Name: *Triumph in the Tropics, 1959*

Section name: Part Two, Chapter XIX, The Maritime Frontier

Pages: 217–238

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Boy with Fish, Heron Is., Barrier Reef.

PLATE XLIV.

(Courtesy of Fred Carew.)
CHAPTER XIX
THE MARITIME FRONTIER

Harvesting, Farming, Mapping and Marking the Sea and the Shore

The fishing industry in Queensland, including harvesting of sea-foods, such as oysters, crabs and prawns, dates from the earliest period of settlement; and some odd and unique activities, such as dugong culture for oil, enliven its story.

The great potential of Moreton Bay as a fishing area was soon recognised, and from the 1840's onward fishing and oyster cultivation were well established.

Both in the quality and variety of its maritime products, Queensland is richly endowed. Almost 2,000 different species of fish inhabit Queensland waters; and, of these, almost 400 are regarded as good food-fish. Many of them are well-known for their choice flavour, and connoisseurs of sea-food consider there are few or no shell-fish in the world which excel our oysters, crabs, prawns, and scallops.

Queensland produces about 3,950 tons of edible fish annually, worth approximately £620,000, at present-day prices.

Oyster culture had become a flourishing industry at the end of the 19th century. In 1900 about 21,500 acres of oyster ground in Moreton Bay and near Maryborough were leased for cultivation. There was an eager demand for Moreton Bay oysters throughout Australia, and the export trade was worth £13,845. To-day, the oyster industry is virtually restricted to Moreton Bay, and has markedly declined from its peak half a century ago. However, Queensland grounds can, and in some cases do, provide oysters as large, fat and well-flavoured as those from the famous oyster centres of New South Wales.

In 1892 Brisbane people ate an estimated 380 tons of fish a year. Fish packed in ice were sent daily from Southport and the Coomera areas to Ipswich, Toowoomba and other inland towns. Fish were far cheaper in Brisbane than in other cities of the colonies, whiting, which would fetch by auction 6/- or 7/- a dozen in Sydney, being retailed at 9d. and 1/- per dozen here.

At the turn of the century rail transport enabled larger quantities of fish to be placed upon the market from more distant localities: consignments were being received from the Maroochy, Mooloolah, Caboolture, and Pine Rivers; from Sandgate, and Pinkenba on the northern side, and from the Logan, the Albert, and the Coomera, and from Wynnum, Manly, Cleveland, and Southport on the southern
side of the Brisbane River. The majority of the consignments were received by the Brisbane Fish and Agency Company, who established in 1897 a fish market in the cold storage of Messrs. Geddes, Birt and Co., at South Brisbane.

In January 1907 a central fish market was established. The one weak link was the distribution of fish to the consumer, which was more or less confined to the ordinary street hawker and his boy.

In 1915, the Ryan Labour Government came into power, and the fishing industry came under the control of the State. In 1916, among other State enterprises, State Fish Shops were established for the retailing of fish, as well as a State Fish Market and cold storage premises.

It seemed a natural corollary to establish a secure supply of fish at reasonable prices, and to cheapen the breakfast table for the basic-wage-earner, by Government trawler. Never did paper proposals clash more heavily with the hard facts of economic enterprise! The purchase by the Queensland Government of the modern trawler Bar-ea-Mul, with gear, from the New South Wales Government in March 1919, at a price of £32,000, began the most ambitious venture in the annals of the fishing industry of Queensland. Delivery was taken at Newcastle, and the vessel arrived in Brisbane on 10 April 1919. The first cruise was undertaken on 17 May 1919, and until the Bar-ea-Mul was laid up in December 1920 forty cruises were made. Here, in summary, are the results achieved:

Number of hours actually engaged in trawling, 1,672½; total quantity of fish caught by trawl 106,626 lb.; quantity of fish caught by line, 18,635 lb.; total amount received for fish, £2,917 5/-; other money earned £120; number of days unable to trawl because of bad weather, 36; number of times trawl shot, 699; locality trawled—from Point Danger to Cairns 1,000 miles each way; total amount of expenses of trawler from date of purchase to 30 September 1920, £14,021 8 shillings and 2 pence; other less sale of fish, etc., £3,037 5 shillings = a deficit of £10,984 3 shillings and 2 pence.

The vessel had an expert crew, and most modern appliances, and the entire coastline was well investigated. The results appeared to prove, without doubt, that the waters of Queensland did not provide trawl fish in payable quantities. Yet these are the waters which Japanese trawlers find it profitable to visit from half across the world, gaining vast hauls of fish—often resold, tinned, in Australia at high prices! The giant Spanish mackerel is the royal fish of North Queensland. Mackerel are caught by trolling; the fishing boats steam around with several lines trailing astern. As many as ten lines may be run simultaneously; outriggers are used to keep them apart. The species grows up to 130 lb. in weight, but fish over 60 lb. are exceptional; the general run is from 9 to 30 lb. with a small proportion up to 60 lb. The boats used in the mackerel fishery are generally from 30 to 40 feet in length, although in recent years several much larger boats have entered the industry.

Before describing prawning, whaling, pearling, and other items of the marine harvest, it may be permissible here to include the story of "dugong farming"; and random attempts to establish a "turtle soup" farm.

**Dugong Farming**

The enterprise of Dr. Hobbs, one of Rev. Dr. Lang's enterprising immigrants, merits more than passing mention.

In an article entitled "Submarine Squatting in the New Colony of Queensland," (117) published in 1862, a sketch of the dugong fisheries then in existence was given. The article stated, inter alia:

"Upon the island of St. Helena, in Moreton Bay, the first submarine run has been formed, and is now in the second season of its operations, under the superintendence of an experienced person formerly engaged in the seal trade in Newfoundland. Around this

