from the fore part of the stem under the bowsprit to the aft side of the stern post,
20.4 ft main breadth to the outside of the plank,
9.4 ft depth in the hold from the tonnage deck to the ceiling at the midships

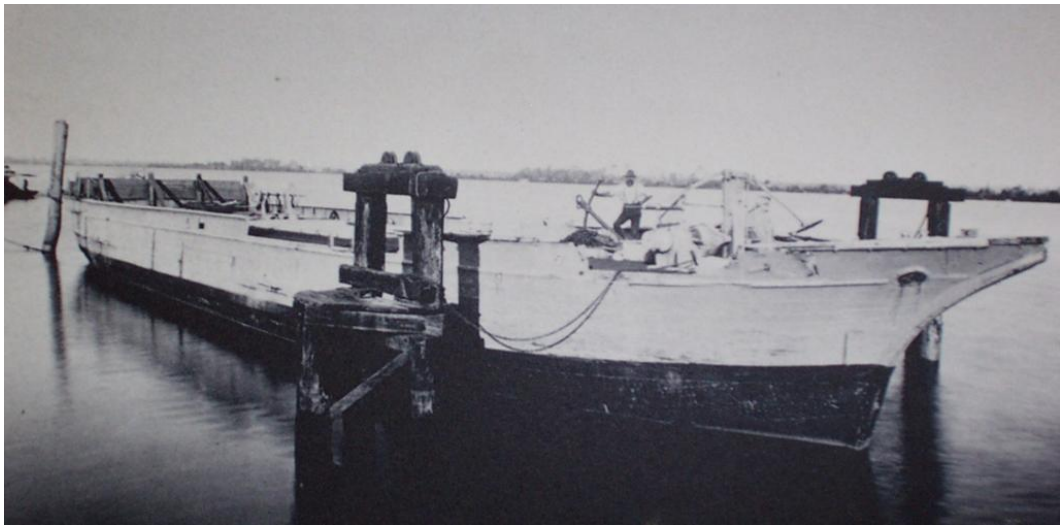
Passenger arrival records show *Keera* entered Sydney on 21st March 1873 from Brisbane with a crew of 13 including the master, Captain William Alexander Curphey and 23 steerage passengers indicating the extent of the ship's accommodation.

The Colonial Sugar Refining Company (CSR) purchased *Keera* from Alfred William Gilles then of Sydney, for the sum of £6,500 soon after by way of a bill of sale dated 5th May 1873. She had six months of survey and was re-registered that day in the name of Joseph Grafton Ross, General Manager. CSR acquired the ship as their first ocean going vessel to secure coal supply for their new sugar mills on the Northern Rivers of New South Wales. This action was in response to the withdrawal of the collier *Platypus* hitherto provided as a dedicated ship from the Clarence & Richmond River Steam Navigation Co., and commenced the shipping activities of CSR that has continued these past 134 years, now making them Australia's longest operating fleet on the coast.

Keera first shipped Newcastle coal to the sugar mills at Darkwater on the Macleay River (the mill operated 1870 to 1873), Southgate (mill from 1870 to 1879), Chatsworth (mill from 1870 to 1887) and Harwood (mill from 1874 to date) on the Clarence River and she back loaded bagged raw sugar to Sydney. CSR engaged Captain Curphey as master of *Keera* and he was later made master of other CSR ships that included the first *SS Fiona* (CSR contracted to have her built to their own specification at the same time as purchasing *Keera*), and PS *Terranora.* Following the arrival of SS *Fiona* in 1875, an unsuccessful attempt was made to sell *Keera*, so she was replated and hulked as a lighter to carry 200 to 300 ton loads of sugar from Chatsworth to Harwood mills thereafter.

The Sydney register No 15/1873 closed showing, " *... the ship made into a hulk and no longer used for seagoing purposes. Certificate of registry delivered up and cancelled this 27th day of November 1877* ".

It would seem this was still the situation in 1894 when the following photograph appeared. Folklore around the Clarence district suggests a local, Captain Charles Pullen, may have acquired the hulk and used it as a river punt after CSR, but it is just as likely to have wasted in river mangroves with other hulks known to be left over the last 100 years. Keera shown hulked on the Clarence River,



(Mitchell Library – Fiona Album: Citation No PXA 6914)

References:

[1] *The Shipping Gazette & Sydney General Trade List*, 10th January 1852,

[2] *Workhorses in Australian Waters*, M. Richards for The Institute of Marine Engineers, Sydney,

[3] *Newcastle Journal* 19th April 1851,

[4] *The Shipping Gazette & Sydney General Trade List*, 14th February 1852,

[5] Taken from microfilm (held in the Vaughan Evans Library at the Australian National Maritime Museum) of ships registered under the British Merchant Shipping Acts of 1827 to 1982: *Keera* O/N 31845, Port No 1852/049, Film No C1/03, Location No SYDB09F076, etc., for this and the follow on registries,

[6] Howard Smith Shipping, Ian Farquhar,

[7] New Zealand National Maritime Museum - Maritime Index: Appendices to Journal AJHR 1867 Section E6 page 21,

[8] The photo at Pelichet Bay also appeared on the cover of the journal of the New Zealand Ship & Marine Society, *Marine News*, Vol 35 Issue 4, of 1985. It ran there with a repeat story entitled "The Great Earthquake Wave of 1868 by C F Amodeo, dated 1982". The story was about the tsunami following the earthquake off the Peru – Chile coast, 15th August 1868, said to have hit New Zealand 17 hours later, that caused horrific devastation in South America and great damage on the east coast of the South Island when the photo was purportedly taken.

It claimed there were tidal movements and warnings, so "*Keera was 'hastily' moved some 8 metres up the beach to escape the wall of water that eventually hit*." To move the ship, weighing well upwards of 100 tons, resting on trestles with its keel packed and aligned, whatever the situation might have been, all in the space of a few hours, is quite impossible, but it made for a good read.

Footnote: Little is known for certain about the *Keera* machinery so a discussion paper is attached rationalising about this. See SS Keera Machinery.

3.2 *SS Fiona (1)*

Built by Cunliffe & Dunlop at Port Glasgow in 1874. LOA 200 feet, beam 28 feet, 728 Tons. Iron steam ship with twin screws, 150 HP. Rigged as a two masted brig with six bulkheads, primarily used as a collier but also used for raw sugar transport. Her story follows,

Fiona **(Official No 71831**) had an all too short life in Australia after launch on the River Clyde in 1874. **She was the first ship built for The Colonial Sugar Refining Co Ltd** (CSR) and the first of four vessels given the Fiona name; three more followed in a fleet that totalled 8 ocean going ships built for the company to its own specification over 83 years.

Mitchell Library – Fiona Album Citation No PXA 6914: *"Old Fiona"*
(only extant photo found for the ship)

Fiona **(O/No 71831) @ Clarence Wharf Walsh Bay ca late 1870's**

CSR has continued in shipping to the present day making it the longest surviving operation on the Australian coast. The circumstances as to why it became active as a ship owner are worth recapping.

CSR was incorporated in 1855, commencing as a sugar refiner under the management of Edward Knox, then a young man of 35 years with considerable energy and commercial ability who came to Australia in 1840 to 'make his mark and his fortune'. He became active in banking, the Anglican Church, and developed interests in the wider community and government, being elected a Member of the NSW Legislative Council in 1856 which he continued for many years, and was knighted in 1897 prior to his passing in 1901.

The Australasian Sugar Company, formed in 1842, had been managed by Knox for three years and was a predecessor to CSR that briefly operated a sugar refinery at Canterbury in Sydney. It closed when CSR began by acquiring two other established refineries; the 'Brisbane House' refinery in Chippendale and the 'Bowden Works' refinery in Liverpool St purchased the following year.

The company prospered in sugar refining for the first few years until a worldwide sugar industry recession hit in 1857/8. Having 'made enough of his fortune', Knox went back to England to pursue 'a more comfortable life', but subsequently had to hurriedly return to save both himself and the company from insolvency. He applied himself with honour and great success and was to remain in Sydney for the rest of his life. Knox lead CSR through an initial period of vigorous growth, that saw many developments that included the establishment of a new concept of centralised sugar mills fed by independent cane growers that CSR introduced on the Northern Rivers of NSW in the 1870's, as well as a new modern refinery that was built at Pyrmont in 1878.

CSR entered the milling business to stabilise both the supply and control the cost of raw sugar to its refineries. Coal was an essential major supply item to raise steam for the operation of these factories, and the timely sea transportation of coal from Newcastle was of strategic importance for the mills that operated seasonally to process cane supplied under contract, when it was at its optimum sugar content. The 'Darkwater' mill on the Macleay River, and 'Southgate' and 'Chatsworth' mills on the Clarence River had all been going for only 2 years when notice was received from the Clarence & Richmond River Steam Navigation Co of their intention to withdraw the collier *Platypus* from its regular Newcastle run the following season. CSR considered alternatives but these were limited to pure sailing ships that were considered a risk so arrangements were initiated for its own steam ships as detailed in the events following.

2. *Fiona* Timeline [1]

- The Clarence & Richmond River Steam Navigation Co notified CSR of the planned withdrawal of their collier, the iron twin screw steamer *Platypus* from the regular coal service from Newcastle to the newly established Northern Rivers mills,

  ….late 1872

- CSR's response was to, (i) decide to build a ship of their own,

  ….Oct 1972

  and (ii) purchase *SS Keera,* a 22 year old iron screw steamer for £6,500 as a stopgap, and as a consequence engage her master, Capt. W^{m} Curphey

  ….5 May 1873

- Plans for the new ship (named *Fiona** later) were drawn up first by Messrs Green of London but these were rejected, then new plans by a Mr Skinner based on Capt. Curphey's design, which were approved by the CSR board,

  ….16 Dec 1873

  * 'Fiona' was the Georgian style home built in 1864 by the Knox family in the Eastern Suburbs of Sydney and the name probably had an earlier significance as well.

- The CSR board gave approval to its London agent, F. Parbury & Co, to decide between Elder & Co and Cunliffe & Dunlop re a contract to build the new ship for a total cost into Sydney inclusive of all fees and insurance at £24,300,

  ….14 April 1874

- CSR sent F. Parbury & Co a letter of credit for £15,000 for *Fiona* (now so named in CSR records prior to launch),

  ….11 Aug 1874

- *Fiona* launched Cunliffe & Dunlop Port Glasgow,

  …. 1874

- *Fiona* arrives Sydney,

  ….18 Apr 1875

- *Fiona* first registered Sydney 35/1875,

  …..26 Apr 1975

- CSR's Pyrmont Refinery commenced in February 1878 with wharves in Johnstone's and Elizabeth Bays where *Fiona* would have then docked; hitherto she berthed in Sydney at Walsh Bay as seen in the photo at Clarence wharf,

  …. 1878

- *Fiona* (200ft long) departed Sydney for Fiji 6 March 1881 with men, materials, plant & equipment including a pile driving rig, and the iron *PS Cakobau* (110ft long) apparently aboard as deck cargo (?), arriving Suva 9 days later in poor weather to the concern of the master, to build CSR's first mill at 'Nausori' on the Rewa River. The new mill commenced as promised the following year meeting a commitment to process 70,000 ton of cane contracted with growers. It exemplified the drive and capability of CSR in those early years,

  ….. 1881

- *Fiona* aground, lost 6 nautical miles south of Seal Rocks Light [2]. The vessel was headed for Qld. with 5 passengers, mail and general cargo on a single charter to The Australasian Steam Navigation Co, under the command of her first (and only) master, Capt. W^{m}. Curphey. Fortunately all lives were saved but the ship was a total loss.

  …. 29 Jan 1882

  The Newcastle Morning Herald & Miners Advocate, dated Thursday, February 16, 1882 reported the Marine Board enquiry had been gone through on the 8th instant, and the Captain's ticket was suspended for 3 months for mistaking the lights at Port Stephens as that at Seal Rocks. He had gone to bed leaving the ship in the charge of the mate who had been drinking for most of the day and later fallen asleep, so the boatswain took the helm. The mate awoke just prior to beaching and was again at the helm when the ship simply sailed up unto the beach in calm weather at 4 am in the morning! Neither the mate nor the boatswain were penalised.

  ….8 Feb 1882

The NSW Gov't. Gazette listing wrecks for the year 1882, notes there were 32 passengers and crew aboard at the time of the loss and the value of the vessel and cargo was £25,000 compared with insurance cover for £20,000. The Newcastle Herald in the article above was particularly critical that " the Marine Board lacked the legislative backing to effectively make all concerned in these disasters criminally culpable, that might otherwise create a climate where the safety and interests of travelling passengers is better protected "; " a sentence of this kind for reckless navigation was generally treated as a 3 month rest from employment ". CSR files show Capt. Curphey was given employment during the suspension.

Considering that upwards of 1800 known wrecks have occurred on the NSW coast since settlement, with great loss of property and life, there appears some merit in the paper's criticism.

2. Port of Sydney Register

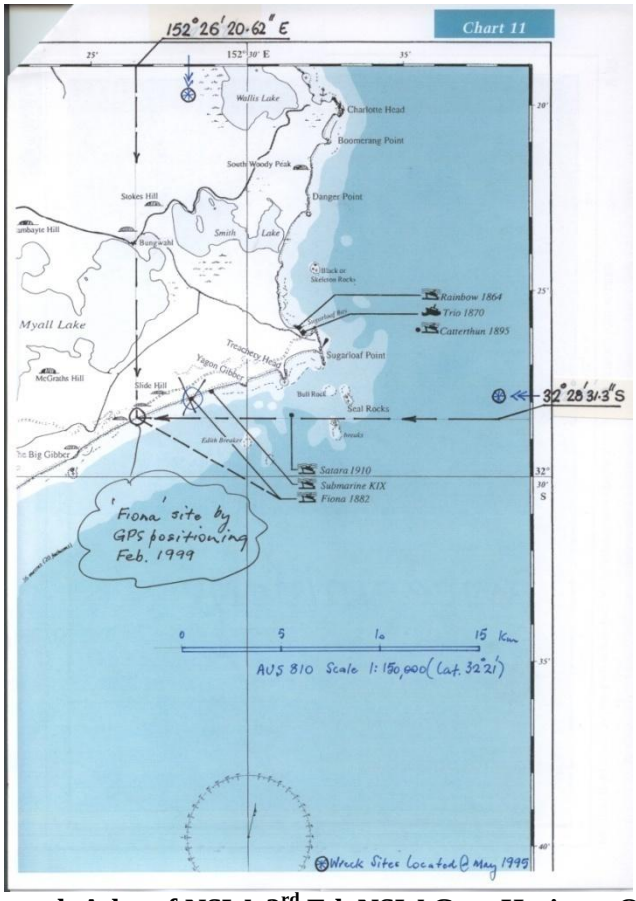
- Register No 35/1875, dated 6/4/1875 registered in the name of Joseph Grafton Ross GM CSR,
- Official No 71831,
- Built Cunliffe & Dunlop, Port Glasgow, 1874,
- One deck, elliptic stern, iron clinker, 2 masts, brig rig,
- L = 200' – 05/10ths, B = 28' – 15/10ths, D of H = 16' – 6/10ths,
- 727.64 gross tons, 288.71 tons allowed for engines (engine room 31'-0"), net registered tons = 438.93,
- Twin screw,
- 4 x inverted, direct acting, compound, surface condensing engines (Cunliffe & Dunlop), Combined Power (estimated HP) = 150 HP, Cylinders; 2 x 23", 2 x 40", Stroke; 2'-0",

  Note; Though the clerk compiling the Sydney register entered the shipyard Cunliffe & Dunlop as engine 'maker', it is questionable that they were the manufacturing engineers for the ships machinery.

