BUSTARD HEAD LIGHTHOUSE

BY RON & YVONNE TURNER

"I am a self confessed pharophile, that is, a person interested in lighthouses. My wife and I have been volunteers assisting the preservation of these unique areas in Queensland for some years. Part of our role is to care for and interpret the heritage of the sites to visitors".

Ron Turner

Lighthouses in the New Colony

Within two years of the First Fleet arriving at Sydney Cove, Australia in 1788, the fledgling colony was short of food. Governor Macquarie directed a lookout be established on the South Heads of the entrance to Sydney Harbour. The objective was to signal the colony of the approach of any ship, including those bringing food.

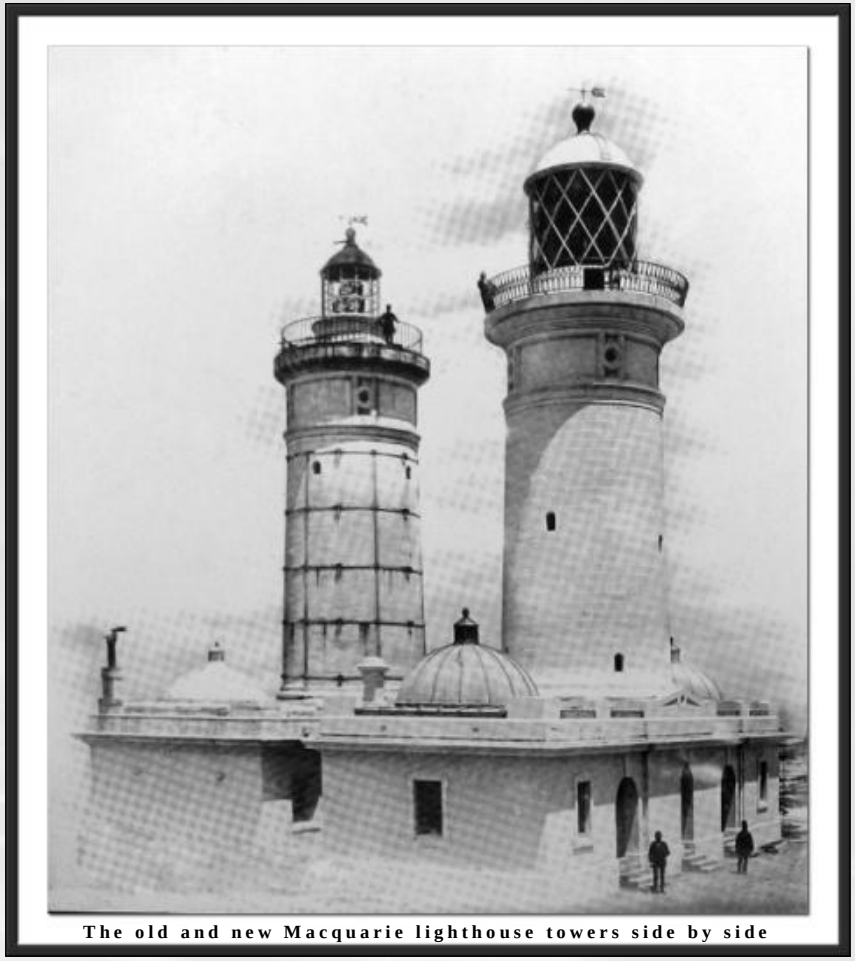
Officers and crew of HMS *Sirius* (flagship of The First Fleet) built huts for shelter 20 January 1790 and erected a flagstaff which could be seen from Sydney Cove. Fires were lit each night from dusk to dawn. The first recorded use in Australia of a navigational light was the fire lit there 15 January 1793 for the *Bellona* waiting off shore to enter Sydney Harbour through the heads.

The present stone building located at the site (inset) was designed by Colonial Architect Mortimer Lewis and built by convict labour in about 1840 to replace the timber huts. In 1893 a 9.2 inch gun (about 234mm) was put into position and the area became known as the 'Signal Hill Fort'.

Australia's first lighthouse was designed by convict Francis Greenway and built at this location at the direction of Governor Macquarie. It began operating 30 November 1818. Fifty years later, stonework in the original tower began to crumble. Iron bars were strapped both horizontally and vertically to hold the stone together while a second tower was built in 1883 as a close replica of the original structure. For a period of time both towers stood side by side. Accommodation for the head light keeper was on the right while two assistants were housed on the left.

Signal Hill Fort

Use of electric power in lighthouse technology prior to 1900 was rare, due to lack of a suitable constant power supply, batteries and lamps. The first electric system in an Australian lighthouse was installed in the late 1800s in the replacement tower at Macquarie Lighthouse. This was powered by electricity that was generated by two dynamos driven by coal gas engines. The cost of operating this system was very high and the electric arc lamp was replaced by a kerosene vapour lamp in 1912.



The old and new Macquarie lighthouse towers side by side

Macquarie Lighthouse in 2013.

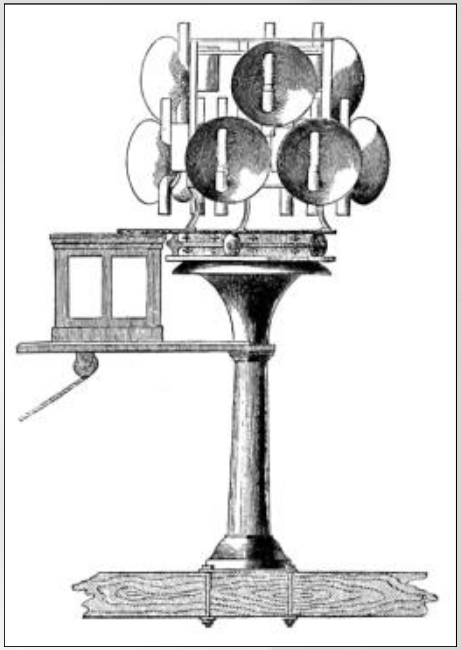
© Ron Turner.

Hornby Lighthouse

In 1857, the sailing ship *Dunbar* was wrecked on rocks in bad weather near South Head, while waiting to enter the harbour. 121 lives were lost. Two months later the *Catherine Adamson* was wrecked in the same area, with the loss of 21 lives. As a result, a manned lightstation known as the Hornby Light was constructed and began to operate in 1858 to assist with the passage of shipping both into and out of the harbour.

The initial light source was 16 kerosene lamps in front of parabolic reflectors arranged in concentric circles.

This early lighting at Hornsby Lighthouse was similar to this model (right). At the top of the pedestal is a flat pan containing the fuel. In this sketch note, three wicks are drawing the fuel upwards from the pan to the round parabolic reflectors.



These early systems tended to have no chimney to vent fumes, and the acrid fumes would build up and burn the eyes and nose of the keeper, often driving him out of the lighthouse lantern room.

The intensity of the light emitted depended on the lantern glass being kept scrupulously clean and the wicks properly trimmed; keepers became known as 'wickies'.

Circular wicks were developed later, and this newer design allowed oxygen to pass both inside and outside of the wick at the same time (see photograph page 17). Together with a glass chimney, the flame burned much more brightly and efficiently with less fumes and smoke.

Some lighthouses used chandeliers holding up to thirty of these lamps to provide adequate light. In 1904 this lighting system was converted to 10 incandescent gas burners. In 1948, mains electricity was connected to the lighthouse and the lighting source was changed over to an electric light system.

The Hornby Lighthouse is more strictly a harbour light than a coastal navigational aid. It was painted with the red and white vertical stripes to distinguish it from the nearby white Macquarie Lighthouse, and remains today as the second oldest harbour light in use in New South Wales.

Defensive gun emplacements are often found on strategic hills near important harbours. In addition to Signal Hill Fort - located about a kilometre to the south of the entrance to Sydney Harbour - gun emplacements were also established beside the Hornby Lighthouse to guard it from hostile attacks.