(117) Quoted by Ebenezer Thorne in "Queen of the Colonies," London, 1876.
lovely island, for miles in every direction, are extensive submarine pastures of great luxuriance, affording a never-failing supply of long grass, upon which the herds of dugong (118) feed and fatten like oxen on the plains; yet unlike them in requiring no stockman to tail them; no stockyard to confine them; and no driving to the abattoirs, etc. For seven months in the year at least, from September to March, these animals are taken almost daily, by means of long nets set across the channels leading to and from their feeding-grounds... A large boiler, capable of holding one of these monsters, is continually steaming away, and the oil flows away from a tap in the upper part of the boiler in a clear limpid stream, of the colour of pale sherry wine. Upon cooling, the oleine and stearine separate. The latter... is sold to the soap-makers for about $40 a ton; while the former is used for medicinal purposes... by Dr. Hobbs (119) and other medical men as a substitute for cod-liver oil... The writer of an article in the Brisbane Courier in 1869 said that herds of dugong in almost incredible numbers were to be found in Moreton Bay, Wide Bay, Hervey Bay and Rodd's Bay. They came in, and went out with the tide, just like huge mobs of cattle at a mustering on a large cattle station... Dr. Hobbs described dugong flesh from which he ate as being like "splendid veal cutlets." Dr. Hobbs, in conjunction with Mr. T. Warry, commenced the manufacture of dugong oil on a considerable scale in the 'fifties; a fishing station was established on St. Helena and others at Tin Can Bay, Wide Bay, and Hervey Bay. An exhibit of dugong oil was made at the Sydney Museum in 1854 by the Commissioners of the Paris Exposition of 1855, and it was afterwards sent to that Exhibition, Dr. Hobbs receiving a silver medal. A flourishing trade sprang up, and soon the demand far exceeded the supply. Great care was taken in preparation at the outset, but as the business grew, the principals were unable to give personal supervision to the operations of their factories. The slovenly tendency to think that "she'll do"—a tendency that disgraced much of our earlier makeshift production—led to irregularities which rendered the supply uncertain in production and inferior in quality. As a result the trade and consumption entirely ceased in Europe, and a promising industry was destroyed.

From time to time attempts were made to revive the dugong fishery. In 1901, Professor Dexley, of the University of Prague, established a camp at Amity to study the nature and habits of the dugong. In 1908, seventy bottles of dugong oil were secured for the Franco-British Exhibition, but in 1910 the dugong were reported to be more scarce than previously, probably because of the use of motor boats by the fishermen.

Dugong fishing, however, continued to be carried out intermittently at Moreton Bay and other places throughout the thirties of the present century. In 1940 the industry revived, dugong fishing for commercial purposes being carried out at Hervey Bay and Torres Strait. The outbreak of the Second World War greatly restricted the supply of cod-liver and other fish oils available in Australia, and locally produced substitutes were in keen demand. All dugong oil produced was readily saleable at satisfactory prices. (At least one Brisbane firm sought supplies of crude shark-liver oil...)

The position to-day is that this unique and interesting animal has been pursued by man to such an extent that the herds have been wiped out, and only more or less stray animals remain. Few Queenslanders have ever seen one! Several scientific workers are of the opinion that the creature should be given total protection to prevent its early extinction—a sad commentary.

"Turtle Soup" Farming

Another curious but valuable activity was that of turtle fishing which, for awhile, seemed promising but failed to establish itself. (120)

PRAWNING

Even in 1906, prawning was a considerable local and interstate industry; upwards of 2,000 quarts of prawns were brought to Brisbane regularly every week, the prawners having "a sort of miniature market to which they brought their prawns daily." From Brisbane the prawns were despatched to all parts of the Commonwealth. The expansion of prawn trawling is the most spectacular development in the history of the Queensland fishing industry. Before 1950, the prawn industry was so negligible that if any real expansion of the industry was made, in a very short time they would have vanished. In view of this, therefore, and particularly of the fact that the creature was far more valuable from the tourist industry angle, protection was proclaimed.

(118) The dugong and the grass on which it fed were both known by the same word to the aboriginals. It varied in accent and intonation slightly, and was the euphonious source from which the ugly name "Tin Can" Bay (which should be Dugong Bay) was derived by mutilation.

(119) Dr. Hobbs, M.L.A., had been Health Officer at Moreton Bay under the "New South Wales" Government. To him belonged the distinction of first conceiving the idea of making use of dugong oil as an article of medicine. It was his house that is now the Deanery of St. John's, Brisbane, the temporary "Government House" rented for Governor Bowen. Compared with cod-liver oil and other fish oils used medicinally, dugong oil was considerably more palatable. In passing it may be mentioned that the oil of mullet liver locally tested appears to have a very much higher vitamin value than that of the halibut or cod.

(120) The Green Turtle is found in considerable numbers in the Capricorn Group less than fifty miles north-east of Gladstone, and also in the most northerly part of the Reef, as in the Torres Strait region. Over the years several attempts have been made to develop a turtle soup industry in the Capricorn Group, e.g. Heron Island, but none of these efforts has succeeded.

The Heron Island Turtle Canning industry on Heron Island failed because the factory ran out of turtles. The female comes ashore to lay her eggs during the hot months of the year (about November to March); the various islands appear to have their own particular turtles. When these are fished out, it is a long time before others alter their habitat and move in. The Heron Island factory soon found that in order to take turtles for processing, a long journey to the next island (Nor't-West) had to be made. This factor, with many other minor ones, brought about the close of the business. Turtles were sold, whole and frozen, for overseas trade until September 1950, when, upon the recommendation of the Government Ichthyologist (Mr. T. C. Marshall), they were placed upon the protected list. It was feared, and indeed, proved, that this creature was rapidly being wiped out and that if any real expansion of the industry was made, in a very short time it would have vanished. In view of this, therefore, and particularly of the fact that the creature was far more valuable from the tourist industry angle, protection was proclaimed.
Contact and Security

Contact with land bases is maintained by commercial fishing vessels by means of two-way radio; the first transmitting and receiving radio station was established at Bundaberg by the Queensland Fish Board. A second station has been established at Gladstone, and a third station will be established at Tin Can Bay, near Gympie. These stations maintain direct speaking contact with fishing vessels carrying receiving equipment. Ninety-five per cent. of the prawn trawlers operating in Queensland waters are equipped with two-way radio sets, and many of the other fishing boats are similarly equipped. Fully 100 fishing vessels are now equipped with radio. Daily weather-casts are supplied by the Weather Bureau and cover the coast from Cape Capricorn, in Central Queensland, to Coolangatta, at the southern extremity of the State; and adjacent waters to a distance of fifty miles offshore.

WHALING

A land-based whaling station commenced operations in Queensland in the winter of 1952. With a small fleet of chasers working off Cape Moreton, the factory, which is situated at Tangalooma, on Moreton Island, processes 600 whales each season; the main products are meat and bone meal and whale oil. The quota of whales that the company, Whale Products Pty. Ltd., is allowed to take in any one season is fixed by the Commonwealth Government, which is a member of the International Whaling Commission.