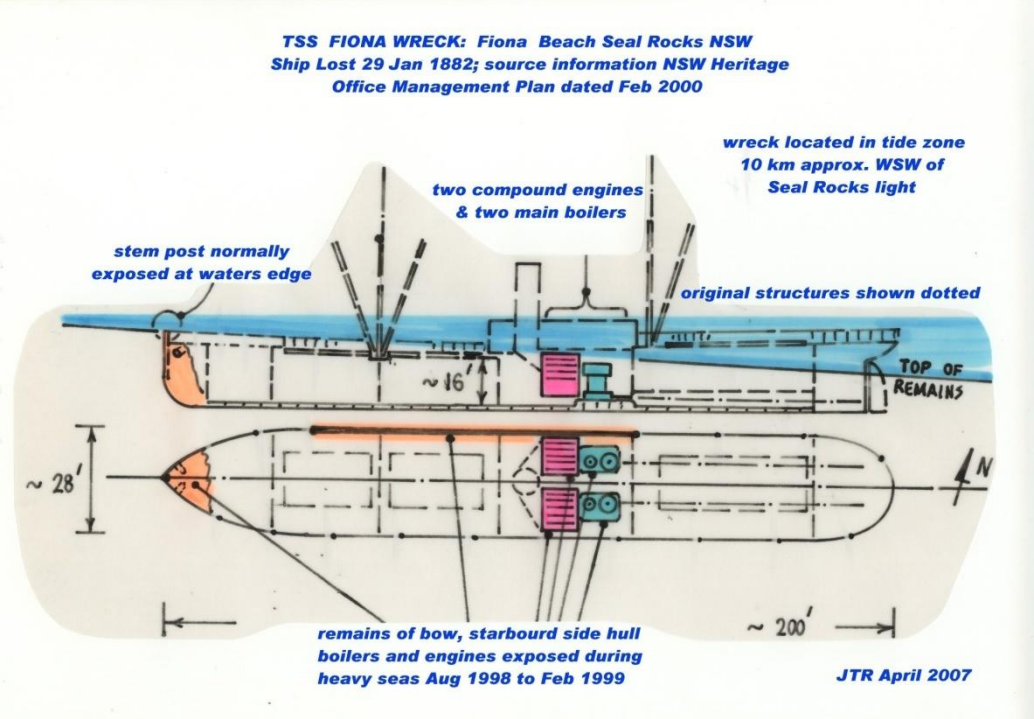
- Register closed following wreck – Certificate delivered up 13 May 1882

3. Wreck Site:

The remains of the wreck are buried in sand at 'Fiona Beach' in the tidal zone, at Lat. 32^0 38' 31.30" S and Long. 152^0 26' 20.62" E, (ie about 10km & 250^0 WSW of the light at Sugarloaf Pt., otherwise known as Seal Rocks Light).



Shipwreck Atlas of NSW, 3rd Ed, NSW Govt Heritage Office



Photos from Heritage Office Conservation Management Plan: Author Tim Smith dated 2000,

Figure 4: .. *the wreck is marked by the tip of the stem-post protruding from the sand Photo by Leanne Legge *.*

Figure 5: *One of Fiona's boilers at time of moderate sand removal. Photo by Leanne Legge *, 1998*

Figure 8: *View of bow section of the Fiona. Note anchor hawse pipes and stem post. Photo: Tim Smith*

Figure 9: *Main body of exposed wreckage, amidships. the starboard hull side (top left), portions of two boilers, and the top of starboard engine exposed at extreme right. Photo: Leanne Legge *.*

Figure 11: *Large volumes of water travel over the wreck during tidal changes (looking north). Photo: Tim Smith.*

Figure 13: Starboard engine's HP& LP cylinder covers. *Photo: Leanne Legge *.*

** Leanne (& Bill) Legge notified The NSW Heritage Office the wreck exposure in Aug 1998*

[See Conservation Management Plan attached as 'WiFiona.pdf' file]

The ships bell was said to have been salvaged and installed in the first St Philips Anglican Church at Auburn in Sydney, built as a simple brick and iron structure in 1885 with a small housing containing the bell at the apex of one gable; a new more elaborate church was built to replace it in 1921 without the bell.

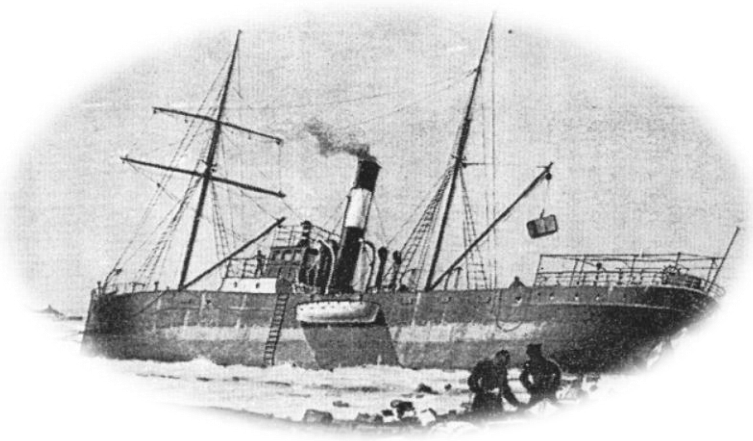
At the time of *Fiona's* loss, CSR had *PS Terranora* in operation on the Northern Rivers as a small coastal vessel servicing the mills with no other back up. A similar, ***but not identical*** , vessel to the first *Fiona* was soon ordered from the Port Glasgow shipyard of John Reid & Co (no connection to the author), and was launched in 1883, then registered in Sydney after arrival in July 1884. The second *Fiona*, known as the *New Fiona*, is shown below. It has occasionally been mistaken for the first *Fiona* but close examination of the images herein show the differences.

Mitchell Library: "***New Fiona"*** at Free Wharf Pyrmont
ca between the years 1884 & 1894 [3]

References:

[1] David Byrne (Master of Literature thesis, C.1990 on CSR Shipping), and in turn, archived company records at the ANU Canberra for dates and background on the ships life in CSR. Other references are from 'South Pacific Enterprise' ed A G Lowndes, published 1956, & unpublished works by the author below.

[2] February – March 1964 Issue of Shipbuilding, Ship Repair & Service, page 23, "A Chapter From The Past, The Wreck Of The First 'Fiona'; written & illustrated by Terry Callen"



The article claims "*Fiona* encountered thick weather considerably reducing visibility nearing Port Stephens:– at 4.15 am (29 Jan 1882) she gently bumped the bottom and came to rest on a beach 6 NM south of Seal Rocks light".

Efforts to refloat her at high water failed and the tug *Goolwa* was sent next day from Newcastle. When the tug arrived, *Fiona* was stranded high and dry on a long sandy beach with the bow facing north. Salvage had to stop due to rising seas, but not before the cargo had been jettisoned as depicted in Terry Callen's sketch. Recovery attempts recommenced after the ship had realigned to face the oncoming high seas – it was later found that the hull was penetrated and the stern had buried 6 feet in the sand with the hull now facing south (the alignment where the remains now rest). After a week, no further salvage attempts were made.

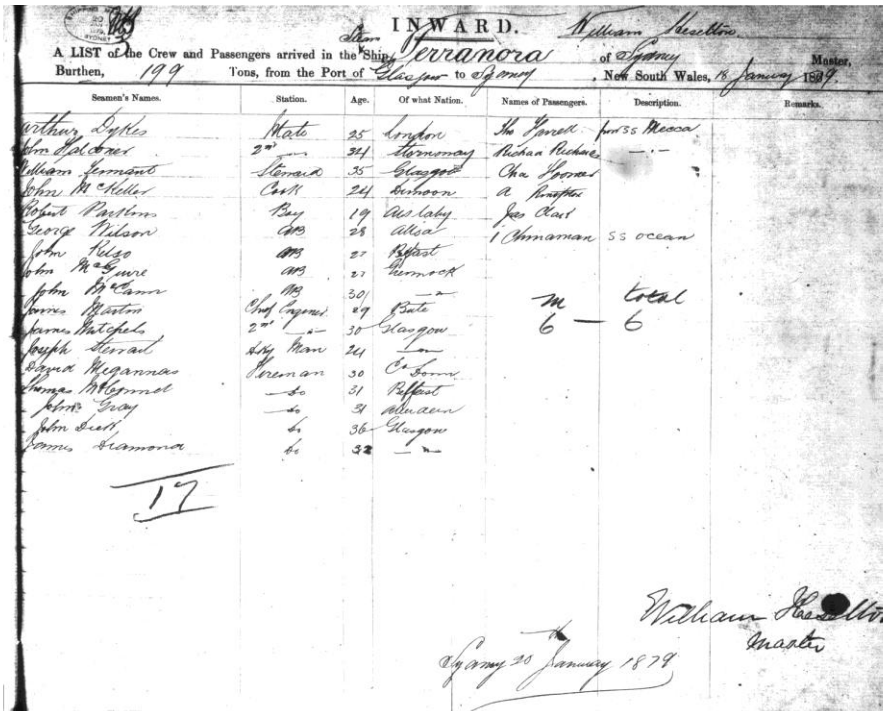
[3] There are various privately held items that have been donated to the State Library that tell part of the CSR story in pre and post colonial times. One in particular is a presentation album (41x32x5cm) bound in Russian leather, embossed in gold, titled "Fiona", presented to the Honourable Edward Knox M.L.C. in 1894 by the directors, officers and employees of the company to mark his 50th year [1844 – 1894] of association (with CSR) as well as marking the eve of his golden wedding anniversary. Each page displays 2 or 3 b&w photos of the contemporary company establishments by J.H. Newman, on a backdrop of original water colour sketches by Percy Spence, B.E. Minns, D.H. Souter, Arthur Streeton & Frank Mahoney – priceless! Catalogued as A6914 in the Mitchell Library, it requires a prearranged gold reader card for access.

(John Reid; updated Dec 2010)

3.3 *PS Terranora*

Built by D & W Henderson at Glasgow for CSR in 1878; LOA 142 feet, beam 27 feet, Burthen 199 Tons (later registries show 350 Tons gross); Steel, feathering float, paddlewheel steam ship, rigged as a two masted schooner.

Terranora arrived in Sydney from Port Glasgow 18 January 1879 having sailed via the Suez Canal (it opened 10 years earlier) and making landfall in Australia 1 January 1879 at Cooktown. The crew and passenger list below shows the master as William Heselton with a 17 man crew comprising 1^{st} & 2^{nd} mate, steward, cook, boy, 4 x AB (seamen), chief & 2^{nd} engineer, a donkey man and 5 x fireman. There were 6 passengers making a total of 24 persons aboard.



INWARD. William Heselton

A LIST of the Crew and Passengers arrived in the Steam Ship Terranora of Sydney Master, Burthen, 199 Tons, from the Port of Glasgow to Sydney, New South Wales, 18 January 1879.

Seamen's Names.	Station.	Age.	Of what Nation.	Names of Passengers.	Description.	Remarks.
Arthur Dykes	Mate	25	London	Thos Farrell	from SS Mecca	
John Falconer	2nd —	34	Stornoway	Richard Richards	—	
William Fermont	Steward	35	Glasgow	Chas Hoomes		
John McKellar	Cook	24	Dunoon	A Rimpton		
Robert Partton	Boy	19	Australia	Jas Clark		
George Wilson	AB	28	Ailsa	1 Chinaman	SS Ocean	
John Kelso	AB	27	Belfast			
John McGuire	AB	27	Greenock			
John McCann	AB	30	—			
James Marton	Chief Engineer	29	Bute	m 6	total 6	
James Mitchels	2nd —	30	Glasgow			
Joseph Stewart	Dky Man	24	—			
David Megannas	Fireman	30	Co Down			
Thomas McConnel	do	31	Belfast			
John Gray	do	31	Aberdeen			
John Scott	do	36	Glasgow			
James Diamond	do	32	—			

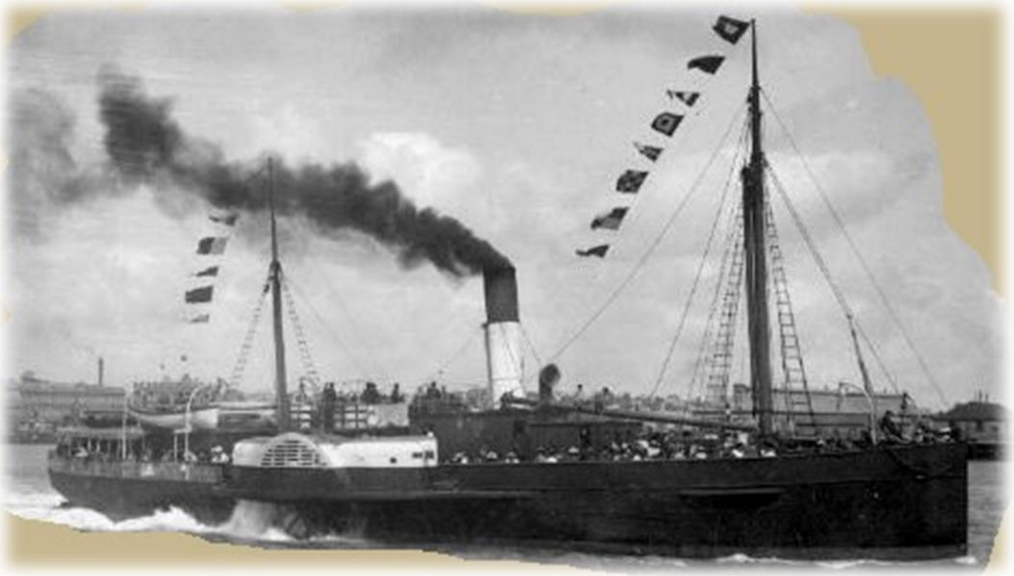
17

William Heselton
Master

Sydney 20 January 1879

She was first used in the Northern Rivers passenger & cargo trade for CSR, later for bagged sugar transfers from the local mills to assemble sugar cargos for *SS Fiona 2* shipped to Sydney. It was said Terranora was not a good purchase, being cumbersome and costly to run (the crew list showed 18 including the master which was 10 fewer that *SS Fiona 2*, so it must have been its high coal use).

CSR sold the paddle wheeler in 1890 to M Gallagher (NZ) & A Cassidy (NSW). It was then sold in 1891 to T Bayly (Waitara NZ) for use as a trader on the Taranaki coast (ie west coast around New Plymouth area of the North Isl. NZ.) The NZ Govt. took it for cable laying in 1892 and sold it in 1896 to F Black (Wellington) who sold it or lost financial control of it in 1898 when it appears in Auckland on "the Thames run" taken over by the Northern Company. It was hulked in 1906 in Auckland and finally scuttled in the Hauraki Gulf in 1914.



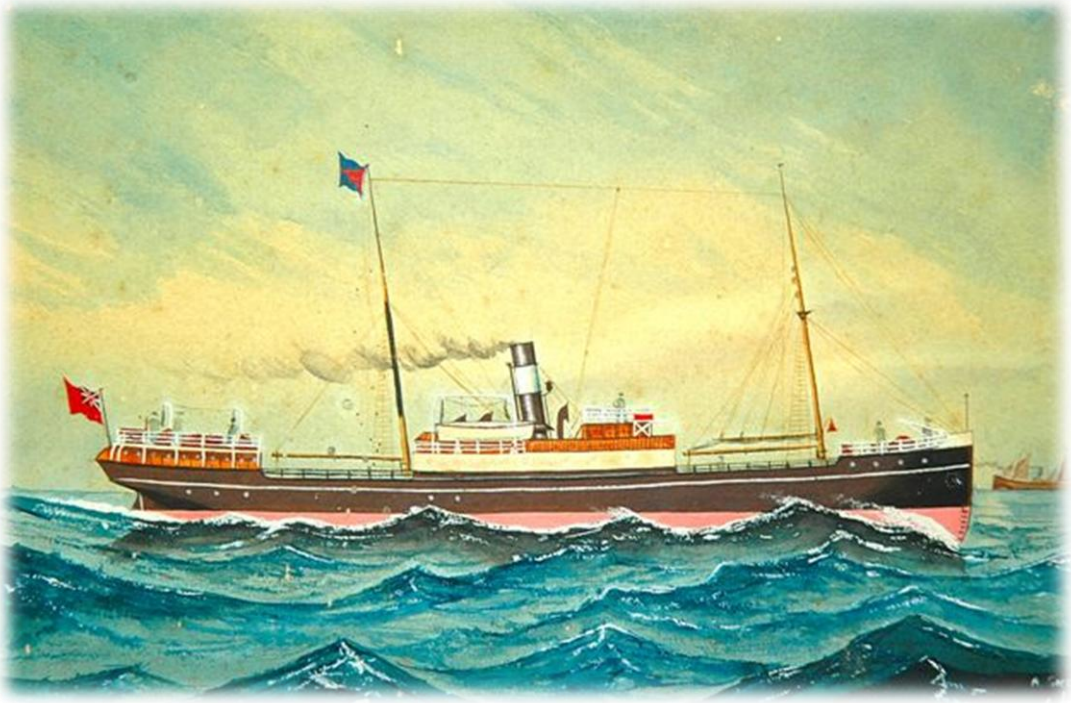
PS Terranora in Auckland ca 1898-1900.

