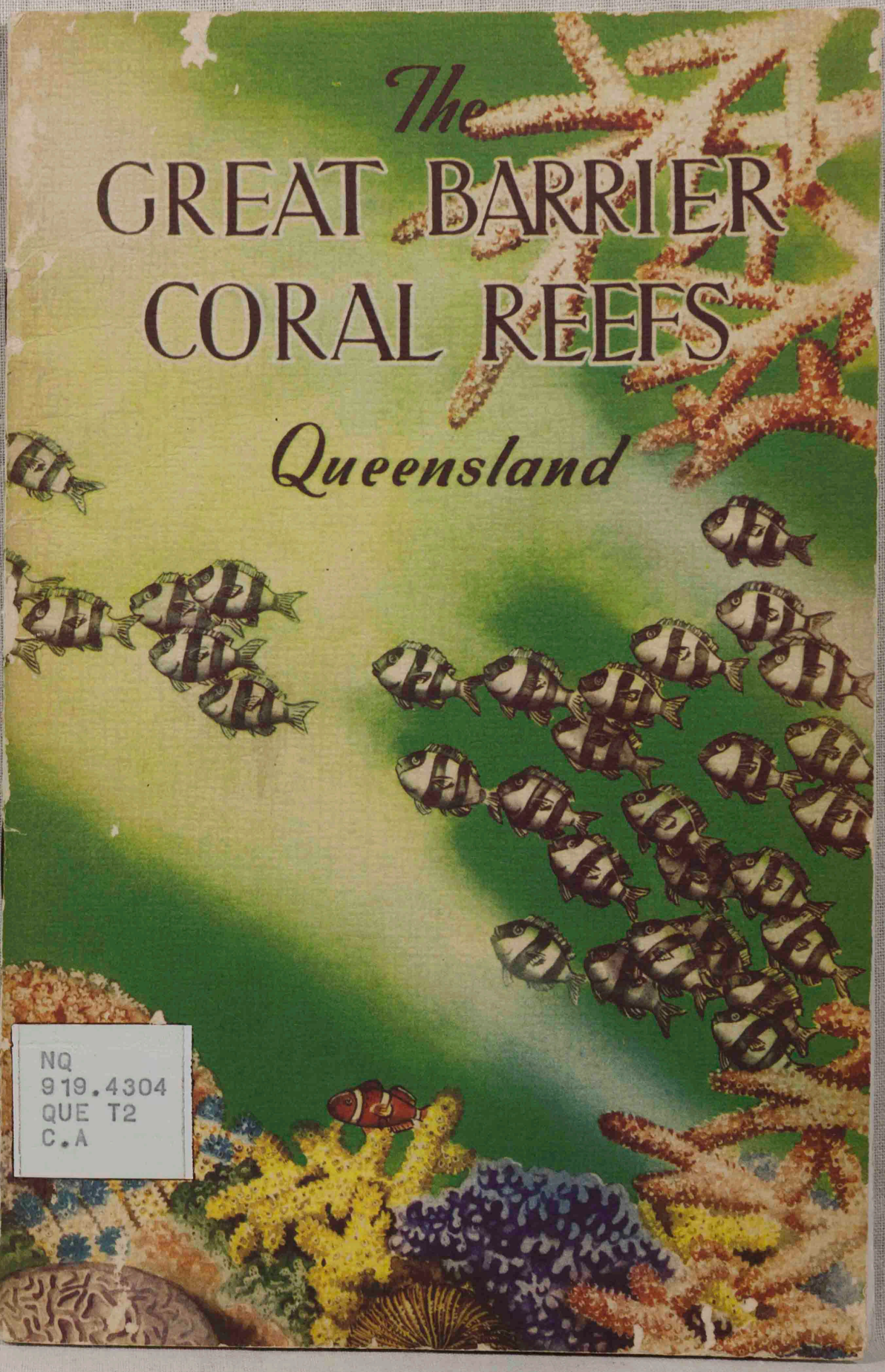
The GREAT BARRIER CORAL REEFS

Queensland



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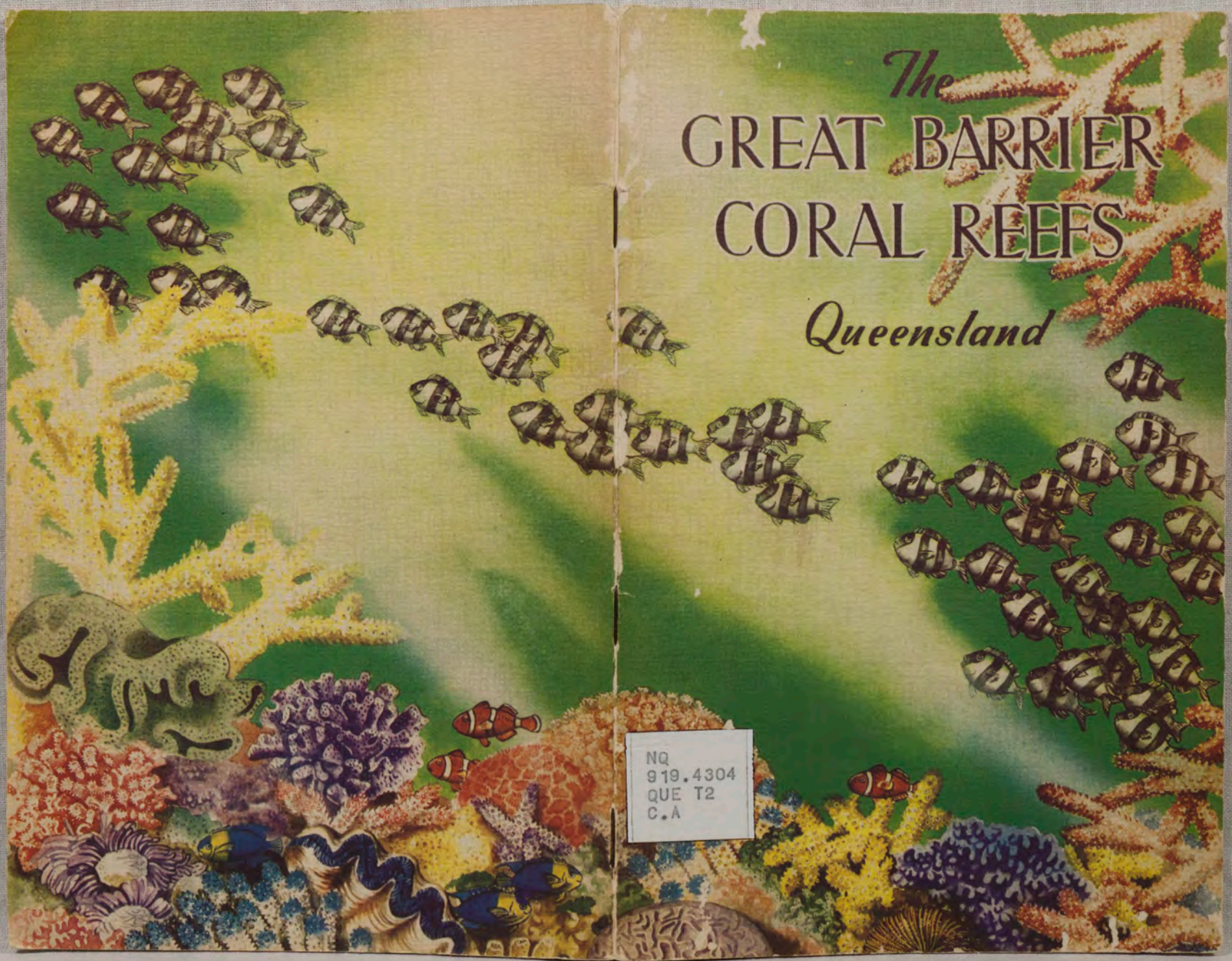

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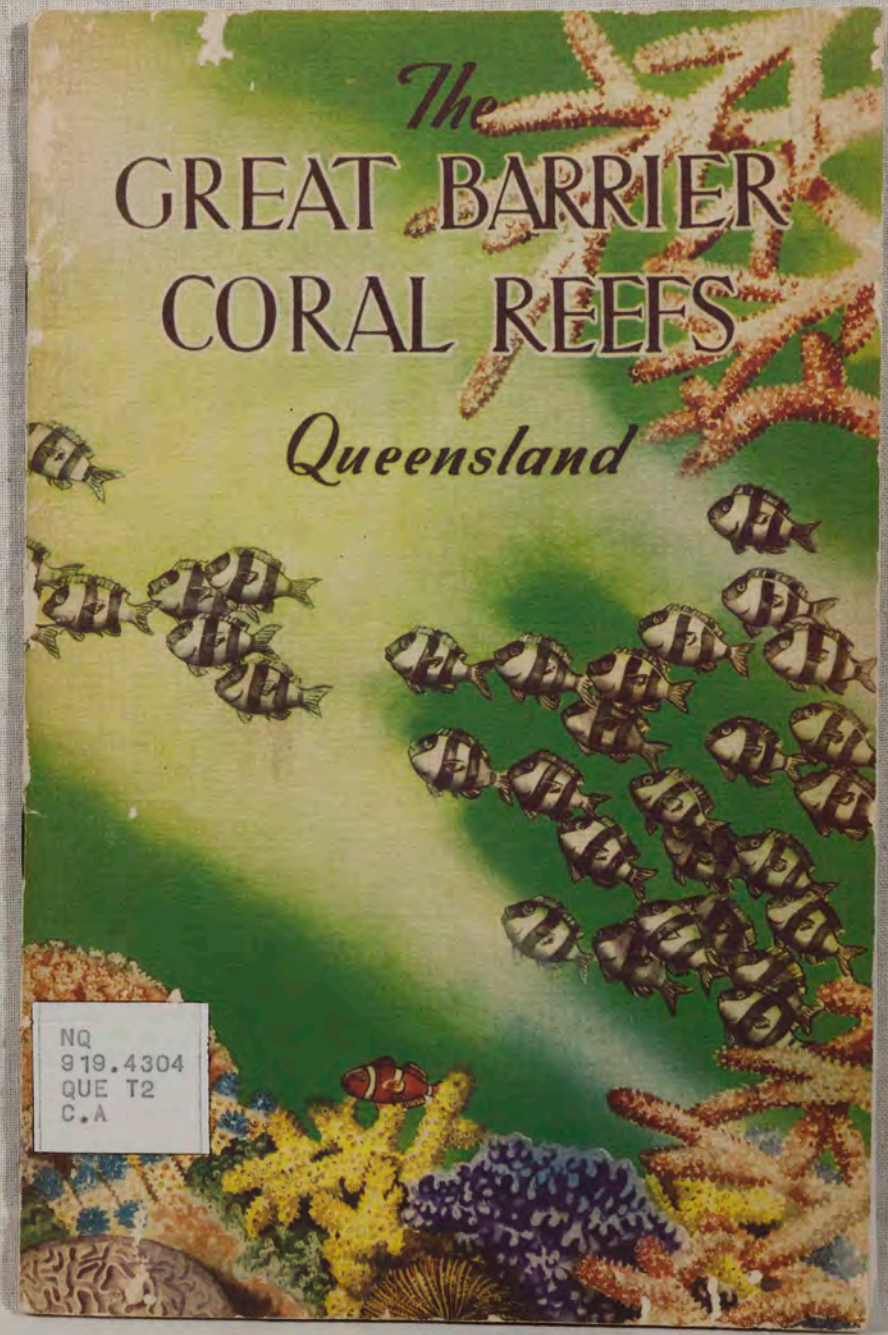