THE STORY OF PEARLING

The pearling industry in Queensland dates from 1868, when Captain William Banner, of the Sydney brig Julia Percy, fished the first cargo of pearl shell from Warrior Reef. Captain Banner noticed the natives preparing for a dance, and saw they had big mother-of-pearl pendants round their necks. He made a bargain with Kebisu, mamoose (chief) of the headhunters of Tutu (Bligh’s “Warrior Island”), who, for generations, raided the islands of Torres Strait in their great war canoes (they carried 200 fighting men and had two masts with huge mat sails). Perhaps the menace of Banner’s shotted fore and aft guns, which could far outrange the eight-foot bows and barbed arrows of the black bowmen of Tutu, had something to do with the friendliness of the blood-thirsty and crafty Kebisu and his headhunters. In return for tomahawks and iron—the most valuable things in their eyes—they gave Capt. Banner as much as he wanted of what they considered the common and relatively valueless pearl shell and pearls. Capt. Banner and his crew won a rich harvest from the coral sea, for pearlshell was then worth £150 a ton in Sydney; and, moreover, the reward for every pearl was a trade tomahawk, and, in return, Banner collected many large pearls!

The only use the Torres Straits headhunters had had for pearlshell was as material for breastplates, or for gleaming plaques inlaid into carved wood, or used as triangular flashing eyes in the human heads they dried, shrank and kept as trophies of the chase.

Captain Banner returned next year with the brig Pakaha and established a pearling station on Warrior Island. Before long the northern waters were invaded by a horde of pearlers; pearling stations were established at many points in the islands and Kanakas and Torres Strait Islanders were ruthlessly exploited to work the sea bottoms for pearl and pearlshell. In 1871 the value of the pearlshell gathered in Torres Strait was £25,000. Divers on the schooner Kate Kearney found a rich bed of shell early in 1872, and gathered two tons in three days. Soon afterwards the captain of the schooner Melanie discovered a rich patch of shell near Warrior Island; his “take” was thirteen tons in less than two weeks.

Enormous profits were made in the early years of the industry. In 1878, over £112,000 worth of shell was obtained; the price was £400 a ton.
The supplies of shell on the exposed reefs in shallow water soon became depleted, and the era of actual “diving” began. Expert native divers descended on occasions to depths of 12 fathoms and more.

In June 1872 the Imperial Pacific Islanders’ Protection Act was passed to regulate labour employment; kidnapping and ill-treatment gave place to improved conditions and safeguards. In 1874 the area being worked for pearl shell in Torres Strait was about 3,000 square miles, but it did not include the deeper waters near the islands in the north-east of the strait. In that year 137 tons of live shell were obtained; the price in Sydney was from £205 to £210 a ton; and the value of the output for the year was £30,000.

The introduction of diving dresses enabled deeper waters to be exploited. They were first used about 1874 by white pearlmen who included Andrew Sinclair, Frank Summers, and Fred Dwyer. In 1877, operating from island bases and from Somerset on Cape York, there were 109 pearl vessels; the crews comprised 50 Europeans and 700 natives. In the same year, the official settlement at Somerset was transferred to Port Kennedy, on Thursday Island, which became and has remained the principal port for pearl lugger operating in Torres Strait and on the North Queensland coast. In 1879 the Queensland Coast Islands Act brought all the islands of the Torres Strait within Queensland jurisdiction. By 1885 there were 195 vessels in the industry.

The entry of Japanese in large numbers into the pearl shell industry dates from 1892, when the Queensland Government entered into an agreement with the British Imperial Government to accept Japanese aliens under the terms of the Anglo-Japanese alliance. Hundreds of Japanese entered the industry.

Japanese divers and some Manila men descended to great depths in the search for pearl shell. Frank Reid records seeing scores of graves of Japanese divers on Darnley Island, most of whom had descended to from 35 to 40 fathoms. They had either been paralysed or so crushed by the great pressure of the ocean depths that the bodies had to be buried in their diving dress. Some Manila divers claimed they had touched the floor of Torres Strait at 40 fathoms.

The year 1897 saw a record take of pearl shell—1,233 tons valued at £126,042. In the same year, because of the numerous deaths of divers from paralysis, the deep water area near Darnley Island, known as “The Diver’s Graveyard” (where nearly all the deaths occurred), was closed by proclamation, and diving was prohibited in that locality. (121)

(121) The Darnley Deeps are not being worked to-day to any extent by Torres Strait Islanders, and only to a limited extent by Ryukyuan divers. The waters adjacent to the Darnley Deeps are being used, but waters from 40 fathoms deep and over, which are the true Darnley Deeps, are not exploited.

Thursday Island was a colourful and cosmopolitan headquarters for pearlmen from the Seven Seas, many of them tough characters. Divers, both white and coloured, earned good money; wages ranged from £20 to £25 per ton of shell raised. Kanaka divers who earned up to £60 a month—when they worked—were good spenders.

Although the first divers in Torres Strait waters were white men (1889), and white men who dived themselves were the most successful shellers, actual diving for pearl shell has for many years been done almost solely by Japanese, Malays, and Koepangers. The original intention, under the “White Australia” policy of the early Commonwealth, was that the employment of Asiatic labour in the pearling industry should be restricted and eventually cease altogether. The decision was, in fact, reached that after 31 December 1913 no further permits to bring in coloured labour for the pearling fleets would be issued. A determined effort was made to reserve the industry exclusively to white labour, and to that end several European divers were brought to Broome, but the experiment was not a success.