3.4 *SS Fiona (2)*

Built in 1883 by John Reid & Co at Port Glasgow for CSR; LOA 211 feet, beam 32 feet, 817 Tons; twin compound engines and twin screw, with twin masts & heavy lift gear. **Disposed of 1908.** There are many extant images of this vessel: CSR Newsletter No 106, at the Free Wharf Elizabeth Bay Pyrmont, on the east wharf of the Pyrmont Refinery ca 1890's and a water colour by artist A. Green, the last three of which are shown below and over.

This ship has been mistakenly identified as *Fiona 1* by some, but the images herein make the differences sufficiently clear to distinguish the two. It is also noted from the Sydney registry (No 1884/074) dated 1884 that *Fiona 2,* like *Fiona 1,* had twin compound engines, and was twin screw.

My forebears came from North East Ayrshire, some 20 odd miles from the builder's shipyard (John Reid & Co at Port Glasgow on the Firth of Clyde), though I have no apparent connection with the yard.

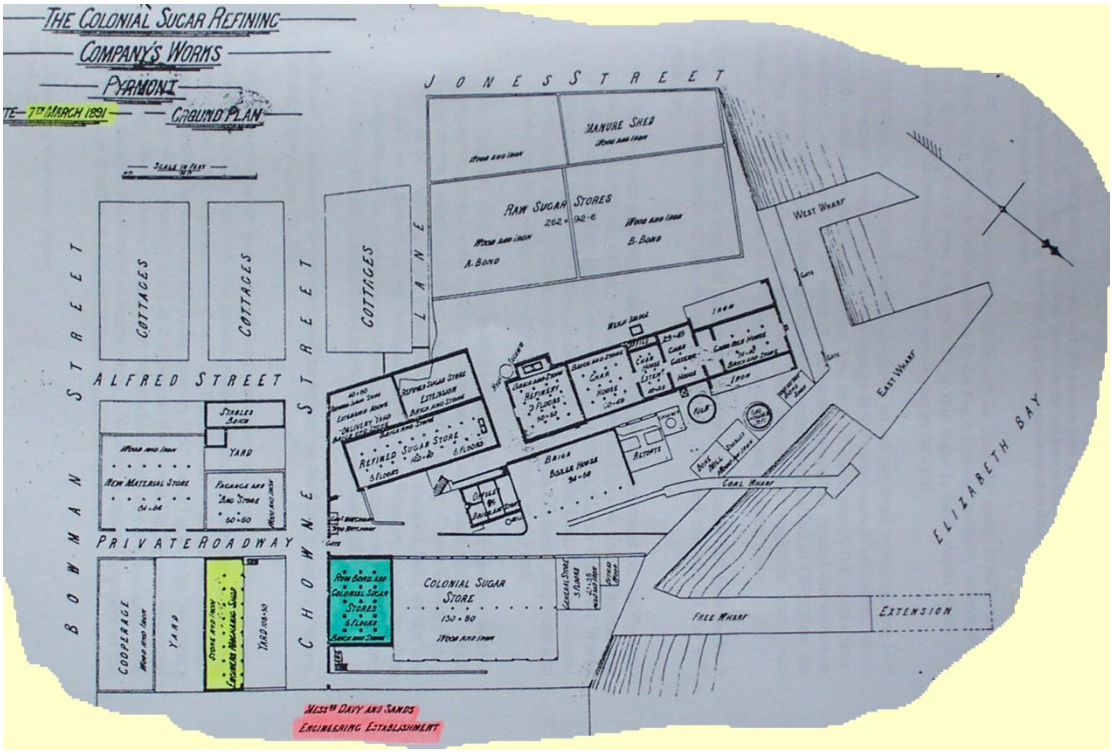


Watercolour by A.Green dated 1894, caption reads *SS Fiona*
(CSR Shipping)

SS Fiona 2 at the Free Wharf, Elizabeth Bay, Pyrmont, ca 1890's
(Mitchell Library)

***SS Fiona 2* @ Pyrmont Refinery ca 1890**

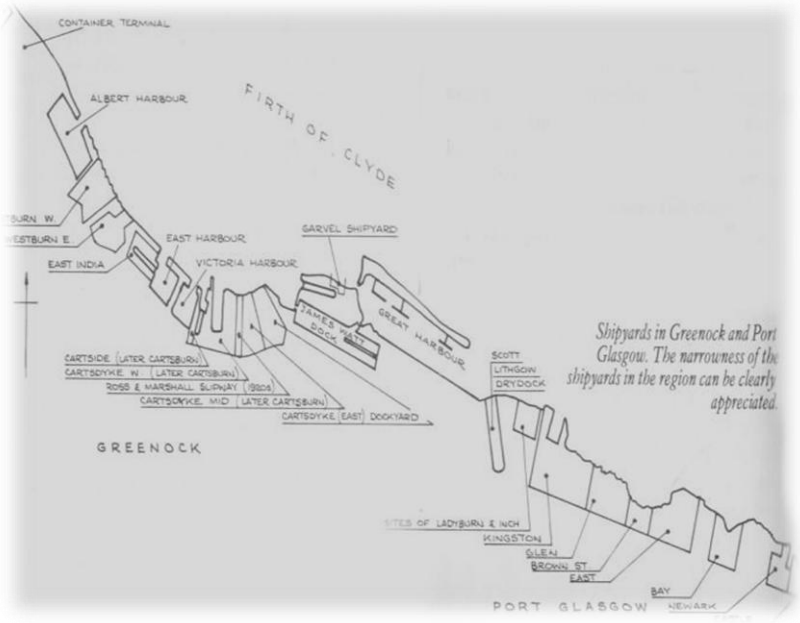
Fiona is berthed on the east wharf in Elizabeth Bay as shown in the 1891 'Ground Plan' over. The brig in the foreground is anchored off the free wharf with rigging of a 3rd vessel behind.



Highlighted are: 'Engineers Machine Shop' in yellow, 'Rum Bond' in blue and 'Messrs Davy and Sands Engineering Establishment' in red.

John Reid & Co Ship Yards in Port Glasgow (1847 – 1891)

John Reid & Co operated three yards over a period of 44 years at various times between 1847 and 1891 in Port Glasgow, upriver from Greenock .They were: the East, the Glen and Newark yards which are shown below. ***SS Fiona (2) was built there in 1883 – possibly in the Glen yard***



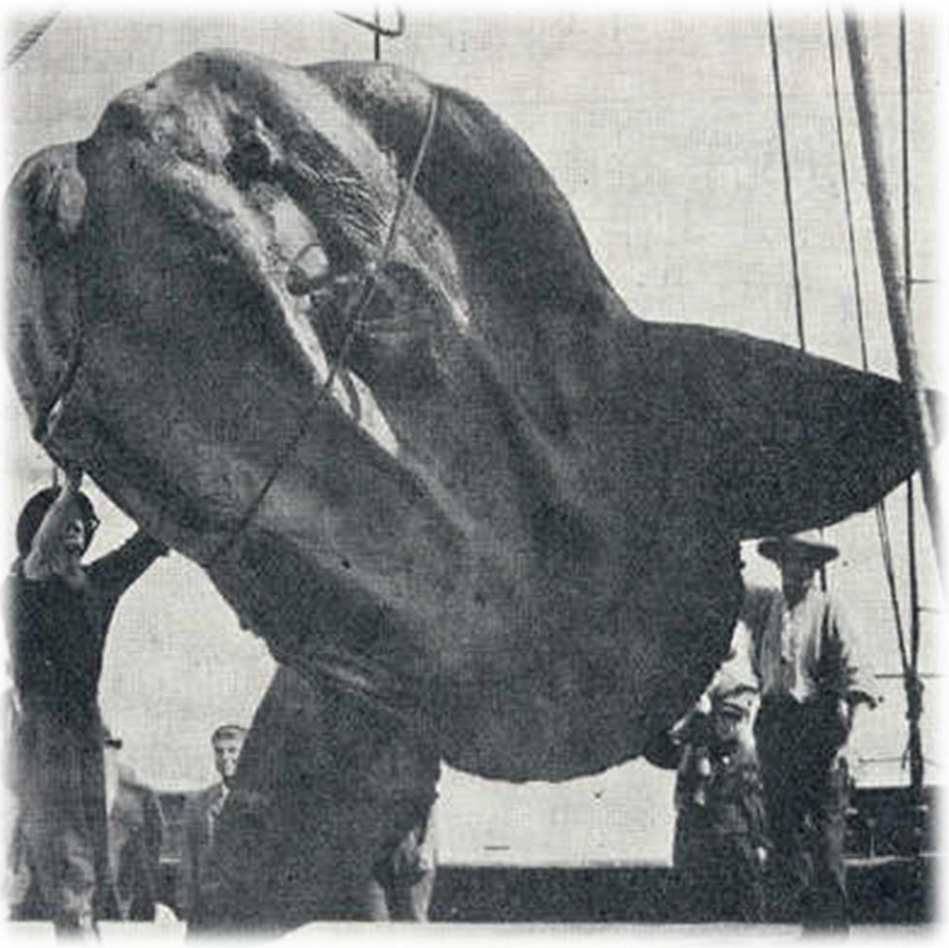
John Reid was (related to) in partnership with John Wood between 1838 and 1857. One of his first contracts was around 1847 with the trustees and managers of a parish of the Free Church of Scotland for a floating church for use on Loch Sunart in the district of Morvern. The great disruption of 1843 had split the Church of Scotland and those dissenting (on conscientious grounds), faced leaving their manses and churches and starting anew. To overcome hostility from landlords who still gave allegiance to the Auld Kirk, the members of the Free Kirk held services in strange places, such as on one Hebridean Island between the high and low water marks.

There were 7 ships under construction when this photo was taken of one of their yards prior to closure in 1891.

When Reid's son, James, joined the business he tried to popularise yacht construction in iron and later steel being an enthusiastic yachtsman. He was successful in that in 1885 the America's Cup challenger Galatea was built of steel and sailed the Atlantic in a vain bid the following year. The work output of the yard ranged from the pioneer SS Collier in 1849 to the largest steel full rigged ship of the 1880's the British Isles. In 1891, after building the paddlers Marchioness of Bute and Marchioness of Breadalbane for the Caledonian Steam Packet and the auxiliary yacht White Heather, the company suspended both work and payments with liabilities of £103,000 with however, an estimated surplus on uncompleted contracts. In 1891 the yard was sold to William Hamilton & Co.

NB. *Though the yard takes my name & my forebears came from North East Ayrshire, close to Port Glasgow, the connection is only coincidental.*

On 18 September 1908, *Fiona 2* was 65 km out from Sydney when it struck a sunfish. It jammed in the framework of the port propeller stopping that engine. Fiona continued to Sydney on the other engine where the fish was measured at 10 feet, 2 inches in length and 13 feet, 4 inches in height (sunfish swim in an upright position).

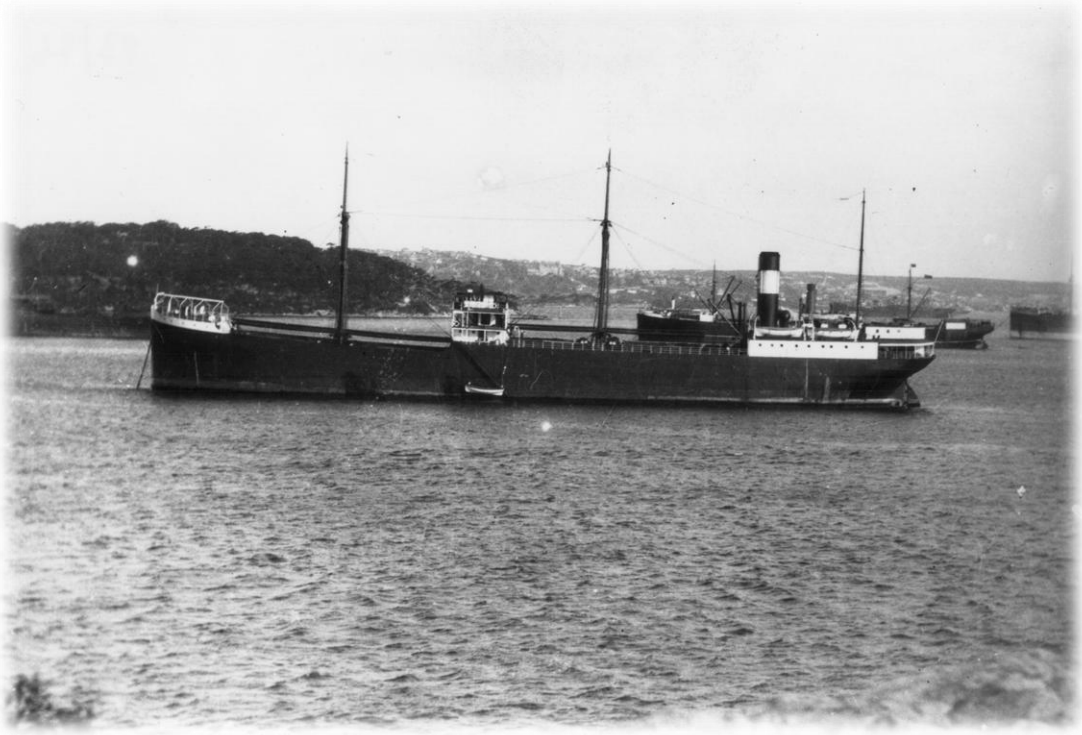


SS Fiona 2 strikes a sunfish (Australian Museum)

3.5 *SS Fiona (3)*

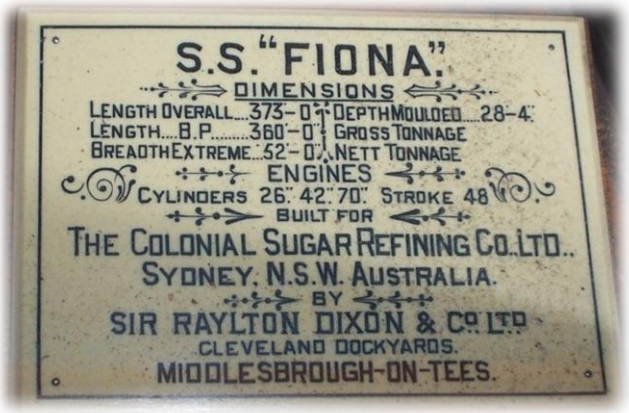
Built by Sir Raylton Dixon & Co at Middlesbrough for CSR in 1908, LBP 360 feet, beam 52 feet, draft 24 feet; 4,471 Tons (ie the 1st of the larger CSR ships); Triple expansion engine, 304 HP, Topside molasses tanks. **Disposed of 1933.**

Fiona 3 looked very like Rona 1 when viewed from a distance, however the hand railing and Sampson Posts make it possible to distinguish photographs of the two when studied closely.



SS Fiona 3 Sydney Harbour ca 1930's

Model with Sydney Heritage Fleet



Fiona 3 was sometimes mistaken for *Rona 1*. *Fiona* had 4 holds whereas *Rona* had 5, there was continuous hand railing beside holds 1 & 2 on *Rona* and there was none on *Fiona*, and the Sampson Posts supporting the foremast of *Rona 1* comprised a pair joined at the top where there was only one on *Fiona 3*, and the boat deck was different on each of these ships.