During the Second World War, armed coastal raiders were known to sink shipping close to the Australian mainland and bombard strategic lighthouses along our coast. In 1942, our defences were inadequate to defend Sydney Harbour from an attack by three enemy Japanese midget submarines.

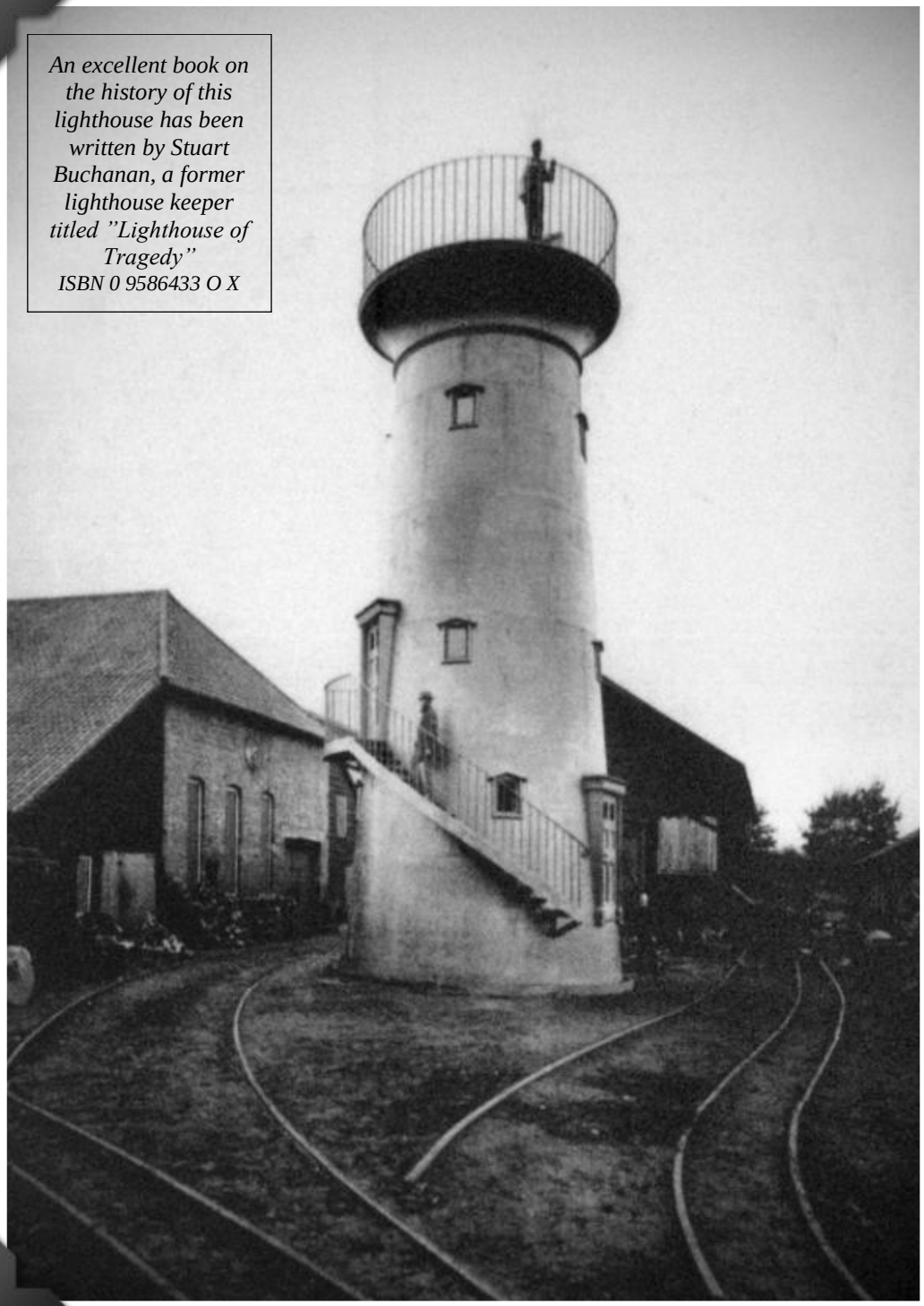
Locale

Another lighthouse was built at Cape Moreton on Moreton Island (east of Brisbane) and commenced operation in 1857. The new colony of Queensland separated from New South Wales in 1859 and at that time the Cape Moreton Lighthouse was the only navigational light for over 5000 kilometres of coastline. It was believed widely during that period that this coastline was inhabited by cannibals and headhunters. If that wasn't enough, there was also a maze of coral reefs stretching northerly along most of the coast. In 1868 this lighthouse at Bustard Head became the first coastal light to be established in the new colony.

Today, all visitors to the lightstation travel this beach - crossing four estuaries along the way. Bustard Bay was named by Lieutenant Cook in 1770 when a party came ashore and shot and ate a bustard, a large mainly ground dwelling bird standing just over one metre tall. A short distance further south is the lesser port of Bundaberg. To the north of the lightstation is the Port of Gladstone, a major coal exporting area. This area is currently being expanded to include liquid natural gas. On most days it is possible to see 20 to 30 ships at anchor - waiting to enter the Port.

Lighthouse

An excellent book on the history of this lighthouse has been written by Stuart Buchanan, a former lighthouse keeper titled "Lighthouse of Tragedy"
ISBN 0 9586433 O X



History

The Bustard Head Lighthouse was initially ordered from England and shipped to Brisbane. An 1866 photo shows the new lighthouse at the Hennet and Spinks yard at Bridgwater in England. Note the base of the steps indicating the depth to which the lighthouse is scheduled to be buried. This depth was about one metre and the internal hole was then filled with 50 tonnes of concrete made from stone carted from the beach below, which was then crushed by hand on site. The door on the lower right was used to access the fuel storage area while the upper left door led to the tower. From there it was placed on the stern wheel paddle steamer *Gneering* and offloaded into the shallow waters of Jenny Lind Creek near its final destination. From there all materials were dragged on a horse drawn sled up the hill to the present site. Just how the whole unit, including segments of the almost three metre high glass lens arrived undamaged, is nothing short of a miracle.

During this period this type of lighthouse design was favoured by the almost bankrupt colony of Queensland due to a lack of nearby building materials. A factor that also had to be considered in building similar lighthouses along the Queensland coast, was the poor quality of natural foundations such as sand and coral, and lack of suitable rock to make building blocks.

Bustard Head Lighthouse at the Hennet and Spinks yard.
Courtesy Bustard Head Lighthouse Association.

Construction

Once in place, storm driven rain leaked into the tower via the upper door. In 1935 it was decided to permanently close that door and to relocate the steps inside the tower. Once completed, the only entry was from the more sheltered lower right hand door.

When the tower at Bustard Head was constructed in 1868, it was the first operational coastal lighthouse in the new colony of Queensland. It actually came about by accident, as the first lighthouse was scheduled to be installed on Sandy Cape, at the northern tip of Fraser Island. This however was delayed, and Bustard Head became the first coastal lighthouse in Queensland.

The external metal plates are made of three different thicknesses of cast iron with an average thickness of 25 mm. They are two metres square and weigh about 1200 kilograms each. Each panel is bolted to its neighbour; with no other internal support structure required. Prior to shipment to Queensland, the panels were assembled and code marked to enable precise re-construction at the Bustard Head site.