The closure of the pearling grounds during the First World War had a beneficial effect on the industry. For practically four years very little mother-of-pearl shell was raised because there was little or no sale for the product. The beds were therefore given a thorough rest, with the result that with the revival of the industry at the close of the war, the quantity of shell raised was considerable and of excellent quality. The quantity of shell exported to 30 June 1919 amounted to 310 tons, valued at £55,143. (There was no possibility of estimating accurately the number or value of pearls won. Pearls did not belong to the boat-owners; they were the property of the lucky divers, who were very secretive as to their finds.) Casualties among divers had also been reduced considerably; to obviate “diver’s paralysis,” which a few years previously had exacted a heavy toll, several of the firms employing fleets on a large scale had fitted their boats with the latest type of air compressors instead of hand pumps, making diving a far safer occupation. (122)

Divers for many years in the industry walked the seabed in their search for shell. It was then found that the diver could work by

(122) Power compressors for pumping air down to divers began to replace manually operated pumps about 1913-14. After World War I came the two-stage high-capacity compressor which enabled two or more divers to work below at the same time. Most shell is gathered at less than 20 fathoms (120 feet). At that depth a diver with an air pressure of 53 lb. to the square inch may work safely for about an hour; half-an-hour is the usual period. The diver’s safety depends mainly on his ascent to the surface being properly “staged,” i.e., stops at various depths according to the time that he has been under water. If he is brought straight to the surface he is in great danger of suffering some form of compressed air illness, possibly paralysis. This is caused by the nitrogen he has absorbed under pressure being released as bubbles in the bloodstream during decompression. Many divers have been crippled by paralysis ("the bend").
being towed along, feet off the bottom; when he sighted shell, he 
signalled to be lowered. In this method of “working to windward,” 
which was introduced about 1917, the lugger drifts, beam-on, with 
some sail set and anchor up. The tender pays out and takes in air-
hose and rope life-line, as required. Signals between diver and tender 
are made by means of tugs, short and long, upon the rope.

From 1931 until the outbreak of war in the Pacific (1941) the 
Japanese began more and more aggressively to exploit Australian 
pearling grounds for themselves, by poaching within the three-mile 
limit, using speedy 30-ton diesel-engined sampans flying the Japanese 
flag. A Federal statute made it an offence for anyone to land on the 
coast from these Japanese sampans, but the Japanese broke the law 
with impunity, until the institution of a patrol service by the armed 
launch Larrakia made the raiders more cautious. Nevertheless, it 
was a physical impossibility for one patrol boat to guard approxi-
ately 3,000 miles of coastline.

The Second World War caused the withdrawal of the Japanese 
from the industry; pearlshell was proclaimed a prohibited export 
and during the war 35,000 dials for ships’ compasses were manufac-
tured from it in Australia for the use of the Allied forces. After the 
war, the pearling industry employed mainly Torres Strait Islanders, 
Indonesians from Timor, Malays, and Australian aborigines. Because 
of the serious shortage of experienced divers and tenders, in 1952 
Australian pearlers were permitted to bring back into the industry 
a limited number of Japanese.

At the end of the war, shell was worth more than £450 a ton, more 
than twice the best pre-war price. In 1953 a Japanese pearling fleet 
of twenty-five vessels fished 942 tons of shell from areas proclaimed 
as being within Australian waters. The Japanese fleet operates under 
a provisional agreement reached between the Australian and Japanese 
governments, in specified areas off the North Australian coast; in 
1956, twenty-one vessels were engaged. The owners, vessels, divers, 
and divers’ tenders are licensed by the Commonwealth Government 
under the Pearl Fisheries’ Act of 1952-53. Under that Act the Com-
monwealth Government proclaimed sovereignty over a large area of 
the sea-bed and subsoil of the continental shelf contiguous to the 
coasts of Australia and its territories, for the purpose of exploring 
and exploiting the area’s natural resources. This amounts to a 
declaration that Australian waters extend to the 100-fathom line, 
except where other boundaries may be fixed, as in areas where the 
continental shelf is also contiguous to the country of another nation.

The claim is at present in dispute (together with other claims 
regarding the “limit of territorial waters”) and may be decided by the 
International Court at The Hague, Holland. Its result may affect the 
conclusions previously laid down in Chapter XV.

In an effort to increase pearlshell production for the world’s mar-
kets as an answer to the threat to pearlshell by plastic manufacture, 
in 1957 the Queensland Government agreed to the request by the 
Thursday Island Pearblers’ Association for the introduction of 
Asian divers. In March 1958, 160 Ryukyuans, engineers, and 
tenders arrived in Queensland to enter the industry, but the success 
which was hoped for from these men was not realised. In most cases 
they had no qualifications and were falsely described as experienced 
divers. Many of them have been returned to their homeland and the 
balance will probably follow this year.

Meanwhile, with every confidence, the Queensland Government, 
through the Island Industries’ Board, is undertaking the further 
training of Torres Strait Islanders as divers and tenders, and the 
school will be re-opened this year with tutors obtained from the 
ranks of the more experienced Torres Strait Islanders. Australia 
has supplied up to 80 per cent. of the world’s pearlshell, principally 
to the American market. The best pearl found during recent years 
was one valued at £2,000 which came from Torres Strait in 1949.

Pearl Culture Research

The Council for Scientific and Industrial Research, working in 
collaboration with the Queensland Government, has established a 
research station at Thursday Island to experiment in the establish-
ment of a pearl-culture industry. Other aspects of the pearl shell, 
trochus, and beche-de-mer industries also are being investigated.

The intelligent and industrious Torres Straits Islanders, descend-
ants of the “Black Vikings” who terrorised the Straits waters long 
ago, make an important contribution to Queensland’s pearlshell and 
trochus industry. They are, indeed, the foundation of Queensland’s 
pearling, trochus-shell, and beche-de-mer industry. Before the out-
break of war with Japan the Islanders possessed a pearling fleet, the 
largest numerically in Australia, totalling thirty luggers and cutters. 
Expert skin-divers, they gathered the marine wealth of the Straits 
from the sea bottom to a depth of up to eight fathoms. When the 
Second World War broke out every able-bodied Islander joined the 
armed forces. They formed, within the Australian Army, the Torres 
Strats Light Infantry Battalion, of more than 700 men.

To-day the Torres Strait Islanders own twenty-three luggers and 
cutters valued at £108,000. In addition to their own fleet, where 260
are employed, 490 man thirty privately-owned Queensland pearling and trochus vessels as divers, engineers, tenders, and crews.

**Trochus**

The gathering of trochus shell continues to be an important marine industry and the output in the past five years has averaged over 1,100 tons. In 1955-56 the 938 tons of trochus shell collected was worth £343,640 to Queensland’s economy.

The value of the trochus shell as a commercial commodity lies in its mother-of-pearl (nacre), found beneath the outer surface of the shell; it is second only to true pearl-shell for the manufacture of buttons and other pearl articles.

Trochus is collected sometimes by wading but more often by swimming or skin-diving. Skin divers operate in water up to five fathoms deep. The swimmer wears diver’s goggles to ensure clear vision, but latterly the use of the Hookah portable diving equipment has become general.