3.6 *SS Rona (1)**

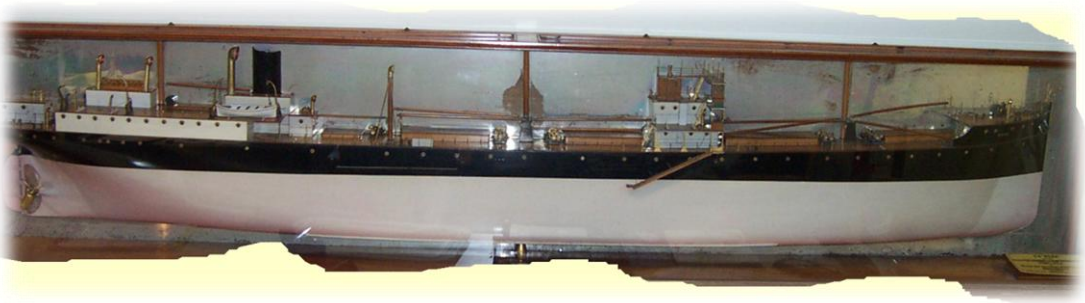
Built in 1918 by Sir Raylton Dixon & Co at Middlesbrough,
LOA 400 feet, breadth 54 feet, depth 27 feet
6,205 grt, 9,100 dwt

Commandeered by the RN for 12 months (as HM Transport Y 2205) before **arriving** in Sydney for CSR in **1919** – it was the largest cargo ship on the Australian coast at the time received, **sold 1956** scrapped 1959. See the correction note on page 3, Section 2 regarding its war service & predecessor.

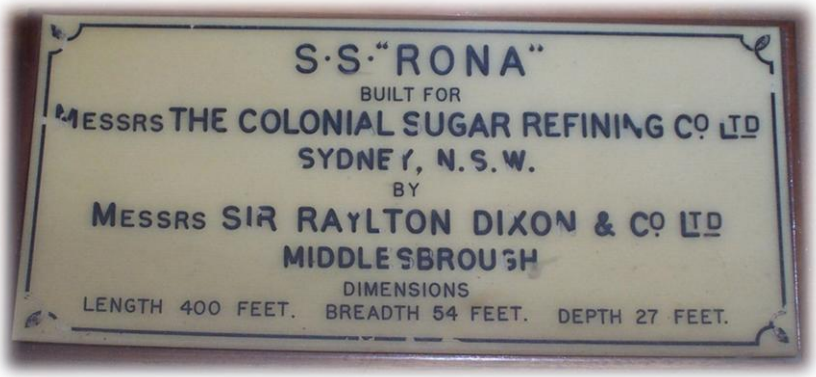
* *See the note on page 3, Section 2 regarding the war service and the predecessor*

SS Rona 1

Steaming north out of Bundaberg early 1950's



Model with Sydney Heritage Fleet



SS Rona (1) unloading bags to horse drawn carts, Pyrmont 27 Sept 1933

3.7 *SS Fiona (4)*

Built 1933 by Caledon Shipbuilding & Engineering at Dundee,
LOA 285 feet, beam 44 feet, 21.4 feet draft,
2269 tons grt,
Triple expansion engine, speed 11 knots,

Purchased 1933, disposed of 1958

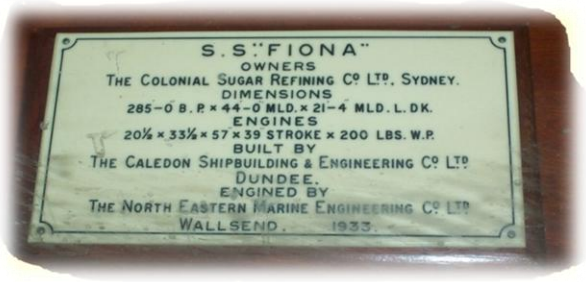
SS Fiona (4) (South Pacific Enterprise)

(CSR Shipping)

Photo is of the original diagram Caledon Shipbuilding & Engineering produced for CSR to give an impression of alternative vessel shapes for *SS Fiona (4)*

SS Fiona 4 undergoing sea trials off the River Tees England ca 1933 (which was interesting because it was built in Dundee Scotland)

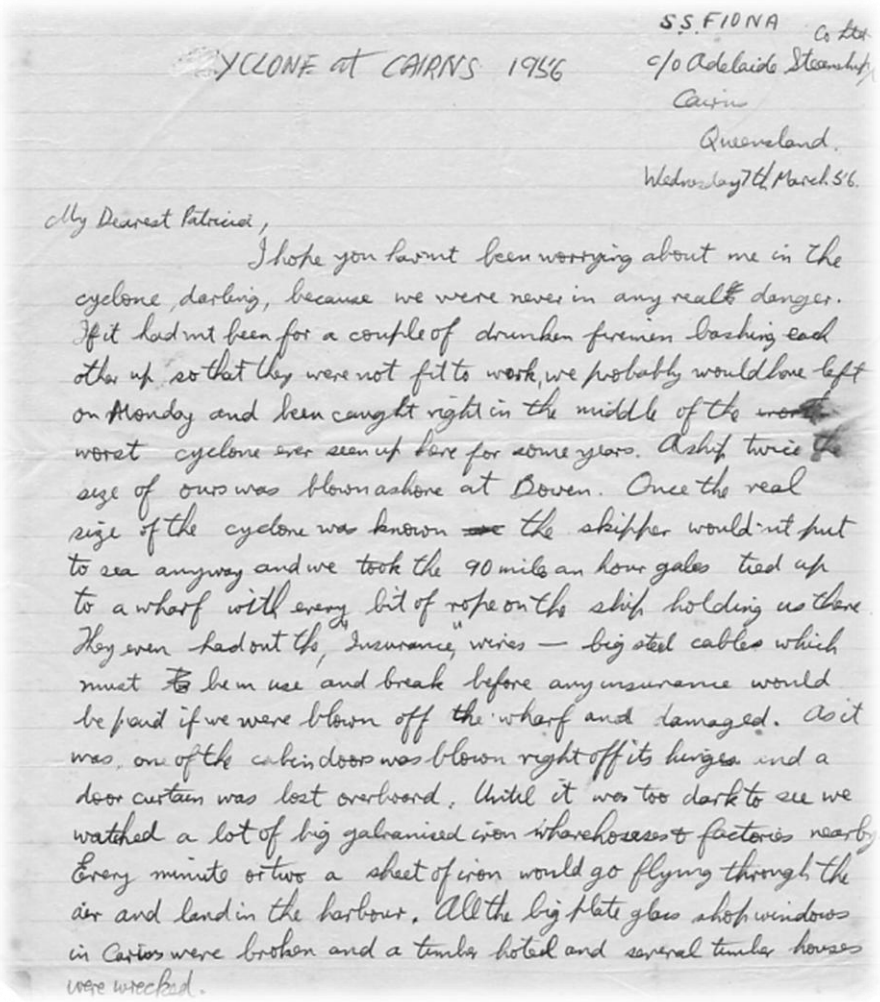
Model with Sydney Heritage Fleet



As a young engineer, Jim remembers some of his early days aboard *Fiona (4),*

Xmas 1954 in Suva
Back row: 3rd from left Capt. Guy Davis
3rd from right Chief Eng. Lofty Noble

Fish for dinner, or was it dinner for fish,
off the stern in Suva Harbour



CYCLONE at CAIRNS 1956

S.S. FIONA
c/o Adelaide Steamship Co Ltd
Cairns
Queensland.
Wednesday 7th March 56.

My Dearest Patricia,

I hope you haven't been worrying about me in the cyclone, darling, because we were never in any really danger. If it had not been for a couple of drunken firemen bashing each other up so that they were not fit to work, we probably would have left on Monday and been caught right in the middle of the worst cyclone ever seen up here for some years. A ship twice the size of ours was blown ashore at Bowen. Once the real size of the cyclone was known the skipper would not put to sea anyway and we took the 90 mile an hour gales tied up to a wharf with every bit of rope on the ship holding us there. They even had out the "Insurance" wires — big steel cables which must be in use and break before any insurance would be paid if we were blown off the wharf and damaged. As it was, one of the cabin doors was blown right off its hinges and a door curtain was lost overboard. Until it was too dark to see we watched a lot of big galvanised iron warehouses & factories near by. Every minute or two a sheet of iron would go flying through the air and land in the harbour. All the big plate glass shop windows in Cairns were broken and a timber hotel and several timber houses were wrecked.

See also: Shipbuilding & Shipping Record, May 4 and June 1, 1933 re *Fiona 4.*

3.8 *MV Moa Moa*

Built 1937 for Burns Philp by Hong Kong & Whampoa Dock Co,
LOA 145 feet, beam 28 feet,
554 Tons,

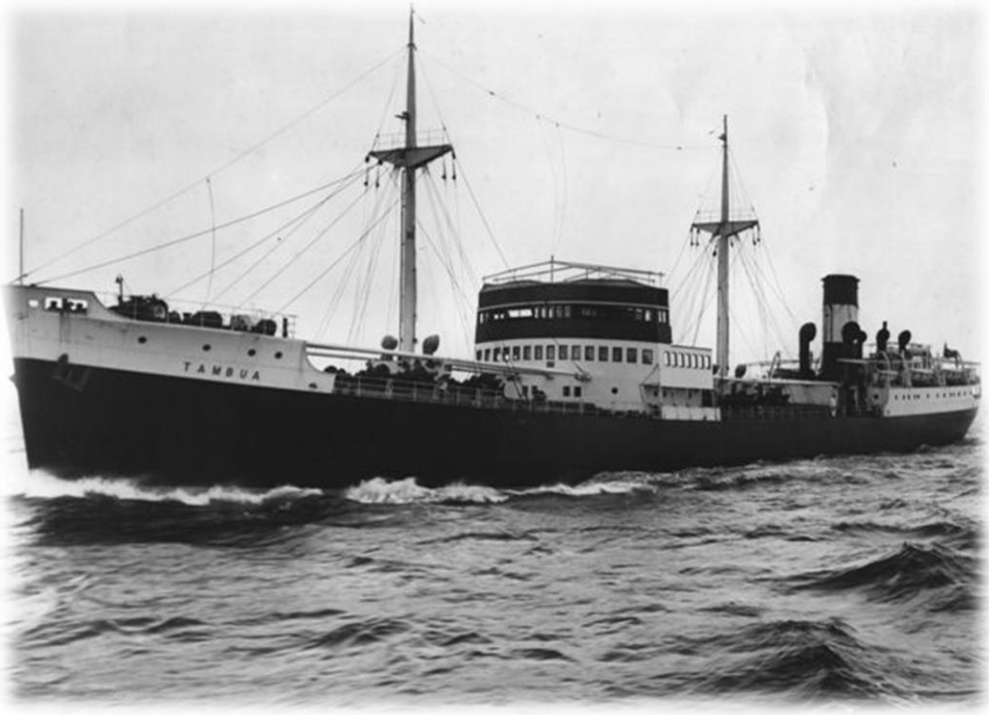
Purchased by CSR in **1941** for use on the northern rivers & Qld, sold to the US Army **1942**.

Frank Gillan was Chief Engineer of this vessel and later Chief Engineer of Pyrmont Refinery when I trained there (his old grey hand painted Daimler was to be seen there often). ***Frank is remembered for his subsequent war record serving aboard HMAS Perth when the Japanese sank her off Java in Feb. 1942, then POW in Changi & the Burma- Thailand Railway.***

3.9 *SS Tambua*

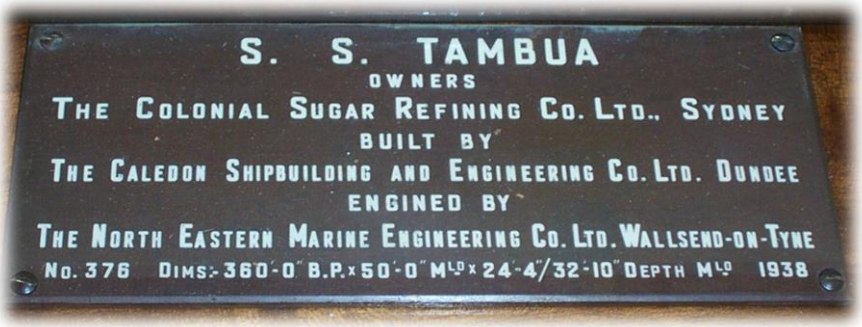
Built 1938 by Caledon Shipbuilding & Engineering at Dundee, Scotland,
LOA 364 feet, 50 feet beam, 24.4 feet mean loaded draft,
3566 tons grt (initial then 3759 grt after coal to fuel oil firing upgrade in 1957),

Purchased 1938, sold 1969.



SS Tambua sea trials.

Model with Sydney Heritage Fleet



SS Tambua in the 1960's:

Loading molasses at Lautoka

Ellington Wharf – Penang Mill

The Chief gets a clip in Suva for a bottle of Reschs

See also Shipbuilding & Shipping Record Nov 1938 *SS Tambua*

3.10 MV Rona (II)

Built in 1957 by Hall Russell & Co at Aberdeen,
LOA 365 feet, beam 54 feet, draft 23 feet,
4469 Tons,
Diesel engine, speed 12.5 knots,

Purchased 1957, withdrawn from service 1972 [ending 99 years of continuous direct CSR ship ownership]

In Woolwich dry dock soon after commencing service 1957

Model with CSR Shipping

On watch – 3000 HP DoxFord Oil Engine Joy Stick

Rolling off Coffs Harbour in a Category 2 Cyclone

Out going turpentine wharf piles for Fiji

Around 60 stevedores would board in Suva, load sugar & other cargo, remain camped aboard for all Fiji ports of call, then disembark in Suva, up to 2 weeks later

The Two Rona Ships Steaming Toward Pyrmont

SS Rona 1 ca 1950's

MV Rona 2 ca 1960's

Particulars	***SS Rona 1***	***MV Rona 2***
Builder	Sir R Dixon & Co	Hall Russel & Co
Length - ft	400	365
Beam - ft	54	54.5
Draft - ft	27	23.5
Tonnage - grt	6,205	4,469
Time with CSR	1919 – 1956	1957 - 1972

4. Tankers & Bulk Carriers

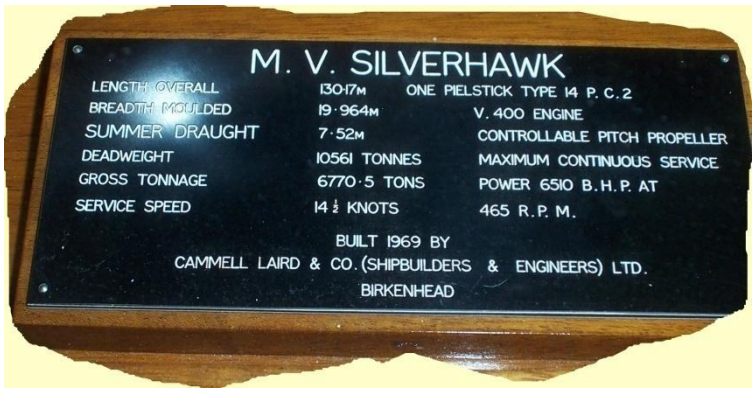
Following the disposal of *MV Rona*, CSR maintained its shipping activity with a number of specialised ships leased directly, or in joint ventures with others including the then ICI and Boral as partners. CSR Shipping has, and or, continues to manage these direct or through shipping agents as follows,

MV Silverhawk:

Tanker built in 1969 by Cammell Laird & Co at Birkenhead on the Mersey R. (near Liverpool). 10,561 dwt - principal particulars are given below from the owners model.

The vessel was used for molasses & ethanol shipments for CSR under an arrangement with ICI Ltd through the Australian Chemship Line (ACL). It is no longer in service for CSR. A sister ship chartered by ACL from the owner, Silver Line, was the Silverharrier, that was occasionally used for CSR though its main service was to carry sulphuric acid for ICI.