CORAL GROTTO

THE GREAT BARRIER CORAL REEFS

QUEENSLAND
AUSTRALIA

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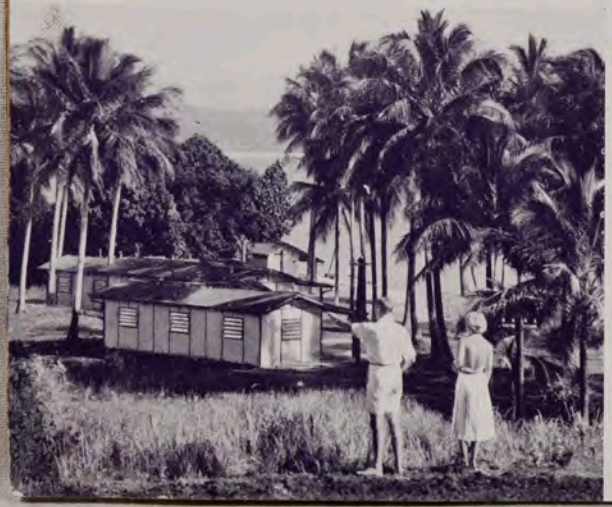
ISLANDS
OF THE
WHITSUNDAY
AND
CUMBERLAND GROUPS
SCALE OF MILES
0 2 4 6
HAYMAN ISLAND
ARKHURST I.
LANGFORD I.
PINNACLE PK 60FT
DOUBLE ROCK
HOOK PEAK 1478FT
HOOK ISLAND
NARA INLET
MACONA INLET
CATERAN BAY
CAIRN 1230FT
DUMBELL I.
PETER I.
WHITSUNDAY ISLAND
1251 FT
APOSTLE BAY
DANIEL PT
CID HARBOUR
CID I.
WHITSUNDAY PK 1426 FT
WHITSUNDAY PASSAGE
HENNING I.
DENT I.
HAMILTON I.
PERSEVERANCE I.
PINE I.
LONG I.
SOUTH HEAD
PORT MOLLE
REEF PT
DENMAN I.
PLANTON I.
MOLLE I.
MID MOLLE I.
NORTH MOLLE I.
WEST MOLLE I.
HANNAH PT
PIONEER PT
PIONEER BAY
CANNONVALE
THE BEAK
SHUTE I.
W WHITSUNDAY
MT KANGAROO 893FT
CONWAY
CONWAY R.
REPULSE CREEK
REPULSE BAY
ROCKY PT
DEFIANCE REEFS
PURITAN BAY
ROUND HD
GENESTA BAY
CAPE CONWAY
PENTECOST I.
CAWARRA I.
LINDEMAN I.
SEAFORTH I.
KENNEDY SD
SHAW ISLAND
BURNING POINT
LEEPER SHOAL
DELORAINE I.
BORDER I.
ESK I.
TONGUE PT
WHITEHAVEN BAY
CRAIG PT
SOLWAY PASS
TEAGUE I.
PINE I.
HASLEWOOD I.
LUPTON I.
WORKINGTON I.
HAROLD I.
EDWARD I.
IREBY I.
PACIFIC OCEAN
CUMBERLAND ISLANDS
MAHER I.
MT OLDEN 712FT
BAYNHAM I.
COMSTON I.
NECK BAY
MANSELL I.
TRIANGLE I.
PINE I.
KEYSER I.

CORAL REEFS

CORAL REEFS are found in many parts of the world, but nowhere do they attain such mighty development as in the Great Barrier Reefs which border the north-eastern shoulder of Australia. Reef-building corals are found only in tropic seas—roughly between the Tropics of Capricorn and Cancer. Certain species of corals, however, occur in the polar regions, in Norwegian fiords, off the English coast—everywhere in deep water, in tropic and temperate zones, corals flourish, but they are often solitary cups, seldom more than an inch or two high. Only in tropic waters do the true reef-building corals develop. They flourish only in shallow water, and where the surface temperature never falls much below 20° C. The more sheltered the water, the more branching and delicate are the types of corals growing there; and the more exposed the position, the more solid the growth.

Corals are among the greatest of the world's builders, and the Great Barrier Reefs are their most magnificent creation. Certainly the Reefs form one of the most interesting geological phenomena known to Australia, and a marine playground of unrivalled loveliness. The isles, the reefs, the shoals, the quiet pools and all the depths are full of extraordinary life; all the channels and lagoons and fissures between the reefs are instinct with bewildering beauty.



"This delicious isle, this unkept unrestrained garden where the centuries gaze upon perpetual summer . . . ." There are more than 600 islands along the Queensland coast, many being of rare beauty.

BARRIER OF REEFS

THE innumerable coral reefs and isles and shoals to which the name "Great Barrier Reef" is applied extend from Bristow Island, near New Guinea, to Lady Elliot Island, a little north of Breaksea Spit—a distance of about 1,250 miles. The area within the Barrier comprises 80,000 square miles.

The distance from the mainland to the inner edges of the reefs varies a great deal. Off Cape York Peninsula it varies from about 80 miles in the north to 25 or 30 miles off Port Stewart, Princess Charlotte Bay. Out from Cape Melville the reefs are closest to the mainland—less than ten miles. At Cooktown the inner edge is about 18 miles and the outer edge nearly 36 miles away, while out from Townsville the inner edge is some 50 miles distant.

Southward the reefs generally trend farther away from the coast, forming an infinite maze of loosely connected reefs different in size, shape and spacing, to Swain Reefs about 150 miles out to sea. Further south the "Reef" becomes even more broken and scattered and finally resolves into a series of widely separated patches such as the Capricorn and Bunker Groups. In fact, these groups and clusters of sand cays can almost be considered distinct from the so-called Barrier proper. Actually only to the north of Cairns does the Reef resemble a Barrier Reef. It is then much more continuous and also much nearer the coast.

The Long Lagoon, the waterway between the Outer Barrier and the mainland, is therefore a sea of considerable width—in most places south of Townsville as wide as the eastern part of the English Channel. Nowhere does dry land face deep sea. Between intervenes a bank stretching seawards for 10 to 100 miles, and sloping outward from a depth of 10 fathoms to 100 fathoms and more. This shallow fringe, the Continental Shelf, makes a step between the land and the ocean abyss. From the outside edge the seafloor plunges down steeply, and there the unfathomed depths begin.

A comprehensive name to cover all the varieties of reefs and islands within the intra-reef zones would be difficult to find. Contrary to popular belief, the infinite maze of "reeferies" is in no sense a continuous barrier, such as the Great Wall of China. They form a barrier, but not a text-book barrier. Following the lead of the Admiralty charts, some scientists have suggested that the phrase "Great Barrier Reefs" should be used. That is more expressive than the use of the word "Reef" in the singular.

ORIGINS

AND what of the origins of these marvellous coral reefs? The formation of fringing reefs is understood, but the origin of the barrier reefs many miles from land, and of atolls thousands of miles away and rising from the deepest seas, has been and still to a large extent remains one of the great mysteries of the world.

Reef-building corals can only live in comparatively shallow water, seldom over 20 fathoms in depth. Though the Australian reefs in places extend for a distance of more than 150 miles from the coast, the water between the reefs and the mainland is for the most part fairly shallow. The Continental Shelf forms the foundation for the reefs. It is bounded on the seaward side by the hundred-fathom line, the position of which in Queensland is exceptional, for instead of being parallel with the coast it is for the most part divergent from the coastal trend.

There have been many theories regarding the formation of barrier reefs, most notable perhaps being the Darwin-Dana theory of land subsidence. The whole problem of origin is obscure even to this day. It is certain, however, that all coral reefs have not been formed in the same way. Some have probably grown up on sinking coasts; others on volcanic banks which have been pushed up from beneath the sea; others again may have formed on banks which were originally islands and had been cut down beneath the surface by wave action; while others still may have grown up from platforms cut by the lowered seas of the Great Ice Age.

Though there have been many individual investigators into the scientific problems of the Barrier Reefs, it was not until 1923 that steps were taken systematically to attack them over a period. Then the Great Barrier Reef Committee was formed, with headquarters at Brisbane. On this Committee are representatives of the leading scientific institutions, learned societies, museums and universities in Australia and New Zealand, while Great Britain is well represented by many scientific men of standing and experience in coral reef investigation in other parts of the world. In 1927 a bore was put down 600 feet on Michaelmas Cay, and in 1937 a bore penetrated 732 feet on Heron Island. The results of the two bores were remarkably similar. The support given by the earlier bore to Darwin's hypothesis or a modification of it was again evident in the later bore. The results of much physiographic study by several distinguished investigators is all in accord with the movements of subsidence as illustrated particularly well in Keppel Bay and the Whitsunday area.

CORAL POLYPS

PERHAPS one of the most amazing features of the Barrier Reefs is that they have been built up through countless ages by tiny animals, the coral polyps. The Barrier can be likened to a series of gigantic marine mountain chains of limestone formed not by the gradual upheaval of earth but by the gradual accumulation of the limy skeletons of corals and the remains of other marine animals. (It is claimed that something less than 50 per cent. of the composition of the reefs is actually coral). It is indeed staggering to the imagination to consider that animals so small in structure are capable of building a rampart 1,250 miles long, many miles wide, and not less than 450 feet high.