Technical

LIGHTHOUSE
LIGHT INTENSITY CHART

- Nautical Mile Range -

Coal & Wood

Small modern auto lights

Kerosene and reflectors

Kerosene and small lens

Rotating modern auto light

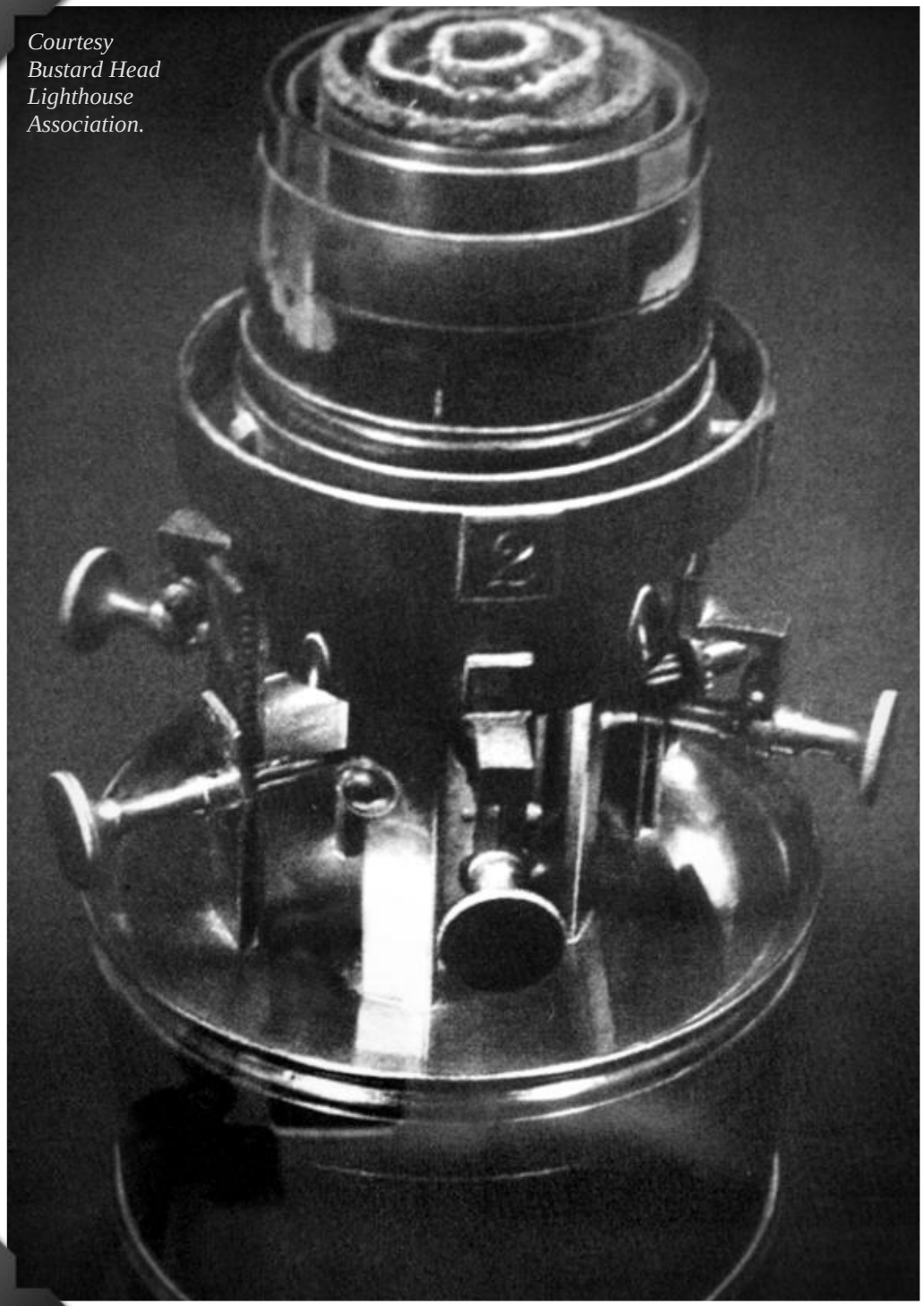
Kerosene and first order lens

Electricity and first order lens

Cape Byron at its most powerful

The Nautical Mile is the unit used by sea and air navigators to measure distance at sea. The International Nautical Mile was defined by the first 'International Extraordinary Hydrographic Conference' held in Monaco in 1929 as being 1,852 metres.

Based on a display at the Cape Willoughby (Kangaroo Island, South Australia) lighthouse.



Courtesy Bustard Head Lighthouse Association.

Lights

The earliest lighthouses in the world are recorded more than 2000 years ago. The initial light source was generally wood or coal (if available) and tended by slaves. Various oils were later used depending on availability and cost.

In the case of Bustard Head Lighthouse, the use of China oil was recorded. This oil may have been obtained from various trees such as tung oil or candlenuts, though I believe it was more likely an early form of what later became canola oil. This was said to have been used by the Chinese and Indians for cooking and lighting for some thousands of years. Other oils came from sperm whales, mutton birds, or beneath the Earth's surface.

Note the three concentric wicks in this photo (left). It indicates a much improved version from the original single wick which, over time, was found to give a steadier and brighter flame when an inverted glass funnel was placed over the top. The wicks were trimmed using a special pair of wick trimming scissors which retained ash from the trimmed wick rather than have it fall into the apparatus (see photograph page 25).

The misuse of wood fires to lure ships to their doom is well recorded. Such people were often known as 'wreckers' and Bella Bathurst, in her book 'The Lighthouse Stevensons', gives accounts of the wealth accumulated into some coastal communities from on-going shipwrecks. She even writes of the opposition encountered to building early lighthouses as local people believed 'It is the will of God' that ships should be wrecked on their shore.

Lenses

The original lens at Bustard Head was slightly smaller than this First Order version (left). The pictured light source is a pressurised kerosene system, using a mantle. An inverted funnel is located above the mantle to catch exhaust heat and fumes, and exit them out of the structure.

The term 'Order' refers to the focal distance between the source of light (of whatever type) and the lens. In this photograph a 'First Order lens' with a focal length is 920mm is shown.

The Second Order lens at Bustard Head Lighthouse had a focal length of 700mm. It stood just on three metres high and weighed five tonnes.

Just how this precision made glass was created, shipped from England, loaded onto another coastal steamer, then towed up the kilometre slope to the station behind horses, was little short of miraculous.

Courtesy Bustard Head Lighthouse Association.

Kerosene Lamp

Many people may be familiar with Grandma's kerosene lantern. Grandpa also had a kerosene hurricane lantern which he could take outside into strong winds and rain. Both of these early lights had a straight wick and needed careful trimming to keep the flame burning evenly. It was noticed by accident that the placement of a glass funnel around the flame encouraged the flame to burn higher and brighter. Some early lighthouses used kerosene lights with reflectors to improve the light strength.

About 1880, an Incandescent Oil Vapour (IOV) burner was introduced into lighthouses. This relied on a pressurised kerosene/air mix forced into a pre-heated tube where, on striking the hot walls of the pipe, the mixture instantly turned to vapour. This pressurised vapour was burnt through an impregnated glass cloth mantle and became a brilliant glowing ball. Methylated spirits, and shellite (or white spirits) were common pre-heating fuels used also in pre-heating camping cookers and lights.

The mantles as supplied by the manufacturer, were silk-like and soft. Once installed on top of the burner, they were burnt-in with a wick at which time the mantle expanded to a spherical shape and became quite brittle.

A disadvantage of using the mantles were flying insects. This is the reason why a second mantle was kept ready for instant use if the need arose.

A fundamental instruction to lightkeepers was 'the light must be kept burning during the hours of darkness'. Lighthouse doors were therefore kept closed to exclude insects.

In the photograph (previous page) the right hand cylinder was used to hold kerosene while the larger left hand cylinder contained air. The light keepers had to pump the hand pump every two hours in order to maintain the required pressure.

This was the light source in use at Bustard Head Lighthouse from 1917 to 1935.

During the 1910-20 era many lighthouses were either established with IOV burners as the light source, or were converted to IOV burners to increase the light's range. The power of the light source was set using burners with mantles of 35mm, 55mm, or 85mm diameter.