Immediately after the Second World War the principal buyer of trochus shell was the United States. However, in 1957, the market for trochus shell practically collapsed in the face of opposition from plastics; many boats and crews which previously had obtained remunerative returns from this industry abandoned it. Towards the end of 1958, however, a welcome revival in prices occurred and many vessels previously employed in the industry are returning to it. The trochus shell section of the marine industry is a most valuable adjunct to the pearling industry.

**Beche-de-Mer**

The gathering of beche-de-mer (or trepang) was a flourishing marine industry in Queensland waters in days gone by, but now has no significance. Beche-de-mer, a sluggish, sausage-like marine creature, is common along the Great Barrier Reef and tropical northern coast of Queensland. It is greatly esteemed by the Chinese and other Oriental races as the principal ingredient of a soup reputed to have aphrodisiac properties, and large quantities were cured by smoking and exported to the Far East. In 1901 beche-de-mer fetched as much as £240 a ton, and the output in 1907 amounted to 338 tons, valued at £30,000.

**MAPPING AND MARKING THE SEA AND THE SHORE**

The first considerable hydrographic survey of the Queensland coast was made by Commander J. C. Wickham, R.N., in H.M.S. "Beagle" in 1838 and 1839. He made a thorough examination of Torres Strait and the shores of the Gulf of Carpentaria, which had not been visited since Flinders’ voyage. Numerous traces of that intrepid officer’s landings were found, e.g. the “Investigator tree” at Inscription Point (see page 85). In March 1841 Wickham returned to England as previously recorded and his first Lieutenant John Lort Stokes, who had officiated as marine surveyor, took command of the “Beagle.”

In November 1841 Captain Francis Price Blackwood, R.N., was instructed by the British Admiralty to explore the Great Barrier Reef for openings suitable for marking with navigational aids for shipping. He arrived in Sydney aboard H.M.S. "Fly" on 15th October 1842. The cutter "Bramble" (Lieutenant Charles Yule, R.N.) acted as tender.

In three years Blackwood surveyed an area 1,000 miles in length and 170 miles in width. He charted the coasts from Sandy Cape as far north as 21° S., including the Capricorn Islands, parts of the Swain Reefs, and broad passages between, over an area 200 miles in length and 100 miles in breadth. He surveyed the mainland coast and the adjacent sea between West Hill and the northern part of Whitsunday Passage, a distance of 100 miles. He marked the outer line of the Barrier Reef from 16° 40' S. to 9° 20' S., a distance of nearly 500 miles. He surveyed Endeavour Strait and the eastern part of Torres Straits from Cape York to the coast of New Guinea, and more than 100 miles of the latter coast, together with numerous off-lying dangers and widespread banks of shoal soundings, and the estuaries of numerous rivers.

To mark the most advantageous channels for vessels to pass through the Barrier Reef, a beacon was erected at Raine Island. Early in 1845 the central and north-western portion of Torres Straits was surveyed; an excellent track for shipping was laid down from Bramble Cay to Endeavour Strait. This route is known to-day as the Great North-east Channel. Subsequently Blackwood discovered the Fly River in Papua.

In 1846 Lieutenant Yule in H.M.S. "Bramble" continued the survey westward in the Gulf of Papua (assisting Captain Wickham, Government Resident at Moreton Bay, in completing a survey of


(123) Torres Strait Islanders’ Act of 1939 gave to the island communities a standard of self-government and home rule to enable the people to fulfil their own destiny assisted by kindly administrative help and advice. The Act provides for adult franchise of the natives for the election of their own councillors, and defines an adult as a person, male or female, over the age of eighteen years. Triennial elections are held on each Island. The councillors are elected for three years, and by law are empowered to act as civic fathers and judges in the case of offences against the Island standard of life and morality. Island police, employed by the Queensland Government, are responsible to the Council and to the Native Court constituted by the Council, for the good order and discipline of the Islanders.
Moreton Bay while on the way to that assignment). In 1847-1850 Captain Owen Stanley in H.M.S. "Rattlesnake" did considerable survey work, including the re-surveying of the entrance to Moreton Bay and the surveying of the north-eastern coast between Rockingham Bay and Jervis Island. As a result of this latter survey cruise the Inner Route was marked and plans of anchorages, including Port Curtis, were completed. In Torres Strait Captain Stanley extended previous investigations by the "Beagle," "Fly," and "Bramble," examining eight of the channels that exist; five of these were not previously known.

Colonial Survey

Queensland's marine survey began shortly after Separation (10 December 1859). Staff Commander James Jeffery, master, R.N., assisted by Donald Matheson, carried out survey work in the northern part of Great Sandy Strait, Hervey Bay, and the entrance to the Mary River. In 1862 Sir George Ferguson Bowen, the first Governor of Queensland, had, as previously mentioned, selected a site for a settlement on Albany Pass, Cape York Peninsula, for use as garrison post, coaling station, and harbour of refuge; and had named it Somerset, after the Duke of Somerset, First Lord of the Admiralty. The settlement was established in 1863 by John Jardine, then police magistrate at Rockhamburger, but the official foundation dated from 21 August 1864, when H.M.S. "Salamander" (Captain George Nares, R.N.) conveyed settlers north. Captain Nares provided useful hydrographical and survey data.

The survey was continued from 1866 to 1880 by navigating Lieutenant E. P. Bedwell, R.N., in the schooner "Pearl," and by 1880 Whitsunday Island had been reached. Valuable hydrographical information was obtained in 1868 by Lieutenant Armit, R.N., a surveyor aboard H.M.S. "Virago," which had succeeded the "Salamander" in the provisioning and protection of the Somerset outpost.

The British Admiralty

In 1881, surveys by the Hydrographic Department of the British Admiralty superseded the Colonial Surveys, and H.M. ships "Alert" and "Lark" were employed in Queensland and New Guinea waters. These vessels were joined in 1883 by H.M.S. "Dart," which continued survey work until 1903, her cruises ranging from Tasmania to the Great Barrier Reef, and from New Zealand to the Solomon Islands.

In 1885 the Queensland Government lent the gunboat H.Q.M.S. "Paluma" to the Hydrographic Department for survey work in Great Barrier Reef waters; the "Paluma" continued to be actively engaged in this work until March 1895. H.M.S. "Penguin" arrived in Australia in 1890 and was employed in survey work around the Australian coastline until 1906. Survey work on the Great Barrier Reef by the "Dart," "Paluma," "Penguin," and "Waterwitch" corrected errors in previous surveys and continued the trigonometrical survey of the Queensland coast between Cape York and Whitsunday Island. In 1907 the "Penguin" was replaced by H.M.S. "Fantome."