Corals in certain respects resemble sea anemones, members of that group of animals which in all appearances seem to be flowers of the reef. Flower-like they seem, but to certain small life dangerously carnivorous. Their hollow tentacles contain thousands of tiny poisonous blisters and so-called nettle-capsules. If any creature touches them, these capsules explode, throwing out poisonous threads which bore into the skin of the victim. The paralysed animalculæ are then pushed into the sac of a stomach by the waving tentacles and motile hairs (cilia). Lime in the food is secreted and deposited round the polyp and thus the coral skeleton is formed.

The sheltered waters of the intra-reef zones—the island-studded waterway between the Outer Reef and the mainland—afford ideal conditions for cruising.

REEF BUILDERS

CORAL polyps usually bloom in all their beauty in the night. Even the tinted coral displayed in show cases at the Government Tourist Bureau give little indication of the exquisite loveliness of the living corals.

A branch of dry coral appears as a delicate fabric pitted over with cells. On magnification each cell is seen to have a series of radial partitions. When the coral was alive a polyp occupied each cell and a thin membrane extended from one cell to the next, so that each individual, although capable of separate life, was one flesh with the whole colony. Living corals are coloured with varying pastel tones of brown, heliotrope, red, green, orange and yellow.

Two conditions are particularly required for the growth of reef-building corals. The water must be pure, unpolluted by river silt, and must be of a certain temperature. The polyp cannot live in a temperature below 68 deg. F. or at a depth of more than 30 fathoms. As the waters along the eastern Australian coast become warmer, reef-building corals develop in proportion. The species of coral found on the Barrier Reefs amount to several hundreds. The most conspicuous and the most universally distributed over the whole area are the staghorn corals. They abound over the reef flats everywhere, but they reach their greatest development in sheltered situations where they are never bared by the tide.

Throughout its entire length, the Queensland coast is indented with innumerable havens and "sun-lit coves of peace"—far removed from the strife of world affairs.

ROMANTIC HISTORY

WHAT a splendid story of early discovery these northern waters tell! Romance surrounds every mile of the Queensland coast—every cape and bay and island recalls some thrilling story of the early days, sometimes of shipwreck and privation and even terrible massacre by the vanished black tribes. Providential Channel, Thirsty Sound, Cape Direction, Restoration Island, and Weary Cape are among names which in themselves indicate stirring sagas of effort and achievement. And who can hear such names as Trinity Bay, Herald's Prong, The Slashes, Jesuit Point, Pandora Passage, Guardfish Cluster, Half-Tide Rocks, Throne Shoal, Britomart Reef, Lola Montes Pass, or Tam o' Shanter Point without sensing the romance of early discovery? What visions these names and a hundred others conjure up—visions of great endeavour, quests of high emprise in the dawning of Australian discovery! And where recorded romance is not, the eye supplies it along every league of this extraordinarily interesting coast.

It was not until Lieut. James Cook had almost completed his voyage of discovery along the east coast of Australia that he became aware of the presence of the Great Barrier Reefs. In the sixteenth century the islands between Asia and Australia came to be well known to European adventurers. A mass of vague and fragmentary evidence points to the conclusion that by the middle of the sixteenth century Spanish and Portuguese navigators had become aware that New Guinea was separated by a strait from the continent lying south—"the Australis Terra is the most southern of all lands . . . and is maintained by some to be of so great an extent that if it were thoroughly explored, it would be regarded as a fifth part of the world." But Torres and de Quiros, who in 1606 named the great southland "Austrailia del Espiritu Santo," Janszoon ("Duyfken," 1605), Carstenszoon ("Pera," 1623, whose journals record the first landing of white men on what is now Queensland soil), Tasman ("Limmen," 1644) and others seemingly were ignorant of the existence of the Great Barrier Reefs. When the British captured Manila in 1762 old Spanish archives were searched and a secret which had been jealously guarded for a century and a-half was revealed—the journals of the intrepid voyagers to the South Seas. Thus, the discovery of Australia by Captain Cook was by no means an accident. The primary objective of his first voyage was the observation of the transit of Venus. This concluded, he set out deliberately to seek the unknown continent of the south.

DISCOVERY

COOK had with him a copy of de Brosse's history ("Histoire des Navigations aux Terres Australes," 1756), which, besides summarising all previous information obtainable about the South Seas, and narrating the explorations of Tasman and Dampier, urged the exploration of the ocean that washed the unknown lands of the south, whose existence had been predicated to balance the land masses of the northern hemisphere. But Cook had no forewarning of the treacherous reef-strewn seas into which he was sailing. East Australia was then a blank on the map. On that blank "the prince of navigators" charted two thousand miles of coastline before he joined up with the survey of Torres. In June, 1770, he was cautiously sailing northward, sounding and charting as he went, quite unaware of the existence of the Great Barrier Reefs which were closing in until he reached Low Isles and became suspicious. On June 11th, the day after he sighted this "Small Low island which lay about two Leagues from the Main," he struck Endeavour Reef at about 11 o'clock on a "Clear Moon light Night." Fortunately, it was calm weather and the following day the barque was refloated. Though making water freely through a great hole, "cut away as if it had been done by the Hands of Man with a blunt-edge Tool," the "Endeavour" was kept afloat by continuous pumping until the leak was "fothered." Thus temporarily repaired, on 17th June the vessel was able, in spite of a south-easterly gale which kept her at anchor for two days, to limp into what is now the harbour at Cooktown and the mouth of the Endeavour River, where repairs were effected. Cook ascended Grassy Hill, and to his consternation saw an intricate maze of reefs and shoals in every direction. When the "Endeavour" was again seaworthy, he made all haste to reach deep water offshore. With anxiety and infinite care, he threaded his course among the reefs until, from the high peak at Lizard Island, on 12th August he saw a clear opening through the Outer Barrier. From a height of 1,179 feet above a blue and green sea patterned with an interminable maze of underwater reefs, Cook gazed upon a scene of rare beauty. (It is not easy to get a general view of the disposition of the Outer Reefs. Perhaps the best view is from the summit of Lizard Island. In this area the separate reefs form a single cordon broken every few miles by gaps.) South-west the two horns of Lookout Point and Cape Flattery thrust out from the low red-brown sandstone hills which stepped back to the massif of the coastal range, forming a tumbled horizon against the shimmering sky.

ADVENTURE

NORTH and west the sea was fringed with white lace where the trade winds swept in against reef and shoal. Southward, behind the high scarps of Direction Islands, a faint white band quivered on the horizon, widened to a broad belt of glinting surf as it swept abreast 10 miles eastward, then swung west in a curve which appeared to blend with the land loom. It was the mighty surf crashing on the Outer Barrier, the repulse of Pacific rollers from their eternal assault upon the living coping of a rampart whose foundations are set miles and miles below in abysmal depths. No wonder that this magnificent panorama gave the intrepid navigator "no small uneasiness"! The prevailing winds came from the south-east quarter, and his was no ship for beating to windward in narrow waters. But from the summit of the Lizard he espied two possible gateways of escape—one almost eastward with clear approaches, the other more northerly with a clear lead from Direction Isles. He chose the former, and with the sun behind to reveal under-water dangers, passed out unscathed. (More than 100 years later, Lizard Island was the scene of tragedy. Mrs. Watson, her baby, and a mortally wounded Chinese gardener escaped from blacks in an old iron tank to No. 5 Howick Island, where they perished from thirst. This is one of the most poignant chapters in coastal history.)

Many of the coral islands are the nesting place of countless sea-birds—huge rookeries of gannets, terns, and mutton-birds. The rich bird-life adds a fascination which is surely unrivalled by any similar region.

ENDEAVOUR

COOK'S joy at leaving the reeferies was short-lived. Three days later the barque was lying becalmed off the Outer Barrier. The Pacific surge carried the little vessel nearer and nearer the reefs until " the ship rose on a breaker prodigiously high so that between us and destruction was only a dismal Valley, the breadth of one wave." Cook's description of his providential escape from shipwreck is probably the finest passage in the Journals. " All the dangers we have escaped were little in comparison of being thrown upon this reef, where the Ship must be dashed to pieces in a Moment." But at the last dreadful instant " a Small Air of Wind " sprang up and the vessel moved slowly away, and with the assistance of boats, an ebb tide, and his " friendly breeze," Cook brought the " Endeavour " through Providential Channel. " It is but a few days ago that I rejoiced at having got without the Reef; but that joy was nothing when compared to what I now felt at being safe at an anchor within it." To-day, the waters of the intra-reef zones have been charted, sounded, buoyed, and made safe for shipping on the route to the North and the Orient, and give to Australia the longest stretch of pilotage in the world.

About twenty years later, a month after he had been turned adrift at Tahiti by the " Bounty " mutineers, William Bligh heard at black midnight the thunder of the surf on the Barrier. Next morning he found a passage through the reefs a few miles south of the opening which had proved his former master's salvation, and eventually reached Timor—probably the most magnificent voyage in a small boat in the annals of the sea. Under much more happy circumstances, " Bounty " Bligh again sailed through Torres Strait in 1792 and explored the whole area, mapping it for the first time. Bligh had with him a young officer named Matthew Flinders, who was destined greatly to increase the knowledge of the Barrier regions. Flinders made two valuable voyages along Australian shores—in the " Norfolk " (1799) and " Investigator " (1802). Then followed Lieutenant P. P. King in the " Mermaid " (1819) and " Bathurst " (1821), whose voyages lead to the almost immediate colonisation of North Australia, " Charles Eaton," " Beagle," " Fly," " Rattlesnake," " Basilisk," and other survey ships of the Royal Navy, which all left their impress on this wonderful coastline.

It is interesting to note the legends which still appear over some of these areas on the charts—" Reefs seen by Ship Wansfell in her dangerous passage through the reefs, 1864 "; " High breakers seen by Flinders "; and other early notes.