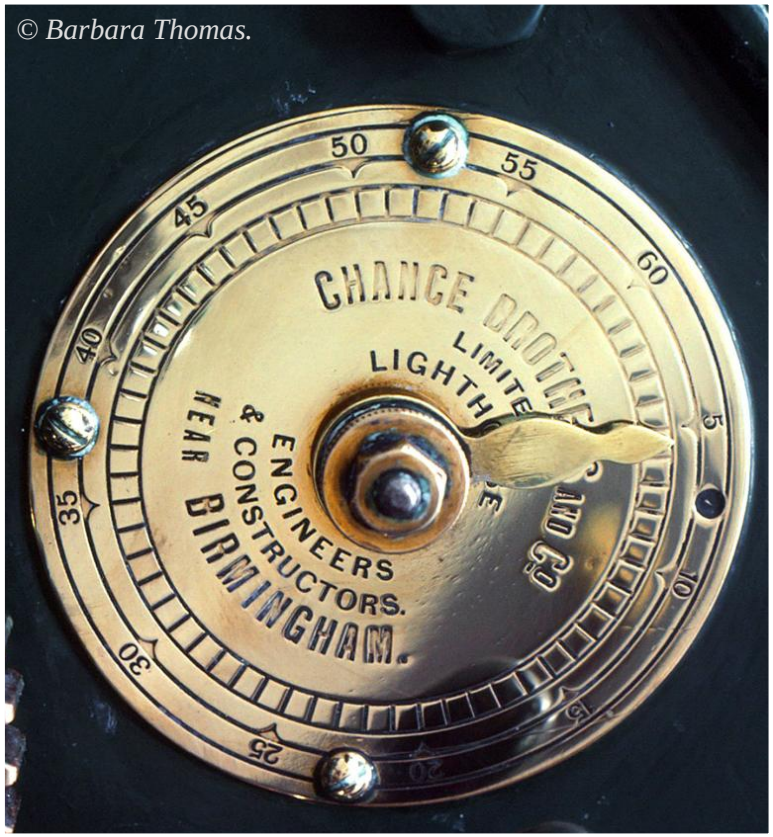
Photograph © Ron Turner.

The 'Weight Tube'. The small door (Gate) is for maintenance. The stainless steel cabinet is modern and contains batteries for reserve power.

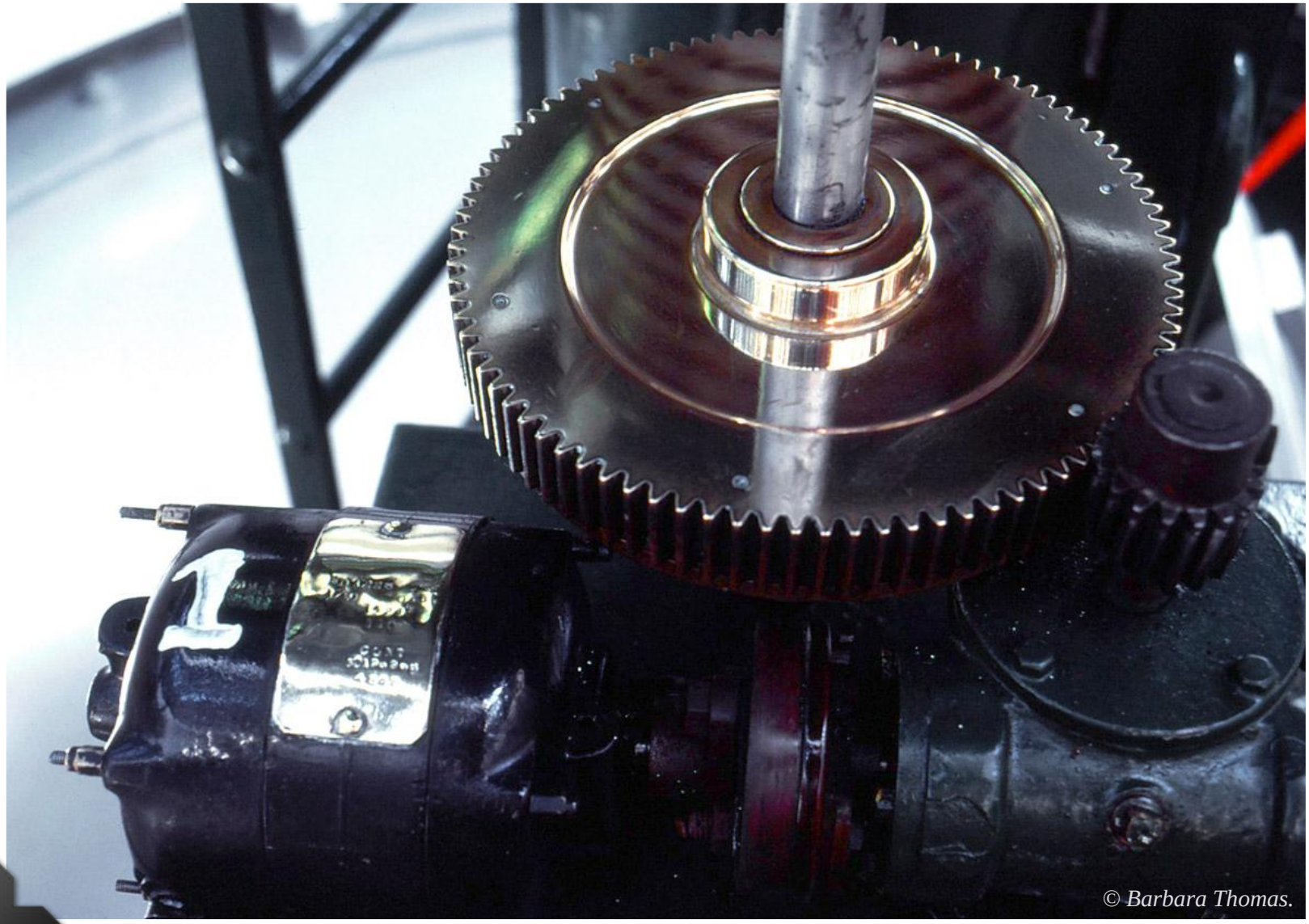
Flashes

To differentiate between lighthouses along the coast, each light was assigned a different 'Character' of flashing. This information was published and available to all interested persons. In the case of Bustard Head Lighthouse, the 1868 "Notice to Mariners" showed the light as being "...a fixed light every alternate minute, the intervening minutes being occupied with a bright flash, preceded and followed by a short eclipse...".

A large grandfather clock mechanism was used to rotate the lens and maintain this precise series of flashes - without variation - each and every night. A heavy weight was connected by a chain beneath the mechanism and contained within a 'Weight Tube' (far left) in the centre of the tower. Every two hours the light keeper had to manually wind the weight back up by means of a handle. The centrifugal force developed by two spinning cast iron balls (governors) was used to even out any minor variations caused within the mechanism as the weight descended. The speed of rotation of the balls was adjusted and set by means of the pointer. Note the original 'Chance Brothers' mechanism.



Two 110 volt DC generators were installed at Bustard Head Lighthouse in 1935. The grandfather clock mechanism was replaced by two small electric motors. In this photo, the 'No 1' motor is seen. The second motor was kept on standby in case of breakdown (as was the second generator). A new "Notice to Mariners" was issued showing the new 'Character' of the light as "...two flashes every ten seconds: Flash 0.3 seconds, Eclipse 2.7 seconds, Flash 0.3 seconds, Eclipse 6.7 seconds". The power of the light was increased to 560,000 candles (which is a light measurement roughly equivalent to the modern candlepower rating).