R.A.N. Surveys

In 1921 the Royal Australian Naval Surveying Service was established; Captain John Robins, R.A.N., was the first hydrographer. H.M.A.S. "Geranium," commanded by Lieutenant-Commander Kenneth MacKenzie, R.N., was commissioned for survey duties. The Admiralty gave assistance with H.M.S. "Fantome," 1921-23, and under the command of Commander P. S. E. Maxwell, R.N., commenced an examination of the western approaches to Torres Straits. The "Fantome" was replaced in 1924 by H.M.S. "Herald," which continued this survey until 1926; the "Herald" also undertook the survey of Endeavour Strait and the south-eastern approaches to Prince of Wales Channel. In 1925 H.M.A.S. "Geranium" began the important survey of the Cumberland Channel within the Great Barrier Reef; she was assisted in this work by H.M. Surveying Ship "Silvio," which was renamed H.M.A.S. "Moresby" in honour of Admiral John Moresby. In 1927 the "Geranium" paid off followed by the "Moresby" in 1929. In 1933, the "Moresby" was recommissioned for urgent strategic surveys in northern waters; she was still engaged on this work at the outbreak of the Second World War. During 1941 the "Moresby" was employed in surveying the Great North-East Channel.

Survey Ships in World War Two

Survey ships of the R.A.N. played a valuable part in naval operations during the Second World War. In the South-west Pacific the duty of surveying New Guinea was undertaken by the R.A.N. Surveying Service, which was under the operational control of the commander of the South-west Pacific Naval Forces. During 1943, as the Allied armies advanced, the survey of the New Guinea coastline progressed. As territory was recaptured from the Japanese, the surveys were extended and completed, this vital service establishing safe navigational conditions, firstly for the combat forces, and later, for merchant shipping, bringing up supplies and reinforcements. The New Guinea coastline was also provided with complete facilities for navigational aids. In 1943 the surveying vessels of the R.A.N. were formed into Task Group 70-5, attached to the U.S. Seventh Fleet; and the Officer-in-Charge, Hydrographic Branch, R.A.N., was constituted the charting authority for Allied Naval Forces in the South-west Pacific. During 1944 Australian surveying vessels were used for a number of daring exploits, and in addition, usually formed part of the forces taking part in the initial operations preceding landings.

At the conclusion of the New Guinea campaign and before the invasion of the Philippines, Task Group 70-5 was divided into three units to undertake important surveys in three widely separated areas.
in the South-west Pacific Command. The principal unit took part in the landings at Morotai, Leyte Gulf, Lingayen Gulf, Subic Bay, Zamboanga, Mindanao, Tarakan, Brunei Bay, and Balikpapan. Another unit conducted the survey across the northern waters of Australia, through the Timor and Arafura Seas and provided a "swept" navigational route for the use of battleships should they need to proceed from the Indian Ocean to the Pacific, north of Australia. The third unit carried out sweeping operations and re-surveyed the route in the intricate waters of Torres Strait as well as providing navigational aids in order that battleships could use that route with safety by night or day.

Recent Surveys
After the Second World War survey work carried out in Queensland waters included Curtis Channel, Port Curtis, part of Hervey Bay, and the area north of the Percy Islands. It is appropriate that the name of a famous Queensland gunboat of colonial navy days, the "Paluma," has been perpetuated in the newest survey vessel of the R.A.N. Surveying Service. The new "Paluma," of 180 tons, is a motor vessel now operating in Western Australia. Late next year (1959) she will come to Queensland to continue to chart the Great Barrier Reef waters, as her namesake did seventy years ago.

Bibliography: G. C. Ingleton, Charting a Continent; the Australian Encyclopaedia; official reports of the Harbours and Marine Department of Queensland, 1871, et seq.

THE BARRIER REEF
The eastern coast of Queensland from a shipping point of view presents conditions that are probably unique. From Sandy Cay to Bramble Bay, a distance of about one thousand miles, the coastline is fronted by the Great Barrier Reef, a gigantic coralline structure, the largest in the world, which, in its vast extent, offers many formidable obstructions to navigation. The "Inner Route," however, has been closely surveyed; is now navigated by the largest class of steamers; and has become one of the ocean highways of the world.

From Point Danger, the southern boundary between Queensland and New South Wales, to Sandy Cape, the coast is clear of dangers, except isolated ones like those off Cape Moreton and the entrance to Moreton Bay. From Sandy Cape to Cape Grafton (eastward of the port of Cairns) the principal dangers to be avoided are numerous small islands, especially between Mackay and Bowen, where the channel known as the Whitsunday Passage narrows in some places to two miles. This passage is well known as a beauty spot amongst visitors to the coast, the scenery here resembling that of the fiords of Norway and the lochs of Scotland.

Beyond Cairns to Thursday Island, the characteristics of the dangers change; high, well-wooded islands are replaced increasingly by sandbanks and sunken coral reefs, with numerous small wooded islands. Those adjacent to the route, fortunately, have now been beaconed, to assist the navigator, picking his way delicately among them. In contrast, the mainland, from Cape Cleveland (Townsville) to Cape York (eastward of the New South Wales Government), is high and mountainous. In some places, indeed, as at Hinchinbrook Island and behind Cape Tribulation, the coastal range reaches a height of some 3,000 feet. The shores of Princess Charlotte Bay are low and fringed with mangroves, but as soon as Cape Sidmouth is reached, the high land commences again and continues without any great break to Cape York.

The inner shipping track between the Great Barrier Reef and the Queensland coast is well lighted and wrecks have been infrequent in recent years.

Lighthouses on this section of the coast are built to withstand gales up to 130 miles an hour and, on an average, are spaced at intervals of twenty miles. They mark turning points in the shipping tracks; form leading lights through narrow passages; and give warning of sunken coral reefs—which are the main danger.

Automatic lights are maintained in localities of less navigational importance.

There are seventeen main coastal lights between Cape Moreton and the Carpentaria lightship in the Arafura Sea; fifteen of them from lighthouses and the other two from lightships. (These do not include the lights within port limits.)

Cape Moreton lighthouse was erected in 1857 by the "New South Wales" Government.

A stone building 75 feet in height, it has a total elevation above sea level of 390 feet. The original light, visible some 25 miles, consisted of 21 kerosene lamps, set in three faces of seven lamps each, the periodic flash being regulated by a hand-wound clock mechanism. This was later superseded by modern lighting. A white light of 1,400,000 candlepower is visible for 27 miles in three group flashes every twenty seconds.