Silverhawk model is with CSR Shipping

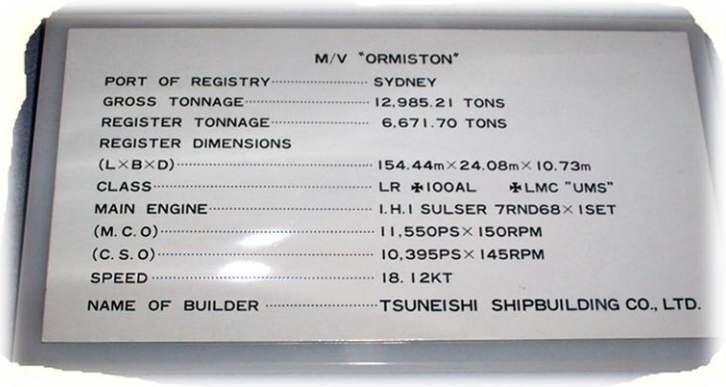


See CSR Newsletter No 118 June 1970 *MV Silverhawk* arrival

MV Ormiston:

Bulk carrier built in 1979 by Tsuneishi Shipbuilding, Japan. 16,600 dwt - principal particulars are given below from the owners model. The vessel is leased by Austocean P/L, wholly owned by CSR. It carries bulk raw sugar and gypsum, and at the time of writing (2004) is nearing the end of its service life with CSR.

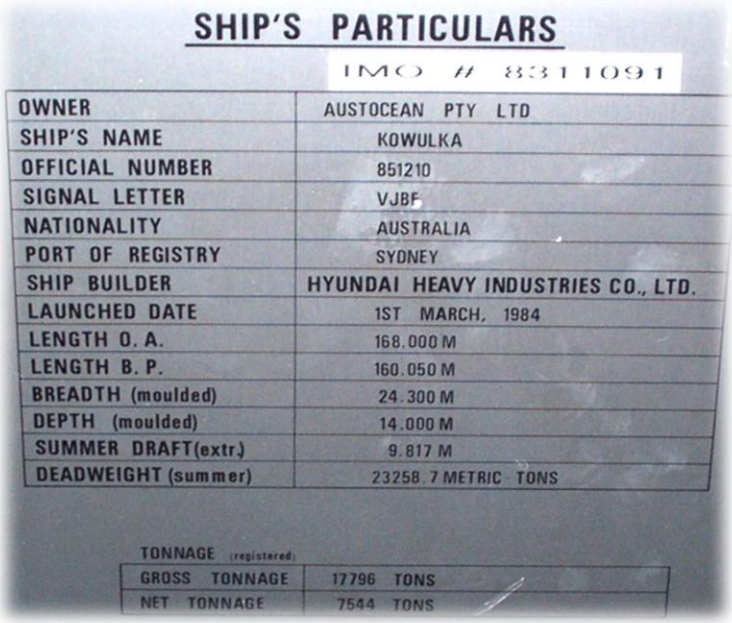
Ormiston model is with CSR Shipping – Certificate of Merit 2002 was awarded by the US Coastguard for participation in its sea safeguard programme



MV Kowulka:

Bulk carrier of 23,235 dwt built in 1984 by Hyundai Heavy Industries in South Korea. It carries gypsum and raw sugar for CSR and Boral under a 50/50 and is chartered out to others as well. It is shown recently discharging gypsum at Glebe Island over.

Kowulka model is with CSR Shipping



SHIP'S PARTICULARS

IMO # 8311091

OWNER	AUSTOCEAN PTY LTD
SHIP'S NAME	KOWULKA
OFFICIAL NUMBER	851210
SIGNAL LETTER	VJBF
NATIONALITY	AUSTRALIA
PORT OF REGISTRY	SYDNEY
SHIP BUILDER	HYUNDAI HEAVY INDUSTRIES CO., LTD.
LAUNCHED DATE	1ST MARCH, 1984
LENGTH O. A.	168.000 M
LENGTH B. P.	160.050 M
BREADTH (moulded)	24.300 M
DEPTH (moulded)	14.000 M
SUMMER DRAFT(extr.)	9.817 M
DEADWEIGHT (summer)	23258.7 METRIC TONS

TONNAGE (registered)

GROSS TONNAGE	17796 TONS
NET TONNAGE	7544 TONS

See also, MV Kowulka discharge Glebe 8 May 2006.doc

MV Goliath:

Since CSR and Rinker demerged, this 15,539 dwt self discharging bulk cement carrier is no longer the direct responsibility of CSR Shipping. It is included here to the extent of its model shown over, and an overview of two major engine (2 stroke) turbocharger failures that occurred in 2002/3 given in Appendix 5.

Goliath model is with CSR Shipping

Official No 854645
Self discharging cement carrier
Built in 1993 by Hanjin at Ulsan, South Korea
LOA 143 m, 11,254 grt

See also MV Goliath Turbocharger failures.doc

MV Pioneer:

A specialised refined sugar bulk carrier (bulk in / bulk or bag out) built in 1996 by Harlingen in the Netherlands for Mackay sugar interests, initially 50% now 75% CSR. The ship is 17,094 grt, 169m x 23m x 13.2m, and carries around 19,000 T of refined sugar that is mainly discharged in bulk at a rate of 500 tph. Only a handful of ships of this type have ever been built, and whereas it has onboard bagging equipment to out load 60 x 50 kg bags per day, this has not been required for some time as the receival locations have converted to bulk. The bagging equipment is kept ready to operate.

A recent discharge of around 18,760 T at Glebe Island,
see MV Pioneer at Glebe 17 July 2006.doc.

6. Small Vessels & Tugs

River access to the mills in Northern NSW and Fiji required tugs and small vessels for transport of cane, sugar, equipment and personnel, that were not intended to be deep sea ocean going, though occasionally some did. The larger among this fleet are briefly described following in order of the date purchased. The book "North Coast Run" by Mike Richards mentioned earlier is a good reference for the times in Northern NSW. However, there don't appear to be as many extant images or particulars for these smaller CSR vessels, which is unfortunate since a model shipwright would have a field day.

May Queen

Built at Balmain in 1869,
Paddlewheel iron steamer,
Rigged as a two masted schooner,
52 ton, 93 ft LOA, 14.3 ft beam,

Purchased by CSR in 1870 and used on the Clarence R for towage for 20 years.
Broken up 1896.

Darkwater

Built by Australasian Steam Navigation Co at Pyrmont in 1870,
Paddlewheel tug,
67 ton, 88.5 ft LOA 16.5 ft beam,

Built for CSR in 1870 and used on the northern rivers until left to rot on the bank opposite Harwood Isl 1894.

Iluka

Built by Watty Ford * at Berrys Bay Sydney in 1879,

* assembled by Ford from a prefabrication by D & W Henderson in Glasgow and shipped out with the engine (typical for the time)

Iron paddlewheel tug, 158 tons, 111 ft LOA, 18.3 ft beam,

Built for CSR 1879, used for towage on the northern rivers & sold around 1911. It became a lighter in Newcastle and was converted to screw and used on Pt Stephens, then used by the US Navy in WW2 in NG and returned to its owners after the conflict; a varied history of more than 60 years.

Wollumbin

Hull built at Mort's Dock & Engineering Co with imported machinery in 1880,
Iron paddlewheel tug, 95 tons, 95 ft LOA, 16.4 ft beam,

Built for CSR in 1880 used for towage on the northern rivers and dismantled and sold as a barge in 1915. Image from Newsletter (Photo) given in Section 2.

Kyogle

Hull built at Mort's Dock & Engineering Co with imported machinery in 1881,
Iron paddlewheel tug, 106 tons, 100.4 ft LOA, 18.6 ft beam,

Built for CSR in 1881 used for towage on the northern rivers until broken up in 1907.

Cakobau

Built by Ford at Berrys Bay in 1881 with imported machinery,
Iron paddlewheel tug, 178 tons, 111.3 ft LOA, 19.3 ft beam,

Built for CSR's use in Fiji. Taken as deck cargo in 1881 on *SS Fiona (2)* for towage on the Rewa R between Nasouri Mill & Suva. Later stripped of her machinery & towed back to the Clarence R by *SS Fiona (2)* where she worked as a lighter until probably cannibalised for her boiler to fit out a new building in 1915.

Rarawai

Built 1884, presumedly in Sydney, in an unknown yard, towed by *SS Fiona (2)* from Sydney to Fiji,

Wooden flat bottom paddlewheel vessel, 108 ft LOA, 28 ft beam,

Built for CSR's use in Fiji in 1884 with a saloon and bunk accommodation aft. She was mainly used for towage, initially at Nasouri and later at Rarawai mills, and provided passage to other Fiji ports. She became redundant in 1907 and scuttled after the rail was built between Rarawai and Lautoka mills. An image of her stranded in low water on the Rewa R (Nasouri mill) is given in Section 2.

There were many others including *Florence Maud, Victoria, Bulli,* ***Captain Tom Fenwick*** **, and Rani etc,* most of which have been mentioned in the earlier references. They are a subject of their own so I leave them for others or perhaps another day.

* See Captain T. Fenwick.docx

Appendix 1.

A Summary Of The Ocean Going Fleet

First 99 Years Of Ocean Going Cargo Ships Owned By CSR

1 (a) Small Cargo Ships

	SS Keera	SS Fiona (1)	PS Terranora	SS Fiona (2)
Official No	31845	71831	75005	82980
Type	iron steamship 60 HP single screw 2 masts schooner rig	iron steamship twin screw 2 masts brig rig	steel paddle steamer 94 hp, sail assisted 2 masts schooner rig	iron steamship twin screw 2 masts not rigged
Molasses Tanks	no	no	no	no
Built - Year	1851	1874	1878	1883
Shipyard	T. Toward St Peters River Tyne	Cunliffe & Dunlop	D & W Henderson	J. Reid & Co
Place	Newcastle on Tyne	Port Glasgow	Port Glasgow	Port Glasgow
LOA	133 ft	200 ft	141.5 ft	211 ft
Beam	20.4 ft	28 ft	27.1 ft	32 ft
Draft			10.4 ft	
GRT	**229 tons**	**728 tons**	**349 tons**	**817 tons**
Yr Received by CSR	**1873 *[1]**	**1875**	**1878**	**1883**
Yr CSR Disposed	**after 1894**	**1882**	**1890**	**1908**
Demise/Fame/Comment	1st screw steamer built for Australia, Sunk in NZ 1867, Salvaged & rebuilt to length & T above, Hulked 1877 & used to lighter sugar between Chatsworth & Harwood	total loss aground Seal Rocks light Jan 1882	sold & reregistered in NZ (cable layer)	sold scuttled Storm Bay 1930 Struck a 2T sunfish in 1908, 40 mls off Sydney, that stopped port engine and remained wedged, ship continued on the other engine

*[1] Commenced 99 years of continuous direct CSR ownership & 133 years of fleet operation

See also: CSR FLEET Appendix 1 Cargo Ships 1873 to 2006 macros.doc

First 99 Years Of Ocean Going Cargo Ships Owned By CSR

1 (b) Large Cargo Ships

	SS Fiona (3)	SS Rona (1)	SS Fiona (4)	MV Moa Moa	SS Tambua	MV Rona (2)
Official No	125196	136451	157604	159645	171243	529927
Type	***1st large steamship*** single screw	steamship single screw	steamship single screw	diesel engine single screw	steamship single screw	diesel engine single screw
Molasses Tanks	3 masts topside tanks 1400 tons	2 masts fore & aft tanks & integral after 1950	2 masts midship tanks integral	tanks added WW2	coal to oil in 1957 2000 tons in 8 tanks cantilevered below tween deck	5100 tons - ring main pump suction was an unspoken failure
Built - Year	1908	1918	1933	1937	1938	1957
Shipyard	Sir R. Dixon & Co	Sir R. Dixon & Co	Caledon Shipbuilding & Engineering	HK & W Dock Co (for Burns Philp)	Caledon Shipbuilding & Engineering	Hall Russel & Co
Place	Middlesbrough	Middlesbrough	Dundee	HK	Dundee	Aberdeen
LOA	360 ft	400 ft	285 ft	145 ft	360 ft b.p.	365 ft b.p.
Beam	52 ft	54 ft	44 ft	28 ft	50 ft moulded	54 5 ft
Draft	28.4 ft	27 ft	21.5 ft loaded		24.4 ft loaded	23 5 ft
GRT	**4,471 tons**	**6,205 tons**	**2,269 tons GRT 3,450 tons DWT**	**554 tons**	**3,566 tons gross 5,700 tons DWT**	**4,469 tons**
Yr Received by CSR	**1909**	**1919**	**1933**	**1941**	**1938**	**1957**
Yr CSR Disposed	**1933**	**1956**	**1958**	**1942**	**1969**	**1972 *[2]**
Demise / Fame	sold torpedoed & sunk WW2 Bay of Bengal	sold & scrapped 1959 largest cargo ship on coast when service commenced & @ 37 yrs, longest CSR service	sold to HK continued to carry molasses etc in far east smaller than Fiona (3) to service Fiji	sold to US Army [Frank Gillan was its chief engineer. He was on HMAS Perth when it sank & then the Burma railway later in WW2]	sold & scrapped 1973 served as a water carrier in Colombo 12 months WW2	sold to Philippines *[2] Terminated 99 yrs of continuous direct ownership by CSR

2. Bulk Carriers & a Tanker

	Silverhawk	**Ormiston**	**Kowulka**	**Pioneer**
Official No	8125662 *no longer leased*	375117 *current*	851210 *current*	855492 *current*
Type	ethanol & molasses tanker	bulk sugar & gypsum carrier	bulk sugar & gypsum carrier	bulk refined sugar carrier bulk in, bulk/bag out
Molasses Tanks	yes	no	no	no
Built - Year	1969	1979	1984	1996
Shipyard	Cammel Laird	Tsuneishi	Hyundai Heavy Ind.	Frisian Welgelegen
Place	Birkenhead	Japan	S Korea	Netherlands
LOA	130.19 m	154.44 m	168 m LOA	168.89 m LOA
Beam	19.964 m	24.08 m	24.3 m	23 m
Draft	7.52 m	10.73 m	14 m	13.2 m
Tonnage	6770 grt 10561 dwt	6671 grt 16600 dwt	17796 grt 23258 dwt	17,094 grt
Comment	Aust Chemship Line	Austocean P/L *[3] 100 % CSR	Austocean P/L *[3] 50 / 50 with Boral	built for Mackay sugar interests, now 75% CSR, 25% Mackay Sugar Co-op, managed by Teekay Aust

*[3] agents ASP Shipping

Note: *Goliath* transferred to Rinker when CSR demerged. Though excluded here, this self discharging cement carrier remains in service

Appendix 2.

CSR News Letter No 106, June 1968, page 29

SHIP TONNAGES

The size of a ship may be expressed as:

Gross Tonnage: Determined by computing the volume of a ship's enclosed spaces with certain exceptions, and then dividing the result by 100 to arrive at tonnage. It is, in fact a measure of space available. Thus a vessel of 6000 g.r.t. (gross registered tons) has 600,000 cubic feet of enclosed space.

Net Tonnage: A vessel's Gross Tonnage minus deductions for the space occupied by officers and crews' quarters, machinery. bunkers, pilot house, chart room, radio shack, below deck anchor gear, stores, galley, bakery. toilets and baths. Originally, the Net Tonnage was intended to show earning capacity of the ship (passenger as well as cargo). It is purely a measurement and is the usual basis for taxation, harbour dues, wharfage and pilotage charges.

Deadweight Tonnage: The number of long tons (2240 lb.) a vessel can carry in cargo, stores and bunkers. It is the difference between the number of tons of water a vessel displaces light and the number she displaces loaded to her deep load line. It is interchangeable with deadweight carrying capacity.

Cargo Tonnage: Computed either on a weight or a measurement basis. When deadweight ton-carrying capacity is used, it usually indicates a vessel's carrying capacity exclusive of fuel and stores. There is some divergence, however, in the ton itself. Both the United States and the United Kingdom use the 2240 lb. measurement ton while France for example, uses the metric or 2204.6 lb. measurement (2204.6 lb. =1000 kilograms). And the space occupied is usually figured at 40 cubic feet per ton. To cover this tonnage more accurately, vessels almost always show the figure as cubic bale capacity.

Displacement Tonnage: Represents in long tons the weight of the vessel and its contents (vessels-of-war are usually classified by displacement tons). This measurement may be determined more practically and be less susceptible to error, by calculating the volume of water displaced by the ship's hull, expressed in cubic feet and dividing the result by 35 which is the number of cubic feet in a long ton of sea water of average density.