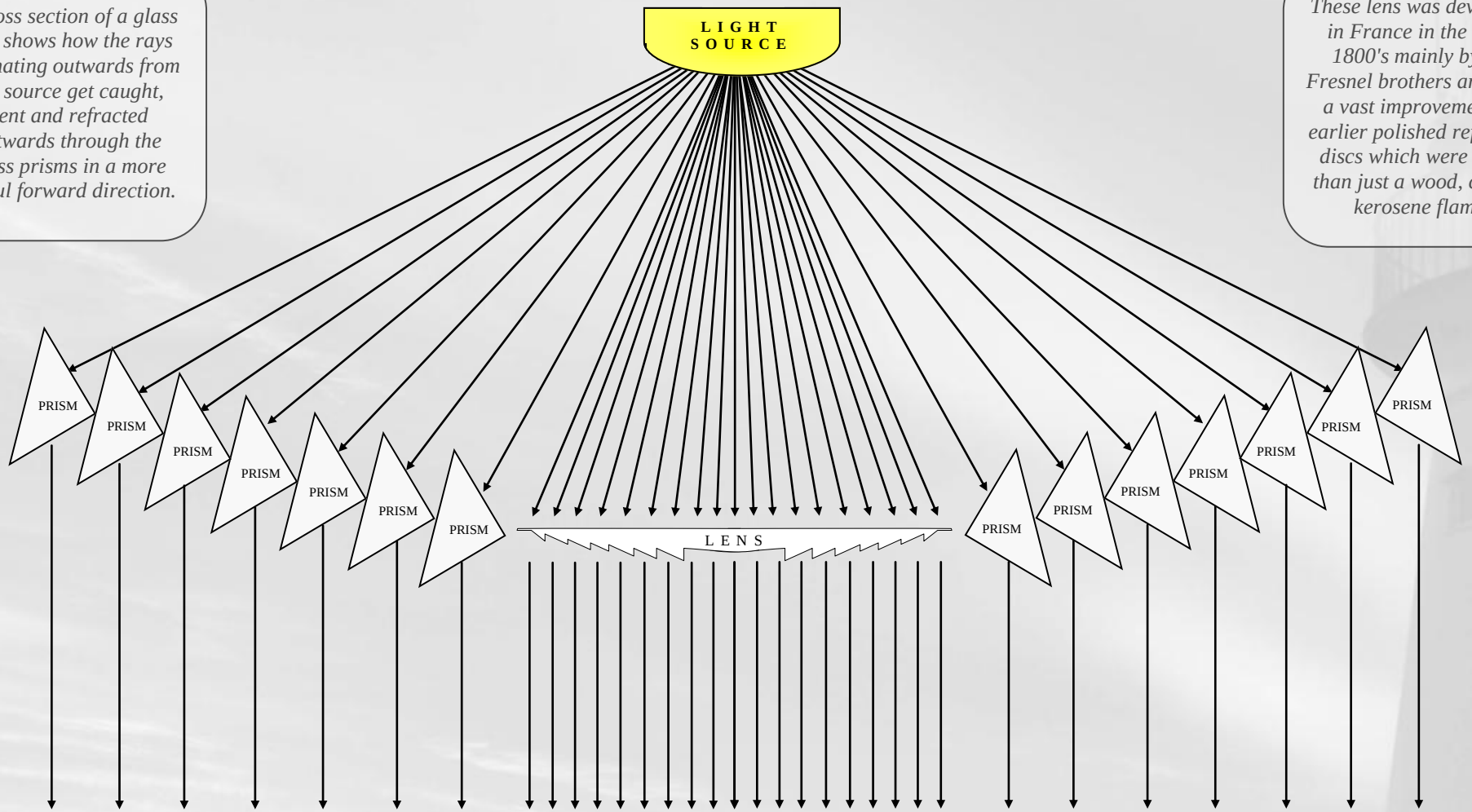


At this time the smaller Fourth Order lens (see page 26) was installed and was located just above the steel shaft seen in this photo.

Lighthouse Lamp
Cross section (Light reflection)

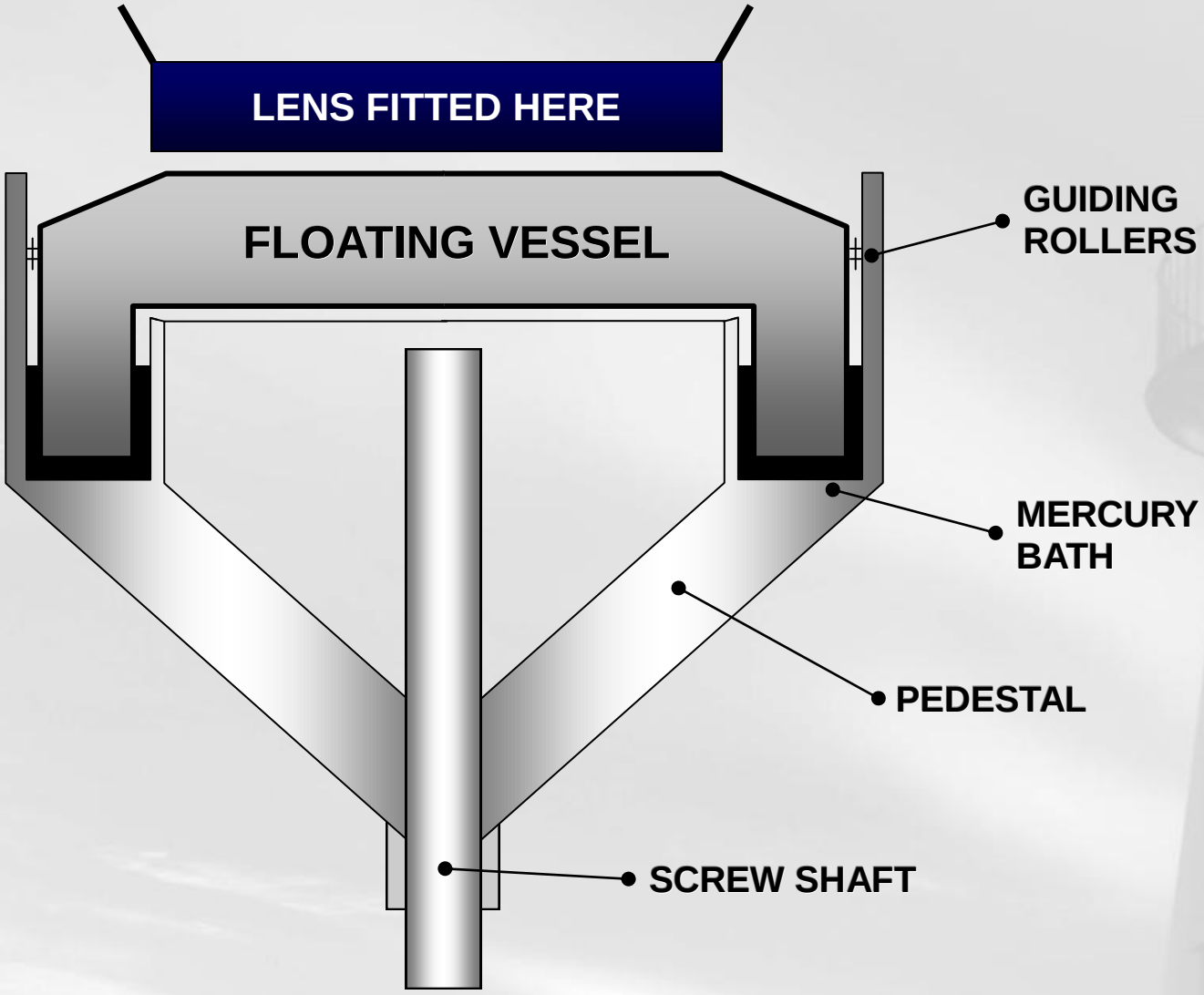
A cross section of a glass lens shows how the rays emanating outwards from the source get caught, bent and refracted outwards through the glass prisms in a more useful forward direction.