ACHIEVEMENT

THEN came luggers in search of pearls and pearl-shell, beche-de-mer, and trochus; schooners in search of cedar and gold; little vessels of exploration in search of new country for settlement and development; and later, fruit sampans, sugar freighters, merchantmen, and tourist liners. There have been numerous shipwrecks, from the early " Stirling Castle " tragedy on Eliza Reef to the stranding on Lady Elliot Island of the " Port St. John." But to-day thousands of passengers voyage every year through this sunlit Grand Canal, knowing little of the privations, the dangers, the tragedies of early exploration which beset settlers and traders only a few generations ago.

According to the Admiralty in London, the term " Great Barrier Reef " (now always used by them in the plural) appeared on a chart entitled " General Chart of Terra Australis or Australia," published in 1814 by Captain Hurd, R.N., hydrographer to the Admiralty. It is presumed that Hurd consulted Flinders, who, while surveying around Australia in 1802, used the word " barrier " in an account in his diary. He may not have been the first to use the term, however, for several years previously Bligh had referred to the Great Barrier Reefs as a " barrier of reefs."

The flora of the Barrier islands range from sparse-growing pisonias, tournefortias and casuarinas of the coral cays, to the riotous splendour of tropical jungles on islands near the mainland.

HIGH ISLANDS

AN extraordinary scientific interest belongs to islands, biologically and geologically. It is conceivable that the globe might have been without islands, but the resultant simplification of our geographies would have meant a tremendous loss of picturesqueness. The very course of history, without these stepping stones, would have been utterly changed. The islands of the sea are geological landmarks, being for the most part either the peaks of mountains thrown up by volcanic action, or the last relics of continental shelves. Our coral islands are examples of the constructional side of such earth movements, while the West Indies and the Aleutians are the crests of ranges which once rivalled not only the Alps and the Andes, but the seemingly inaccessible top of Everist itself. Geologically speaking, islands bear the strongest testimony to rises and falls more cataclysmic than that of kings and peoples—to the very heavings of the breast of old Mother Earth.

The islands of the " Four Hundred League Lagoon " come roughly under two distinct categories—(a) high or continental islands; (b) sand cays and low-wooded islands. Physiographically, the Queensland coast is a typical drowned coast. Throughout its entire length there are numerous embayments which are practically filled only with river alluvium.

Magnificent seascapes unfold over festoons of islands —especially in the beautiful Whitsunday archipelago. Tourist resorts have been established by several of the lovely bays which indent the isles.

LOW ISLANDS

THE numerous rocky off-shore islands are formed of rocks similar in every way to the adjacent mainland. They, too, are usually deeply embayed and were once clearly connected to the mainland, pointing to a time when this land mass extended much to the east of its present limits. Such islands are the Whitsunday Archipelago, Magnetic, Dunk, Hinchinbrook, and other islands.

Most of the isles are forested, often dense rain-forest vegetation covering them from summit to water's edge. Many of the larger islands show evidence of dissection very clearly. They are cut into deep valleys which radiate from a central peak, or if the island be elongate, the valleys furrow the longer side, such as on Gloucester and Hinchinbrook Islands. Gulnare Inlet on Whitsunday Island (the " heaven " of the vanished tribes), and Nara and Marcona Inlets on rugged Hook Island, are excellent examples.

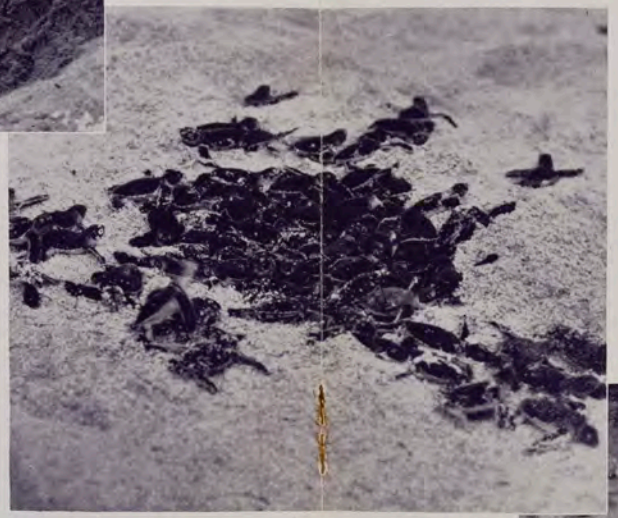
Hinchinbrook National Park, with deep gullies and valleys between the peaks which rise to more than 3,000 feet, is the most magnificent island along the whole of the Queensland coast. It is separated from the mountain-bordered mainland by a narrow, deep, and very picturesque channel, " which like Whitsunday Passage, Mourilyan, and Albany Pass, has been stolen direct from Paradise."

Viewed from a tourist liner, these high islands resemble nothing so much as partially submerged mountain masses. Often the slopes are nearly unbroken down to the water level, and where the islands are in groups the similarity to drowned mountain areas is so great as to leave no reasonable doubt as to the general nature of their origin. This is strikingly seen in the Whitsunday and Palm Groups.

Where the islands are smaller they usually stand out as verdant bosses on a mobile plane of turquoise, as, for example, the Family Group off Cardwell. Viewed from Richards or Dunk Islands, they form one of the most beautiful scenes along the coast—although scarcely more beautiful than the island-studded seascape seen from Mount Olden on Lindeman Island or from the summit of Whitsunday Peak.

These high or terrigenous islands vary much in their distance from the land. Some merely fringe the coast; others, such as The Palms and still more the Lizard Group, stand well away to sea. Many of the high islands are partly or wholly surrounded by coral reefs.

Female turtles deposit their eggs in " nests " scooped in the sand high up above the limit of the tide. The average clutch is about 120 eggs. About nine or ten weeks later—



The eggs are hatched by the heat of the sun. The young turtles scramble to the surface of the sand and instinctively hasten down the beach into the water.

ISLAND LANDFALL

THESE enchanting Barrier seas are still among the few areas of the Earth's surface which are not completely mapped and which, in some ways, are unexplored. There is such an intricate maze of reefs, such a number of clustering isles that it would seem impossible to map them all completely. In the Long Lagoon the visitor can experience the thrill of exploring little-known isles and lonely portions of the mainland, making landfalls with all the pride of an explorer. It may be instinctive and it may be ancestral—for all instincts are at root racial memories—but whether it be a section of our subconsciousness inherited from doughty forebears who searched the seas for new homes or not, the feeling of interest and delight arises spontaneously in the heart when we visit an island. And then to ride at anchor at night in some sheltered haven, listening to the whisper and lisp of the tide, the eerie cries of sea-birds, the splash of leaping fish . . . .

ENCHANTED ISLES

AND should the island be uninhabitated, how briskly does the visitor leap ashore, looking for traces of human occupancy, attracted by the shells on the beach, the plants, the birds that surround him, and not without the expectation that somewhere in the interior he may hap upon some ancient relic, a bunyip perchance, or prehistoric monster shambling across the glade !

An island landfall—there is indeed magic in the phrase. Queenslanders need not go so far afield as Polynesia for romantic islands. These are dotted along our coast from Moreton Bay—where Flinders more than a century ago first felt their charm—to Possession Island round the corner of Cape York. Islands are always and everywhere fascinating whether they be found amid the solitudes of an ocean, jewelling an inland sea, or sprinkled in groups and clusters along this coral-girt tropic coast.

Her egg-laying finished, the turtle ponderously journeys back to the sea, leaving a well-defined and distinctive track. The average time a turtle is ashore is about two and a-half hours.

CORAL CAYS

THE low islands of the regions of the Barrier Reefs fall under two main groups. One includes all the simple cays which are usually found on or near the Outer Barrier; the other the more complex cays or low-wooded islands which are practically confined to the area enclosed between the Barrier and the mainland coast. Very briefly, simple cays are nothing more than masses of coral and sand piled up on a reef. They vary in size, but 300 yards is a fairly good average for their larger diameters, and 150 to 200 yards for their shorter diameters. They are usually not more than 4 or 5 feet above high-water springs, and are sometimes well covered with vegetation. There is usually a formation of beach rock around such cays.

Low-wooded islands are very much more complex. In nearly all instances there are two quite distinct islets—one a sand cay, and the other a mangrove-shingle cay, such as Low Islands. The Bunker and Capricorn Islands are in one sense only cays, but their isolated position and the fact that some of them are entirely of shingle formation puts them into a separate class. Together they form an entity and cannot be considered part of the Barrier Reef proper. Green Island, a popular resort regularly visited by tourist parties, and about 15 miles out from Cairns, is said to be the largest and most complex cay.

"Reefing"—exploring the exposed reefs at low tide—is an absorbing diversion. For delicacy of colour, for attractiveness of design, the shell-fish life on the reefs is surpassed only by the gem-like fishes in the coral pools.

TROPIC BIRDS

THERE are more than 600 of these "Keys to Paradise"—each in itself a Pacific Cosmos—which are sufficiently large to be recognised by the State Lands Department, and there are innumerable islets. Several terrigenous islands contain caves with rock drawings and are redolent of aboriginal lore. Some of the islands depasture sheep, goats, and pigs, and brumbies range the hills. Many years ago the Philp Government ordered goats and domestic fowls to be placed on a number of the islands as provision for wrecked sailors. Large numbers of coconut palms also were planted, but invariably the blacks dug them up for food. The largest palm grove, planted more than forty years ago, is on Brampton Island and contains more than 200 palms. Opossums and kangaroos are plentiful on several islands.

Most of these islands are rich in avifauna. In the forests and jungles on the isles bordering Whitsunday Passage, for example, are to be found some of the most interesting of Australian avian population—birds which are melodious and beautiful; birds which twice yearly negotiate the hazardous journey between Siberia and this continent; and archaic forms of bird-life which are survivals of ancient times. In one or two instances, birds which are fast becoming extinct on the mainland are numerically strong on some of the more remote isles. Each year large flocks of nutmeg pigeons migrate from Aru Islands to isolated rocky islands off the coast. These flocks of beautifully-marked white and black birds are becoming smaller and smaller, due to the ravages wrought by "sportsmen." However, most of the islands are now Government sanctuaries or national parks.