Tonnage & Tons Burthen:

Historically, 'tonnage' was the volumetric capacity of a ship in terms of the *tuns* it could carry (tun being a wine cask holding approximately 252 gallons weighing approximately 2,240 pounds). Confusion between this capacity and the weight based terms of deadweight and displacement that share the same etymology, led to the eventual decision to assess taxes and harbor dues based on a ship's deadweight rather than counting tuns of wine.

Prior to the late 18th Century, the size of a vessel was quoted as *Builder's Measurement* based on the number of tuns that could be fitted into the hull. This was known variously as burden, *burthen* or *Tons Burthen*. Up to 1773, *Tons Burthen* was calculated from a standard formula that involved multiplying keel length by the maximum breadth, and multiplying the result by the hold depth and dividing by 94.

After 1773 the British Parliament established more accurate limits of measurement and enacted a new formula called *"Builders Old Measurement" (BOM)* that defined length more closely: with length equal to the length along the rabbet of the keel (where the lower planks of the bottom terminate) from the fore side of the stem beneath the bowsprit to the aft side of the stern post.

The BOM method was used up until the 1870s when it was replaced by *gross* or *deadweight* tonnage for merchant ships (and *displacement* tonnage for warships).

By way of example, the first registration certificate, dated 1st May 1852, for CSR's first ship, *SS Keera,* shows "Burthen 113 .7 Tons", and its re-registration certificate when in CSR's name, 5th May 1873, as "Gross Tonnage 229.68 Tons" (less an allowance for propelling power plant as calculated, to give Net Tonnage 158.09 Tons – ie this was the Register Tonnage as it was a steamer).

To further confuse, there have been a myriad of variations such as the Moorsom System of 1854, the Thames Method, and the more recent Panama Canal/Universal Measurement System (PC/UMS) that is based on *net tonnage*, modified for Panama Canal purposes, etc. Suffice to say one needs to state what system is to be used when quoting capacity.

Appendix 3.

3.1 Raw Sugar Mills*[1] in the late 1950's

*[1] mills built by CSR, unless purchased as noted

NSW Northern Rivers Mills

1. **Harwood** on the Clarence R: 1873 – *[2] (incorporated the milling equipment from Darkwater mill that ran 1870 - 1873, and Chatsworth mill that ran 1870 – 1887)

2. **Condong** on the Tweed R: 1880 - *[2]

3. **Broadwater** on the Richmond R: 1881 - *[2]

Generally, all the raw sugar from these mills was sent by ship to Sydney for refining, as was the molasses, however the latter was first transhipped by road to Brisbane by the early 1960's.

*[2] CSR sold these mills in 1978 to cane growers who formed NSW Sugar Milling Co-op., and all continue to operate. A subsequent refinery was built alongside the Harwood mill in a 50/50 jv with Manildra – Manildra Harwood Sugars.

Fiji Mills

1. **Nausori** on the Rewa R, 12 miles from Suva on the main island of Viti Levu: 1882 -

   Early in 1881, *SS Fiona (1)* transported the men, equipment and the steam launch *Cakobau* for towing lighters, to establish this 1st CSR Fiji mill

2. **Rawawi,** on the Ba R on the west coast of Viti Levu north of Lautoka: 1886 -

   Built to escape the problems associated with the high rainfall at Nausori

3. **Lambasa,** on the north coast of the 2nd largest Fiji Isl, Vanua Levu: 1894 -

4. **Lautoka,** on the west coast of Viti Levu south of Rawawi: 1903 -

   When built it was the largest mill in the S Hem. – ca 60,000 tpa raw sugar and similar to Victoria mill on the Herbert R in Qld.

5. **Penang,** on the north coast of Viti Levu: established by a planter Dr Chalmers in 1878, purchased by CSR 1926

Following independence in 1970, CSR divested its Fiji sugar interests in 1973.

Qld Mills

1. **Victoria** on the Herbert R: 1883 -

2. **Goondi** on the Johnstone R: 1885 -

3. **Macknade** on the Herbert R: purchased by CSR in 1896 -

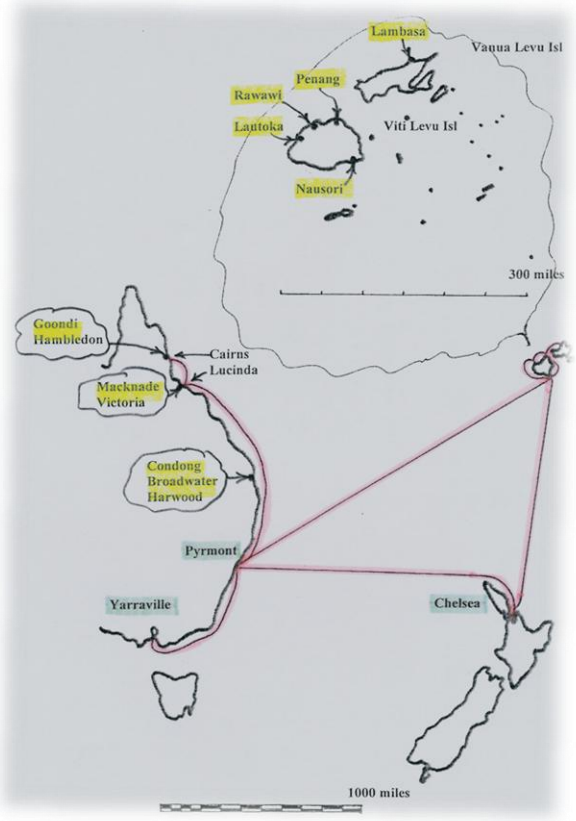
4. **Hambledon,** Cairns: purchased by CSR in 1897 –

Raw sugar from Victoria & Macknade mills was generally shipped out of Lucinda Point (bulk storage installed in the late 1950's at the old wharf, prior to installation of the off shore bulk loading point [5.6 km jetty] around 1979). Sugar from Goondi was transhipped to Cairns and with the Hambledon sugar was shipped from there.

There were other bulk sugar terminals such as at Townsville, Mackay, Mourilyan, Bundaberg and Brisbane and CSR ships could have travelled to these ports as well as to Lucinda & Cairns etc.

In the early days at Lucinda, there was no towage and ships such as SS Rona had to turn unaided in the small turning basin – a difficult manoeuvre for a single screw ship with only the rudder and forward & reverse, without thrusters. No doubt this caused SS Rona to hit the old wharf in 1951.

Regular sailing routes for CSR ships in the 1950's were as below,



Appendix 4.

Cyclone Category System (Ref. Brisbane Tropical Cyclone Warning Centre)

CATEGORY 1

Negligible house damage. Damage to some crops, trees and caravans. Craft may drag moorings.
A Category 1 cyclone's strongest winds are GALES with gusts to 125 km/h.
These winds correspond to Beaufort 8 and 9 (Gales and strong gales).

CATEGORY 2

Minor house damage. Significant damage to signs, trees and caravans. Heavy damage to some crops. Risk of power failure. Small craft may break moorings.
A Category 2 cyclone's strongest winds are DESTRUCTIVE winds with gusts of 125 -170 km/h.
These winds correspond to Beaufort 10 and 11 (Storm and violent storm).

CATEGORY 3

Some roof and structural damage. Some caravans destroyed. Power failures likely.
A Category 3 cyclone's strongest winds are VERY DESTRUCTIVE winds with gusts of 170 - 225 km/h.
These winds correspond to the highest category on the Beaufort scale, Beaufort 12 (Hurricane).

CATEGORY 4

Significant roofing loss and structural damage. Many caravans destroyed and blown away. Dangerous airborne debris. Widespread power failures.
A Category 4 cyclone's strongest winds are VERY DESTRUCTIVE winds with gusts of 225 - 280 km/h.
These winds correspond to the highest category on the Beaufort scale, Beaufort 12 (Hurricane).

CATEGORY 5

Extremely dangerous with widespread destruction.
A Category 5 cyclone's strongest winds are VERY DESTRUCTIVE winds with gusts of more than 280 km/h.
These winds correspond to the highest category on the Beaufort scale, Beaufort 12 (Hurricane).

As well as indicating the expected maximum wind gusts near the centre of the cyclone, warning messages will usually indicate the strength of the maximum wind gusts expected over particular areas in any of the following terms:
GALES with gusts to 125 km/h
DESTRUCTIVE winds with gusts above 125 km/h
VERY DESTRUCTIVE winds with gusts above 170 km/h

Beaufort Scale

Beau-fort No	Description	Cyclone category	Average wind speed (Knots)	Average wind speed (kilometres per hour)	Specifications for estimating speed over land	Specifications for estimating speed over water
0	Calm		Less than 1	less than 1	Calm, smoke rises vertically.	Sea like mirror
1	Light Air		1 - 3	1 - 5	Direction of wind shown by smoke drift, but not by wind vanes.	Ripples with the appearance of scales are formed, but without foam crests
2	Light breeze		4 - 6	6 - 11	Wind felt on face; leaves rustle; ordinary wind vane moved by wind.	Small wavelets, still short, but more pronounced; crests have a glassy appearance and do not break
3	Gentle breeze		7 - 10	12 - 19	Leaves and small twigs in constant motion; wind extends light flag.	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses
4	Moderate breeze		11 - 16	20 - 28	Raises dust and loose paper; small branches moved.	Small waves, becoming longer; fairly frequent white horses
5	Fresh breeze		17 -21	29 - 38	Small trees in leaf begin to sway; crested wavelets form on inland waters.	Moderate waves, taking a more pronounced long form; many white horses are formed (chance of some spray)
6	Strong breeze		22 - 27	39 - 49	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.	Large waves begin to form; the white foam crests are more extensive everywhere (probably some spray)
7	Near gale		28 - 33	50 - 61	Whole trees in motion; inconvenience felt when walking against the wind.	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind
8	Gale	Category 1	34 - 40	62 - 74	Breaks twigs off trees; generally impedes progress.	Moderately high waves of greater length; edges of crests begin to break into the spindrift; the foam is blown in well-marked streaks along the direction of the wind

9	Strong gale	Category 1	41 - 47	75 - 88	Slight structural damage occurs (chimney pots and slates removed).	High waves; dense streaks of foam along the direction of the wind; crests of waves begin to topple, tumble and roll over; spray may affect visibility
10	Storm	Category 2	48 - 55	89 - 102	Seldom experienced inland; trees uprooted; considerable structural damage occurs.	Very high waves with long overhanging crests; the resulting foam, in great patches, is blown in dense white streaks along the direction of the wind; on the whole, the surface of the sea takes a white appearance; the tumbling of the sea becomes heavy and shock-like; visibility affected
11	Violent storm	Category 2	56 - 63	103 - 117	Very rarely experienced; accompanied by widespread damage.	Exceptionally high waves (small and medium sized ships might be for a time lost to view behind the waves); the sea is completely covered with long white patches of foam lying along the direction of the wind; everywhere the edges of the wave crests are blown into froth; visibility affected
12	Hurricane	Category 3,4,5	64 and over	118 and over	Severe and extensive damage.	The air is filled with foam and spray; sea completely white with driving spray; visibility very seriously affected

An average wind is averaged over 10 minutes, and is read at a height of 10 metres above open flat ground. Values for gusts are higher than average wind values.

Appendix 5. Miscellaneous

A collection of related material with more than just items of personal interest,

- Biography of Sir Edward Knox
- George Dempster (1900 – 1987) and his words on the 1922 grounding of *SS Rona 1* (Flat Rock in the Hauraki Gulf north of Auckland NZ)
- Paddle Steamers (viz a viz *PS Terranora*)
- Notes on sail assisted ships
- Bulk Handling Replaces Bag Raw Sugar Unloading @ Pyrmont Refinery in 1955, (with photos of construction cranes)
- Kooragang Bulk Facilities Terminal in Newcastle
- A final note (6th Jan 2011)

KNOX, Sir EDWARD (1819-1901), sugar-refiner and banker, was born on 6 June 1819 at Helsingör, Denmark, one of eight children of George Knox, a Baltic merchant, and his wife Elizabeth Frances, née Mullens. His father died in 1830 and Edward was educated by his mother's family at a Danish school and Soröe College. At 16, after commercial training in Lübeck, he entered his uncle's London merchant house as a junior clerk. Promotion was slow and he quarrelled with his uncle and decided to seek fortune in Australia as a pastoralist.

Knox reached Sydney on 26 February 1840 in the *Sophia*. After some time at Bayly Park, near St Marys, he joined the Australian Auction Co. and in 1843 became manager. In August he transferred to the Australasian Sugar Co. at a salary of £250 and 'more when times mended'. With two associates he bought Bowden's refinery and R. Cooper's distillery which he leased to the Australasian Sugar Co. On 4 June 1844 at Hunter's Hill he married Martha, sister of William Rutledge. Later that year Knox was appointed official assignee. He traded in real estate and accumulated capital and recognition in the business community. He was a director of the Commercial Banking Co. of Sydney in 1845-1901 and in his four absences overseas acted as a London director. In July 1847, after the managing director had been dismissed for embezzling £10,700 out of capital of £72,000, Knox became manager, with orders to 'devote his whole time to the management' of the bank. In 1851 he resigned as manager, became a director of the Sydney Tramway and Railway Co. and helped to found the Sydney Chamber of Commerce.

In 1854 the Australasian Sugar Co. went into liquidation after dissension among the partners. On 1 January 1855 Knox founded the Colonial Sugar Refining Co., holding a third of its capital of £150,000. The new company bought the refinery and distillery from Knox and his associates. He was its first chairman of directors and except when overseas held the post until 1901. For two years the company flourished and all raw sugar was imported. In 1856 a dividend of 50 per cent was declared. In 1857 the Victoria Sugar Co. was formed with half the capital subscribed by C.S.R. shareholders and half by Victorian merchants. As its superintendent and chairman Knox arranged for a refinery to be built at Sandridge. He sold his home and some shares in C.S.R. and went to England but world prices fell, leaving the company with costly stocks of sugar. Losses of £120,000 appeared probable and Knox faced ruin. He returned to Sydney to find that R. M. Robey planned to build a rival refinery. When the directors refused to sell his equity in C.S.R., Robey threatened legal proceedings to dissolve the company. Knox restored the confidence of some anxious partners, and gradually put the company's affairs in order. He determined that profits would never again be lavishly distributed but withheld to establish adequate reserves and to finance expansion. He discouraged competition by take-overs and fostered internal strength and efficiency. With shrewd judgment of world raw sugar markets he maintained a voluminous correspondence with overseas agents and kept abreast of technical developments in refining and milling. With a genuine interest in his employees he established one of the first staff provident funds and rarely had industrial trouble. Under his leadership refineries were established in other Australian colonies and New Zealand, and mills were built to crush cane from independent farmers in New South Wales, Queensland and later Fiji. In 1880 he handed over the general management of the company to his second son Edward William but remained chairman until 1901.

Knox had many other business and public interests. In the 1860s with M. C. Stephen he held Whiteside, 24 sq. miles (62 km²) in the Moreton Bay District, and six runs in the Burnett District. He served on the advisory committee of the Australian Agricultural Co. and as executor supervised the operations of other pastoral properties. In the early 1870s he was a director of the Sydney Exchange Co. and chairman and trustee of the local board of the Liverpool and London and Globe Insurance Co.

In 1893 he had returned from England and been reappointed chairman of the Commercial Banking Co. of Sydney only two months before it suspended payment on 15 May. It reopened for business on 19 June after Knox had devised a scheme of reconstruction acceptable to both shareholders and depositors.

A devout Anglican, Knox had been a member of the Diocesan Committee in 1857 and a lay member of the Board of Missions. From 1866 he was a member of each Sydney, provincial and general synod, and active on many committees. He was associated with All Saints, Woollahra, and St Andrew's Cathedral. He was sometime a director of the Benevolent Society and the Sydney Infirmary and Dispensary, a founding director and chairman of the (Royal) Prince Alfred Hospital and vice-president of the Carrington Centennial Hospital for Convalescents, Camden. A friend described him as doing 'good by stealth in religious and charitable matters'. Knox was a member of the first Legislative Council in 1856-57 and was reappointed in 1881, but resigned in 1894 through illness. Political life had no great appeal to him but in the 1880s he organized opposition in the council to Sir Alfred Stephen's divorce bills and gave painstaking attention to legislative details.