There are fifty-five automatic lighthouses on the Queensland coast. In addition, there are two unattended lightships and thirteen lighted buoys. These mark danger spots, such as shoals, in places where it is not possible to erect a lighthouse.

Each lightship, after having been placed in position, is kept in service for twelve months; it is then replaced by a spare lightship and returned to the lighthouse depot for reconditioning. There are thus two identical lightships named Breaksea Spit and two named Carpentaria. The first two sister ships alternately mark Breaksea Spit, a dangerous coral formation extending north of Sandy Cape, outside Bundaberg, and the second two are used to mark Merkara Shoal, about 80 miles west of Thursday Island, in the Arafura Sea. The lightships are towed to and from their positions by a lighthouse steamer. In the
same way each light buoy is kept at its station for twelve months; it is then replaced by a spare buoy and returned to the depot for overhaul.

The lighthouse system on the Queensland coast was, until the turn of the century, the responsibility of the Government of Queensland, but after Federation all the main coast lights came under the jurisdiction of the Commonwealth Government.

On its establishment in 1901 the Commonwealth was authorised to make laws with regard to lighthouses, lightships, beacons, and buoys. The Lighthouses Act of 1911 gave the Commonwealth power to enter into an agreement with the Governor of any State for the acquisition of lighthouses and marine marks, and to erect or alter such navigational aids as required. On 1 July 1915 the Commonwealth took over from the States 179 marine marks, comprising 104 manned light stations, 18 automatic lighthouses, 1 lighted buoy, 16 unlighted buoys, and 40 unlighted beacons and obelisks. It was thought advisable at the time that the States should continue to control the lights and navigational aids established in ports, harbours, and rivers, and this procedure has been adopted.

THE PORTS OF QUEENSLAND

The Port of Brisbane is situated in latitude 28 deg. south, long. 153 deg. east. Moreton Bay and the Brisbane River lie within its limits, which extend from the south end of Stradbroke Island to Cape Moreton, and thence, by an imaginary line to Caloundra Head. For deep or heavy draft vessels the safest entrance is through the north-west channel, which is remarkably well lighted and buoyed; there is no less than six fathoms of water anywhere until the Pile Lighthouse, at the entrance to the Brisbane River, is approached. It is some seventeen and a half miles from the Pile Lighthouse to Victoria Bridge, Brisbane.

Maryborough is the next port to the northward of Brisbane; the city lies twenty miles up the Mary River. Maryborough is supplemented by a deep water jetty at Urangan.

Bundaberg is on the Burnett River, some nine miles from the mouth. Coasting steamers of 600 to 700 tons trade to this port constantly. A deep water port has been constructed a mile inside the estuary by deepening and widening the river channel. A bulk sugar loading plant has been installed. The new deep water port was opened by the Premier of Queensland (Mr. Frank Nicklin) on 21 September 1958.

Gladstone (Port Curtis), eighty-five miles north-west of Bundaberg, possesses one of Australia's best natural harbours. It is also a stopping place for seaplanes and a storage depot for the big oil operators. Wool dumping and coal loading facilities have been installed.

Rockhampton, on the Fitzroy River, is nearly forty miles from the sea. In 1881 a deep water port was established at Port Alma, and accommodates all vessels of big tonnage.

Mackay has an artificial deep water harbour in the Pioneer River, some three and a half miles from the city; it covers an enclosed area of 185 acres. The harbour was completed in 1947 at a cost of £1 ½ million. The biggest bulk sugar terminal in the world, costing £1,600,000, handles the raw sugar in bulk from Mackay's seven sugar mills. It has a capacity of 150,000 tons of sugar, and can load and trim sugar into a ship's hold at the rate of 600 tons per hour.

Bowen (Port Denison) has a magnificent natural harbour, well protected and landlocked. It contains four wharf berths and exports sugar and meat. An average of 300 ships enter and leave the port annually.

Townsville, on the shores of Cleveland Bay, has an artificial harbour. The Great Northern Railway which extends 600 miles west to Mount Isa brings lead, zinc, wool, and uranium for shipment. In all, more than 1,300 miles of railway serve the port. Principal exports are wool, chilled, frozen, and canned meats; sugar, timber, and minerals. The port is being equipped with sugar bulk handling plant and will export 100,000 tons of sugar annually.

Cairns, in the south-west corner of Trinity Bay, is also a "made" port, and is the outlet for the exported wealth of the Atherton Tableland as well as for the sugar produced in the Cairns district. Modern conveyors on the wharves handle the 100,000 tons of sugar which pass into the holds of coastal and overseas ships every year. During the Second World War, full utilisation was made of the port as a naval base. Oil tanks were constructed at Edge Hill, and a wharf built for the handling and fuelling of ships. The whole area became officially H.M.A.S. Kuranda. From this base, the various operations of the Allied Services in the Pacific were maintained and serviced. From Mareeba the planes flew to battle and from the Inlet in Cairns the Catalinas set out on their daily "milk run."

Lucinda Point, or Port Hinchinbrook, at the southern entrance to Hinchinbrook Channel, was formerly known as Dungeness. A large bulk storage terminal for the handling of raw sugar shipped from the mills of the Ingham (Herbert River) district was opened in 1958.

Mourilyan, thirty-five miles north of Hinchinbrook, is a small, almost entirely landlocked harbour. The entrance is about one-eighth of a mile wide between two headlands some 300 feet high; the navigable entrance is actually reduced by rocks to a width of some seventy feet, through which the tide runs with great velocity. The port entrance is being deepened and widened and otherwise
Innisfail, five miles from the mouth of the Johnstone River, is used by light draught vessels. Trade is mostly confined to the shipment of sugar by lighters for trans-shipment in Cairns.

Port Douglas and Cooktown, on the Endeavour River, sixty miles north of Port Douglas, have historic associations, but have at present largely lost their significance as ports. Cooktown was the port for the Palmer and Hodgkinson goldfields, and ocean-going ships berthed there. The E. and A. Steamship Co. operated a Torres Strait mail service on its London-Brisbane schedule. In those days Cooktown received direct mail from London, a service which ceased in 1880. For many years Cooktown was the northern terminus of the A.U.S.N. Company’s steamer service from Melbourne.