These lens was developed in France in the early 1800's mainly by the Fresnel brothers and were a vast improvement on earlier polished reflecting discs which were better than just a wood, coal or kerosene flame.



Based on a display at the Cape Willoughby Lighthouse, Kangaroo Island, South Australia.

Lighthouse Lamp
Mercury Float



Mercury was an important part of lighthouse lamp design. When a rotating crystal Fresnel Lens was installed, so was a Mercury Float to enable the heavy lens to rotate easily. As mercury is 13.6 times heavier than water, it was possible to make heavy fixtures to float on it. A first order lens weighed around 4,300 kg and required around 8 litres of mercury to enable it to float.

Based on a display at the Cape Willoughby Lighthouse, Kangaroo Island, South Australia.

Light Sources

1868 - 1917 The oil wick burner was used. Special scissors were used to trim the oil burning wicks and catch any ash.

1917 - 1935 The white unburnt mantle was used with pressurized kerosene as the illuminant.

1935 - 1965 1935 saw the introduction of 110 volt electricity produced by petrol engines. The large round 500 watt globe was used.

1965 - 1986 The 110 volt system was superseded by a diesel powered 240 volt generator. The tall 1000 watt tungsten halogen globe was introduced in 1970 and these were replaced every 3000 hours.

With the advent of Global Positioning Systems and better navigational aids, larger ocean going vessels no longer had need for light houses. As a result, light stations were progressively de-manned in favour of automatic operation. Smaller coastal vessels still had a need for lights, and the tendency was to install what were known colloquially as 'Tupperware' lights in the lighthouses to support this need. These were illuminated by a baby quartz iodide globe, standing around 30 mm high in total and generally powered by solar panels. At Bustard Head Lighthouse, strong afternoon sunlight presented a problem as the magnifying power of the lens of the suns rays could cause damage to bulb filaments.

Today, solar panels have been superseded by the more reliable 240 volt power, which rotates the lens 24 hours a day.

Fourth Order Lens

On display in the lantern room within the Bustard Head lighthouse tower is this green Fourth Order lens which was powered by the 500 watt globe. It replaced the original lens, part of which can be seen on the left.

This glass panel (far left) stands almost a metre high. Its value was recently calculated at $160,000. Note this segment of the whole lens has a smooth glass strip in the centre as opposed to the concentric 'bullseye' in other lens.

In 1868 the 'Notice to Mariners' spoke of "...a fixed light every alternate minute..." while in 1935 the new 'Notice to Mariners' issued to match this Fourth Order lens advised of a "...flash of 0.3 seconds, and eclipse of 2.7 seconds, a flash of 0.3 seconds....".

Acrylic Vega VRB-25 Lens

Within the lighthouse 'community' these lenses are known colloquially as a 'tupperware' lens, meaning they are good, but not to be compared with the original glass prism lens. Either six or eight sided, they are powered by a 100 watt quartz iodide globe. The range of this light is only about half of the former polished and magnifying lens driven by kerosene or electricity, but is sufficient for coastal navigation.

The black vanes are to prevent a continuous glow while the whole unit revolves, and to give a clear 'on again, off again' light. Note the similarity of concentric rings and a bullseye to assist magnification, as seen in many modern vehicle tail and parking lights.

At Bustard Head Lighthouse one of the duties of the light keepers was to move a calico curtain inside the lighthouse to protect the glass lens from the morning and afternoon sun. Blank panels remain permanently in the western side of the tower to prevent after dark nuisance to the nearby township of Turkey Beach.

Problems arose with both maintenance and fuel supply for the back-up generator (in case of power outages - which happens due to storms or vandalism). In 1985, a 25 kilometre long overhead 240 volt power line was erected through bushland to service the lighthouse and keep the lens revolving 24 hours a day.

In case of loss of power, current volunteers were instructed to contact the local power company and advise them that the power is off at the lighthouse. As the lighthouse is necessary for safety at sea, the power company have directions to always allocate it high priority.

The Fourth Order Lens was replaced with this smaller Vega VRB-25 lens which is lit by a tiny 100 watt globe about 30mm high (see previous page). The light now revolves 24 hours per day by means of the 240 volt electricity supply. Back-up power is provided from batteries charged from mains power.

The Bustard Head Lighthouse has seen many changes after being first lit in 1868. The most dramatic change occurred in July 1986, when the last remaining employee was withdrawn due to automation. Due to more modern technology, navigators of large international ships no longer rely on lighthouses for navigation. Today the Global Positioning System (GPS), radar and radio directional signals are able to direct ships more accurately and safely.

Today, lighthouses encircle Australia and are a poignant reminder of the all-to-frequent loss of life in nearby waters. They stand in mute testimony of the endeavours of the pioneers who built them (often in the most adverse conditions) the engineers who improved them, and most of all, the people who manned them in isolated conditions and during all extremes of weather, when living conditions were often a daily struggle. They are now a beautiful visual reminder of our history and heritage.

End of an Age

End of an Age

Prior to Federation in 1901, the various States were responsible for their own lighthouses. When the Commonwealth of Australia assumed control in 1915, the coastal lights were placed under a single authority. However, the individual States retained ownership and responsibility for harbour lights as distinct from coastal lights.

The Commonwealth Department responsible underwent a number of name changes until, in 1991, it was given its current title of Australian Maritime Safety Authority (AMSA). With improvements to navigational aids such as radar and the release of the highly accurate Global Positioning System, international shipping now relies less and less on the lighthouses for navigation. Management by AMSA hence became focussed on demanning the lightstations and electrification and automation of all lights - using either mains or solar power.

Development of smaller acrylic lenses (known colloquially as 'Tupperware lights') allowed operation by solar cells and batteries and this became the norm, although many are operated by 240 volt systems. Some of the more important lights continue to use the early glass lens. All coastal lighthouses were demanned before the end of 1996.

More important was the disposal of these Commonwealth owned lighthouse lands to either State control or by outright sale.

However, the actual lighthouses remained under Commonwealth control for operation with maintenance often carried out by means

The aftermath of moronic vandalism

of helicopter. It was common to see the various State 'National Park' authorities assume control of the land, and in turn to have them advertise for expressions of interest. They would then issue 20 year leases to various groups. It is not uncommon today to see the cottages rented to individuals - to defray the cost of ongoing maintenance.

In the case of Bustard Head Lighthouse, there was a lengthy period of procrastination within the State bureaucracy and serious, mindless vandalism began to occur at this remote headland. A small band of former light keepers and volunteers set to rebuild the lightstation to its original condition - in keeping with heritage values. An Eco-tour group now operates full-day tours, bringing paying visitors to the lightstation by an amphibious LARC. Once at the lightstation, they are taken on a tour and learn about the history of the lighthouse and how the families once lived.

History gets a new lease of life

The availability of these vehicles (or vessels) enabled the costly two year re-building of the Bustard Head Lighthouse by a small group of former lightkeepers and other volunteers. Not only did the two houses and associated storage sheds need a full re-construction but a major access route from the ocean to the station had to be developed to enable materials to be delivered to the site. The vessel was an improvement on the American Second World War DUKW. The craft shown here is a LARC or Lighter Amphibious Recovery Craft as developed during the Vietnam War, and can carry about half its own weight. It is a four wheel drive vehicle with a rear mounted engine and is also a propeller driven vessel.

Carrying some 32 passengers, they are used by the commercial "1770 Environmental Tours P/L" eco-tourism business. Travelling northerly from the township of Seventeen Seventy along the beach they cross four estuaries en route on their full day tour arriving at the lightstation in the late morning. Part of the fee paid by customers goes to the Queensland Parks and Wildlife Service; another part goes to the Bustard Head Lighthouse Association to help defray costs associated with maintenance of the station. A major function of the volunteer caretakers is to conduct visitors through a display house, and into the lighthouse.