On the sand spits and shingle beaches is a great variety of long-legged, strong-winged birds clad in mottled browns and greys—sea curlews, godwits, sandpipers, stints, and knots. Although so small and seemingly frail, these birds twice yearly cover the tremendous distances between Siberia and Japan and the Queensland coast. Elegant reef-herons, noisy terns, noddies, and gulls feed and breed in thousands on the coral islands. Grassy slopes are covered with gulls' nests, stony flats bestrewn with terns' nests, and pisonia trees liberally bedecked with the nests of dainty white-capped noddies, while the extraordinary sea-going battalions of mutton-birds honeycomb with holes the sand beneath the pisonias, tournefortias, and casuarinas. The gannet folk are ever-present, and the thieving frigate birds wheel in graceful flight. All are there, from the majestic sea-eagle to tiny sunbirds that flit from flower to flower among the magnolias along the sun-drenched coral strands.

THRILLING SPORT

THE Barrier waters and the Islands of the Sun offer a wide variety of sport. With an incomparable climate throughout the year, they form an ideal realm of holiday.

Fishing, of course, has a fascination for all. Few visit these glorious sun-drenched regions without becoming enthusiastic anglers. Light-gear angling is always available on the fringing reefs, while big-game hunters of the sea find splendid sport trolling in the deeper water "out wide."

Queensland possesses a fish fauna remarkable for the abundance of its species and for the structional variety of its constituents. All told, the number of combined marine and fresh-water species authentically recorded up to date falls but little short of 900—two-thirds of the entire fish fauna of Australia.

A deeply indented coastline extending for 3,236 miles, and fringed for about two-thirds of its length by the Barrier Reefs, provides extensive breeding and spawning grounds in which fully 250 species of edible fish are to be caught.

All along the Queensland coast the angler will find opportunity for the pursuit of any kind of line or rod fishing in vogue in other parts of the world. While many of the species abound throughout the year, they are in greater abundance during the winter months—the regular tourist season.

Most of the potential sporting fish belong to the swordfish and mackerel tribes. As these sea-rovers migrate over long distances, an investigation is being conducted to determine seasonal occurrences, &c. Comparatively little information is available about swordfish at present, but investigations to date indicate that the eastern coast of Australia could be as famous for game-fish as Santa Catalina Island (U.S.A.) or Bay of Islands (New Zealand).

The records of the Queensland Museum show that swordfish and sailfish have been caught during the past eight years in Moreton Bay, off Noosa Heads, Double Island Point, Yeppoon, and several other places farther north. Most of the catches were made from January to May. It will probably be found that these big sporting fish migrate from south to north and occur in the more northern waters towards the middle of the year.

The Queensland Game Fishing Association has been formed in Brisbane and has met with encouraging success.

GAME FISHING

SHARKS of various species abound, including the mako or blue pointer (one of the greatest of the leaping sea-tigers whose vitality is said to be equal to that of the broadbill swordfish), grey nurse, tiger, whaler, thresher, hammerhead, and several other death-dealing engines of the deep. Various species of rays are found in the Barrier waters, including the giant devil-fish or manta.

Spanish mackerel is the principal sporting fish of the Great Barrier Reefs. Although it may be caught along the edges of the tide rips of the Outer Barrier all the year, it is most common in the intra-reef zones between May and October. Working up from the Capricorn and Bunker Groups, mackerel are most abundant in the Whitsunday region during June. The average weight is from 25-35 lb., ranging up to 60-80 lb. Queen-fish are said to surpass even mackerel in fighting qualities. The most stubborn fighter is probably the turrum, a giant trevally weighing up to 70 lb. Other important game-fish are giant pike, tuna, bonito, diamond trevally, albacore, and king-fish. The American wahoo (called jack mackerel), and yellow-fin tuna, are also caught along the Queensland coast. Eighteen or fifteen of the best cuttyhunk is generally used. Hand lines are most common. If rods are used, the reels should be large enough to hold 300 to 800 yards of fifteen-cord cuttyhunk.

Angling for reef-fish—king snapper, red emperor, coral cod—or trolling for surface-feeders, such as Spanish mackerel, queen-fish, or turrum, is a sport which excels in the Barrier waters.

REEF FISH

REEF fish, remarkable for their gorgeous colouring and excellent eating qualities, include coral cod, which tip the scales up to 30 lb., no two alike in colour—some bright red spotted with blue, others blue with red spots; snapper, a delicate pink with a flashing iridescence; red-throated emperors, bluish-silver with blood-red markings about the head and on the dorsal fin and the basis of the pectorals; hussars, pale pink with a broad greenish-yellow band traversing the sides longitudinally; groper in a variety of beautiful liveries, some green along the back with blue fins and pale pink sides, others bright pink with multi-hued fins; coral bream like glistening silver; and a host of other reef fish, species far too numerous to mention here.

Beche-de-mer, ranging in colour from mottled cream-white to various shades of yellow, orange, and brown to black; conical-shaped trochus shell; pearl-shell (found now only in very deep water beds); green, loggerhead, and tortoiseshell or hawkbill turtles; species of sponge suitable for commercial purposes; oil from dugong; leather, oil, fertiliser, and Chinese delicacies from sharks; and some of the finest eating fish, large and small, in all the Seven Seas—such constitute some of the economic wealth of the Great Barrier Reefs, as yet almost totally unexploited by Australians. Marine products from Queensland waters are valued at £369,716.

Drifting over the coral reefs provides never-ending pleasure. Through glass-bottomed floats can be seen corals of all shapes and colourings, fish and anemones, and other reef life of indescribable beauty.

CRUISING

UNDOUBTEDLY, trolling in a launch for surface-feeding fish or angling over the reefs for bottom-feeders constitutes a highly popular form of recreation. But cruising in these enchanted regions also has a fascination—cruising on slumber seas and through waterways and channels of cobalt-blue streaked with sap-green among the Thousand Isles. As mentioned previously, many of the islands of continental origin, such as Whitsunday Archipelago, are mountainous, heavily forested, with deeply indented shores. Making, for instance, Day Dream Island a base, the holiday-maker may rove the Australian Main under idyllic conditions. Such a cruise among the seventy or more Whitsunday Islands involves some 400 miles of sea travel—all within a radius of not more than 20 miles from the base.

Fossicking on the fringing reefs is an absorbing pastime which never seems to pall. The Great Barrier Reefs proper are usually inaccessible to the average visitor, who must be content with the reefs which girt the islands near the coast. For that reason, the Outer Barrier has barely been mentioned in this publication. However, the fringing reefs, even those quite near the mainland, are rich in marine fauna associated with the outermost Barrier regions.

And what can be seen on the reefs with the naked eye is really an infinitesimal portion of the keen life of the coralline structures. A terrible, relentless warfare is constantly in progress on the reefs—various creatures building with blind instinct, and other destructive agencies perpetually undermining the marvellous ramparts. It is, indeed, incredible that Nature should be so cruel amid such exquisite beauty.

The outer edges of the reefs fringing the coral isles fall almost sheer to comparatively great depths. On a calm bright day at low springs the visitor may stand on or row along the edge of the reef and peer down where sometimes it is like a sheer wall, sometimes like broken battlements, disappearing into blue and green profundities of colour.

But the Outer Barrier, even on calm days, presents a spectacle of grandeur. The league-long mountainous Pacific rollers sweep in without check until, with utter abrupt arrest, they crackle and smash on the calcareous platforms in foamy turmoil. These sunshot green tons crash on the impregnable, are thrown like fountains to the sky, and fall shattered and harmless. The broken tide sweeps across the reef ankle or knee deep in an effervescing flood and boils over into the lagoon.

CORAL GARDENS

NOW and again the visitor may venture sufficiently near to gain a glimpse of the bare, rounded parapet worn smooth by the attrition of a million tides and which has withstood year in year out the monstrous violence of the implacable ocean. As the riven waters tear over the reef past the adventurer's legs, tiny brilliant blue flashes like electric sparks are noticed—little fish not an inch long, yet living unharmed in this terrific smashing turmoil.

Here and there in pools and crevices are rainbow mats of green and blue with wavy edges frankly defined—the mantles of giant clams, the most extravagantly beautiful things on the reefs. A red sea-slug may be noticed, and a tassellated reef-eel. Some species of eel grow up to 12 feet in length, and are most vicious. Flower-like anemones, sea urchins, star-fish, reef-worms, and brittle-fish also add their colour. Exquisite coral growths can be glimpsed in the more sheltered parts before the hissing spates tear across and blot out the hanging gardens of the crevice walls. And all the while there is the deep thunderous boom of the surf like the lowest note of some gargantuan organ tried over with muted stops.

Much quieter and safer are the coral reefs which encircle the islands of the intra-reef zones, together with much that is genuinely beautiful.

The species of corals found on the Barrier Reefs amount to several hundreds. The main types of stony corals comprise slender, fragile branching forms, such as the staghorn, and the more solid types, such as the meandrine or brain corals.

WORLD OF FANTASY

THE coastline of Queensland behind the vast natural breakwater of the coral reefs unfolds scene on scene of entrancing loveliness unexcelled by any of the ports and happy havens of lands washed by Ionian seas. "The morning lands of history" they call the Lydian shores of Asia; and so they were 4,000 years ago. But our Austral shores to-day have a better claim to the name. They have just awakened from the age-long night harbingered by Captain Cook and his sailors, gazing in a wild surmise as they voyaged north.

And the beauty of indigo seas turning to bright green over the shallows has an antiphon below the surface. Is there any fairer garden on land than the coral gardens beneath these translucent waves? Through the lanes and bypaths of softly flowering gardens brilliantly coloured fish flash and flame—emerald and torquoise, amethyst and indigo, and orange and pink, of almost incredible loveliness—lucent gardens of Neptune that rival those of the Hesperides, the daughters of Oceanus.

As the fossicker picks his way over the exposed reefs, he may find a great fissure split across his path. Putting on water goggles, he may kneel, take firm hold, and plunge his head beneath the surface. For thirty seconds or so he will gaze into literally and absolutely the fairyland of the children's story-books. Below are enormous caverns. All round the water is shot with light—long slant fences of light, which dimly illuminate a fantastic world.

The living reefs have all the redundant colours of tropic lands—all the exquisite subtleties of pastel tints together with volatile flamboyant splashes of rich colour. But for the most part the corals are softly toned with pigments of delicate blue, brown, heliotrope, green, pink, and orange. Coral polyps are not usually highly coloured like many of the little coral fish, reef worms, and the mantles of giant, horse-hoof, and burrowing clams, and some anemones.