Knox was a founding member of the Union Club in 1857 and president in 1882-1901. In 1864 he had built **a large Georgian-style house, Fiona, on New South Head Road**, and later bought beautiful mirrors and Persian carpets in Paris. Devoted to his family, he took great pride in his sons and in 1894 celebrated his golden wedding and fifty years association with the 'sugar company'. In 1898 he was knighted. He died at his home on 7 January 1901 and was buried in Waverley cemetery, survived by his wife, four daughters and three of his four sons. His eldest son George (d.1888) was a lawyer, Edward William succeeded his father as chairman of C.S.R., Thomas Forster became managing director of Dalgety & Co. Ltd and Adrian chief justice of the High Court of Australia. Fiona became part of Ascham Girls' School, Darling Point.

Portraits are in the Union Club, Colonial Sugar Refining Co. archives and Christiansborg Palace, Copenhagen. The east window in St Thomas's Church on Carwoola station was donated by Knox and his wife.

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Author: A. G. Lowndes

Print Publication Details: A. G. Lowndes, 'Knox, Sir Edward (1819 - 1901)', *Australian Dictionary of Biography*, Volume 5, Melbourne University Press, 1974, pp 38-39.

George Dempster [1900 – 1987]

George Dempster began his life in CSR in the Engineer's Workshop in 1916, as I did some 43 years later. By the time he retired in the 1960's he had served on many of CSR's ships and had become the Superintendent Marine Engineer for the CSR Shipping Department, a position he had held for many years. Whereas I did not know him personally, I did know his son-in-law, Hyla Gimblett who had also served as an engineer on some of the CSR ships and had come ashore, and worked with me in the Pyrmont Distillery.

George and Hyla were aboard SS Rona on the separate occasions when it grounded in 1922 and 1956 as noted in the following. George had a major influence on the engineering aspects regarding the purchase and maintenance of the CSR ships of his day. He was known to be a dedicated believer in steam power plant though apparently he was not quite as enthusiastic about the change to an oil engine as was decided for MV Rona 2.

I am grateful to be able to use the following that has come from the Gimblett family.

George records,

Quote,

I commenced my apprenticeship in Fitting and Turning at the Colonial Sugar Refining Co.'s Pyrmont [Sydney] Workshops in March 1916 aged 16, and completed the 5 year course, of which the last 10 months were in the Head Office Drawing Office, in March 1921.

Head Office in Sydney, in O'Connell St, held the plans for all major works at each of their 6 Refineries, all their Sugar Mills in Queensland, N.S.W and Fiji plus the ships which they owned at that time.

I attended the Company's classes for 2 years for 2 nights per week, passing first in the 3rd year exam in my first year, and first in the 5th year exam in my second year. From then on I was exempted from the Company's classes and attended night classes at the Sydney Technical College in Heat Engines and Applied Mechanics.

I resigned from the Company at completion of my apprenticeship as I wished to go to sea. I applied to all the Coastal Shipping Companies running out of Sydney but did not get one reply. I was able to get four days work in five weeks.

When attending a meeting of the Engineering Apprentices and Old Boys Club of the Company, I was told that the Company required a 5th Engineer for the SS Rona, as the previous one had done only one voyage and resigned suddenly. I was at Pyrmont Workshop first thing next morning but was told by Bert MacGregor, foreman of the Fitting Shop, that I would have to go to Head Office. I was there when the doors opened at 9 a.m. and reminded the officer who attended to employment in the Engineering Dept. that I had told him when in the Drawing Office that I wished to go to sea. He remembered and after about an hour I was given a letter to the Chief Engineer of the " Rona ", Mr Jim Morrison who was at Mort's Dock at Balmain where the ship was undergoing a major survey. I started next morning as a Fitter working there until signing on as 5th Engineer when the survey was complete and the vessel was ready. A few hundred tons of general cargo for the Company's Fiji Mills and the Refinery at Chelsea, New Zealand were loaded and we departed Sydney on Monday , June 22nd 1921 for Port Kembla (after all the crew had been found and put on board down the Harbour from memory, I think it was a Public Holiday).

We arrived at Port Kembla that afternoon and went alongside the only coal loading berth there at that time. This was the only time to my knowledge that a Company ship had gone to Port Kembla for a cargo of coal.

Loading started that night or next morning and after about 2,000 tons had been loaded, a coastal vessel arrived for bunkers and the " Rona " had to move off the berth and anchored opposite the opening in the breakwater. Vessels requiring bunkers only, took precedence over those loading cargo coal. During the night a gale got up which drove big seas through the breakwater. The " Rona " was laying head on to the wind and abeam to the seas. With 2,000 tons in the bottom she rolled fast and continuously. Steam had to be kept on the main engines and everything on board which was not fastened down, shifted about. Next day the "Rona" went alongside and completed loading bunkers and a full cargo before the week-end. We then departed for Fiji.

A steamship named "Canastota" had been in Sydney unloading a cargo from the U.S.A. (I think) consisting in part of tinned petrol. Some of the containers were leaking and the wharf labourers refused to handle it. She departed Sydney for New Zealand and was never heard of again. After we left Port Kembla we went in sight of Lord Howe Island and Balls Pyramid to pick up any news they may have had of wreckage and / or survivors, but none.

The usual routine at that time in Fiji for C.S.R. ships was to anchor in Suva Harbour, pass the Port Doctor, take on Fijian cargo handling labour and then go outside the Reef to another entrance at Laucala Bay, about an hour's journey. Here lighters would be waiting for loading cargo for Nausori Mill on the Rewa River. Usually this was completed by the next morning and we departed for Lautoka when Captain Wallis arrived from Suva with a clearance etc, on the Co's steam tug which served Nausori Mill.

On this voyage we entered the Reef a few miles on the Lautoka side of Suva and loaded molasses from a mill which had closed down. The mill had been owned by a different Co. and the lighters we loaded from were from Nausori Mill on loan. At Lautoka, we discharged coal and general cargo for Rarawai and Lautoka Mills. Then to Lambasa via outside the Reef, which was a 26 hr. trip. At the anchorage we discharged general cargo and coal into lighters for Lambasa Mill and loaded molasses. About 2,000 tons of coal was left in the ship, levelled off and sugar [all bagged] loaded on top of it from lighters. Then back to Lautoka where more sugar and molasses was loaded. Then back to Laucala Bay where sugar and molasses were loaded from lighters. Leaving here for Auckland she would usually load down to her full load line draught of 26' 10½", except on the last voyage of the season.

When fully loaded, "Rona" was a very wet ship on deck and from Cape Washington in Fiji, until we reached shelter in Hauraki Gulf , it was impossible to work on deck and planks were usually in position at the forward end of the aft alleyway on the weather side. It was common to find one's room flooded.

Fiji-Auckland took 5 days and we usually anchored in Auckland Harbour, off the main wharves, until we passed the Port Doctor. This had to be in daylight hours. We then berthed at the Chelsea Sugar wharf on the following slack tide.

From memory of this my first voyage, after passing the Doctor and proceeding to Chelsea in the afternoon at the low tide slack, **"Rona" went aground off Northcote**, which is the point on the north side of Auckland Harbour where the bridge now lands you and within about four miles of the Chelsea wharf. No damage was sustained, but it was too late to berth by the time the tide rose sufficiently to float her off and we had to wait until the following day. This would have been about end of July 1921.

This mud bank had apparently been ignored or unknown, by the Port authorities, maybe because they did not have vessels with such a deep draught using the upper harbour. A buoy was anchored on the bank and it became known as the "Rona" Buoy.

At Chelsea all the sugar and remaining coal was discharged. Chelsea at this time used all Newcastle coal, not New Zealand coal, but this cargo was from Pt. Kembla. A reserve Coal stack was near No.4 dam. I remember on at least one occasion whilst on the "Rona" discharging sugar at Chelsea , "Fiona" (3) [another C.S.R. ship] was at the coal wharf discharging a Newcastle cargo she had made a special voyage with.

From Chelsea the " Rona " sailed direct to Sydney with her molasses cargo of 2,000 tons. Usually she departed Fiji with 6,000 tons of sugar or, sugar and coal, plus 2,000 tons of molasses, when doing a double header. That was, going back up to Fiji before returning to Sydney, and taking 2 months to do it, Sydney to Sydney.

A voyage on the "Rona, June, 1922

On the 26th June, 1922, whilst on a voyage from Fiji to Auckland with sugar and molasses, at about 7p.m., the " Rona " grounded at full speed on Flat Rock in Hauraki Gulf, As she averaged about 10 knots, the speed at this time of the watch was nearer 10.5 knots. When it happened I was in the 4th Engineer's cabin (Jack Freeman) with him and the 3rd Engineer (Tom Wolfe) playing records on a record player the Chief Engineer [Jim Morrison] had built a timber cabinet for. A number of the crew occupied their spare time between watches engaged in various pastimes and carpentering at that time seemed to be favourite with the Engineers and we still have pieces that Dad made. There was also a large amount of studying to be done because they sat for their various certificates when on leave so most studying was done at sea. The certificates were essential for promotion of course as well as time spent at the various levels.

I had finished my evening meal after relieving the 2nd Engineer (William Matthews) for his meal. Suddenly the ship jumped up and down as if she was going over a reef of rocks which was about 6" too shallow for her. We all rushed to the Engine Room, but shortly after I was sent on deck to assist with bolting the hatch beams of No. 1 Hold, both on the Main and Tween Decks. Also, spare hatch timbers were cut and used as "toms" between the two sets of beams to strengthen the Tween deck covers in case the water level in No.1 Hold, which was flooded, increased.

I noticed the light on Tiri and saw a light being flashed on the "Rona' s" bow which 1 thought was one of our Deck Officers signalling to the Signal Station on Tiri. I did not realize until hours later that this was an unattended light we were so close to.

When it was realized that the vessel was fast on the rock, the main engines were kept on Slow Ahead and the molasses cargo was allowed to run into the sea. The sea was calm and, although dark, it was a clear night.

Later that night, or early next morning, lighters were brought from Auckland and the sugar in the aft end of No. 2 Lower Hold transferred to them by crew members and a few wharf workers from Auckland. This activity increased greatly next day (Tuesday 27.6.1922) with the arrival of more lighters and cargo workers. The sugar at the forward end of No. 2 Lower Hold (about half the length of the hold) was left in the ship to strengthen the bulkhead between Nos. 1 & 2 Lower Holds should the flooding increase in No. 1 when the vessel came off the rock. All other openings, such as the runway into No 1 Lower Hold from the Tween deck had been blocked with timber made from spare hatch covers.

All this sealing off of No. 1 Lower Hold was a precaution against when the vessel came off the rock that she may be floating at a greater depth than the Tween Deck and, if so, the water could flood the Tween Decks into Nos. 2, 3, 4 and 5 Lower holds.

The Harbour Board sent a Pulsometer Pump (about 6") to the ship and this was installed between the Main Deck and the Tween Deck Starboard Hatch coamings.

I worked all Tuesday night disconnecting the steam pipe from No 2 Starboard side winch and making up steam pipe from the winch stop valve to the Pulsometer using, amongst other things, the flexible metallic hose, about 2", which we used in those days for supplying compressed air from the "Rona" to the Molasses lighters.

It was intended the ship should be moved on the Wednesday morning at high tide, but the wind and the seas increased during the night to such an extent that she started to lift and bump on the shoal. The feed pump and other gear in the Engine Room were bouncing with each bump. The steam tug of the Harbour Board and paddle wheeler were each on a long line from the stern of the "Rona", one from each quarter. The Chief Engineer informed the Captain that, she could not last until high water so she was put astern straight away. She swung to port coming off and did a lot of damage to the port bilge from forward to aft.

Crowds were on the wharves at Auckland expecting to see a very damaged ship passing but to sightseers she was on her normal draught and no damage could be seen. She proceeded to the Sugar Wharf at Chelsea and was unloaded without incident, including the wet sugar in No. 1 Lower Hold.

After unloading , the "Rona" was moved into the Calliope Dry Dock at Devonport and it was then that the damage could be seen, particularly that along the Port Bilge. The Engineers were busy with Lloyds' Surveyors climbing through all the double bottom and noting the damage. Most of the crew members had been sent back to Sydney prior to entering the Dock.

On this voyage were :-

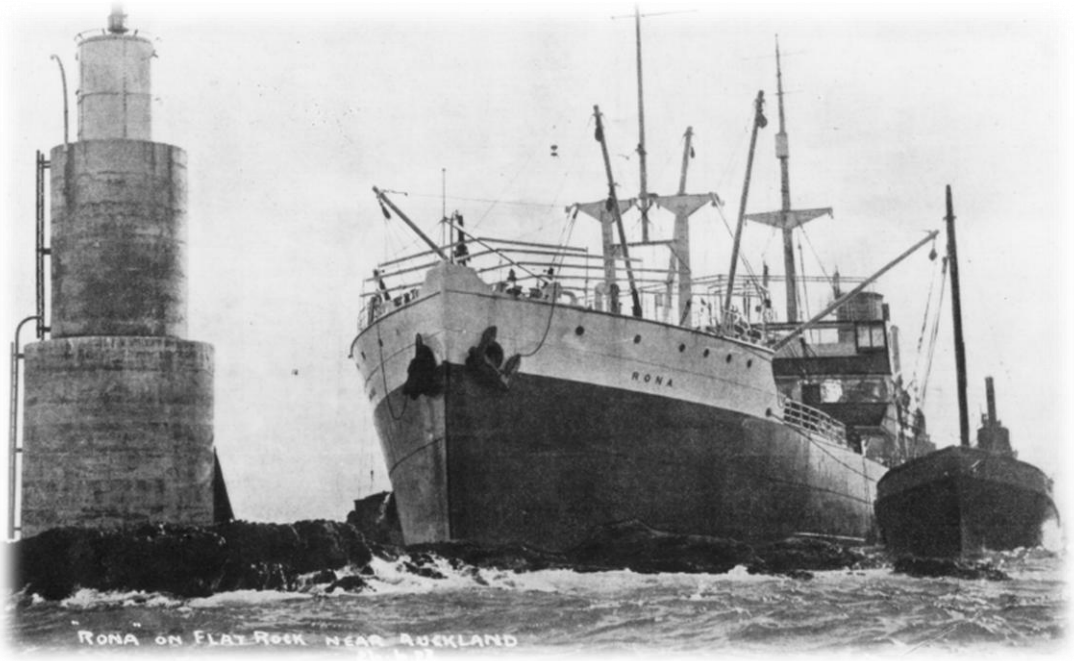
Master	Captain J.A. Wallis	Chief Eng.	James Morrison
1st Off.	Grantley	2nd "	Wm. Matthews
2nd "	E. Stafford	3rd "	Thos. Wolfe
3rd "	Balharrie	4th "	John Freeman
Radio "	Norm Wickham ?	**5th "**	**Geo Dempster**
Chief Steward	Sid. Russell.		

Capt. Wallis and 1st Mate Grantley, on watch when the accident occurred, were required in Auckland until the Court of Marine Inquiry was completed. I think the Master was fined part of the costs of the Inquiry and Grantley's Certificate was cancelled and the Company dismissed him.

The Chief, 3rd and 4th Engineers were kept employed on the "Rona " repairs and the 2nd went on holidays to the U.K. I was returned to Sydney and worked in Pyrmont Refinery until the repairs were completed and I then rejoined the "Rona" in Auckland at Western Wharf. The "Rona" then proceeded to Fiji once more.

Unquote.

Photos of the 1922 grounding appear following. It is believed the general manager E W Knox held the Captain accountable, but his co – directors exonerated him, so he kept his ticket and his job. The repair took 3 months and the cost was equal to the replacement cost of a complete hull - a very expensive diversion from a safe course.