The tour operator (seen here 5th left) interprets the history of the lightstation including the dangerous off shore rocks. He might describe the rocks as being some "two miles off-shore and either just awash or barely above high water mark. The outer rock is known logically as the Outer Rock; the closest rock is known as the Inner Rock while the middle rock is known as the Middle Rock". If he is feeling lighthearted (or mischievous) he might go on to describe the other two rocks as "...the Inner Outer Rocks and the Outer Inner Rocks".

Not only is a flagpole used to display the Australian flag (another duty of the volunteers to hoist and lower daily) it is significant historically.

Prior to ship-to-shore radio internationally recognized flags were used in various combinations to 'talk' to and from ships off-shore. In the early days of the colony, ship's captains might report contagious diseases on board, how many new settlers were seeking work and what skills they might have. This information would be relayed by morse code along telegraph wires and residents at the port might meet the ship to instantly engage tradesmen, or maidservants.

Living at a lighthouse

After the tour guide outlines the history of the lightstation, another role of the volunteer caretaker is to conduct visitors through the display house talking about the various exhibits on display. As a result of my talking to a person who lived at the station during the war, I have changed the focus of my talk to concentrate on how the women coped. Food was transported two kilometres to the station by horse and dray. A variety of heavily salted meat came in tins as did butter, cured bacon and corned beef. Flour came in large bags (about 65 kg) and there were even larger bags of potatoes. Sugar came in 30 kg bags, honey in 20 litre tins while syrup came in 3 kg tins. The quality of the potatoes was important; some were boiled and the heavily laden starch liquid was kept to be brewed up with hops to make yeast for bread making.

For cooking, a three burner kerosene stove (about a metre wide) was used, with the kerosene held in a bottle at the side. When the bottle was inverted, the kerosene would drip feed to the burners and be available for lighting. A portable oven was placed over the top of two of the three burners to make bread, cook roasts, or for other cooking tasks. Self raising flour was made by mixing baking soda with plain flour. A house cow was kept for milking. Occasional fresh meat came from a nearby cattle station, or from turtles or native pigeons. There was also a small fruit and vegetable garden.

Prior to the war, a Coolgardie safe was used. This consisted of an insect proof container around which was a sheet of hessian or similar material. Water was fed from an elevated container which kept the hessian moist. Any breeze moving onto the damp hessian would lower the temperature inside the container. During the war, an icy ball refrigerator was used. This was actually invented by an Australian

A Coolgardie Safe

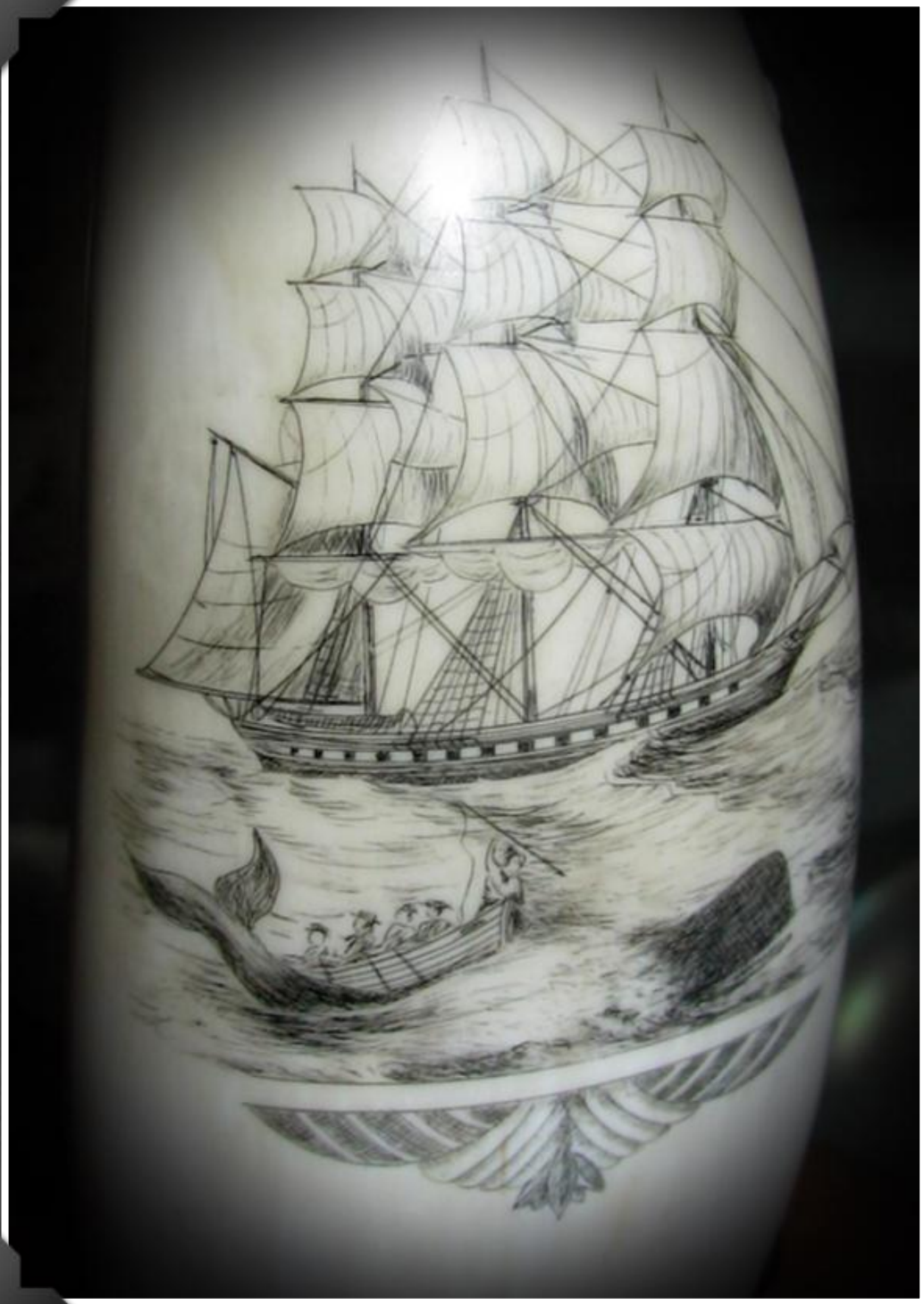
in the 1920's and consisted of two sealed spherical balls containing a solution of ammonia and water. The balls were connected by a pipe and it was operated by heating the 'hot ball' (the 'ridged' sphere) which would drive the ammonia solution through the pipe into the smooth ball. The smooth ball would then be placed into a chest type box which held the food. Movement of the ammonia via the pipe back towards the outer ball would cause the temperature inside the box to fall. So effective was the system, that it was even possible to make a small amount of ice (in a container inserted into the hole through the icy ball). Kerosene refrigerators were supplied in 1947, and a two door electric refrigerator in 1975.

If storms delayed the scheduled six week resupply of food, the keepers and their families would fish and take their crab pots to either of the two estuaries; they would also collect oysters from the plentiful supply around the rocky foreshore. (Tough life)!

Hot water for washing and laundry was heated by a kerosene 'Steamkleen' boiler. Lighting within the house was entirely by use of kerosene lanterns until 1965, despite the lighthouse being operated by 110 volt electricity from 1935. For recreation there was painting, sketching, or shell collecting.

This latter item leads me onto describing scrimshaw and various shells. I give an explanation of a recorded case of a man dying from the 'sting' from a beautiful, but deadly coneshell on display; this attracts 'riveting attention'. There is lots to talk about and exhibits to explain, but lunch becomes necessary as the tour is tide dependant.