Through the opaque green aqueous lanes between the coral grottoes the fossicker might see a school of scintillant fish glide into view, pause a moment in doubt, and then with a simultaneous flick the whole living opal disappears through the filigree and lace-work of the branching corals, lost in the dim watery world beyond. At other times schools of fry might swim past as thick as driven rain. An oddity of the reef pools is the sea hare or ink-fish. When attacked it ejects a purple smoke screen.

REEF ODDITIES

IN these submarine gardens are every imaginable colour and combination of colour ever on an artist's palette. There are fish which have stolen their colours from tropic sunsets, their designs from Futurists and Cubists, their liveries from Oriental mandarins—finny curves and arabesques of cardinal and cobalt, tangerine and turquoise, saffron and salmon, grey and green, black and brown—fishes barred and banded, speckled and spotted, with frills and furbelows, tapes and tassels, panaches and pennons streaming gracefully behind.

And there are square fish and tubular fish, and flat fish and fish that drive every last belief out of you, for what power in the name of sanity could have conceived them? There are beasties of the reefs, small and large, that are lovelier than birds of paradise or more hideous than a nightmare—grotesque, madly-conceived oddities. Most of the coral fish have parrot-like jaws which enable them to scrape weed and encrusting animals from the surface of the coral growths.

There are galaxies of sea-stars and black, spiney urchins seemingly arrayed in regular geometrical patterns over the white sandy bottom; giant anemones, olive-green veering to brown, or sometimes bright blue, always attended by three handmaidens—a shrimp, a crab, and a tiny orange and black fish; finely tapering "pencil" shells mottled brown and yellow, and the shorter and more rounded "olive" with delicate purple marking on smooth yellow enamel; spider shells with underside and interior a beautiful rose red; the much-prized pearly nautilus, and paper argonaut with delicate cradle-like white shell beautifully sculptured; cowries spotted like the leopard; long snake-like synaptas, and evil-eyed reef-eels; beche-de-mer or sea slugs, huge bailer or melo shells; dainty "cats-eyes," disc-shaped shells (strictly opercula) with a central area of rich deep green surrounded by a lighter band, part white, part brown; attractive helmet or cameo shells; armoured loricates or chitrons; and an infinite number of other marine oddities. There are crabs in shells as small as seed or as large as a coconut; crabs that decorate themselves with wisps of seaweed and grains of sand; crabs of every conceivable shape and colour.

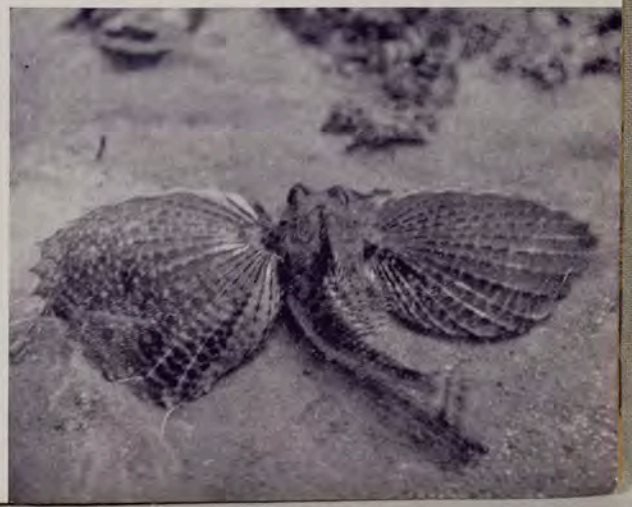
On all sides are corals—mushrooms on long stalks, brain corals with cerebral markings, nodular masses of organ pipe corals, flat counterpanes, many-pointed antlers, shrubs, fans, vases—there is seemingly an endless variety of coral. The colours of the staghorns are the most beautiful of all corals. A whole colony may be a uniform hue, or an infinite variety of intermediate shades, or the tips may form a beautiful contrast.

INFINITE VARIETY

AND now the 30 seconds is up—which is well, for already the fossicker can scarcely believe the little that he has seen. The marvellous prodigality of these Barrier waters, the infinite variety of life on the teeming reefs and lagoons is a constant source of interest and wonder. Every reef pool is a marvel of bizarre life, under every rock the lurking place of strange, fantastic marine creatures. One can never forget the Great Barrier Reefs, never forget those precious memories of a marine lotus-land.

There are innumerable other pastimes besides cruising and fossicking on the reefs. Aquaplaning in sheltered sounds and bays; exploring little-known isles or lonely stretches of the mainland; swimming in opaline waters which seem to have an invigorating caress; rowing, sailing, wild pig-hunting, turtle-spearing—there is no end to the holiday possibilities of these extraordinarily fascinating island resorts.

And at night-time there are dancing, card and other indoor games, impromptu concerts, moonlight cruises, strolls along the mysteriously quiet beaches or through aromatic hoop-pine forests. These "Fortunate Isles" are ideal for the weary man seeking relaxation and repose. The sounds he hears are the soughing of light airs in the palms, the tinkle of shells among coral shingle, the whisper and lisp of silver tides breaking along the beach . . . .



Among the most beautiful life on the marine landscape are the flower-like anemones. But also mingling with indescribable beauty are ugly and, perhaps, dangerous animals—so be careful, fossicker!

"My Tropic Isle" . . . . When once you have holidayed in these enchanted regions the Spirits of the Reefs will forever call you to return—and he who hears the call must needs obey!

MARINE PLAYGROUND

DURING the summer months, when the female turtles come up on the islands to lay eggs, visitors may watch by torchlight the amazing process of nesting and egg-laying. Turtles are a feature of the life of the Great Barrier Reefs from Torres Strait to the Capricorn cays. Although there are five species in these waters, three only are abundant—the green or edible turtle, the hawkbill or tortoiseshell, and the loggerhead. At that time of the year the coral islands are frequented by immense colonies of sea-birds. The weird cries of mutton-birds echoing through the pisonia forests sound for all the world like the wailing of the souls of lost mariners.

Without question, Australia has in the Great Barrier Reefs a tourist asset of inestimable value. No other marine playground can offer such wide diversity of holiday attractions, such a delightful all-the-year-round climate, such glorious dawns and sunsets, such sea-scapes of ineffable loveliness.

Wide wastes and spaces of ultramarine sea and azure sky. The insistent music of waves and wings and winds. And in the midst of this Pacific playground the visitor can spend memorable holidays—holidays which leave golden memories to gladden riper years. Surcease, health, and happiness are indeed rare jewels on the string of Time.

TRAVEL SERVICE

VISITORS to the regions of the Great Barrier Reefs are enabled to see the coralline wonders by holidaying on the various island resorts. Lady Musgrave Island, in the Bunker Group, and Heron, in the Capricorn Group, at the southern extremity of the Barrier Reefs, are reached from Bundaberg and Gladstone, respectively. Lindeman Island is in the Cumberland Group, roughly midway between Mackay and Bowen, with Seaforth as the point of embarkation. Day Dream (or West Molle), South Molle, Hayman, and Long Islands are within the beautiful Whitsunday zone, and are reached by train via Proserpine or by liner. Magnetic Island is a few miles off the shores of Townsville. Visitors to Dunk Island detrain at Tully. Green Island is near Cairns.

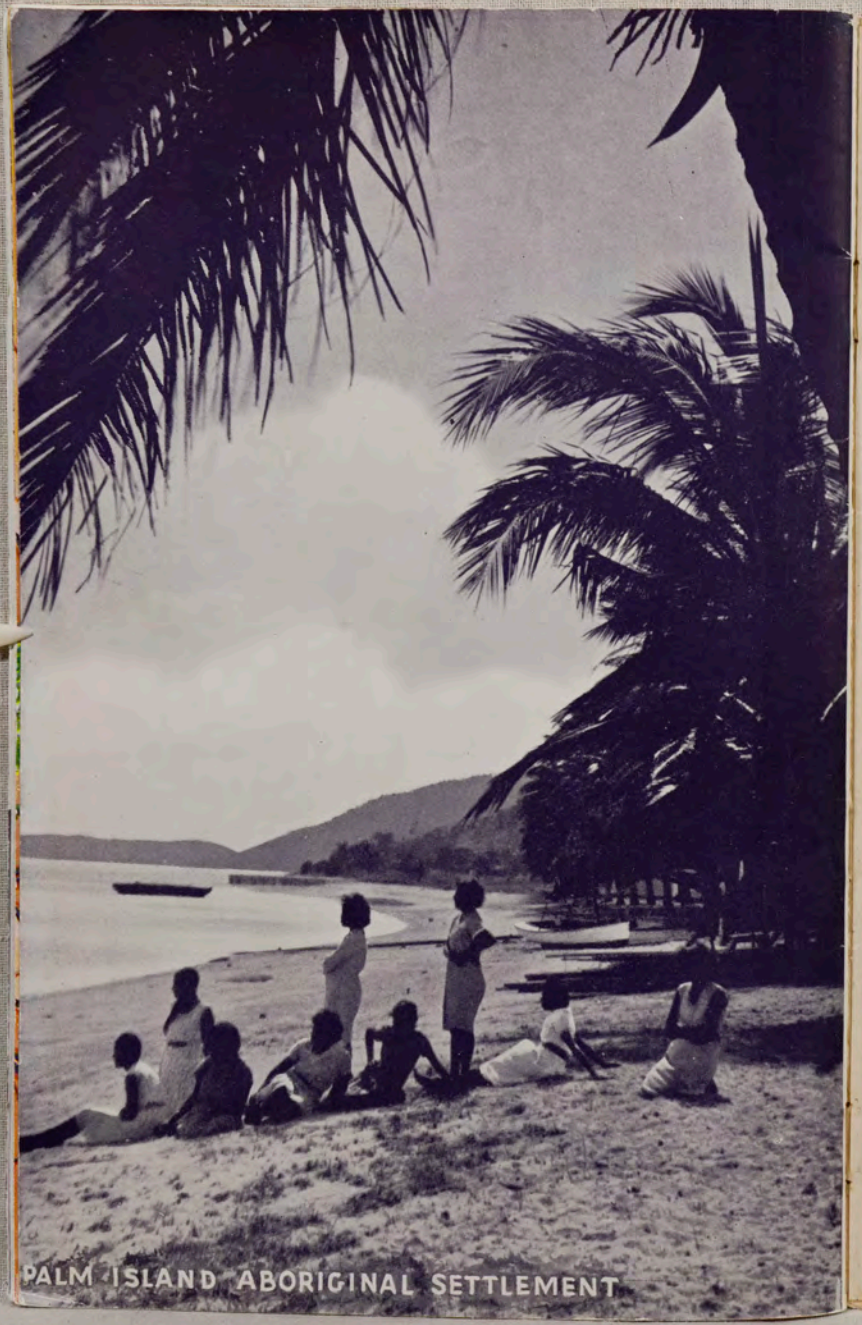
Accommodation on the islands, cuisine, and general services are satisfactory. Several of the settlements are electrically lighted, sewered, and possess refrigeration plants. All particulars are available in separate folders and in various other publications of the Queensland Government Tourist Bureau. Officers of the Bureau arrange inclusive itineraries and so relieve visitors of all "travel worry."