Aground on Flat Rock NZ in 1922

The experience of being there was repeated when the ship grounded again in 1956 on a coral reef just north of Lautoka. It was steaming to Lambasa on its last voyage prior to disposal and came to a halt around 6 am on the 16th March 1956. The Master on this occasion was on the bridge and blinded by the rising sun in a channel that at best was marked with timber stakes and at worst had no channel marks at all. Hyla was below in the engine room and took the photos below. Fortunately on this occasion the damage was superficial only and after a flooding inspection the ship was refloated and continued on its way to Lambasa 3 days later on 19th March 1956. It was later docked for a full inspection.

Paddle Steamers (viz a viz *PS Terranora*)

Paddle steamers first appeared around 1800 predating screw steamers. Their popularity as cargo ships soon waned, but as passenger vessels on closed waters particularly in Europe, they are timeless with an enduring appeal as the photos of some I have seen attest.

Lake Lucerne Switzerland (two of five PS that still operate are shown below)

PS Unterwalden (built 1902)

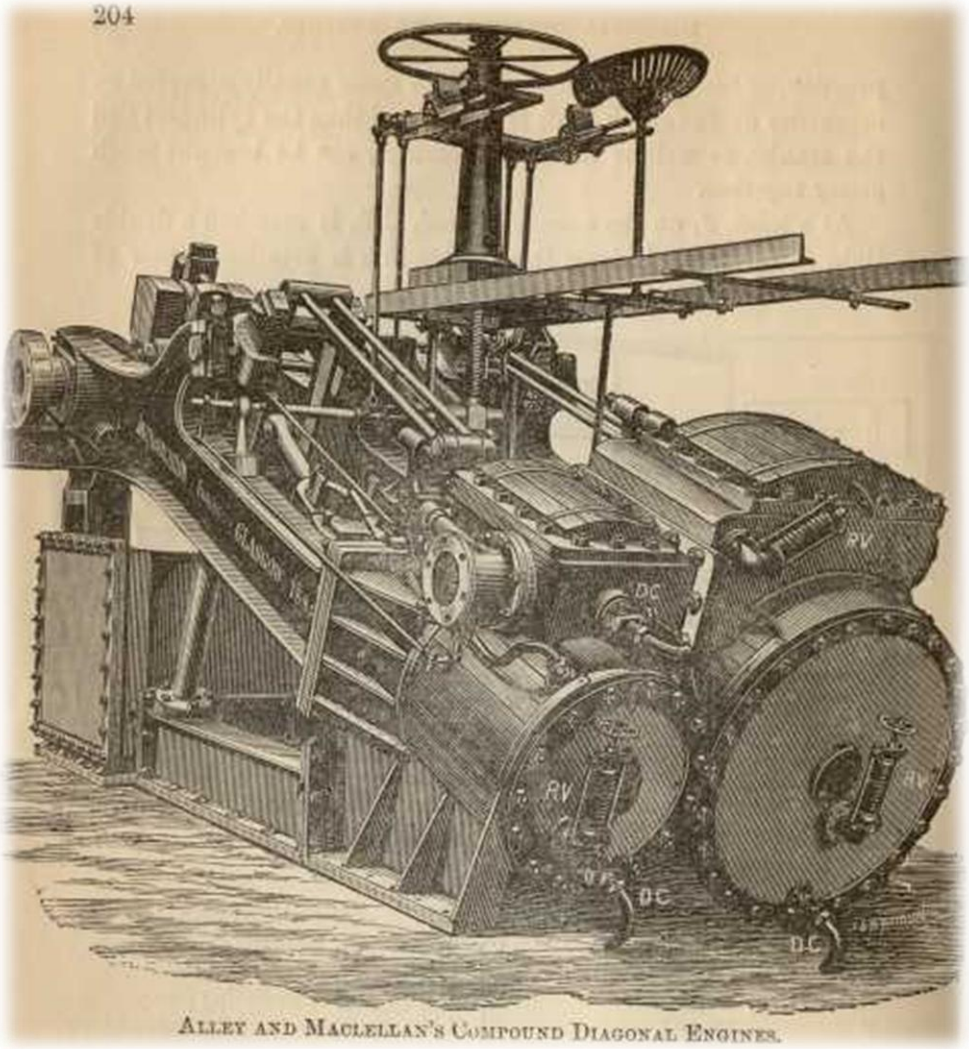
PS Uri (built 1901)

PS Montreau on Lake Geneva

Compared to these paddle wheel steamers, *PS Terranora* belching thick black smoke in its all black livery was a world away in appeal, but as a steamer there are some who will forgive that and argue the appeal is still there none the less, so a few notes follow,

Typical diagonal paddle steamer engines (compound)
& feathering float paddle wheels

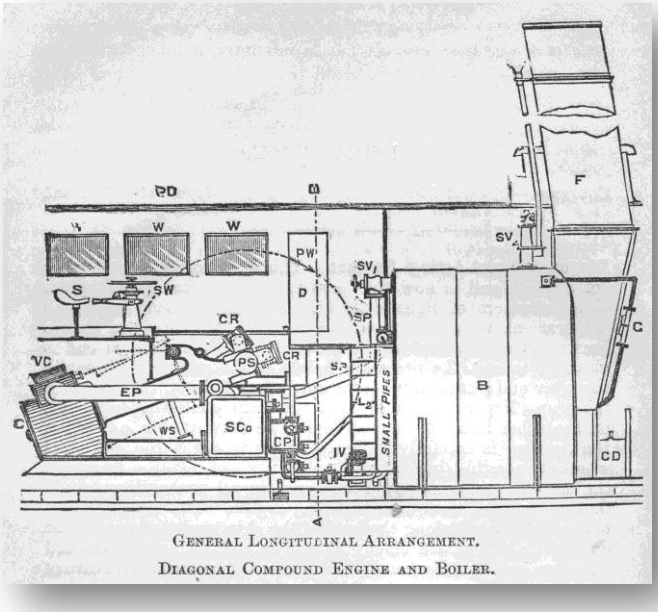
[Ref. Jamieson's *Steam and Steam Engines* (1886)]



ALLEY AND MACLELLAN'S COMPOUND DIAGONAL ENGINES.

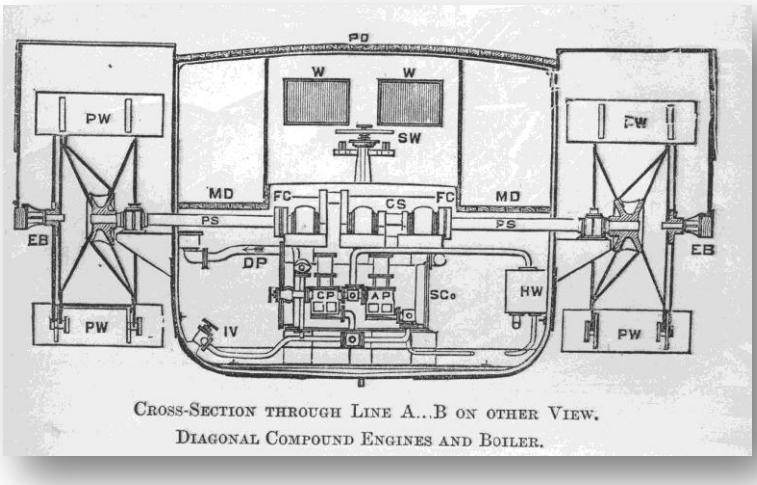
Dimensions of Compound Diagonal Engines (typical)

Steamer	**One Boiler**	**Engines**
Builders Measure = 222 Tons	Diameter = 11 ft 6 inches	Diameter HP Cyl = 22 inches
Length = 140 ft	Length = 9 ft 6 inches	Diameter LP Cyl = 37.5 inches
Beam = 18 ft	Shell Thickness = 13/16th inch	Length of Stroke = 30 inches
Depth of Hold = 7 ft 6 inches	Two Furnaces	No Strokes per min = 44
Speed = 14.5 knots	192 Tubes 2.25 inch OD	Cut Off in each Cyl = 15 inches
Weight of Engines = 22 Tons	Grate Surface = 23 sq ft	Indicated HP = 100
Weight of Boilers = 23 Tons	Heating Surface = 1295 sq ft	Paddle Wheel Dia = 12 ft
	Pressure = 100 psi	Breadth of paddle = 6 ft
		Immersion 2 ft 3 inches



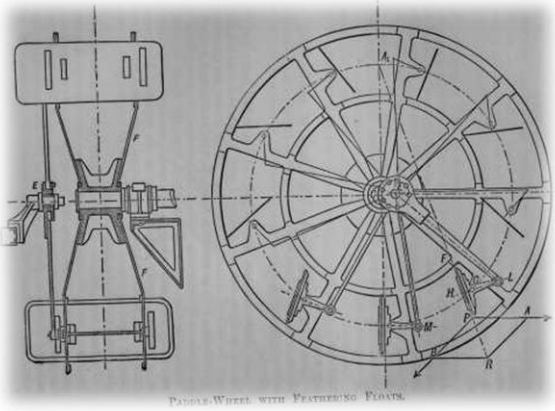
General Longitudinal Arrangement.
Diagonal Compound Engine and Boiler.

Engine & Boiler



Cross-Section through Line A...B on other View.
Diagonal Compound Engines and Boiler.

Vessel Section



Paddle-Wheel with Feathering Floats.

Feathering Floats*

(* Floats [paddles] are tilted vertically when entering & leaving the water)

Note On Sail Assisted Ships

At least three or four of the early CSR ships were rigged at the time of initial Lloyds Survey, and perhaps initially operated with auxiliary sail assistance, assuming favourable winds. For example *SS Keera* was known to have sailed under canvas alone on its maiden voyage to Australia. Based on the register entries these (four) were,

- *SS Keera* – a 2 masted schooner
- *SS Fiona 1* – a 2 masted brig
- *PS Terranora* – a 2 masted schooner
- *SS Fiona 2* – a 2 masted brig

The schooner rigs in these cases were a fore and aft sail plan with a main sail only behind each of the foremast and the main mast. The brig rig was shorthand for brigantine that had yards only on the foremast for square sails, and fore and aft sails on the main mast.

In favourable winds, the assistance that could be given by these sails was twofold,

First and obvious was the additional effort to produce forward motion to the ship that allowed less coal to be used thereby improving the cost to run the ship.

The second is less evident, but would be known to sailors who might read this. The steering mechanisms on these early ships were by way of mechanical linkage between the wheel and the quadrant driving the rudder. Steering was generally heavy, and in some cases so cumbersome as to be dangerous when say crossing the bar at a river entrance from the open sea. By erecting fore and aft sails, the position of the combined centre of effort (COE) of the sail plan could be moved forward or aft and give some assistance to holding a course. This feature was even more necessary with pure sailing ships that did not have the benefit of screw assistance.

The location of the resultant combined force from the sail plan effort, in relation to the position of the centre of lateral resistance (CLR) offered by the wetted surface of the hull in the water, produces a moment or twist on the hull that causes it to want to turn either into the wind (a weather helm) or away from the wind (a lee helm).

With these ships, where the masts were spaced far apart on either side of the CLR, it is believed that the steering could be greatly affected by simply having only one sail erect – ie the fore sail to give a weather helm or the aft sail to give a lee helm.

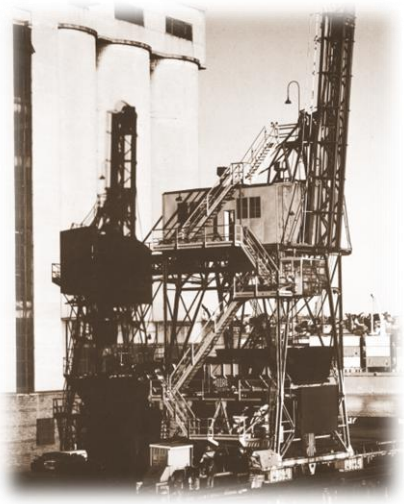
Just how often sails were employed is speculation. In my opinion, the feature was probably allowed to fall into disuse, if it was ever used, as the extant images of these particular ships don't show the sails furled on their booms which would indicate a readiness for use. After a while sails will require replacements adding to the cost and management would not want to carry extra crew for an occasional use.

Bulk Handling Replaces Bag Raw Sugar Unloading @ Pyrmont Refinery in 1955:

SS Tambua **at the wharf discharging raw sugar bags &/or molasses ?**

SS Rona **unloading bags to horse drawn carts, 27 Sept 1933**

Bag raw sugar store & 'cutting in'



First bulk unloading used the coal crane, then 'Stothert & Pitt' gantries erected with Titan floating crane in Oct 1954; Bulk handling fully operational from 1955

Discharging *Jeparit* 1978

Refinery photos courtesy of ,

- C W Davis PhD Thesis,
- 'The Sugar House', CSR Pyrmont Refinery 1878 – 1992
- CSR Pyrmont Refinery Centenary 1978 Photography Project – Mark Johnson photographer

Footnote: on floating cranes,

Titan was a 150 ton floating steam driven crane, designed by Cowans & Sheldon of Carlisle in the Lakes District England, built in sub assemblies in the UK, then shipped out and erected at Cockatoo Isl. Dockyard in 1918/9; it was sold after the Dockyard closed in 1991 and lost off the NSW coast the following year whilst under tow to Singapore.

Titan was used to raise the ferry *Karrabee* after it sank at Circular Quay in 1984, however as floating cranes go these days, it was a minnow beside the **7,500T** monster built in Shanghai by the **Shanghai Zhenhua Port Machinery Co. shown over,**

Compare the pair of 150T Brambles (Manitowoc) mobile cranes used to lift the (50T) mid section for each of the Hartman suction unloaders prior to erecting the wharf side (reversing) conveyor gallery, shown in the KBF project photos (1981/3) following.

Kooragang Bulk Facilities (KBF) Project:

Late 1982, heavy lift ship *STELLAPRIMA* arrives from Taiwan with ship unloader sub assembly structures (50 – 150 tonnes), off loaded to half completed wharf,

Mid 1983, unloading 25,000 tonne alumina commissioning shipment from ANL ship *Lake Eyre,*

Rotten Row in1983; Tomago Aluminium storage on left, KBF wharf in centre and Alcan storage on right; *Lake Eyre* at the KBF wharf with Stockton in background.

TNT Capricornia discharging 75,000 tonnes of alumina to Tomago in 1985

The KBF terminal was an Alcan / Tomago joint venture adjoining the MSB general purpose berth hitherto used by Alcan and the new facility was served by two 550 tph Hartman suction unloaders. Berth time for this design ship size was a little over 3 days. The *TNT Capricornia* and its sister ship *TNT Carpentaria* were then powered by steam turbines with oil fired boilers that were later converted to pulverised coal firing, and the ships renamed *Fitzroy River and Endeavour River* respectively.

A Final Note:

A few words should be said as to why the original (2006) paper has been revised. The most apparent is to incorporate further study of *SS Keera* and *SS Fiona (1),* however changes in CSR were the main driver.

CSR in recent times has continued to make wholesale changes to its business; most notably, the sale of its sugar interests completed in December 2010. Some say it thereby brings an end to the association with the business that commenced 155 yrs ago that led to shipping under its own flag, started 136 yrs ago in 1873.

The small group of shipping personnel that remained in 2006 have now gone, and the CSR office moved to North Ryde from Chatswood. Accordingly, CSR's continued shipment of bulk cargos for its remaining business has been reduced to cargo charters, currently under a contract with CSL Australia (part of the Canadian Steamship Line) and managed by them.

The five shipyard models, noted herein as being located at CSR Shipping (Chatswood office) have now gone from there, three being donated to the ANMM, *MV Rona*, *Ormiston* and *Goliath* (ANMM ref. #'s 00047863,4,5 respectively), the *Silverhawk* is at the North Ryde office of CSR, and the *Kowulka* model is at the Wetherill Park site. Consequently any attempt in future to house a single collection of all these extant artefacts from the CSR merchant fleet under one roof, requires some effort, not the least of which is to get an agreement with the ANMM & SHF. Accordingly all that is left for me is to ensure that the record is preserved (a copy of this work is therefore with both the ANMM Vaughan Evans library, and the museum curator of the MRRC for the SHF – just down the corridor from each other at Wharf 7). I continue with an occasional model like *SS Keera* below (radio controlled in cedar & brass @ 1 in 50 with an auxiliary helm, and prior to lengthening).

John Reid
6th Jan 2011