Icyball fridge similar to that once used at the lighthouse



Early Scrimshaw Art Form

Scrimshaw was an art practised by the early whalers. In this instance the tooth of a sperm whale has been used. The outline of the sketch is made with the tip of a sail needle, or sailor's knife. Lamp black is then rubbed into the groove to highlight the outline.

There is no evidence women at Bustard Head Lighthouse engaged in this form of artistic outlet, but there is no reason why they would not have done so, apart from the availability of a whale's tooth.

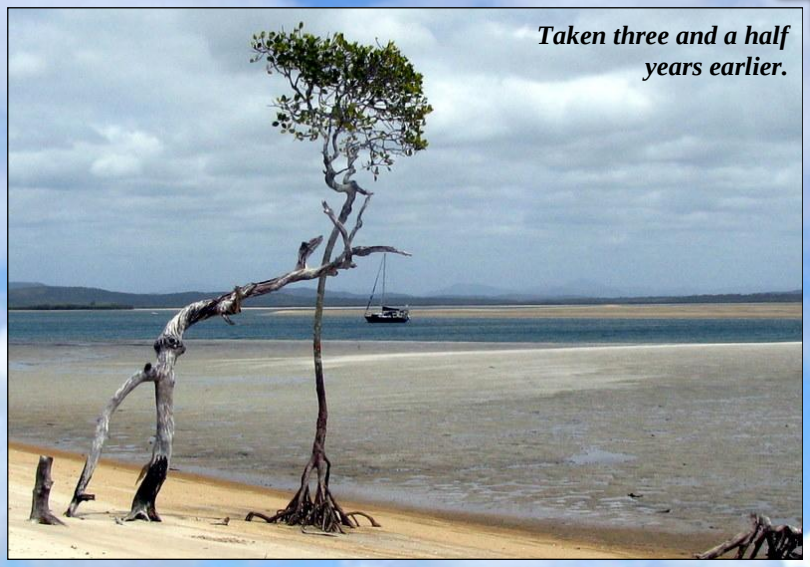
The art was practised by early Inuit peoples for many hundreds of years before Europeans sailed the oceans. The Inuit people would use walrus teeth or bones. These peoples were often confined to igloos for lengthy periods.

Seeking refuge from a violent gale, the schooner *'Jenny Lind'* was wrecked on the bar at the entrance to this creek in 1857. Fortunately there was no loss of life. At that time, Jenny Lind was a well known Swedish opera singer. This inlet is the fourth estuary the amphibious LARC (Lighter Amphibious Recovery Craft) has to cross on the 90 minute trip along the Bustard Bay Beach (left) before climbing the headland to the lighthouse where, together with our food and clothing, we are offloaded right at the cottage door. On the skyline is Round Hill Head, named by Lieutenant Cook. The townships of Agnes Water and Seventeen Seventy (our departure point) are located at the far end of the beach.

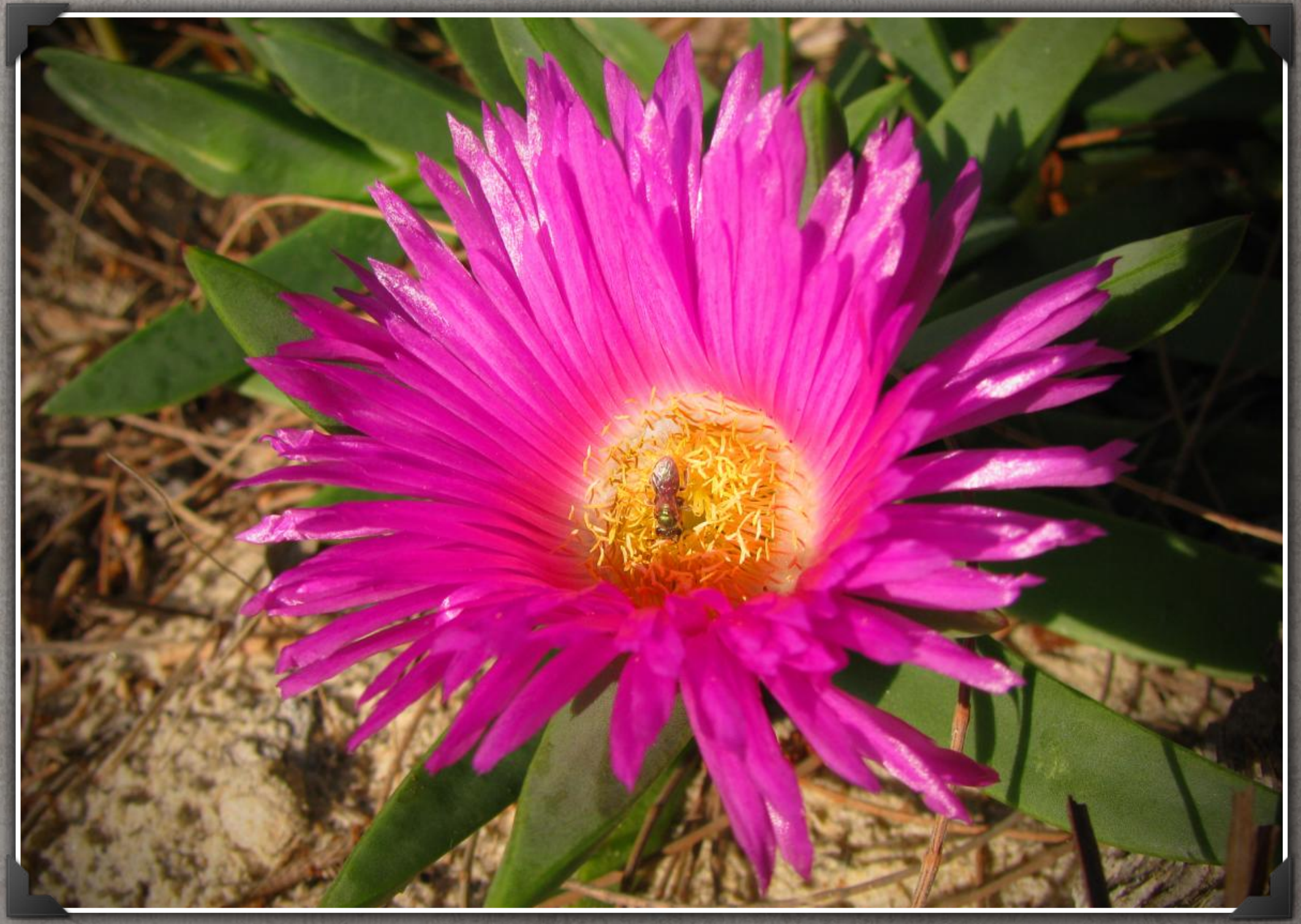
Bustard Bay was named by Captain Cook in 1770, as members of the Endeavour had gone ashore and shot a bustard (or plains turkey). This was a large mainly ground dwelling bird, standing just over one metre tall. Formerly common in Victoria 100 years ago, Cook may have been the first European to describe it as 'excellent eating'.

Many people have lost their lives in the waters here, mainly by drowning but about 30 years ago, two Fisheries Inspectors disappeared in somewhat mysterious circumstances whilst engaged in checking 'crabbers'. Their boat and items of clothing were found in the ocean but the bodies were never recovered. The mud crab is a tasty and valuable resident of estuarine areas and invites involvement by some unscrupulous individuals.

What volunteers do in their spare time



Taken three and a half years earlier.



Seed head of the native Beach Spinifex

Exposed roots at Pancake Creek, 2 km from the lighthouse where lighthouse stores come ashore

Bustard Head Lighthouse

By Ron & Yvonne Turner and David Hibbert.

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Special thanks to Stuart Buchanan, former lighthouse keeper, author and President of the Bustard Head Lighthouse Association, whose enthusiasm and knowledge helped extend our appreciation of the iconic sentinels we now see standing around our coastline.

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