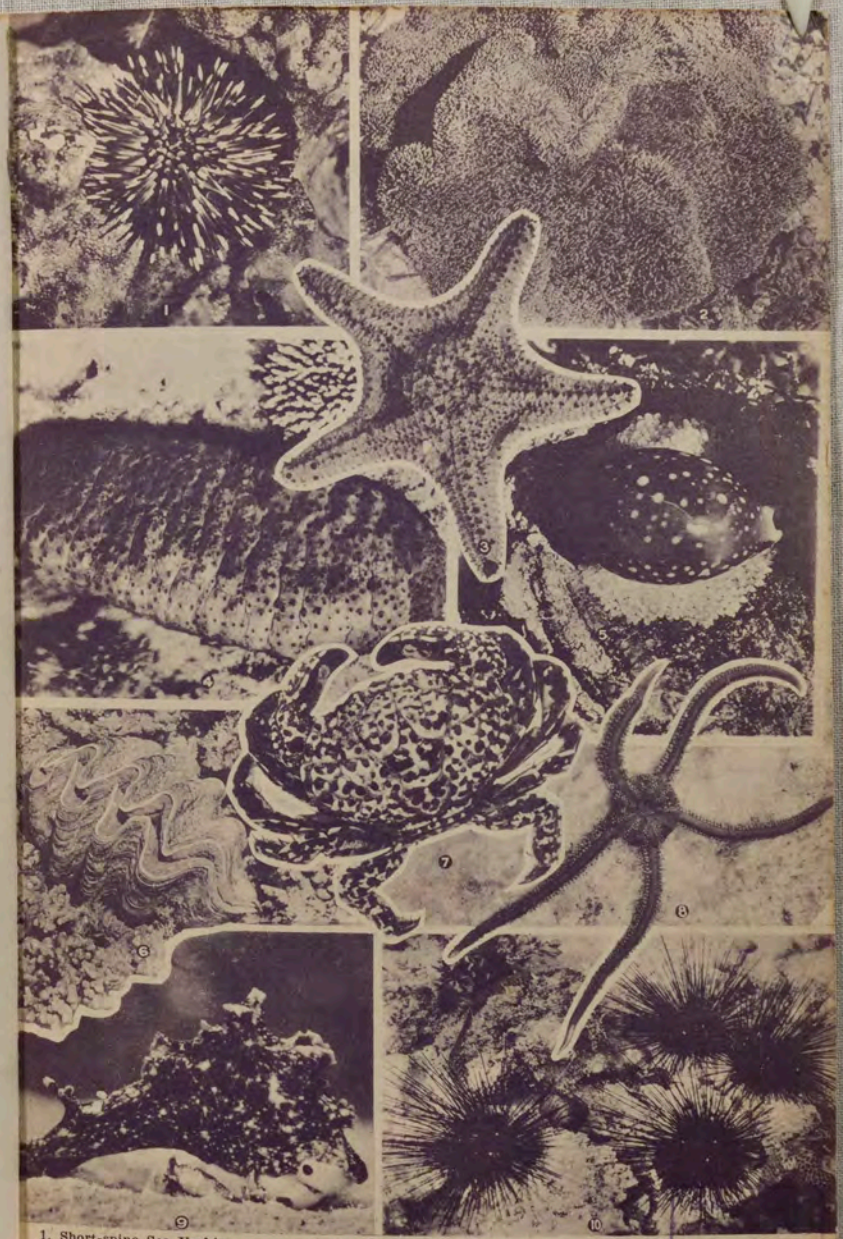
[NOTE.—Visitors to the regions of the Great Barrier Reef are reminded that the removal of coral or flora and fauna from the islands is forbidden.

QUEENSLAND GOVERNMENT TOURIST BUREAU

ADELAIDE STREET	–	BRISBANE
MARTIN PLACE	–	SYDNEY
COLLINS STREET	–	MELBOURNE
PLAZA ARCADE	–	PERTH
MACQUARIE STREET	–	HOBART
EAST STREET	–	ROCKHAMPTON
FLINDERS STREET	–	TOWNSVILLE
ABBOTT STREET	–	CAIRNS

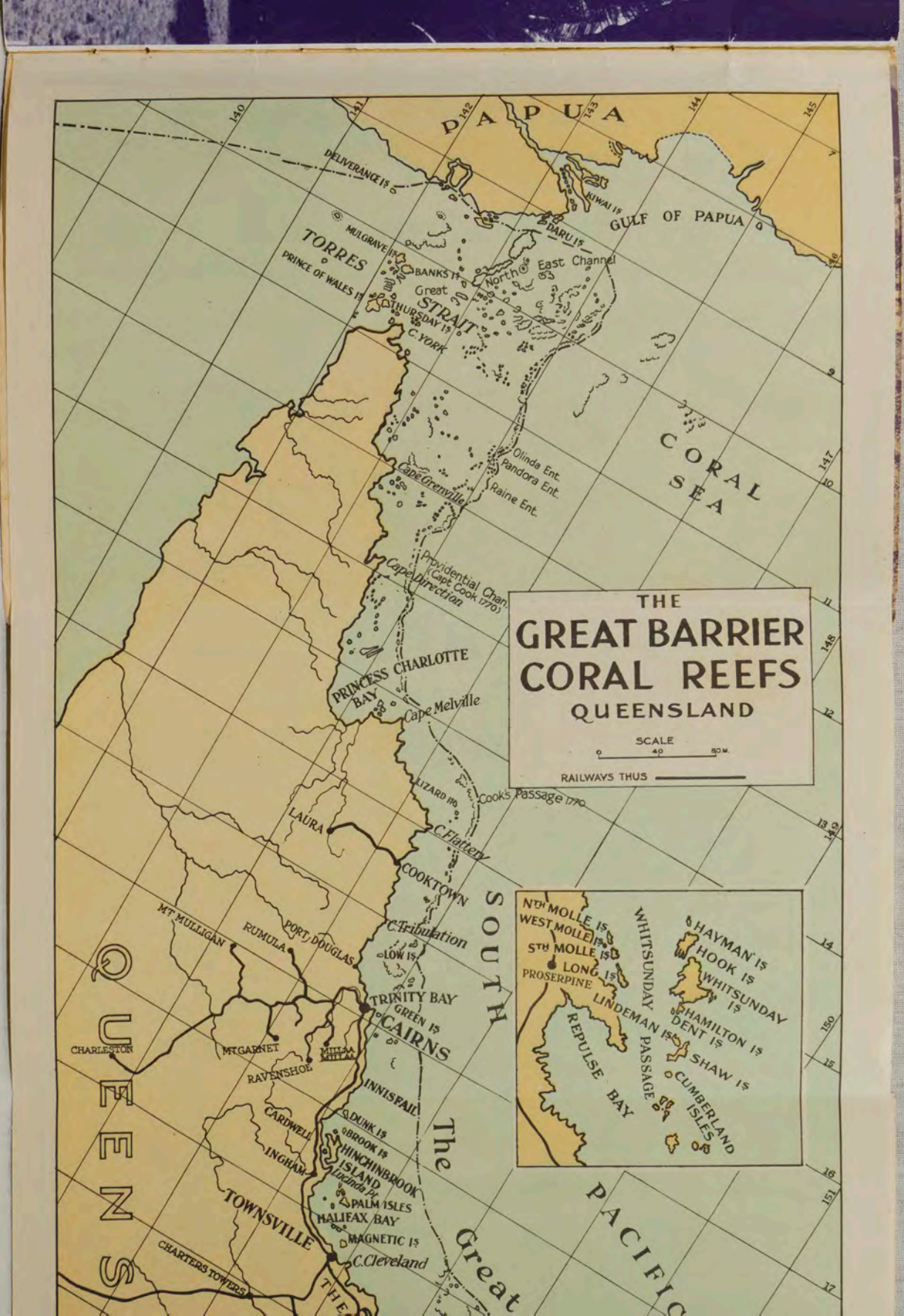

ISLANDS
OF THE
CAPRICORN
AND
BUNKER GROUPS
SCALE OF MILES
0 4 8 12
NORTH REEF
TRYON I.
NORTH WEST I.
BROOMFIELD REEF
WILSON I.
WRECK I.
CAPRICORN GROUP
HERON ISLAND
WISTARI REEF
ERSKINE I.
SYKES REEF
ONE TREE I.
C. CAPRICORN
CURTIS ISLAND
MASTHEAD I.
POLMAISE REEF
CURTIS CHANNEL
LAMONT REEF
FITZROY REEF
BLACK H.
GRAHAM I.
NORTH PT
LLEWELLYN REEF
BOULT REEF
BUNKER GROUP
HOSKYN I.
PICNIC PT
QUOIN I.
FACING I.
FAIRFAX I.
GLADSTONE
NORTH CHANNEL
PORT CURTIS
CATCOMBE H.
BOYNE I.
LADY MUSGRAVE ISLAND
SOUTH CHANNEL
RODDS PENINSULA
BUSTARD H.


PALM ISLAND ABORIGINAL SETTLEMENT



1. Short-spine Sea Urchin.
2. Sea Anemone.
3. Sea-star.
4. Trepang or Beche-de-mer.
5. Spotted Cowrie on eggs.
6. Giant Clam.
7. A Reef Crab.
8. Brittle Sea-star.
9. Sea Hare.
10. Needle-spine Sea Urchin.

Photos. by courtesy of Otho Webb, F. A. McNeill, W. Boardman.