Thursday Island, or Port Kennedy, fifteen miles west of Cape York, among the Prince of Wales group of islands, is the centre of the pearl and pearl shell fisheries.

Normanton, fifty-five miles from the mouth of the Norman River, which flows into the south-east corner of the Gulf of Carpentaria, and Burketown, thirty-five miles up the Albert (the last port on the coast of Queensland), complete the list of Queensland ports.

BRISBANE AS A RIVER PORT

The port of Brisbane is the largest river port in the Commonwealth, and accommodates the largest ships in the Australian trade. Queensland’s overseas trade goes mostly through Brisbane, which over the past five years has handled about 90 per cent. of the imports and two-thirds of the exports. Townsville, with about one-twentieth of the import trade and about one-eighth of the export trade, is the second port; and Cairns ranks third.

Seven Queensland ports—Bundaberg, Gladstone, Rockhampton, Mackay, Bowen, Townsville, and Cairns—are administered by Harbour Boards. All the other ports (including Brisbane) are controlled by the State Treasury, through the Department of Harbours and Marine, which also controls the Brisbane Dry Dock and Cairncross Dock.

The total overseas trade of Queensland in 1957-58 amounted to £205,990,240. Imports were worth £49,497,820, and exports were valued at £156,492,920—an excess of £106,995,100 in favour of exports.

In 1957-58, 1,217 ships (207 from overseas direct and 299 from overseas via States) entered the Port of Brisbane, the net tonnage being 3,755,000.

Though the Moreton Bay settlement was founded in September 1824, twenty-two years elapsed before Brisbane was officially declared a port of entry and clearance. The first pilot station was at Amity Point, on Stradbroke Island, but on 1 August 1848 the station was removed to Bulwer, Moreton Island. As mentioned (see page 71) the first seagoing ship to enter the river was the cutter Mermaid, which crossed the bar on 6 September 1825; and regular sea communication between Moreton Bay and the parent Colony of New South Wales dates from 1842, when the Hunter River Steam Navigation Company, founded in July 1840 (see page 127), put the steamer Shamrock on the Brisbane River trade, charging £1 per ton for freight.

The first improvements were carried out between 1862 and 1866 when an entrance channel, named Francis Channel (after Mr. Francis, Superintendent of Dredging), was cut to a depth of 10 feet across the bar; it was used until 1883 when a new cutting slightly to the east, previously (1863) advocated by Lieut. G. P. Heath, Portmaster, came into operation. At the outer end a light signal and telegraph station were erected. The combined structure became known as the Pile Light. (A new Pile Light was erected at the outer end of the New Bar cutting in 1912 and remade later in 1949.)

The development of the shipping compartment of the Brisbane River began in the South Brisbane and Town Reaches. Practically all the loading and discharging of cargo took place in these two reaches. Exceptionally there was some use of the Bulimba Reach, where the sailing ship Fortitude moored and discharged her cargo (1849).

With larger ships, the need for a deep water port at the mouth of the river was felt, and Pinkenba, with its wharf and railway connection, came into being. (The first Orient ship to use the Brisbane River berthed at Pinkenba.)

Pinkenba was found to be too far down the river, however. The lower reaches of the river, Eagle Farm flats, Parker Island, Quaries Reach, and Hamilton Reach were dredged by powerful suction cutter dredges and bucket dredges, and Bulimba Reach then became the deep water port for Brisbane. (The Orient ships (Osterley, Orsova), P. and O. ships, Liverpool White Star (Suvic, Persic, and others), and Aberdeen White Star (Demosthenes, Themistocles) all berthed at Dalgety’s Wharf and the Brisbane Stevedoring and Wool Dumping Co. Wharf.)

Meanwhile, reclamation work was carried out behind the training wall in the Hamilton Reach, which formed part of the extensive

(124) The Gulf of Carpentaria is one of the most remarkable bodies of water in the world—an arm of the sea with but one tide in every twenty-four hours. For many years vessels of John Burke Ltd. have provided the shipping service to Thursday Island; the Gulf ports; and to Cooktown and Portland Road on the north-east coast. (This service is assisted by a State subsidy.)
work, begun in earnest in 1900, to regulate the broad tidal estuary of the river. The inner channel behind Parker Island was also filled in and its erstwhile channel became the Royal Queensland Golf Links; Gibson Island became joined to Hemmant, and easy access was provided for powerhouse development; while, further down the river, Bulwer Island (below Pinkenba) was joined to the mainland. The Brisbane River thus gained the skeleton of a carefully considered training-wall scheme which succeeding years would complete.

With the reclamation at Hamilton, the natural movement down the river began again with the construction by the Government of a reinforced concrete wharf and cold stores there in 1922; wharf construction upstream by Brett and Company in 1929; and by the Brisbane Stevedoring and Wool Dumping Company in 1935.

This development was consolidated by meatworks, built by the Australian Meat Export Company (Swift's) at Cannon Hill, the present site of the Abattoirs; and by Borthwick's a few hundred yards further downstream; supplementing the Queensland Meat Export Works which had been constructed many years before, on the site presently occupied by A.C.F. and Shirleys Fertilizers, Ltd. During the past ten years, moreover, the Brisbane Stevedoring and Wool Dumping Company's wharf has been extended downstream; the Government has built a modern steel wharf for use by B.H.P. Co. Ltd., and a general cargo wharf for France-Australia Co. Ltd., in the Hamilton Reach; a bulk wheat loading installation is nearing completion at Pinkenba; the Shell Company has built a modern tanker berth and tank farm below Pinkenba, on what was Bulwer Island; and Vacuum Oil Co. Ltd. have constructed an oil berth immediately upstream from the Abattoirs.

Proposals for the future development of the Port of Brisbane will entail the dredging of river channels to a depth of 31 feet below low water; the widening of river channels for 500 feet; the construction of wharves from Hamilton to Pinkenba and beyond; while, on the south side, wharves will be built at Gibson Island, Hemmant, and a portion of Aquarium Passage, to meet an estimated demand for a length of commercial wharves in Brisbane (from Victoria Bridge to Luggage Point) of 32,000 feet by 1975. There is ample room to expand from the present 21,000 feet of wharfage, and, if necessary, with modern dredges, it would be a straightforward task to make Cleveland into a subsidiary port of Brisbane.

Time has indeed its revenges!

Acknowledgement is made to E. C. Fison, Esq., Chief Engineer, Department of Harbours and Marine, for data supplied.