THE
GREAT BARRIER
CORAL REEFS
QUEENSLAND
SCALE
0 40 80 M.
RAILWAYS THUS
PAPUA
GULF OF PAPUA
DELIVERANCE IS
KIWAI IS
DARU IS
MULGRAVE IS
TORRES
PRINCE OF WALES IS
BANKS IS
North East Channel
Great
STRAIT
THURSDAY IS
C. YORK
CORAL SEA
Olinda Ent.
Pandora Ent.
Raine Ent.
Cape Grenville
Providential Chan.
(Capt. Cook 1770)
Cape Direction
PRINCESS CHARLOTTE BAY
Cape Melville
LIZARD IS
Cooks Passage 1770
C. Flattery
COOKTOWN
LAURA
C. Tribulation
LOW IS
MT MULLIGAN
RUMULA
PORT DOUGLAS
TRINITY BAY
GREEN IS
CAIRNS
CHARLESTON
MT GARNET
MILLA MILLA
RAVENSHOE
INNISFAIL
CARDWELL
DUNK IS
BROOK IS
HINCHINBROOK ISLAND
INGHAM
Lucinda Pt
PALM ISLES
HALIFAX BAY
TOWNSVILLE
MAGNETIC IS
C. Cleveland
CHARTERS TOWERS
QUEENSLAND
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LINDEMAN IS
REPULSE BAY
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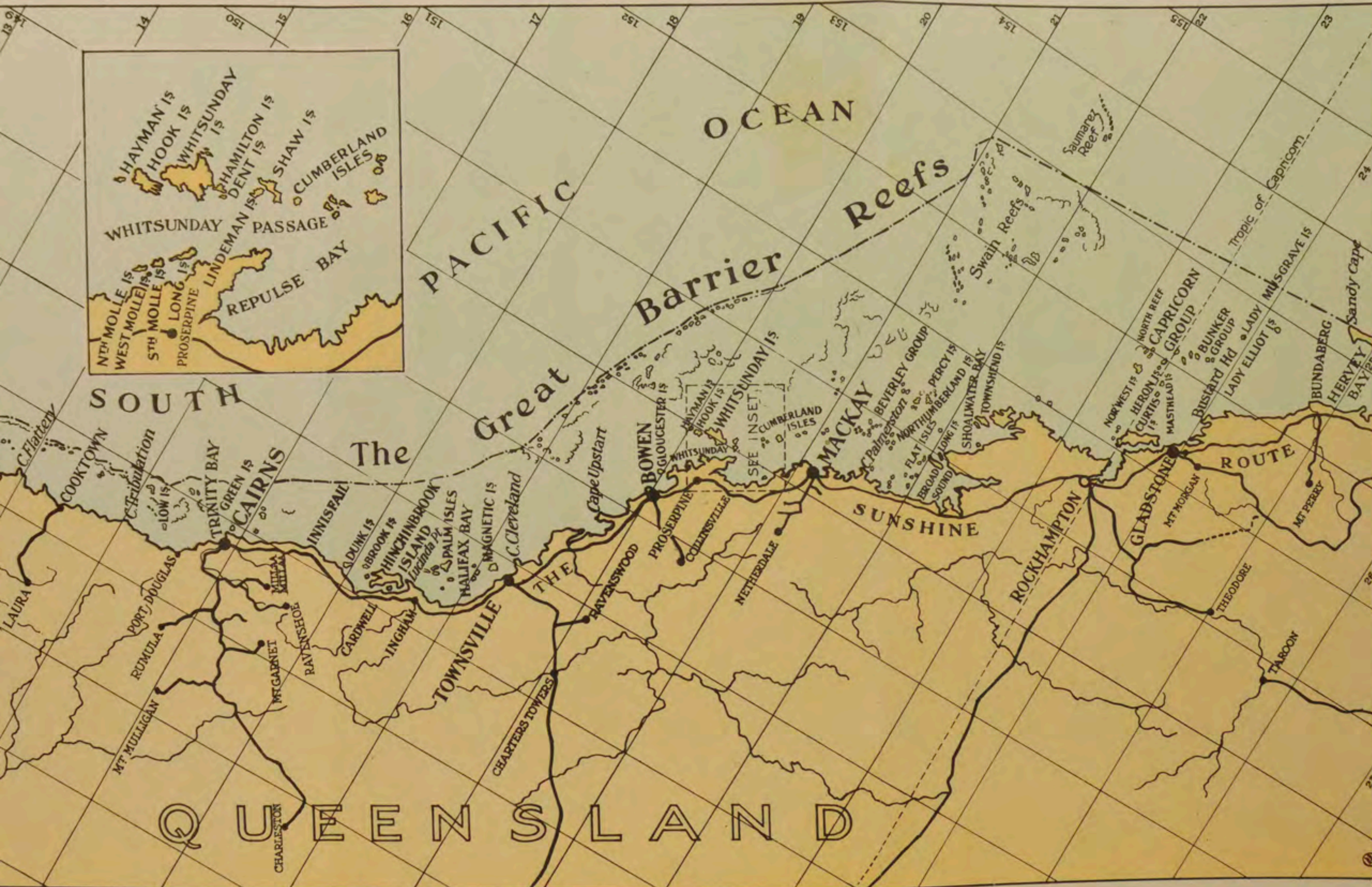
HAMILTON IS
DENT IS
SHAW IS
CUMBERLAND ISLES



SOUTH PACIFIC OCEAN
The Great Barrier Reefs
QUEENSLAND
THE SUNSHINE ROUTE
HAYMAN IS
HOOK IS
WHITSUNDAY IS
HAMILTON IS
DENT IS
SHAW IS
CUMBERLAND ISLES
WHITSUNDAY PASSAGE
LINDEMAN IS
NTH MOLLE IS
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PROSERPINE
REPULSE BAY
SEE INSET
Saumarez Reef
Swain Reefs
Tropic of Capricorn
C. Flattery
COOKTOWN
C. Tribulation
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PALM ISLES
HALIFAX BAY
MAGNETIC IS
C. Cleveland
Cape Upstart
BOWEN
GLOUCESTER IS
WHITSUNDAY
COLLINSVILLE
MACKAY
C. Palmerston
BEVERLEY GROUP
NORTHUMBERLAND IS
PERCY IS
FLAT ISLES
LONG IS
BROAD SOUND
SHOALWATER BAY
TOWNSHEND IS
NORTH REEF
CAPRICORN GROUP
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HERON IS
CURTIS IS
MASTHEAD IS
BUNKER GROUP
LADY MUSGRAVE IS
LADY ELLIOT IS
Bustard Hd
Sandy Cape
BUNDABERG
HERVEY BAY
LAURA
PORT DOUGLAS
RUMULA
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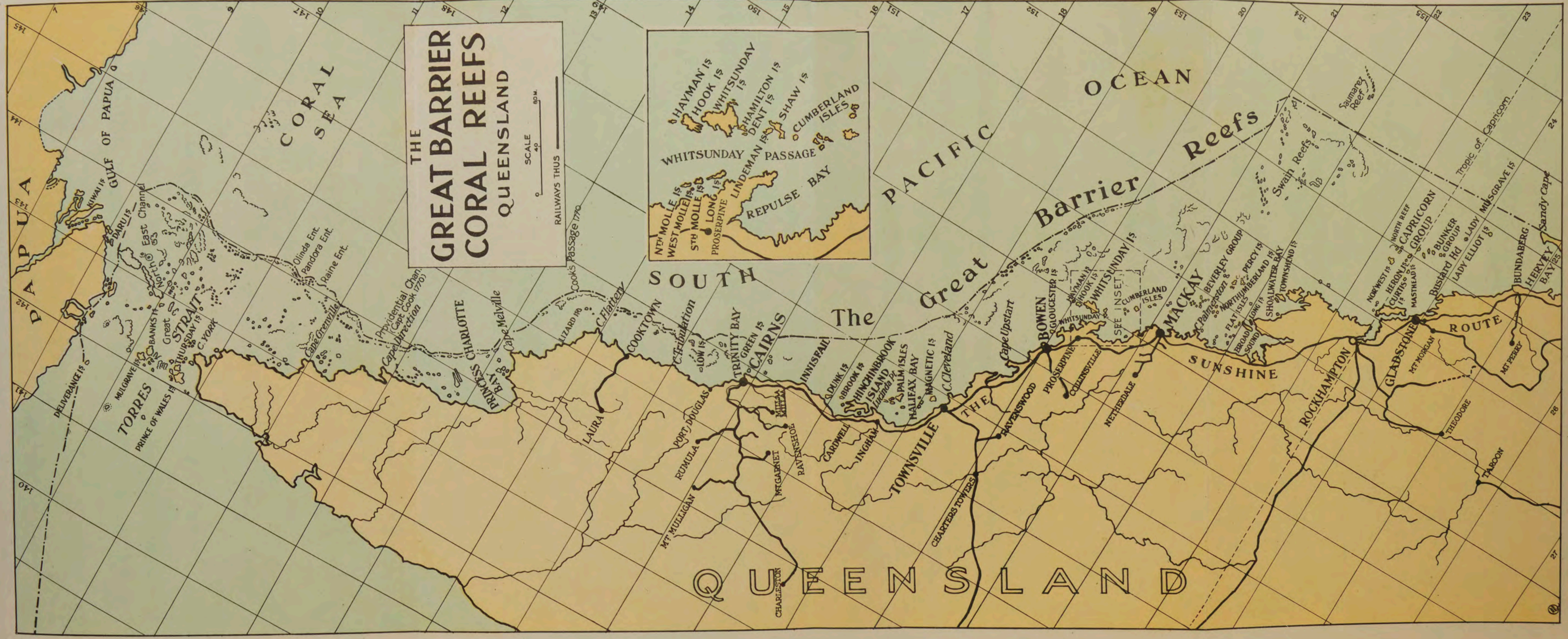
MT GARNET
RAVENSHOE
MILLAA MILLAA
CARDWELL
INGHAM
TOWNSVILLE
CHARTERS TOWERS
RAVENSWOOD
NETHERDALE
ROCKHAMPTON
GLADSTONE
MT MORGAN
MT PERRY
THEODORE
TAROOM
CHARLESTON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HAMILTON IS
DENT IS
SHAW IS
CUMBERLAND ISLES
WHITSUNDAY PASSAGE
LINDEMAN IS
REPULSE BAY
NTH MOLLE IS
WEST MOLLE IS
STH MOLLE IS
LONG IS
PROSERPINE